

INSURANCE FOR AUTONOMOUS VEHICLES: WHO WILL DRIVE THOSE RISKS?



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After years of starts¹ and stops,² autonomous vehicles (AVs) have again started to roll on American streets. Some AV makers appear to have moved beyond the original concept of personal self-driving cars to fleet-based business models as the more promising route to viability. Accordingly, two AV companies, with authorization from California regulators, have recently launched autonomous taxi services in San Francisco, with no safety drivers on board.³ Autonomous truck companies have begun testing their long-haul vehicles on Texas highways with backup safety drivers.⁴ And another AV manufacturer has announced testing in 14 cities nationwide, aiming to deliver \$1 billion in revenue in 2025.⁵

Regulatory accommodations are also underway. The National Highway Traffic Safety Administration (NHTSA) recently previewed new rulemaking that would remove caps on AV fleets in exchange for companies sharing performance data⁶ and has announced a new Office of Automation Safety to consolidate its rulemaking efforts.⁷ The Arizona Department of Transportation set up relatively simple regulatory requirements to operate an AV without a backup driver, requiring only the submission of a law enforcement interaction plan and a written statement attesting to compliance with applicable law and a NHTSA exemption.⁸

In theory, the renewed push for driverless vehicles should be a boon for traffic safety. Over 90 percent of driving accidents are currently attributed to human error,⁹ and removing human drivers from behind steering wheels should dramatically reduce those accidents. In practice, however, safety risks remain inescapable. For example, as autonomous taxis have rolled out in San Francisco, complaints about AV-related offenses have rolled in, ranging from striking pets to interfering with city fire trucks racing to emergencies.¹⁰ Moreover, novel AV technology introduces novel privacy and cybersecurity risks.¹¹ And the risks from human interference or downright sabotage cannot be discounted. In San Francisco, for example, protestors concerned about safety risks, as well as job displacement, have taken to putting traffic cones on top of AVs to paralyze them in their tracks.¹²

Thus, the crucial question for AV-industry stakeholders is: How will the inevitable risks of AV-related accidents be distributed, shifted, or otherwise managed?

This article begins with a brief overview of legislative proposals for alternative compensation schemes for AV-related accidents and looks at what currently seems the more likely near- and middle-term scenario: the adaptation of existing commercial insurance products to AV risks. It then addresses personal auto insurance as a potential first-line form of accident compensation. It discusses the potential role of tort law in assigning and allocating responsibility for AV-related losses and reviews the types of commercial insurance and other risk-management solutions that corporate stakeholders—such as AV manufacturers and AV fleet owners or operators—will need for the liability risks they may face, whether from direct claims by accident victims or from subrogation claims by insurers. It concludes by anticipating some of the issues that insurers can be expected to face in adapting pre-existing commercial insurance products to a world in which AVs increasingly rule the roads.

ALTERNATIVE COMPENSATION SCHEMES

AV technology raises a unique set of issues for current liability schemes. Most states have established a regime in which crash victims seek compensation through the tort liability of a negligent driver.¹³ As discussed below, if a vehicle malfunction causes an accident, victims seek compensation through products liability claims against the auto manufacturer.¹⁴ This tort liability system is a somewhat awkward fit for fully self-driving vehicles, because the current tort law conception of driver “fault” does not contemplate vehicle automation or driving decisions made by artificial intelligence. The personal auto insurance system is built on similar notions of driver responsibility (e.g., auto insurance companies factor a human policyholder’s accident history into their premiums).¹⁵ The identification and allocation of fault may be particularly difficult in crashes involving both conventional and fully autonomous vehicles.¹⁶

Scholars have proposed a range of alternative compensation schemes to address the unique issues that AV liability presents. Several notable proposals would introduce strict liability for bodily injury in AV accidents. Kenneth Abraham and Robert Rabin’s Manufacturer Enterprise Responsibility scheme would collect federal fees from manufacturers (eventually based on crash frequency) to reimburse personal auto insurance companies for claims.¹⁷ Alternatively, Tracy Pearl Hresko looks to the National Vaccine Injury Compensation Program as a model for NHTSA to both process and pay claims out of a manufacturer-funded compensation program.¹⁸ Tort law scholar Kyle Logue would broaden the concept of enterprise liability even further, extending the compensation program to all transportation-related accidents and thus eliminating disparate treatment of fully autonomous and conventional vehicles; under this proposal all vehicle manufacturers would directly reimburse victims of accidents involving their vehicles, regardless of the cause or level of automation involved.¹⁹

These proposals for alternative compensation schemes offer compelling mechanisms to align liability with risk, incentivizing manufacturers to invest in safety. If current state and federal action is any

indication, however, such proposals are a distant prospect. Proposed federal legislation to establish even basic principles for state regulation of AV development has failed to pass.²⁰ Meanwhile, NHTSA to date has focused for the most part on research and voluntary guidance with respect to AVs.²¹ Even the one AV-related rule NHTSA has finalized does not address automation per se, but merely revises pre-existing collision safety standards by removing references to a driver's seat, steering wheel, and other traditional vehicle components that may be absent from fully autonomous vehicles.²² Thus, it appears unlikely that alternative compensation schemes through legislation or regulation will gain the necessary political traction to displace the current tort liability regime any time soon.

A RAND Corporation survey of industry participants across automobile manufacturers, AV start-ups, insurance companies, and state and federal governments found a high degree of skepticism about alternative compensation schemes as a realistic option in the near future.²³ For example, no industry experts in the RAND study considered a national no-fault system likely to succeed, while only 23 percent thought a state no-fault system likely.²⁴ Instead, "a large majority of stakeholders, including those who anticipated changes in the insurance industry, thought that the status quo would persist for the foreseeable future."²⁵ The majority of stakeholders across sectors believed that "the existing insurance framework would be able to adapt to the deployment of AVs."²⁶

AUTO INSURANCE

Individual Auto-Owner Coverage

Over the past several years, many have suggested that AVs will shift vehicle liability away from claims based on the current system of personal auto insurance. For example, a 2017 article in the Harvard Business Review predicts that two AV-related factors will reduce the need for individual auto insurance.²⁷ First, the shift away from privately-owned vehicles to fleet-based ownership could reduce the number of individual vehicle owners, and that, in turn, will likely reduce the number of policyholders. Second,

since as many as 94 percent of accidents are attributed to human error, both the number and severity of accidents are predicted to drop, which will also reduce premiums as insurers adjust pricing to match risk. Similarly, a 2017 KPMG study predicts that personal auto insurance will shrink by roughly \$137 billion in nominal dollars by 2050.²⁸ More dramatically, a 2016 Deloitte analysis modeled the personal auto insurance market with and without AVs to estimate a reduction of roughly \$305 billion in personal auto insurance premiums by 2040.²⁹

Though some have called AVs an existential threat to the auto insurance industry, at least some auto insurers see new opportunities. The Travelers Institute, a unit of the major auto insurer, issued a white paper in January 2021 (updating a similar 2018 white paper³⁰) that weighs conventional auto insurance against the product liability regime and concludes that auto insurance is the preferred first-instance solution for AV protection.³¹ First, Travelers asserts that the auto insurance system generally works well as designed to compensate victims for bodily injury and property damage in a relatively quick, fair, and efficient manner, with which consumers are already familiar. Second, Travelers points out that continuing to rely on a conventional auto insurance model will "help to ensure consistency during the long period in which AVs and driver-operated vehicles share the road."³² Additionally, personal auto insurers will continue to seek subrogation after paying claims that involved product defects. Travelers notes that subrogation "creates an incentive for AV manufacturers to design and build safer vehicles, which is a key benefit of this system."³³

In contrast, Travelers argues, the tort and product liability system is poorly structured to serve as a primary compensation mechanism.³⁴ A product-liability-only compensation regime for AV accidents would force consumers into complex and lengthy litigation even for fender benders. Such a regime would be too costly for victims in most instances, the report concludes, and would likely result in under-compensation. Further, as the RAND report concludes, the "sheer volume of auto crashes requires a vast infrastructure of specialists who

resolve, adjudicate, and repair the damage from these claims,” a role for which “[i]nsurers have considerable specialized expertise.”³⁵

Given these advantages of the traditional personal auto insurance policy, the Travelers report recommends that: (i) the existing auto insurance infrastructure be extended to AVs; (ii) that AV auto insurance be mandatory; and (iii) that mandatory policy limits be increased to account for the more expensive technology in AVs. The RAND report similarly found that expensive sensors and other AV technologies would increase the cost of accidents, and thus, the necessary coverage limits, though lower collision frequency could help to counteract this concern.³⁶ At least in the near-term, therefore, it appears likely that personal auto insurance could continue to play an important role in vehicle liability for both autonomous and conventional vehicles.

Adapting Current Auto Policy Forms to AVs

Given the likelihood that personal auto insurance will be a primary means to compensate AV liability, it is important to consider potential ambiguities in current personal auto insurance policies that insurers should clarify before offering AV coverage. The American Association of Insurance Services (AAIS) publishes standard policies that insurers commonly use as the basis for their policy wordings.³⁷ The AAIS standard personal automobile policy forms present several policy exclusions that should be updated for AV coverage, such as exclusions for losses to electronic equipment and data signals, as well as gaps in supplemental coverage for such equipment.

First, the standard personal automobile form excludes “loss to any electronic equipment that is designed to reproduce, receive, or transmit audio, visual, or data signals.”³⁸ The policy clarifies, however, that “this exclusion does not apply to such equipment that is permanently installed.”³⁹ This provision appears designed to exclude additions such as after-market car stereo systems and police scanners.⁴⁰ For example, a court in 1979 found the exclusion language “plain and unambiguous” as applied to radio systems, including where removal “involved

the disconnection of electrical and aerial wires.”⁴¹ Courts at that time certainly did not contemplate the types of technology that automated driving systems would introduce to personal automobiles.

Although AV manufacturers have achieved cost reductions in expensive electronic equipment such as Light Detection and Ranging (LiDAR) sensors (e.g., one AV manufacturer has reported reducing its sensor cost from \$75,000 to \$7,500), electronic guidance equipment is an expensive—and essential—AV component.⁴² Thus, failure to clarify the electronic equipment exclusion could significantly affect the value of a personal auto policy to AV policyholders.⁴³ In coverage disputes, courts have interpreted “permanently installed” equipment provisions by considering “the physical complexity of the installation process and the manner in which the [equipment] is affixed to” the insured property.⁴⁴ While an automated driving system would likely be installed “permanently” in new AVs, certain types of AV development could challenge this assumption. For example, some AV technology companies will install their systems on conventional vehicles purchased from manufacturers, or even sell aftermarket kits that allow consumers to convert their conventional vehicles into AVs.⁴⁵ “Permanently installed” exclusionary language that was drafted for an entirely different type of equipment would be an awkward fit in the context of electronic guidance systems, especially if the consumer installed the system and the car could be converted back to a conventional vehicle.

Additionally, standard personal auto policies exclude “loss to any tapes, records, discs, or other media used with any electronic equipment that is designed to reproduce, receive, or transmit audio, visual, or data signals.”⁴⁶ AVs will rely on vast amounts of data to navigate the driving environment.⁴⁷ At higher levels of automation, AVs will utilize artificial intelligence systems to decide on routes and handle new environments.⁴⁸ In such scenarios, it is possible that new data uploads will become a part of repair bills after AV accidents, and policyholders may seek personal auto insurance policies that do not exclude data loss. Commentators have also discussed who will “own” AV data due to its anticipated economic

value and have proposed that the data should be owned by the AV user.⁴⁹ If AV users are able to monetize their driving data, they will likely seek personal auto insurance policies that include coverage for such data.

Individual policyholders may also look to supplemental coverage with language such as the AAIS' Audio, Visual, or Data Electronic Equipment Coverage.⁵⁰ Such supplemental auto coverage would typically fill the gaps created by the standard personal auto policy's exclusions. Automated driving systems may, however, fall in a unique gap between these two types of policies. The supplemental policy covers permanently-installed electronic equipment without applying a deductible, but specifically excludes electronic equipment "that is essential to the normal operation of a 'covered auto', a 'non-owned auto', or the operating system of a 'covered auto' or 'nonowned auto'."⁵¹ To the extent an automated driving system is permanently installed, it could certainly be considered "essential to the normal operation" of the AV. As insurance companies and AV users prepare for new levels of automation, it will be important to review personal auto insurance policies carefully and ensure that language clearly indicates which portions of the AV are covered, and to what extent supplemental coverage for deductibles or higher policy limits will be available.

The Manufacturers' Alternative to Traditional Auto Insurance

In late 2019, Tesla announced the launch of Tesla Insurance, advertising premiums 20 to 30 percent lower than average conventional auto premiums through the use of Tesla data reporting.⁵² As General Motors launched its own insurance offering, OnStar Insurance Services, in 2022, its president highlighted the "opportunity to participate in the insurance ecosystem in ways [manufacturers] haven't had in the past" due to manufacturers' "access, [] understanding of the technology that's coming for vehicles, and the data that comes from those vehicles[.]"⁵³ In 2022, Ford and State Farm launched a partnership to provide another usage-based car insurance

offering called the Drive Safe & Save Connected Car program.⁵⁴

This new trend presents intriguing possibilities for reducing transaction costs in the auto accident compensation system. First, as the Tesla announcement noted, the manufacturer's direct access to vehicle operation data (now called "telematics") would, at least in theory, permit it to price its insurance product more precisely than a traditional auto insurer—even an insurer that has persuaded its customer to install a data tracking device on the car in exchange for a small premium concession. Second, direct manufacturer-issued insurance eliminates the need for subrogation litigation to reallocate AV-related losses: if the insurer and the product manufacturer are one and the same, then the initial loss is—again in theory, and ignoring the role of reinsurance and a host of other factors—allocated to the maker of the allegedly defective product. Finally, a manufacturer-insurer is in a position to draft policy forms from a clean slate, precisely tailoring them to its product, and unencumbered by provisions dating from a different era and a different set of automotive technologies.

What may preserve the traditional auto insurance industry's edge, however, is its long experience in claims-handling and its well-established structure for processing and compensating claims with reasonable efficiency. If traditional insurers can remain nimble in adapting their underwriting processes and their policy forms to the novel challenges of highly automated vehicles, then they may be able to compete effectively with upstart insurance products from the auto industry.

COMMERCIAL INSURANCE FOR MANUFACTURERS AND SERVICE PROVIDERS

For AV-related accidents, litigation seeking reallocation of loss through tort liability—whether lawsuits brought by creative plaintiffs' lawyers seeking primary reallocation or subrogation claims brought by auto insurers seeking secondary reallocation—seems inevitable for at least the short and medium terms. And the costs of that litigation can be

expected to be high. In the past, the law has sometimes taken many decades to adapt to new technologies, because it takes time for the costs and harms of the emerging technologies to become evident and for the causal links between particular technologies and resulting harms to be established.⁵⁵ We explore next the liability risks that AV manufacturers are likely to face and the forms of commercial insurance that may cover these risks—or that will need to adapt to cover them adequately.

Direct Products Liability Claims

AV deployment is likely to expand the number and types of products liability claims against manufacturers arising from vehicle accidents. Currently, only a small share of vehicle accidents trigger products liability claims because the vast majority of vehicle accidents (94 percent, according to NHTSA) are attributed to driver error.⁵⁶ In 2018, however, two highly publicized crashes involved driverless technology, and in both the automated driving system was found partially at fault.⁵⁷ As the role of “driver” shifts from human beings to automated driving systems, products liability claims against manufacturers are likely to take on a more important role in the vehicle liability landscape.⁵⁸

AV technology will inherently present new challenges in determining the cause of accidents. For example, a report by the Center for Democracy and Technology addresses the challenges of determining fault and liability for harms caused by Internet of Things (IoT) products.⁵⁹ The report explains that complex supply chains for the design, manufacture, assembly, delivery, and sale of IoT products will make answering the question “who is liable?” more difficult than for many non-digital products. Accordingly, it predicts that it may be relatively easier to allocate liability for IoT products in sectors where the Original Equipment Manufacturer (OEM)/Value-Added Reseller model is well-established, such as in the automotive industry.⁶⁰

Further complicating matters, however, is the difficulty of defining a defect in the context of automated driving. For example, if a crash occurs because an AV

swerves into a piece of property to avoid hitting a pedestrian, was that property damage caused by an automated driving system defect? If an AV issued a warning for the fallback-ready operator to take control before a crash, can manufacturers argue that the human operator was contributorily negligent?⁶¹

Even when it is clear which vehicle component is at fault for an accident, AVs will create a notable shift in products liability toward claims based on vehicle software defects, as opposed to traditional mechanical defects. Technology company investments and partnerships with AV companies have soared in recent years.⁶² At least nine companies focused on LiDAR technology for AVs have gone public.⁶³ Technology partnerships such as the strategic collaboration between Google Cloud and AV software developer Oxbotica demonstrate the importance of software to the design and operation of AVs.⁶⁴

The first issue is whether product liability doctrines would apply to the automated driving system software. Courts apply strict liability to claims based on defects in a product’s manufacture, design, or warning.⁶⁵ Legal scholars have argued that the “driving automation system and the automated vehicle should be considered products” subject to products liability.⁶⁶ In fact, the shift to products liability for vehicle software has already begun. For example, the introduction of electronic stability control (ESC) software has led to new products liability claims for accidents involving faulty braking. When a driver presses a vehicle’s brakes, “ESC combines data from multiple sources in the car to selectively apply the brakes on a subset of the wheels, leading to increased control on turns and slippery surfaces.”⁶⁷ As this automated feature has become more commonplace in the automobile marketplace, manufacturers have faced claims for *not* providing ESC software to help “steer” the vehicle in a crash,⁶⁸ as well as for ESC defects in vehicles equipped with the software.⁶⁹

NHTSA has also recognized this shift in vehicle defect liability from traditional mechanical hardware to software. In 2011, NHTSA issued Federal Motor Vehicle Safety Standard (FMVSS) No. 126 to require

electronic stability control (ESC) systems in new vehicles.⁷⁰ Then, in 2016, NHTSA issued an Enforcement Bulletin that asserts regulatory authority over vehicle software, including “automated safety technologies” as a component of vehicle safety.⁷¹ NHTSA regulation may impose direct regulatory requirements for new AVs, or as in the case of ESC software in pre-2011 vehicles, provide standards that form the basis of defective design claims when a vehicle lacks the safety-enhancing software.

The automobile production delays due to pandemic-related computer chip shortages in recent years⁷² are illustrative of this steady trend toward the integration of computer software into conventional automobile products; and the distinctions between cyber and physical components in the operation of the vehicle become ever more difficult to discern as we move up the scale of automation to fully autonomous vehicles. As discussed further below, however, the commercial insurance market may be trending in the opposite direction in the wake of the so-called “silent cyber” initiative. With the encouragement of regulators, some insurers are seeking to draw artificial lines between cyber and physical risks and to segregate those risks into separate lines of coverage. Unless commercial insurers can provide unambiguously seamless coverage for both sets of risks in their policy forms for corporate AV stakeholders, those sophisticated insureds may look elsewhere for AV-related risk-management solutions.

Subrogation Claims

Even if personal auto insurance claims rather than direct products liability claims are assumed to be the dominant source of first-instance compensation for losses from AV-related accidents, secondary reallocation of those losses remains likely. If a vehicle component is found at fault for an accident, personal auto insurers will likely seek subrogation against the manufacturers involved.

Notably, the United Kingdom has enacted an AV law that replaces direct products liability claims against manufacturers with a requirement that claimants turn to the existing personal auto insurance scheme.⁷³

The UK Automated and Electric Vehicles Act of 2018 then provides insurers a right of recovery against AV manufacturers under currently existing common and products liability laws.⁷⁴ The Act appears to be the first of its kind and could well become a model for other common-law jurisdictions.

Establishing responsibility for AV-related accidents in particular cases can be expected to require highly sophisticated investigations into the roles played by specific components in the vehicle and by the algorithms buried within them. The UK Automated and Electric Vehicles Act of 2018 does not expressly address the details of the subrogation remedy, and it is still unclear how existing UK products liability law will respond to the legal challenges posed by AV technology.⁷⁵ The same is true in the US. Therefore, we can expect AV-related product litigation to entail disputes over both the applicable legal rules and the nitty-gritty details of individual accidents.

As discussed above, AV manufacturer-issued insurance policies would, in theory, short-cut the need for subrogation claims by eliminating the distinction between the first-line source of accident compensation and the secondary source of reallocation. The devil, however, may lurk in the details of those manufacturer-issued policies and the reinsurance structures that may lie behind them. Time and experience will tell whether this novel development in the insurance world can reduce the overall transaction costs of loss compensation for AVs.

Transportation as Service

As the recent deployment of driverless taxis in San Francisco may illustrate, AVs may accelerate the current shift from transportation as a consumer product (i.e., individual car ownership) to transportation as a service. Auto manufacturers, as well as technology and ride-sharing companies, have begun to explore transportation networks where AVs pick up and drop off customers, on a subscription or ride-hailing basis.⁷⁶ AVs will provide advantages over conventional vehicles, but these advantages come at a price; one manufacturer’s CEO has estimated that its AV would cost nearly \$200,000.⁷⁷ A shift from

personal vehicle ownership to transportation as a service would reduce the access cost for those who wish to ride in AVs and, even if AVs become more affordable, improve efficiency by reducing the number of vehicles that sit idle.⁷⁸

Such a shift toward transportation as a service, however, also raises the prospect of expanding commercial liability. Personal auto insurance typically excludes coverage for accidents that occur when drivers are working for transportation networks.⁷⁹ Instead, most state laws require companies to provide insurance for their drivers.⁸⁰ Further, customer disclaimers are unlikely to be effective to reduce liability in the context of AVs as a service. Whether the company operates as a transportation network service or a vehicle subscription service, “the implied warranty of merchantability has merged into strict liability in most jurisdictions.”⁸¹ Courts are also likely to give great weight to the public interest in AV safety in evaluating even limited waivers.

Companies touting safety benefits will expect AV accidents to occur less frequently than accidents involving conventional vehicles, but the higher cost of each vehicle increases the cost of each accident. In response, AV service providers and manufacturers may seek to supplement or replace conventional commercial insurance policies. For example, the Product Liability Risk Retention Act of 1981 allows manufacturers to self-insure through captives or risk retention groups.⁸² A Deloitte report predicts that “[a]utonomous vehicle manufacturers and commercial fleet operators may reach a scale that allows them to self-insure in ways similar to what large transportation and logistics companies do today.”⁸³ Such an approach may also allow commercial fleet operators to pursue a hybrid approach, wherein they self-insure for typical accidents and purchase commercial insurance policies with high deductibles for catastrophic network-wide events.

BUMPS IN THE ROAD AHEAD?

As with any emerging technology, AVs are likely to lead to coverage disputes if insurance policy forms drafted in a different era fail to adapt to the novel

risks of AV technology. This section explores a few of the challenges that insurers and policyholders might encounter where existing standard-form policies fail to fit the AV risks they are sold to protect against.

“Silent Cyber” and “Cyber Silos”

AVs present cyber risks both as a form of vehicle malfunction (e.g., a glitch in the automated driving algorithm causes an accident) and in their potential susceptibility to hacking or other interference by malicious actors.⁸⁴ In addition, the many terabytes of data that AVs must collect and process, not only to navigate but also to adapt to user needs and preferences, may also present data privacy and cybersecurity risks.⁸⁵ NHTSA too has recognized cybersecurity as a major risk factor for all automated vehicles.⁸⁶ Therefore, if AV fleet operators or AV manufacturers wish to manage these novel AV-related risks through commercial insurance, they will need policies that seamlessly cover cyber-related perils and harms along with traditional physical harms.

A potential roadblock is the so-called “silent cyber” movement, which came to the fore in 2017 as a Supervisory Statement from the UK’s Prudential Regulatory Authority.⁸⁷ Insurance regulators in the US, including most recently the New York Department of Financial Services,⁸⁸ have followed suit, either requiring or encouraging insurers to address with greater clarity the “silent cyber”—also known as “non-affirmative cyber”—coverage that their traditional all-risks policy forms may provide.⁸⁹

For example, AV fleet owners may seek first-party property coverage for physical damage to AVs under traditional commercial “all risks” policies that do not specifically exclude cyber-related perils. But some property insurers have argued that these policies were only priced for property damage from traditional physical perils, such as broken windows or damage caused by a fire—even though they explicitly cover “all risks” of property damage except for those excluded.⁹⁰ In response to claims of cyber-physical losses as well as the “silent cyber” regulatory initiative, many commercial insurers have

started to introduce exclusions that purport to draw lines between property and cyber risks by excluding cyber coverage and offering separate, supplemental cyber coverage.⁹¹

The concern from the insurers' perspective is understandable. Some commentators have opined that standalone cyber policies for AV fleets are "likely to be very expensive because they involve catastrophic peril."⁹² Others have noted the challenge of pricing the risks of connected networks that could potentially result in widespread infrastructure damage from hacking by malicious actors.⁹³

From the perspective of corporate policyholders, however, if—in addition to high premiums—they face uncertainty over whether the cyber and physical risks of AVs will actually be covered under commercial insurance forms, then AV manufacturers and fleet owners may simply choose to forgo commercial insurance and look to other risk management tools. Commercial insurers' general liability and cyber policy forms already contain exclusions that do not always fully align. For example, most cyber forms are well-suited for privacy and data breach claims, but expressly exclude physical bodily injury and property damage, under the assumption that those risks are covered under the insured's general liability policies. But the latter policies often contain a standard exclusion aimed at data breaches that some insurers have sought to stretch more broadly to physical harm from cyber-related causes; and even more explicit cyber-related exclusions can be expected in response to the "silent cyber" regulatory push.⁹⁴

What corporate stakeholders in the AV industry need, however, is seamless coverage for the inextricably intertwined cyber and physical risks of AVs—not insurance products that attempt to put those risks into separate silos in the form of separate lines of coverage that may or may not mesh precisely. If asserted coverage gaps between cyber and traditional "all risk" policies appear, then the cyber-physical losses inherent in networked products like AVs would lead, at best, to frequent coverage

disputes and unreliable protection for corporate policyholders.⁹⁵

Some insurers and brokers have advertised insurance products, such as Marsh's Cyber CAT form, aimed at providing seamless cyber-physical coverage.⁹⁶ Such policies are promoted as providing "Internet of Things coverage for negligence in the design or manufacture of an IoT product and/or service," "[p]roperty damage to tangible property caused by a cyber event," and "[b]odily injury and property damage liability resulting from a cyber event."⁹⁷ Thus far, these seamless insurance products do not appear to be widespread in the insurance marketplace. But if commercial insurers hope to capture the business of the major corporate stakeholders in the growing AV market, they will need to respond to the need for unambiguously seamless cyber-physical coverage terms. If the current trend toward "cyber silos" continues, then the major AV players will self-insure or form risk retention groups rather than pay for unpredictable insurance protection.

Fortuity Issues

The traditional "expected or intended" exclusion illustrates how longstanding insurance concepts may need to be reviewed in the context of fully autonomous vehicles. This longstanding provision in standard general liability policies excludes coverage for "'[b]odily injury' or 'property damage' expected or intended from the standpoint of the insured."⁹⁸ It implements the fundamental concept of fortuity in insurance: one cannot be rewarded by insurance for a loss intentionally caused. A human driver whose mere negligence causes an accident will not trigger this exclusion. But how will insurers and courts apply this exclusion in the context of intentionally coded algorithms in automated driving systems that happen to result in accidents? Courts have established that "robots cannot be sued," but a manufacturer may face products liability claims for a robot's actions.⁹⁹ Will bodily injury or property damage resulting from an intentionally designed decision-making process in the robot "driver" somehow be deemed "expected or intended"?

One popular illustration of the challenges in coding AV guidance systems is the (anachronistically dubbed) Trolley Problem—the classic philosophical dilemma whereby a runaway trolley is headed toward a group of five people, and an operator must decide whether to divert the trolley’s path to hit another single person instead.¹⁰⁰ Similarly, an AV system’s coding may prioritize a course of action to minimize ethical harm, such as detecting the presence of a crowd of people and swerving to hit a smaller number of people.¹⁰¹ Academic critics of this application of the Trolley Problem have pointed out that no decision in a fast-paced and uncertain environment will present an absolute either/or option, and that AVs should be designed to minimize the risk of harm in the same way a human driver seeks to avoid crashing.¹⁰² But the claims against AV manufacturers may challenge that academic wisdom.

Courts typically apply the “expected or intended” exclusion using a subjective standard, so that “coverage is excluded only if the insured actually expected or intended the consequent damage or injury.”¹⁰³ Some courts, however, have instead applied an objective standard, asking whether the insured was aware that the injury could occur to infer intent.¹⁰⁴ But how do these concepts apply when an automated driving system was programmed to take an action that leads to property damage or bodily injury, but the insured argues that the coding did not trigger the specific intent to cause the damage or injury itself?

Regardless of how well an automated driving system is designed, it is possible that an AV will deviate course “intentionally,” with or without ratification by the vehicle owner. In addition to the AV manufacturer’s software, insurers may focus on the vehicle user’s actions. As in debates surrounding the Trolley Problem, insurers may attempt to draw a line between actions taken by an AV (i.e., the runaway trolley hitting the crowd) and those where the fallback-ready user changes the AV’s course of action intentionally (i.e., pulling the lever). The option to minimize overall harm could, counterintuitively, be the option most likely to lead to coverage disputes

under the standard wording of the expected or intended exclusion.

As machine coding begins to replace human decision-making, or even simply changes the default option for fallback-ready users, it will be important to clarify the scope and application of “fortuity” exclusions such as this one. Again, failure to do so could motivate corporate policyholders to seek alternative risk management solutions.

Discovery Challenges

In addition to issues that may arise if common current policy language is not adapted to the AV context, policyholders and insurers may face novel discovery challenges if and when litigation begins. For example, AVs collect massive amounts of data; an eight-hour driving shift can create more than 100 terabytes of data.¹⁰⁵ Under the Federal Rules of Civil Procedure, litigants must maintain relevant data when they become aware of the possibility of a lawsuit in order to avoid spoliation.¹⁰⁶ A products liability claim by an AV user or insurer seeking subrogation would require extraordinary amounts of data storage and analysis. NHTSA regulates the storage of data from the seconds before and after a crash through event data recorders (EDRs), “to help ensure that EDRs record, in a readily usable manner, data valuable for effective crash investigations and for analysis of safety equipment performance.”¹⁰⁷ Although current NHTSA regulation of EDRs is based on the amount of data collected by a conventional vehicle,¹⁰⁸ insurance companies such as State Farm have already begun to apply EDR requirements to automated driving systems in an expansive manner: “Insurers should have access to ADS information and data – including crash accident and incident information and data – that is timely, complete and useful.”¹⁰⁹

Insurer requests for the data collected by AVs will also raise privacy issues. The vast quantities of data that AVs must collect and transmit in the normal course of navigation will inevitably include data that may be deemed protected, such as video streams of pedestrians and vehicle passengers.¹¹⁰ As AVs

become increasingly connected, vehicle-to-vehicle communications will exacerbate this challenge. IBM has noted that a wide variety of data can be collected from a connected auto, including data about the driver and their use of the car, data from any applications within the vehicle, and data from the connected vehicle's navigation services.¹¹¹

A patchwork of privacy laws, such as the Health Insurance Portability and Accountability Act (HIPAA) and the California Consumer Protection Act (CCPA) (along with more recent legislation in other states modeled on the CCPA), could raise conflicting legal requirements between investigation or discovery obligations and privacy law.¹¹² Because a major advantage of AV technology is the ability to improve transportation accessibility for disabled passengers,¹¹³ HIPAA requirements will be a particularly important consideration for AV companies prompted to disclose passenger-related data. AV fleet owners and

manufacturers will need to implement thoughtful strategies to ensure that data disclosure to insurers does not run afoul of privacy regulations.

CONCLUSION

While the day when AVs dominate the roads has still not arrived, it is not too early for AV stakeholders to consider strategies to manage and mitigate AV-related risks. Securing adequate insurance protection for costly AV-related products liability litigation may require expert insurance coverage analysis, both at the underwriting stage and at the claim stage. Current standard insurance offerings were not drafted with an eye to artificially intelligent products. They will require careful review and adaptation—whether by insurers or by sophisticated insureds and their lawyers and brokers—to adapt them to the brave new world of driverless cars. 🚀

Notes

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