

# Autonomous Vehicle Risk

Out with the old, in with the new

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# Introduction

## Michael Stankard

Automotive Industry Practice Leader  
Aon Risk Services

I challenge you to go for more than a few days without reading something about the developing mega-trend called autonomous vehicles. The media tends to focus our attention on the rapidly advancing technology that is gradually taking away human decision making in a quest for a zero accident driving environment. They're also keen to show how innovations in mobility (a different but related mega-trend) will substantially broaden the options available for our daily transportation needs.

### The mega-trends of automotive technology and mobility

Transportation as we know it is being challenged from almost every perspective. Safety is the primary driver behind the technology arms race that has channeled billions of dollars into R&D investment beginning with the introduction of Advanced Driver Assist Systems (ADAS) features available in mostly luxury vehicles today. Original Equipment Manufacturers (OEM) are challenged with making collision avoidance systems such as emergency brake alert/assist, lane departure warning and blind spot detection affordable for main stream vehicles. In 2016, twenty automakers entered into an agreement with the National Highway Traffic Safety Administration (NHTSA) to make Emergency Brake Assist a standard feature in US vehicles by 2022.

In addition to features built into vehicles, the industry disruptor called "Mobility Services" is attacking the financial inefficiencies of the current car ownership model. This aligns with the demographic and urbanization trends that is making car ownership in large cities a problem for both the young and the old. The average family-owned car sits idle for up to 21 hours per day. Purchasing transportation "by the mile" from a mobility service could not only be more cost effective, but also more convenient and flexible when considering the wide variety of vehicles available to consumers.

With these mega trends stealing the daily headlines, consumers are not hearing enough about topics such as who is going to be responsible for accidents in this new world? How will insurance work? And what role and responsibilities will be required of infrastructure to make this all work?

### Key Highlights

- The mega-trend of autonomous vehicles will result in a dramatic reduction in traditional accidents which are mostly caused by human error, shifting responsibility for remaining claims in the direction of vehicle manufacturers, infrastructure providers and mobility services.
- The report, *Riding the Innovation Wave*, reveals that if autonomous vehicle technology is adopted at even a moderate pace, US motor insurance premiums could decrease by 20 percent by the year 2035 compared to their 2015 levels – and potentially by more than 40 percent by 2050 when it is expected that autonomous vehicles will reach full adoption.

# Autonomous vehicles – looking forward

## Who pays for accidents today?

As we explore where liability for accidents may end up in this rapidly changing environment, it is important to review how it has worked for the past 75-100 years. The sobering fact is that we experience over 3 million accidents per year on US roads. This resulted in an estimated 40,000 deaths in 2016 – a 6% increase over 2015 and a 14% increase over 2014 – the most dramatic two-year escalation in 53 years according to National Safety Council. Just as alarming is the industry estimate that approximately 94% of all accidents are the result of poor human decision making.

With the driver being the responsible party in the large majority of accidents, our insurance and regulatory systems have naturally focused on insurance for the owners of vehicles and their assigned drivers. State by State regulations place responsibility on vehicle owners to purchase minimum amounts of insurance coverage and track each licensed driver's performance via point systems associated with violations. Insurance companies use this information along with a wide variety of demographic information to create rating models. These models determine the probability of an applicant causing a traffic accident during the upcoming policy period. In most states, injured parties and their attorneys look to the at-fault vehicle owner and their insurance company for remedy. The overall model works with the insurance companies paying the majority of claims funded by the premiums and the deductibles of the individual vehicle owners. In a small percentage of cases, the insurance company

who paid the claim can subrogate against another responsible party such as the vehicle manufacturer or infrastructure provider who may have contributed to the cause of the accident.

## Risk, responsibility and insurance in the future

The premise behind autonomous vehicles is built on the hope that they will prevent the 94% of current accidents involving human error from ever happening. This would have a substantial disruptive impact on the current regulatory, legal and insurance industry approach. For example, Personal Automobile Insurance has become the largest segment of the overall insurance industry amounting to 47% of global insurance premiums according to a recent Aon Benfield report. The report, *Riding the Innovation Wave*, reveals that if autonomous vehicle technology is adopted at even a moderate pace, US motor pure premiums could decrease by 20 percent by the year 2035 compared to their 2015 levels – and potentially by more than 40 percent by 2050 when it is expected that autonomous vehicles will reach full adoption.

Who will be responsible for the remaining claims and who will pay for them? If human decision making is completely replaced by machine, then consumer (autonomous vehicle owners and passengers) expectations will likely be, "It can't be me, I'm not driving anymore!" It is currently expected that the focus will shift primarily to the vehicle manufacturers and their software and component parts suppliers who are developing the technology that will take on the ominous task of anticipating "all" driving situations that were formally the responsibility of humans.

## Supporting Facts

- In 2016, twenty automakers entered into an agreement with the National Highway Traffic Safety Administration (NHTSA) to make Emergency Brake Assist a standard feature in US vehicles by 2022.
- In 2016 there were an estimated 40,000 deaths on US roads according to the National Safety Council. The industry estimates that approximately 94% of all accidents are the result of poor human decision making.

Now add in the complexity of the “connected vehicle” that facilitates communication between vehicles and with infrastructure. This new dimension of vehicle functionality will also contribute to the overall risk profile of personal vehicle transportation and lead to new accident scenarios and associated liability.

Mobility Services, the portion of the rapidly expanding Sharing Economy that arranges alternative transportation for consumers, has plans to optimize their future business model through the use of autonomous vehicles. Their exposure to liability will likely increase if they take on the role of owner/operator of large vehicle fleets.

It will take time, but the cost of insurance for individual vehicle owners will gradually be reduced as autonomous vehicle technology proves its value in substantially reducing human caused accidents. Conversely, while manufacturers and infrastructure providers will also benefit from the lower frequency of accidents, they are likely to experience increases in regulatory requirements related to liability and insurance as well as a higher cost-per-claim related to more severe accidents. One contributing factor will be the vast amounts of pre and post collision data captured by each vehicle. Today’s human caused accidents rarely provide certainty around what factors contributed to a collision. Not only will data collected by vehicles of the future provide precise information on accident situations, reducing uncertainty in the insurance underwriting process, but it will also lead to a less complex claim resolution process between the involved parties.

#### **Where does infrastructure fit in?**

Infrastructure will play a key role in bringing this all together to a workable solution. As it exists today, infrastructure providers will be required to provide safe roads to accommodate moving traffic. However, signage and lane markings will need to be repurposed for direct communication with vehicle

sensors and cameras, rather than only available for human viewing. Similar to current day, if these signs and markings are designed and installed improperly, infrastructure builders and operators may be held liable. A significant challenge that has already been identified is the inconsistency of physical materials (paint, reflectors and metal) used across state and local roads combined with the varying sensor technology used by each vehicle OEM.

In addition to the preparation of the physical roads, one of the most significant risks facing infrastructure providers will be the digital communication to vehicles at an intersection. Today, four vehicles approaching and intersection rely on the human driver to interpret the signaling (static signs or variable traffic lights) to make decisions on vehicle priority. In the future, vehicles will be in communication with each other combined with digital signaling from local infrastructure to manage intersection safety and traffic flow. This more complex responsibility could lead to incremental liability all levels of government and their subcontractors.

Lastly, parking will also become a disrupted by-product in the autonomous vehicle world. Mobility services that will keep vehicles in virtually continuous use throughout the day will make current parking infrastructure largely redundant. Those vehicles needing to be parked will have the capability of self-parking at less-costly remote locations thus eliminating the need for convenient parking in close proximity to the passenger’s destination. Future parking spots will also be expected to come equipped with electric charging stations (likely the fuel of the future) capable of recharging a vehicle without human interaction.

**Fasten your seats belts, as we are in for big changes over the next decade in how we transport through our daily lives. It’s happening fast - we can’t wait for tomorrow’s news.**

# Contacts

**Mike Stankard**

Managing Director |  
Industrial & Materials Practice  
Automotive Practice  
248.936.5353  
Mike.Stankard@aon.com

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Aon plc (NYSE:AON) is a leading global professional services firm providing a broad range of risk, retirement and health solutions. Our 50,000 colleagues in 120 countries empower results for clients by using proprietary data and analytics to deliver insights that reduce volatility and improve performance.

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