



Background on: Self-driving cars and insurance

Auto | Technology

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Overview

Each new generation of cars is equipped with more automated features and crash avoidance technology. Indeed, many of today's high-end cars and some mid-priced ones already have options, such as blind-spot monitoring, forward-collision warnings and lane-departure warnings. These will be the components of tomorrow's fully self-driving vehicles.

Since most car crashes are caused by human error, in theory, taking control of the moving vehicle away from the driver is expected to drastically reduce highway fatalities. Â Â

Except that the number of crashes will be greatly reduced, the insurance aspects of this gradual transformation are at present unclear. However, as crash avoidance technology gradually becomes standard equipment, insurers will be able to better determine the extent to which these various components reduce the frequency and cost of accidents. They will also be able to determine whether the accidents that do occur lead to a higher percentage of product liability claims, as claimants blame the manufacturer or suppliers for what went wrong rather than their own behavior. Liability laws might evolve to ensure autonomous vehicle technology advances are not brought to a halt.

The progress towards full automation

The Society of Automotive Engineers (SAE) International has developed a classification system for defining driving automation for motor vehicles. This system has been adopted by the U.S. Department of Transportation and the United Nations. There are six levels of automated driving ranging from no automation to full automation. For most drivers there will be a steady progression from a minimally or semi-automated car to the next level.

Experts vary as to when the changeover to self-driving cars will occur. A transport scholar at the University of Minnesota believes that by 2030 every car on the road will be driverless.

A Status Report from the Highway Loss Data Institute (HLDI) suggests that it could take as long as three decades for 95 percent of all registered cars to be equipped with crash avoidance systems. Forward-collision warning systems have been available since 2000, HLDI says, and if they follow their current trajectory, they will not be available in most cars until 2049.

According to the Insurance Institute for Highway Safety, it is anticipated that there will be 3.5 million self-driving vehicles on U.S. roads by 2025, and 4.5 million by 2030. However, the institute cautioned that these vehicles would not be fully autonomous, but would operate autonomously under certain conditions.

A survey by IEEE, of more than 200 experts in the field of autonomous vehicles found that of six possible roadblocks to the mass adoption of driverless, these three were ranked as the biggest obstacles: legal liability, policymakers and consumer acceptance. Cost, infrastructure and technology are less of a problem. When respondents were asked to specify the year in which some of today's commonplace equipment will be removed from mass-produced cars, the majority said that rear view mirrors, horns and emergency brakes will be removed by 2030, and steering wheels and gas/brake pedals will follow by 2035.

Laws and regulations

Federal Regulations: On September 12, 2017, the U.S. Department of Transportation released revised voluntary guidelines for companies developing self-driving cars. Manufacturers are "encouraged" but not required to submit to voluntary federal assessments.

In February 2014 federal agencies approved vehicle-to-vehicle (V2V) communications systems that will allow cars to "talk" to each other so that they know where other vehicles are and can compensate for a driver's inability to make the right crash avoidance decisions because of blind spots or fast-moving vehicles. V2V communication uses a very short-range radio network that, in effect, provides a 360-degree view of other vehicles that are nearby. The Department of Transportation estimates that safety systems using V2V communications will be able to prevent 76 percent of crashes on the roadway.

State Laws: The National Conference of State Legislatures (NCSL) has a autonomous vehicles legislative database providing information about state autonomous vehicle legislation.

Public attitudes

An Insurance Information Institute Pulse survey^Â conducted in May 2016 found that 55 percent of consumers say that they would not ride in a fully autonomous vehicle. Earlier polls found that 50 percent said that a driverless car's manufacturer should bear responsibility in case of an accident, and only 25 percent say that they would be willing to pay more for a driverless car to cover the manufacturer's liability in case of an accident.

In addition, some people who enjoy driving and do not want control to be taken from them may resist the move to complete automation. Already there are some who say they refrain from using the cruise control feature because they prefer to maintain control themselves.

Autonomous vehicle testing

Among the major automakers testing self-driving cars are Audi, Ford, Mercedes, Nissan, Tesla, Toyota and Volvo. Technology companies including Apple, Waymo, Lyft and Uber are also considerably invested in testing autonomous vehicles.

Fatalities involving self-driving cars

In July 2016 the first fatality involving a semi-autonomous vehicle was reported when a collision between a Tesla Motors Model S with Autopilot technology and a tractor trailer led to the death of the Tesla's owner. Tesla said Autopilot sensors failed to detect the truck, turning in front of a Model S, against a bright sky. ^Â The National Highway Traffic Safety Administration concluded that the crash did not result from a flaw in the system, but that the system lacked safeguards to prevent its misuse.

In March 2018, there was a fatal crash involving a Tesla Model X with Autopilot engaged in which the driver was killed when the car collided with a median barrier in California. During the same month, a pedestrian was struck and killed by an Uber-operated autonomous test vehicle.

Automated safety features available now

A 2015 study by the Insurance Institute for Highway Safety (IIHS) has found that improvements in design and safety technology have led to a lower fatality rate in accidents involving late model cars. The likelihood

of a driver dying in a crash of a late model vehicle fell by more than a third over three years, and nine car models had zero fatalities per million registered vehicles. Part of the reason for the lower fatality rate might also have resulted from the weak economy, which led to reduced driving, the IIHS said.

The study, which looked at fatalities involving 2011 model year cars over a year of operation, found that there was an average of 28 driver deaths per million vehicle car years through 2012, down from 48 deaths for 2008 model cars through 2009. Eight years ago, there were no models with a zero death-rate.

The IIHS attributed the lower death rate to the adoption of electronic stability control, which has reduced the risk of rollovers, and to side airbags and structural changes that improve occupant safety. However, the IIHS said, there was a wide gap between the safest and the least safe models, with the riskiest cars mostly small lower cost models.

Data from the Insurance Institute for Highway Safety (IIHS) and Highway Loss Data Institute (HLDI) already show a reduction in property damage liability and collision claims for cars equipped with forward-collision warning systems, especially those with automatic braking. The exact percentage varied depending on the car manufacturer.

Risks of self-driving cars

A 2014 automotive study by IHS, a global information company, entitled “Emerging Technologies: Autonomous Cars—Not If But When” notes two major technology risks, software reliability and cybersecurity.

The risk of an accident is unlikely to be completely removed since events are not totally predictable and automated systems can fail. In addition, the transition from hands-off driving to hands-on promises to be tricky.

Other potential risks include inclement weather, imperfect GPS, outdated infrastructure, and lost jobs.

The impact on insurance

Some aspects of insurance will be impacted as autonomous cars become the norm. There will still be a need for liability coverage, but over time the coverage could change, as manufacturers and suppliers and possibly even municipalities are called upon to take responsibility for what went wrong.

Product liability laws might incorporate the concept of cost-benefit analysis to mitigate the cost to manufacturers of claims, according to a 2014 RAND report. Coverage for physical damage due to a crash and for losses not caused by crashes but by wind, floods and other natural elements and by theft (comprehensive coverage) is less likely to change but may become cheaper if the potentially higher costs to repair or replace damaged vehicles is more than offset by the lower accident frequency rate.

The number of vehicle-related workers compensation claims should drop as will the share of healthcare and disability insurance costs related to auto accidents.

Regulation: Insurance is state-regulated. Each jurisdiction has its own set of rules and regulations for auto insurance (and so far for self-driving cars). Basically, there are two kinds of liability systems. In some states liability is based on the no-fault concept, where insurers pay the injured party regardless of fault, and in others it is based on the tort system. But there are many important differences among the states in the regulations that now exist within each category, see report on No-Fault Auto Insurance. Will the auto insurance system change to be more uniform with the arrival of self-driving vehicles and will the federal government play a larger role? If car manufacturers are required to accept more responsibility for damage and injuries, they might push for a greater role for the federal government to eliminate some of the cost of

complying with the rules of 51 jurisdictions.Â Â Â

Underwriting:Â Initially, many of the traditional underwriting criteria, such as the number and kind of accidents an applicant has had, the miles he or she expects to drive and where the car is garaged, will still apply, but the make, model and style of car may assume a greater importance. The implications of where a car is garaged and driven might be different if there are areas set aside, such as dedicated lanes, for automated driving.

During the transition to wholly autonomous driving, insurers may try to rely more on telematics devices that monitor driver activity. Usage-based insurance (UBI) policies, which depend on data about the driver's behavior submitted by an electronic device in the driver's car, have attracted a smaller than expected percentage of the driving population, possibly because people do not want to be monitored. Approximately 70 percent of all auto insurance carriers are expected to use telematics UBI by 2020.

Liability:Â As cars become increasingly automated the onus might be on the manufacturer to prove it was not responsible for what happened in the event of a crash. The liability issue may evolve so that lawsuit concerns do not drive manufacturers and their suppliers out of business

RAND has suggested a variation on the no-fault auto insurance system. Others foresee something akin to the National Childhood Vaccine Injury Act, a no-fault compensation program for vaccine recipients who suffer a serious adverse reaction when vaccinated. The legislation was passed in 1986 in response to the threat that life-saving vaccines might become scarce or even unavailable if manufacturers, overwhelmed by claims of injury, scaled back or terminated production.

Repair costs:Â While the number of accidents is expected to drop significantly as more crash avoidance features are incorporated into vehicles, the cost of replacing damaged parts is likely to increase because of the complexity of the components. It is not yet clear whether the reduction in the frequency of crashes will lead to a reduction in the cost of crashes overall.Â Â

Automobile ownership appears to be on the decline, and more people in urban areas are opting for public transportation and shared rides. Some people wonder whether when all vehicles are self-driving anyone will own a car. Cars may belong to a company, municipality or other group and may be parked away from the center of the community in a location from which they can be summoned by phone.

A 2014 study by the University of Texas at Austin of how the advent of autonomous cars may change vehicle ownership found that each shared autonomous vehicle (SAV) replaced about 11 conventional vehicles. The study assumed that only 5 percent of trips would be made by SAVs.

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Additional resources:

National Conference of State Legislatures, Autonomous Vehicles State Bill Tracking Database

National Highway Traffic Safety Administration

Brookings Institution, The State of Self-Driving Car Laws Across the U.S.

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