WARRANTIES AND PREEMPTION IN THE AGE OF AUTONOMOUS VEHICLES UNDER US LAW

ABD HUKUKU UYARINCA OTONOM ARAÇLAR ÇAĞINDA TEKEFFÜLLER VE FEDERAL HUKUKUN ÜSTÜNLÜĞÜ

Araştırma Makalesi

Atilla KASAP*

ABSTRACT

Autonomous vehicle (AV) technology promises society many social, economic, and environmental benefits. It is crucial to examine the legal environment behind this breakthrough technology. Under US law, where the AV technology is most regulated, this Article delves into two critical legal issues AVs will face: i) law of warranties and ii) preemption of state common law claims. This Article argues that the role of warranty claims would be limited because most AVs will not be sold to the public in the first years, meaning that there will be no express or implied warranties. However, we will likely witness AVs will be sold to the public at some point in the future. When this happens, express or implied warranties will arise in the contract between the buyer and the seller. Preemption of common law claims, including those relying on warranties, would bring complex and uncertain problems as to whether these claims are preempted by federal law on AVs. Since previous preemption cases related to conventional motor vehicles involved specific designs, this Article asserts that performance-oriented standards—assessing whether an AV drives more safely than a conventional vehicle—will work around unpredictable preemption questions. Moreover, if the threat of future litigation becomes too great for AV manufacturers, federal preemption could limit AV manufacturers' liability for compensation to injured plaintiffs. These proposals will constitute pragmatic and efficient solutions to the preemption-related, complicated and uncertain problems.

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Dr., Ondokuz Mayıs Üniversitesi Medeni Hukuk Ana Bilim Dalı.

E-posta: atilla.kasap@omu.edu.tr

ORCID: 0000-0002-8130-9776

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Keywords: autonomous vehicles, law of warranties, disclaimers, preemption.

ÖZ

Otonom araç (OA) teknolojisi topluma birçok sosyal, ekonomik ve çevresel faydayı vaat etmektedir. İnovasyonun sürekliliğinin önünü açmak için bu çığır açacak teknolojiyi düzenleyen hukuki çerçeveyi incelemek önem arz etmektedir. Bu makale, OA teknolojisinin en çok düzenlendiği yer olan ABD hukuku uyarınca, OA'ların karşılaşacağı i) tekeffüller hukuku ve ii) federal hukukun eyalet içtihat hukukuna üstünlüğü şeklindeki iki hukuki sorunu incelemektedir. OA'ların çoğunun ilk yıllarda halka satılmayacağı ve bu nedenle açık veya zımni tekeffül oluşmayacağını tahmin ederek bu makale OA'ların sebep olacağı kazalarda tekeffül hukukuna ilişkin taleplerin rolünün sınırlı olacağını öngörmektedir. Diğer yandan gelecekte bir noktada OA'ların halka satılacağına tanık olacağız. Bu gerçekleştiğinde ise alıcı ile satıcı arasında yapılacak sözleşmede açık veya zımni tekeffüllerin doğacağını öngörebiliriz. Bu ihtimalde tekeffüllere dayanan davalar da olmak üzere eyalet hukuku kapsamında getirilecek davaların federal hukuk tarafından üstün gelip gelmediğine ilişkin karmaşık ve belirsiz sorunları beraberinde getirecektir. Motorlu araçlarla ilgili önceki federal hukukun üstünlüğüne ilişkin davalar spesifik tasarımları içerdiğinden, bu makale bir OA'nın geleneksel bir araçtan daha güvenli sürüp sürmediğini değerlendiren performans odaklı standartların getirilmesinin federal hukukun üstünlüğü ile ilgili öngörülemeyen hukuki sorunları çözebileceğini tartışmaktadır. Ayrıca, OA üreticileri için gelecekte karşılaşacakları dava tehdidi çok büyük olursa, federal hukukun üstünlüğü OA üreticilerinin zarara uğrayan davacılara olan tazminat yükümlülüğünü sınırlayabilir. Bu öneriler federal hukukun üstün gelmesine ilişkin komplike ve belirsiz problemlere yönelik pragmatik ve etkili çözümler oluşturabilecektir.

Keywords: otonom araçlar, tekeffüller hukuku, sorumluluk reddi, federal hukukun üstün gelmesi.

INTRODUCTION

Autonomous vehicle (AV) technology promises many social, economic, and environmental benefits to society, such as decreasing the number of traffic accidents and greenhouse gas emissions, providing mobility for people in need, and helping the economy and climate change. It is crucial to examine the legal environment behind this breakthrough technology in order to pave the way for continuous innovation. In this context, the most complicated legal issues need to be solved or at least identified. This Article specifically delves into two salient legal issues AVs will face: i) law of warranties and ii) preemption of

common law claims. The relation between the two is under-explored and also has potential to be applied to other liability theories.

Warranties provide a legal theory in the product–related cases in the *pre*–strict–product–liability era, and they remain as a legal remedy for injured plaintiffs in jurisdictions that have not adopted strict product liability.[1] In the future, maintaining legal actions based on both breach of warranty and strict product liability against AV manufacturers would be a strategic decision for plaintiffs because a warranty enables a plaintiff to obtain a recovery for all damages, including even pure economic loss,[2] which tort theories do not. However, the contract aspect of warranties may create barriers to a full recovery—such as privity of contract, disclaimers, limitation of remedies, and notice of breach.

Rules pertaining to warranties are included in Article 2 of the Uniform Commercial Code (UCC).[3] There are three warranties recognized in the UCC: (i) express warranty; (ii) implied warranty of merchantability (IWoM); and (iii) implied warranty of fitness for a particular purpose. In this Article, the first two warranties will be discussed. Fitness warranties are omitted from the discussion because AV manufacturers or sellers will likely not sell AVs to satisfy buyers' specific needs, which is the case for the implied warranty of fitness.[4]

On the other hand, we could easily predict that AVs will be sold to the public in the future. This will be achieved through contracts between the buyer and the seller in which

[1] For example, warranty liability is important in states that have not adopted strict products liability, namely Delaware, Massachusetts, Michigan, Virginia, and North Carolina. *See, e.g.*, Cline v. Prowler Indus. of Maryland, Inc., 418 A.2d 968, 980 (Del. 1980).

[2] U.C.C. § 2–714. (allowing recovery of damages for harm resulting in the ordinary course of events); *ibid*. § 2–715. (recognizing incidental and consequential damages resulting from the seller's breach).

[3] The warranty provisions codified in Article 2 of the UCC are only applicable to "goods," defined as all things that are movable when identifying the contract for sale. *Ibid.* § 2–105(1). Therefore, sales transactions involving AVs are within the scope of the UCC.

[4] *See ibid.* § 2–315. ("Where the seller at the time of contracting has reason to know any particular purpose for which the goods are required and that the buyer is relying on the seller's skill or judgment to select or furnish suitable goods, there is . . . an implied warranty that the goods shall be fit for such purpose.").

express or implied warranties would arise. In that case, this Article foresees that federal preemption of common law claims, including warranties, will be at the AV liability table. As the federal government takes the predominant role in regulating products, the federal preemption defense has been more frequently invoked in product liability cases to preclude state tort claims.[5] When new regulation or legislation is enacted for AV technology, this Article foresees the likelihood of preemption of state common law. That Congress has two failed bills[6] under its belt is a sign that it has no problem with express preemption and a saving clause conjoined as a summary of the status quo—this brings the possibility of implied preemption to the fore. However, the case law on motor vehicle preemption does not provide clear guidance, and AV technology will face this uncertainty soon.

This Article is divided into two chapters. In the first chapter, this Article will briefly explain the law of warranties and discuss the possible application of these rules to AV technology. Specifically, this Article will focus on express and implied warranties and will address contractual limitations, namely privity requirements, disclaimers, and limitation of remedies. The second chapter will analyze the preemption of common law claims, including warranties, in the age of AVs. The conclusion will summarize the findings in two chapters.

[5] ATWELL, Barbara L., "Products Liability and Preemption: A Judicial Framework", **Buffalo Law Review,** Year: 1991, Vol: 39, Issue: 1, p. 181–82. Federal preemption has evolved to be the most complicated and important legal issue in modern products liability law. EGGEN, Jean Macchiaroli, "The Normalization of Product Preemption Doctrine", **Alabama Law Review**, Year: 2006, Vol: 57, Issue: 3, p. 725 ("One area of the law in which the doctrine of preemption has been especially difficult to interpret has been tort law, and particularly product liability law.").

[6] These two failed bills—namely the Self-Drive Act and the AV Start Act—included an express preemption provision and a savings clause together, as explained below.

I. WARRANTIES

A. Express Warranty

An express warranty arises when an affirmation of fact or promise made by the AV seller to the buyer is related to the AV and constitutes part of the basis of the bargain.[7] A "breach" of an express warranty occurs if an AV seller sells an AV that does not adhere to the warranty, and as a result, the buyer or some other party is injured.[8] Express warranties distinguish between facts and opinions—only the former can create an express warranty.[9] The AV seller's affirmation of facts or promises might be related to an AV's characteristics of safety, quality, construction, performance capability, or durability.[10] Any factual assertion made by any means of any communication has the potential to create an express warranty.[11] Liability based on an express warranty depends on the falsity of such assertions, not the defective condition of the product in question.[12] An express warranty does not necessarily have to be in writing and could be created by oral representations.[13]

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[7] *See* U.C.C. § 2–313(1)(a).

[8] OWEN, David G. / DAVIS, Mary J., **Owen & Davis on Product Liability**, 4th ed., Thomson Reuters, St. Paul, Missouri, United States, 2020, § 4.6; Peterson v. Bendix Home Sys., Inc., 318 N.W.2d 50, 52–3 (Minn. 1982) (proving a warranty claim requires showing the existence of a warranty, a breach, and a causal relation between the breach and the resulting harm).

[9] U. C. C. § 2–313(2) (excluding the seller's opinion or commendation). Some factors are being used to draw the line between facts and opinions by the courts. These factors are (i) the specificity of the representation; (ii) whether the representation could be objectively assessed; (iii) the likelihood that the buyer believes the representation reasonably; and (iv) the knowledge of the buyer and the seller. OWEN / DAVIS, **2020**, § 4.10.

[10] *See ibid*. § 4:5.

[11] *See ibid*. § 4.8. The language that creates express warranties may be found (i) on a product's packaging, label, or tags; (ii) in advertisements, catalogues, brochures, circulars, pamphlets, owners' manuals, product literature, spec sheet, promo videos; or (iii) on a website. *Ibid*. § 4.8.

[12] *See, e.g.*, McCarty v. E. J. Korvette, Inc., 28 Md. App. 421, 437 (1975) (stating that a breach of an express warranty does not require showing of a defect but only "a failure to conform to the warrantor's representations").

[13] *See, e.g.,* Weiss v. Keystone Mack Sales, Inc., 310 Pa. Super. 425, 431–32 (1983) (holding that oral representations made by a salesman may constitute a new warranty obligation). However, the written agreement of sale will typically have an integration clause that states that all is contained within the four corners of the document and nothing outside that document, including oral representations, is part of the deal.

If false factual assertions are made by AV manufacturers or the sales representatives of car dealers pertaining to the capabilities and limitations of AVs, this will give rise to a breach of express warranty. Such assertions might claim that an AV will operate everywhere, even though it is, in fact, limited to a certain operational design domain. Or, they might state that a Level 3 vehicle needs no human intervention whatsoever when, in fact, such vehicles definitely require human intervention.

For example, undercover researchers from MIT's Agelab interviewed salespeople who work at seventeen dealerships in Boston.[14] The research aimed to investigate the knowledge of salespeople about advanced driver assistance systems they were selling in retailers.[15] This research revealed that only six of the seventeen salespeople provided adequate explanations of these systems.[16] Four salespeople provided poor information, and at least two gave nearly dangerously incorrect information.[17]

Moreover, the use of the terms "Autopilot" or "Autonomous" in public advertisements to promote a lower–level vehicle—such as a Level 2 or 1 vehicle—could create the impression for consumers that the vehicle requires zero human intervention in all cases.[18] This may give rise to a breach of express warranty claim. However, as discussed below, there are contractual limitations that would disclaim an express warranty or limit the remedies for plaintiffs. Similarly, pedestrians, cyclists, or occupants of other vehicles would be excluded from using express warranty claims for recovery.

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[14] MARSHALL, Aarian, **Car Dealers Are Dangerously Uneducated About New Safety Features**, https://www.wired.com/2017/01/car–dealers–dangerously–uneducated–new–safety–features/ (accessed on 30.08.2022)

[15] *Ibid.*

[16] *Ibid.*

[17] *Ibid.*

[18] **Tesla's Autopilot: Too Much Autonomy Too Soon**, https://www.consumerreports.org/tesla/tesla–autopilot–too–much–autonomy–too–soon/ (accessed on 30.08.2022).

B. Implied Warranty of Merchantability

Sellers can control the scope of express warranties and can escape responsibility simply by avoiding any affirmations of fact or by not making promises. However, plaintiffs may still rely on an IWoM, which is a key warranty in product liability law. An implied warranty that an AV is merchantable will be implied in a contract for their sale if the AV seller is a merchant regarding products of that kind.[19] The most important aspect of IWoM for AVs is being "fit" for its purpose, which would require that the AV be reasonably safe during its ordinary use and reasonably execute its ordinary functions.[20] Nevertheless, the concept of merchantability does not mandate selling the safest AV.[21] IWoM is categorized as a truly strict liability because it does not require the manufacturer's fault to establish liability but only the defective condition of a product.[22]

It is foreseeable that plaintiffs will invoke IWoM more frequently than express warranties to recover damages caused by a defective condition of AVs. This is because IWoM requires neither an AV manufacturers' false factual representation nor their negligent conduct to allow recovery. For example, a Level 2 vehicle controlled by the vehicle system crashed into an empty vehicle on Florida Turnpike when it was traveling at the speed of 80

[19] *See* U. C. C. § 2–314(1). The UCC further provides minimum conditions for "merchantability" of products: (i) pass, without confronting an objection, in the trade under the contract description; (ii) possess, in the case of fungible goods, fair average quality according to the description; (iii) are fit for the general purposes for which such products are used; (iv) operate the same kind, quality, and quantity within each unit and among all units involved (uniformity requirement); (v) are sufficiently contained, packaged, and labeled as the agreement may mandate; (vi) adhere to the promises or affirmations of fact made on the container or label, if exists. *Ibid*. § 2–314(2).

[20] *See* Turner v. Manning, Maxwell & Moore, Inc., 216 Va. 245, 250 (1975).

[21] *See* Gall by Gall v. Allegheny Cty. Health Dep't, 521 Pa. 68, 75 (1989). Instead, IWoM requires selling products that (i) are suitable for the purpose of their design; (ii) are free from significant defects; (iii) should perform like goods of same kind perform; and (iv) possess a reasonable quality within its expected variations. *Ibid.*

[22] *See, e.g.*, Red Hill Hosiery Mill, Inc. v. MagneTek, Inc., 138 N.C. App. 70, 75 (2000) ("[A] products liability claim based on breach of warranty is not dependent upon a showing of negligence.").

mph.[23] The driver suffered many physical injuries after the crash and, thus, sued the vehicle manufacturer relying on many legal theories, including breach of implied warranty.[24]

However, disclaimers or limitations of remedies would be a barrier to consumers' and bystanders' full recovery based on IWoM, as explained below. Since the standard for a defect in IWoM and strict product liability are strikingly similar, the application of the strict product liability rules to AVs will likely be applicable for IWoM claims.[25]

C. Privity Requirement

Due to the contractual aspect of warranty law, courts have limited warranty claims to plaintiffs who are in a contractual relationship with the defendant.[26] The concept of privity may preclude non–purchaser plaintiffs from obtaining a recovery for a breach of warranty, also called "horizontal privity."[27] Vertical privity addresses the question of whether a plaintiff can direct a warranty claim against remote sellers who are placed above the retailer in the

[23] DAVIES, Alex, **A Florida Man Is Suing Tesla For A Scary Autopilot Crash**, https://www.wired.com/story/tesla-autopilot-crash-lawsuit-florida-shawn-hudson/ (accessed on 30.08.2022).

[24] *Ibid.*

[25] See, *e.g.*, Gumbs v. Int'l Harvester, Inc., 718 F.2d 88, 94–5 (3d Cir. 1983) (stating that the elements for IWoM and strict products liability claims are essential the same); Hines v. Wyeth, No. CIV.A. 2:04–0690, 2011 WL 1990496, at *4 (S.D.W. Va. May 23, 2011) (stating that claims for strict products liability and IWoM are substantially coextensive in products liability actions). Some courts distinguish IWoM and strict products liability claims. *See, e.g.*, Denny v. Ford Motor Co., 87 N.Y.2d 248, 262 (1995) (stating that the distinction between the defect concepts in tort law and in implied warranty theory would diverge in some cases because of the nature of the proof and the way the issues are litigated); Fahey v. A.O. Smith Corp., 908 N.Y.S.2d 719, 4 (2010) (stating that a defect element in an implied warranty claim rests upon contract principles, whereas a defect in a strict products liability claim hinges upon tort principles associated with social policy and risk allocation). For a detailed discussion about the application of strict product liability to AV technology *see* KASAP, Atilla, **Autonomous Vehicles: Tracing the Locus of Regulation and Liability**, Edward Elgar, Massachusetts, United States, 2022, p. 93-131.

[26] *See, e.g.,* Compex Int'l Co. v. Taylor, 209 S.W.3d 462, 465 (Ky. 2006), as modified on denial of reh'g (Jan. 25, 2007) ("[A] seller's warranty protections are *only* afforded to 'his buyer.'").

[27] Such remote plaintiffs may be a member of the purchaser's family, household or household guests, an employee of the purchaser, or only bystanders.

chain of distribution.[28] However, the UCC has developed three alternatives that can be adopted by states to allow certain beneficiaries of a warranty to bring a direct action.[29] These alternatives are only with regard to horizontal privity and vertical privity is left to state common law.

Privity requirements will likely bar some plaintiffs injured by AVs from recovery. For example, cyclists, pedestrians, or occupants of other vehicles will likely not be allowed to bring a warranty claim in the states that have adopted the most conservative alternative for privity provided by the UCC. In states that extend warranties to "foreseeable" persons, those victims could pursue breach of warranty claims.[30] Also, different outcomes would occur for these plaintiffs in terms of the damages they could recover, as some alternatives permit recovery for property damage and economic loss in addition to personal damage, while others

[28] Such an entity may encompass wholesalers, distributors, manufacturers of the finalized product, component parts or raw materials.

[29] First, Alternative A, which is the least liberal option, states that:

> A seller's warranty whether express or implied extends to any natural person who is in the family or household of his buyer or who is a guest in his home if it is reasonable to expect that such person may use, consume or be affected by the goods and who is injured in person by breach of the warranty. A seller may not exclude or limit the operation of this section. U. C. C. § 2–318.

Courts that have followed Alternative A need to determine who constitutes the family or household of the buyer or a guest. *See, e.g.*, Miller v. Preitz, 211 A.2d 320, 323 (Pa. 1966) (holding that a nephew of the buyer is within the scope of the family); Thompson v. Reedman, 199 F. Supp. 120, 121 (E.D. Pa. 1961) (classifying a guest passenger in an automobile as not a guest in the home). Second, Alternative B states that:

> A seller's warranty whether express or implied extends to any natural person who may reasonably be expected to use, consume, or be affected by the goods and who is injured in person by breach of the warranty. A seller may not exclude or limit the operation of this section. U. C. C. § 2–318.

Third, Alternative C states that:

> A seller's warranty whether express or implied extends to any person who may reasonably be expected to use, consumer or be affected by the goods and who is injured by breach of the warranty. A seller may not exclude or limit the operation of this section with respect to injury to the person of an individual to whom the warranty extends. *Ibid.*

[30] Both Alternative B and C adopts a liberal approach toward third–party beneficiaries and appears to extend warranties to foreseeable persons who may be harmed due to the warranty's breach, thus incorporating the concept of reasonable foreseeability in tort law. OWEN / DAVIS, **2020**, § 4.25.

do not.[31] Corporations that suffered damage to their vehicles in accidents associated with AVs would be able to recover in some states and not in others.[32] Thus, pursuing express or IWoM warranty claims would vary in cases involving AVs, depending on the state in which a claim is brought and which alternative of UCC 2–318 the state has adopted.[33]

D. Disclaimers

Again, because of its contract background, an AV manufacturer or seller can implement disclaimers in the agreement for limiting or negating warranties, thereby avoiding responsibility in case of breach of warranty.[34] The UCC requires consistency between words or conduct that create an express warranty and words or conduct attempting to negate or limit that warranty.[35] To exclude or modify part or all of an IWoM, the UCC mandates that the language use the term "merchantability" and must be "conspicuous"[36] in cases where the warranty is given in writing.[37] In the future, AV manufacturers would likely implement disclaimers easily in the sales contract by satisfying the "consistency" requirement for the

[31] Both Alternative A and B cover personal injury and do not extend to property damage or economic loss. Unlike Alternative A and B, Alternative C extends to property damage and economic loss in addition to personal injury.

[32] Both Alternative A and B are limited to "natural" persons, thereby excluding non–human entities, such as corporations. Unlike Alternative A and B, Alternative C allows "any person" to be a third–party beneficiary of a warranty, such as corporations.

[33] Most jurisdictions, roughly half of all states, implemented Alternative A or its similar version; nearly seven jurisdictions adopted Alternative B or a similar version; and around fifteen jurisdictions followed Alternative C or a modified version. *Ibid*.

[34] U. C. C. § 2–316.

[35] *Ibid*. § 2–316(1). Some jurisdictions prohibit disclaiming express warranties. *See, e.g.*, S.C. CODE ANN. § 36–2–316(1) (including provision that if the agreement creates an express warranty, words disclaiming it are inoperative).

[36] Conspicuousness could be achieved if the disclaimer is displayed prominently and likely to invite the attention of a reasonable person, especially focusing on font—size, style, color, italics, or bold type face—, heading, and location. OWEN / DAVIS, **2020**, § 4.35.

[37] U. C. C. § 2–316(2).

express warranty and the "conspicuous" requirement for IWoM warranties.[38] Specifically, the terms "Autopilot" or "Full Self-Driving" for Level 1 and 2 vehicles are followed by many disclaimers today such that drivers should not leave the steering wheel unattended for more than a few seconds.[39] These disclaimers could disclaim or negate the meanings of "Autopilot" or "Full Self-Driving" and might be found consistent or inconsistent by the courts.[40] For

[38] *See* ROTHSCHILD, Donald P., "Magnuson—Moss Warranty Act: Does It Balance Warrantor and Consumer Interests", **George Washington Law Review**, Year: 1976, Vol: 44, No: 3, p. 343 (arguing that the disclaimer requirements fail to protect the buyer from unexpected and unbargained language because the term "merchantability" means little to the average consumer); KALRA, Nidhi / ANDERSON, James / WACHS, Martin, **Liability and Regulation of Autonomous Vehicle Technologies**, University of California, Berkeley, California, United States, 2009, p. 26 ("First, because warranties . . . can generally be disclaimed, manufacturers are likely to substantially limit warranties.").

[39] For example, Tesla's Autopilot is followed by this statement on an official website:

> Autopilot advanced safety and convenience features are designed to *assist* you with the most burdensome *parts* of driving. Autopilot introduces new features and improves existing functionality to make your Tesla safer and more capable over time. Autopilot enables your car to steer, accelerate and brake automatically within its lane. Current Autopilot features *require active driver supervision* and do not make the vehicle *autonomous*. (emphasis added)

Tesla, https://www.tesla.com/autopilot (accessed on 30.08.2022). Another disclaimer for Tesla's Autopilot stated that:

> Traffic–Aware Cruise Control cannot detect all objects and, especially in situations when you are driving over 50 mph (80 km/h), may not brake/decelerate when a vehicle or object is only partially in the driving lane or when a vehicle you are following moves out of your driving path and a stationary or slow–moving vehicle or object is in front of you . . . In addition, Traffic–Aware Cruise Control may react to vehicles or objects that either do not exist or are not in the lane of travel, causing Model S to slow down unnecessarily or inappropriately.

Tesla**, Model S Owner's Manual,** p. 89–90 (accessed on 30.08.2022)., https://www.tesla.com/sites/default/files/model_s_owners_manual_north_america_en_us.pdf.

In the Florida Turnpike accident where a Level vehicle crashed into an empty, disabled vehicle, the vehicle's manual included this disclaimer:

> Traffic-Aware Cruise Control cannot detect all objects and may not brake/decelerate for stationary vehicles, especially in situations when you are driving over 50 mph (80 km/h) and a vehicle you are following moves out of your driving path and a stationary vehicle or object is in front of you instead.

DAVIES, **A Florida Man Is Suing Tesla.**

[40] *See also* YEEFEN LIM, Hannah, **Autonomous Vehicles and the Law: Technology, Algorithms and Ethics**, Edward Elgar, Massachusetts, United States, 2018, p. 60 ("[G]iven Tesla's own messages about the inflated capabilities of its Autopilot feature mixed in with what seems like hollow reminders that drivers should keep their hands on the steering wheel coupled with a system that allows drivers to go hands–free for at least 6 minutes, drivers and consumers have been misled into believing or wanting to believe that their Teslas are capable of self–driving."); WOOD, Molly, **Self-driving Cars Might Never Be Able to Drive Themselves**,

IWoM, the sale of AVs will likely be undertaken through a written contract that disclaims that warranty and mentions merchantability and does so conspicuously. However, this freedom is not without limitations. Some courts will impose the obligation of good faith on AV sellers who implement a disclaimer of warranty and might hold it void if its inclusion in the contract violates that obligation.[41]

E. Limitation of Remedies

Remedies for breach of warranty can be limited by an AV seller in the agreement,[42] which is again a reflection of the contract aspect of the warranty law. In the sale agreement of an AV, the parties may agree to modify remedies and limit or change the measure of recoverable damages.[43] The contract must state that any limited remedy is exclusive and other remedies may not be pursued.[44] For example, the buyer's remedy may be limited to allow for

https://www.marketplace.org/shows/marketplace-tech/self-driving-cars-might-never-drive-themselves/ (accessed on 30.08.2022) (hosting Missy Cummings, who is the director of the Humans and Autonomy Laboratory at Duke University and stated that: "so many people believe . . . that this technology really can be fully self-driving, despite all the warnings and despite all the statements and the owner's manual, and you having to agree that you're going to pay attention. Despite all of those warnings, there's some belief likely based in calling a technology Full Self-Driving and calling it Autopilot where people believe in the religion of Tesla full self-driving, and that is dangerous."); EURO NCAP For Safer Cars, **Assisted Driving 2020 Tesla Model 3 Autopilot**, p. 1, https://www.euroncap.com/en/ratings-rewards/assisted-driving-gradings/ (accessed on 30.08.2022) ("Tesla's system name Autopilot is inappropriate as it suggests full automation. The promotional material suggests automation where the handbook correctly indicates the limitations of the system capabilities, which could lead to confusion.").

[41] *See* Potomac Plaza Terraces, Inc. v. QSC Pro., Inc., 868 F. Supp. 346, 351 (D.D.C. 1994); Henningsen v. Bloomfield Motors, Inc., 32 N.J. 358, 391–404 (1960) (manufacturers' powerful bargaining position control and limitation are harmful to the public good, courts may declare contractual provisions void). Although most states allow disclaiming IWoM by complying with § 2–316, courts generally are not favor of such disclaimers and interpret them restrictively in favor of customers. OWEN / DAVIS, **2020**, § 4.35; *Henningsen*, 32 N.J. at 373.

[42] *See* U. C. C. § 2–316(4). The freedom to shape remedies is not without limitation, and at least minimum adequate remedies must be made available. *Ibid.* § 2–719 cmt. 1. If, however, there is no such an agreement exists, the buyer may recover any reasonable damages resulting from the seller's breach, including incidental or consequential damages. *Ibid.* §§ 2–714 and 2–715.

[43] *Ibid*. § 2–719(1)(a).

[44] *Ibid*. § 2–719 cmt. 2. Otherwise, it is presumed that clauses prescribing remedies are cumulative rather than exclusive. *Ibid.*

the recovery only of property damages or repair or a replacement of the defective parts of an AV.[45]

If circumstances are such that the "essential purpose" of an exclusive or limited remedy cannot be fulfilled for the AV purchaser, a remedy provided in the UCC may be restored, including a recovery for economic loss.[46] Most courts will look at the AV seller's compliance with the limited contractual remedy in determining whether a restricted remedy fulfills its "essential purpose."[47] However, most courts generally will not apply this provision to personal injury cases involving AVs but rather AVs that are "lemons," such as an AV with continual problems that the AV seller cannot or will not fix within a reasonable time, thus depriving the owner of its use.[48]

Lastly, consequential damages that would arise out of the operation of AVs may be limited or excluded as long as such a limitation or exclusion is not unconscionable, and limitation of consequential damages for injury to the person in the case of consumer goods is deemed to be prima facie unconscionable.[49] In the overwhelming number of cases, limitations on personal injury damages involving consumer goods are held unconscionable and, therefore, invalid and unenforceable, which will be the case for AVs as well.

[45] OWEN / DAVIS, **2020**, § 4.37; U. C. C. § 2–719(1)(a).

[46] *See Ibid.* § 2–719(2).

[47] *See, e.g.*, Dowty Commc'ns Inc. v. Novatel Computer Sys. Corp., 817 F. Supp. 581, 587 (D. Md. 1992). So, if a seller is unable to satisfy its warranty, such as repairing or replacing defects, the limited remedy may fail to its essential purpose. *See, e.g.*, Goddard v. Gen. Motors Corp., 60 Ohio St. 2d 41, 45 (1979).

[48] *See* OWEN / DAVIS, **2020**, § 4.39.

[49] *See* U. C. C. § 2–719(3). To establish unconscionability, some courts require showing that (i) one of the parties did not have a meaningful choice; and (ii) the terms of the agreement unreasonably favor the other party. Riggs Nat. Bank of Washington, D.C. v. D.C., 581 A.2d 1229, 1251 (D.C. App. 1990).

F. The Future of Warranty Claims for Accidents Involving AVs

The AV industry will likely adopt ride-hailing as a business strategy in order to recoup the significant costs of research and development.[50] Or, the industry may lease AVs or offer customers a subscription service.[51] Thus, AVs will not be sold to the public for individual personal use in the first years,[52] which means that there would be no contract between purchasers and sellers of AVs that would give rise to express or implied warranties.[53] That said, a few AVs may be available for private purchase, and those could give rise to express or implied warranties. In that case, however, pedestrians, cyclists, or occupants of other vehicles who might be harmed by the operation of AVs will be unable to pursue a warranty claim against AV sellers unless they are deemed to be third–party beneficiaries.[54] Even if

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[50] *See, e.g.,* NIEDERMAY, Ed, **Hailing a Driverless Ride in a Waymo**, https://techcrunch.com/2019/11/01/hailing–a–driverless–ride–in–a–waymo/ (accessed on 30.08.2022) (stating that a test ride with an AV may presage a ride–hailing service with AVs that is already used by members of an early rider program). Moreover, some states have developed terminology, including an "autonomous vehicle network company" or "on–demand autonomous vehicle network" that connects a passenger to a fully AV via a software application or other digital means. FLA. STAT. ANN. § 316.003(49); MICH. COMP. LAWS ANN. § 257.2b(8); NEV. REV. STAT. ANN. §§ 706B.030 and 706B.160; UTAH CODE ANN. § 41–26–102.1(21); IOWA CODE ANN. §§ 321.514(6) and 321.518 (also including goods); NEB. REV. STAT. ANN. § 60–3301(8) (same); N.H. REV. STAT. ANN. § 242:1(II)(h) (same); N.D. CENT. CODE ANN. § 8–12–01(3) (same). These networks may offer transportation for hire, public transportation, or transportation for multiple passengers. IOWA CODE ANN. §§ 321.514(6) and 321.518; NEB. REV. STAT. ANN. § 60–3305(2); N.H. REV. STAT. ANN. § 242:1(X)(a); N.D. CENT. CODE ANN. § 8–12–02(1); UTAH CODE ANN. § 41–26–102.1(21).

[51] WAYLAND, Michael, **GM Expects to Offer Personal Self-Driving Vehicles to Consumers This Decade**, https://www.cnbc.com/2021/05/05/gm-expects-to-offer-self-driving-vehicles-to-consumers-this-decade.html (accessed on 30.08.2022)

[52] *See, e.g.,* SALESKY, Bryan, **The Argo AI Approach to Deploying Self-Driving Technology: Street-by-Street, Block-by-Block**, https://medium.com/@ArgoAI/the-argo-ai-approach-to-deploying-self-driving-technology-street-by-street-block-by-block-4d234073ed5a (accessed on 30.08.2022) ("The system currently under development is not intended to be applied to vehicles that will be purchased and owned by individuals . . .").

[53] *See* ANDERSON, James M. / KALRA, Nidhi / STANLEY, Karlyn D. et al., **Autonomous Vehicle Technology: A Guide for Policymakers,** RAND Corporation, California, United States, 2016, p. 133 ("Manufacturers themselves may be able to affect the liability by offering transportation as a service rather than a product.").

[54] *See also* MCCORMICK, Lucy, **Product Liability in The Law and Autonomous Vehicles** (Matthew Channon et al. eds.), Routledge, Milton Park, Oxfordshire, 2019, p. 45 ("However, contractual claims are limited in that claims may generally only be brought where there is a direct contractual relationship between

they are deemed to be third–party beneficiaries, they are subject to the same limitations on and exclusions of warranties and limitations to remedies for breach of warranty as the buyer.[55] This would be a significant barrier to full recovery by bystanders. Therefore, the role of warranty claims will be limited for recovery of harm caused by a defective AV.[56]

II. PREEMPTION OF COMMON LAW CLAIMS

In *Cipollone v. Liggett Group*, an express preemption case, the dispute was whether federal law requiring cigarette manufacturers to place a health warning on cigarette packages preempted state common law claims.[57] The Supreme Court held that the broad language of a preemption clause that includes the statutory phrase "requirement or prohibition" encompasses common law claims as well as positive enactments by state rulemaking bodies.[58] *Cipollone* pioneered in including state common law claims within the scope of express preemption.[59] Federal preemption, therefore, will bring the most pivotal question to

the parties–hence a pedestrian knocked down by an autonomous vehicle would not have a contractual cause of action.").

[55] OWEN / DAVIS, **2020**, § 4.33. For example, if an express warranty is not created between the buyer and the seller in the sales contract, then a third–party injured by a defective product will not rely on warranty to claim a breach. *Ibid.*; Hydra–Mac, Inc. v. Onan Corp., 450 N.W.2d 913, 916 (Minn. 1990) ("A valid disclaimer extends to the original purchaser as well as to all parties covered as third–party beneficiaries."). However, this does not mean that third–party beneficiaries are provided less protection than the buyer, which is prohibited in the UCC. U. C. C. § 2–318 (stating in the end of Alternative A, B and C that: "A seller may not exclude or limit the operation of this section.").

[56] *See also* KALRA / ANDERSON / WACHS, **2009**, p. 26 ("The warranty theory of liability is unlikely to be particularly important to the development of autonomous vehicles . . . ").

[57] Cipollone v. Liggett Group, Inc., 505 U.S. 504, 504 (1992).

[58] *Ibid.* at 505. In pre–*Cipollone* era, federal preemption typically aimed to restrict states when passing their positive enactments, such as statutes or regulations.

[59] However, commentators criticized *Cipollone* for failing to clarify the law of federal preemption. AUSNESS, Richard C., "Preemption of State Tort Law by Federal Safety Statutes: Supreme Court Preemption Jurisprudence Since Cipollone", **Kentucky Law Journal**, Year: 2003, Vol: 92, No: 4, p. 914.

the fore—namely, whether common law is superseded by federal regulation, and if so, what the scope of such preemption is.

Federal motor vehicle law brings one of the most complicated preemption discussions to the fore, which waits for AV technology as well. An express preemption provision exists and states that if an FMVSS exists, a state or a political subdivision of a state is barred from enacting a standard that is not identical to the federal one.[60] This provision might encompass state common law claims as well. However, the statute also contains a "saving clause"[61] that provides that 'compliance with a motor vehicle safety standard . . . does not exempt a person from liability at common law.'[62] The saving clause, therefore, assumes that there are some number of common–law liability cases to save.[63] However, the words "compliance" and "does not exempt" in the saving clause simply bar a regulatory compliance defense, otherwise, it does not make sense why Congress would have persisted in a compliance–with–federal–regulation precondition to that provision's applicability if it had desired to save all state–law tort actions.[64] Traditionally, saving clauses were not given broad effect if doing so would hinder the carefully–tailored regulation provided by federal law.[65]

The Supreme Court in *Geier* held that the saving clause does not prohibit the application of implied conflict preemption principles[66] by asserting that there is nothing in

[60] 49 U.S.C. § 30103(b)(1).

[61] **Savings Clause**, Black's Law Dictionary, https://thelawdictionary.org/saving–clause/ (accessed on 30.08.2022) ("A savings clause is an exception to the general things mentioned in the statute.").

[62] 49 USCS § 30103(e).

[63] Geier v. American Honda Motor Co., Inc., 529 U.S. 861, 868 (2000).

[64] *Ibid.* at 870.

[65] *See, e.g., Locke*, 529 U.S. at 106.

[66] "Implied conflict preemption" arises when the federal and state regulations are in genuine conflict. In such cases, state law must yield to federal law on the grounds that it is not possible to comply with both federal and state requirements ("impossibility conflict preemption"). Mutual Pharmaceutical Co., Inc. v. Bartlett, 570 U.S. 472 (2013); Hillsborough County, Fla. v. Automated Medical Laboratories, Inc., 471 U.S. 707, 713 (1985). Second, state law presents an impediment to the accomplishment and implementation of the entire purposes and objectives of Congress ("obstacle conflict preemption"). OWEN / DAVIS, **2020**, § 15:1 (*citing* Wyeth v.

the language of that clause that implies an intent to save state tort law actions that interfere with federal regulations.[67] The Supreme Court believed that the two provisions, the express preemption, and savings clause, in fact, mirror a neutral policy toward the application of ordinary implied preemption principles.[68] However, the scope of implied preemption in motor vehicles is still not clear today.

The most notable case addressing federal preemption of motor vehicles, *Geier v. American Honda Motor Co.*, involved FMVSS 208, which required car manufacturers to install some, but not all, of their 1987 vehicles with passive restraints.[69] The *Geier* Court tackled the question of whether a state common law tort action is impliedly preempted when the defendant car manufacturer who complied with the standard could nevertheless be held liable for failing to install airbags in a 1987 Honda Accord.[70] The *Geier* Court first examined whether express preemption existed and answered that the saving clause leaves sufficient room for state tort law to operate, thereby finding no express preemption.[71] However, the Court reasoned that a state law imposing a duty to install an airbag in the 1987 Honda Accord would require manufacturers of all similar cars to install airbags instead of alternative passive restraint systems such as automatic belts or passive interiors.[72] Since such a duty could constitute an obstacle to a variety of devices that federal regulation desired, including the

Levine, 555 U.S. 555, 563–64 (2009)). Third, federal law implicitly imposes a barrier to state regulation. *Louisiana Pub. Serv*., 476 U.S at 368.

[67] *Geier*, 529 U.S. at 869.

[68] *Ibid.* at 870–71.

[69] *Ibid.* at 864–65. At the time of the accident in question, the car was not installed with airbags or other passive restraint systems, which led the plaintiffs to argue, *inter alia,* that the defendant car manufacturer designed its car negligently and defectively because it did not include a driver's side airbag. *Ibid.* at 865.

[70] *Ibid.*

[71] *Ibid.* at 868.

[72] *Ibid.* at 881.

gradual adoption of passive restraint systems, the Court held that it would stand as an obstacle to the accomplishment and execution of federal objectives and thus impliedly preempted.[73]

The *Geier* Court provided a detailed history of FMVSS 208 and concluded that this standard purposefully pursued a mix of several different passive restraint systems by leaving manufacturers to choose among different passive restraint mechanisms, including airbags, automatic belts, or other passive restraint technology.[74] Also, the Court noted that the FMVSS 208 standard intentionally sought a gradual adoption of passive restraint systems such that manufacturers were required to equip merely 10% of their car fleet manufactured after September 1, 1986 with passive restraints.[75] The standard planned to increase this threshold in three annual stages, up to 100% of the new car fleet for automobiles manufactured after September 1, 1989.[76]

Geier was criticized on the basis that it interpreted the objectives and purposes of federal regulations very broadly, which has the potential to impliedly preempt a broad swath of state tort law.[77] Moreover, court decisions on the preemptive scope of FMVSS varied across jurisdictions in the post–*Geier* era.[78]

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[73] *Ibid.*

[74] *Ibid.* at 875–79.

[75] *Ibid.* at 879.

[76] *Ibid.*

[77] OWEN / DAVIS, **2020**, §15:14; HAAS, Alexander K., "Chipping Away at State Tort Remedies through Pre-Emption Jurisprudence: Geier v. American Honda Motor Co.", **California Law Review**, Year: 2001, Vol: 89, No: 6, p. 1949 (criticizing the Geier decision because it increases the power of administrative agencies to supersede state law with, which unnecessarily broadens pre–emption jurisprudence and wipes out critical rights under state law).

[78] For example, the Fifth Circuit found that the plaintiffs' design defect claim was preempted on the same grounds as *Geier*. Carden v. Gen. Motors Corp., 509 F.3d 227, 232 (5th Cir. 2007), *abrogated by* Williamson v. Mazda Motor of Am., Inc., 562 U.S. 323 (2011) (stating that the FMVSS 208 standard allowed the manufacturers to choose either lap–only or lap/shoulder belts, and the plaintiff's claim would preclude that option). Yet, Court of Appeals of New York held that the plaintiffs' design defect claim to include passenger seatbelts on the buses was not impliedly preempted because FMVSS 208 did neither impose the inclusion of passenger seatbelts nor provide a discretion to manufacturers. Doomes v. Best Transit Corp., 17 N.Y.3d 594, 603–8 (2011).

The Supreme Court had a chance to clarify the scope of implied preemption based on an FMVSS in *Williamson v. Mazda Motor of America*, where the deceased was sitting in a rear middle seat, wearing a lap belt at the time of the accident, and was killed.[79] Plaintiffs asserted that the manufacturer should have equipped the vehicle with lap–and–shoulder belts in rear middle seats, given that FMVSS 208 permitted manufacturers to install either simple lap belts or lap–and–shoulder belts on rear middle seats.[80] The *Williamson* Court distinguished its holding from *Geier* because a choice left to manufacturers in *Williamson* was the fear of additional costs and serves a less significant regulatory objective compared to concerns pertaining to additional safety risks and consumer acceptance in *Geier*.[81] The *Williamson* Court explained that the U.S. DoT's concerns about cost-effectiveness do not show preemptive intent. Otherwise, all federal standards must be treated as maximum standards, and they cannot be reconciled with a saving clause.[82] The *Williamson* Court took the U.S. DoT's as seriously as the *Geier* Court had and concluded that state tort actions were not preempted, although they would constrain the manufacturer's choice.[83]

The *Williamson* Court also failed to provide clear guidance on motor vehicle preemption. Today, it is not entirely clear which state laws constitute "an obstacle" and are impliedly preempted.[84] This uncertainty waits for AVs in the future. The two bills that failed

[79] *Williamson*, 562 U.S. at 326.

[80] *Ibid.* at 326–27.

[81] *Ibid*. at 332–33.

[82] *Ibid.* at 335.

[83] *Ibid.* at 336.

[84] *See, e.g.,* GLANCY, Dorothy J. / PETERSON, Robert W. / GRAHAM, Kyle F. et al.; **A Look at the Legal Environment for Driverless Vehicles – Chapter II: New Technologies and Legal Change: A Brief History**, NCHRP Legal Research Digest, Year: 2016, p. 74, https://ssrn.com/abstract=2722236 ("Current preemption law, particularly with regard to ground transportation matters, is by no means predictable."); AUSNESS, **2003**, p. 916 ("An examination of . . . cases reveals how the Court's preemption jurisprudence appears to be bereft of any coherent theory or methodology.").

in Congress included a saving clause[85] and an express preemption clause. [86] Therefore, we can surmise that Congress intends to maintain the coexistence of saving clauses and express preemption clauses, thus bringing the scope of implied preemption to the fore for AVs.

The motor vehicle preemption cases discussed in this chapter involve specific designs such as airbags, seatbelts, and lap belts. Thus, this Article highly recommends the future enactment of performance-oriented and technology-neutral standards for AVs. This approach would work around unpredictable preemption questions by only prioritizing that AVs drive *more safely than humans* rather than dealing with design–specific issues. In that case, there will be fewer design–specific standards, and thus, there will be fewer instances in which design defect claims would interfere with federal interests—presumably finding a design defect would occur only when the AV would be safer with the alternative design. However, design–specific standards will certainly arise at some point in the future, and AV manufacturers will invoke the implied preemption defense to escape liability.[87] Plaintiffs, therefore, will need to engage with an exceedingly fact-intensive inquiry to counter an implied conflict preemption, such as providing a comprehensive factual record of the regulatory framework, clarification of how actual conflict could be shown, the objectives of the federal legislation, and Congressional intent, and the pertinent federal agency's position

[85] SELF DRIVE Act § 3(2) (stating that nothing in the proposed bills shall be understood to preempt common law claims); AV START Act § 3(a).

[86] SELF DRIVE Act § 3(1); AV START Act, § 3(a) (prohibiting any State or political subdivision of a State to maintain, enforce, prescribe, or continue in effect law or regulation regarding the design, construction, or performance of highly automated vehicles, ADS, or components of ADS unless such law or regulation is identical to a standard prescribed under this chapter).

[87] *See also* KALRA / ANDERSON / WACHS, **2009**, p. 34 (arguing that if USDOT promulgates regulation, it is predictable that state tort law claims that were found to be incompatible with the objective of such regulation would be held to be preempted); MARCHANT, Gary E. / LINDOR, Rachel A., "The Coming Collision Between Autonomous Vehicles and the Liability System", **Santa Clara Law Review**, Year: 2012, Vol: 52, Issue: 4, p. 1321 (arguing that the NHTSA would write and explain future safety standards for AVs in a manner that preempted some, or all, state tort actions).

on the preemption issue.[88] Predicting the future scope and nature of implied preemption is impossible.

Some proposals go even further and recommend enacting legislation that protects manufacturers from civil liability, just as the National Childhood Vaccination Injury Act of 1986 (NCVIA) shielded vaccine manufacturers from liability arising out of vaccine-related deaths or injuries,[89] thereby preempting all state tort claims.[90] This Act provided a compensation scheme for vaccine victims.[91] The vaccine analogy, however, is not ideal concerning AVs. The magnitude, severity, and probability of vaccine-related deaths or injuries are far lower than what we might expect for future AV–related accidents.[92] Public health considerations were a prime justification advanced to protect vaccine manufacturers from liability. At the time the 1986 Act was passed, vaccines were in short supply, some manufacturers were exiting the vaccine market, and the magnitude and unpredictability of tort claims were thought to be at least partially responsible for this state of affairs. AVs do

[88] OWEN / DAVIS, **2020**, §15:12. SHARKEY, Catherine M., "Preemption by Preamble: Federal Agencies and the Federalization of Tort Law", **DePaul Law Review**, Year: 2007, Vol: 56, Issue: 2, p. 258 (arguing that courts seem to grant agencies broad discretion to interpret or declare the preemptive scope of the regulations they promulgate). When interpreting the FMVSS 208's objectives and conclusion, the Court greatly benefited from the DOT's position because of the technical subject matter, the complicated and extensive relevant history and background. *Geier*, 529 U.S. at 883.

[89] GOODRICH, Julie, "Driving Miss Daisy: An Autonomous Chauffeur System", **Houston Law Review**, Year: 2013, Vol: 51, No: 1, p. 284; BROCK, Caitlin, "Where We're Going, We Don't Need Drivers: The Legal Issues and Liability Implications of Automated Vehicle Technology", **University of Missouri-Kansas City Law Review**, Year: 2015, Vol: 83, Issue: 3, p. 787-88.

[90] KALRA / ANDERSON / WACHS, **2009**, p. 35 ("Another possible approach is regulatory preemption—requiring manufacturers to incorporate the most promising forms of this technology by regulatory fiat but simultaneously exempting the manufacturers from state court liability. Mandatory driver first–party health insurance might be an additional variation on this approach to minimize the risk of uncompensated victims."); ANDERSON / KALRA / STANLEY, et al., **2016**, p. 133.

[91] *See* 42 U.S.C.A. § 300aa–15 (describing regulations for the compensation scheme).

[92] **$4 Billion and Growing: U.S. Payouts for Vaccine Injuries and Deaths Keep Climbing**, https://childrenshealthdefense.org/news/4–billion–and–growing–u–s–payouts–for–vaccine–injuries–and–deaths–keep–climbing/ (accessed on 30.08.2022) ("Over the vaccine court's 30–year history, individuals and families have filed over 20,000 petitions for vaccine injury compensation. This month, even as 12% of filed petitions remained unadjudicated, the payouts crossed over the $4 billion threshold."); OSHINSKY, David M., **Polio: An American Story**, Oxford University Press, Oxfordshire, 2006, p. 238-43 (discussing the Cutter Fiasco named after deadly incidents caused by polio vaccinations).

promise to increase public safety by reducing fatal accidents, but the public health benefits are not nearly as salient or extensive. As well, if such a scheme were adopted, it would minimize the role and extent of state tort claims, as the NCVIA did. Therefore, this Article is skeptical about such broad immunity for AV manufacturers, which robs the public of its ability to pursue legal remedies.

On the other hand, preemption could play a role in the safeguarding of industry against the threat of litigation.[93] Increased liability was one of the main concerns in the airline industry, which led to the adoption of the Warsaw Convention in 1929.[94] For example, the Warsaw Convention introduced a monetary cap for the liability of airline companies to each passenger, but this applies only to international travel.[95] The monetary caps are recalculated every five years because of inflation, and the current one for passenger bodily injury or death is $113,100.[96] Similarly, courts may be required to hold AV manufacturers liable for a certain amount of compensation for plaintiffs whose bodily injuries are caused by the defective condition of an AV. For example, Abraham and Rabin's MER system covers unlimited medical expenses, with a maximum of $1 million compensation for wage loss and a maximum of $500,000 compensation for noneconomic losses in case of specified permanent or long–term injuries.[97] A similar limitation on the amount of compensation could be implemented by federal legislators if the AV industry needs such protection in the future.[98]

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[93] *See* GLANCY / PETERSON / GRAHAM, **2016**, 34.

[94] ORR, George W., "The Warsaw Convention", **Virginia Law Review**, Year: 1944-1945, Vol. 31, Issue: 2, p. 425 ("Three of the above twelve conventions are of particular interest . . . These are: I. Liability to Passengers and Shippers (known as the Warsaw Convention) . . . ").

[95] Convention for the Unification of Certain Rules Relating to International Carriage by Air art. 22, Oct. 12, 1929 ("In the carriage of passengers, the liability of the carrier for each passenger is limited to the sum of 125,000 francs.").

[96] BROCK, **2015**, p. 783.

[97] ABRAHAM, Kenneth S. & RABIN, Robert L., "Automated Vehicles and Manufacturer Responsibility for Accidents: A New Legal Regime for a New Era", **Virginia Law Review**, Year: 2019, Vol: 105, Issue: 1, p. 161.

[98] *See also* BROCK, **2015**, p. 784 ("The airline industry system of predictable payouts and caps on recovery amounts would most likely be easily adapted to the automated vehicle industry."); CALO, Ryan, "Open

CONCLUSION

Regarding the application of the law of warranties, this Article concluded that the role of warranty claims would be limited. This is because most AVs will not be sold to the public in the first years, which means that there will be no express or implied warranties. Even as AVs are increasingly sold, pedestrians, cyclists, and occupants of other vehicles who are injured by AVs will be unable to pursue a warranty claim in some states. Even if they are allowed to do so in other states, they and the original purchasers will be subject to the limitations on and exclusions that apply to breach of warranty, such as disclaimers, privity requirements, and limitation of remedies which could prevent a full recovery.

The second chapter analyzed the implications of federal preemption of state tort claims involving AVs. Future safety standards developed or legislation introduced could preempt state common law claims. Federal regulation paves the way for implied preemption in the context of motor vehicles. However, the Supreme Court in *Geier* and *Williamson* did not provide clear guidance on implied preemption, which awaits AVs in the future. Since previous preemption cases related to motor vehicles involved specific designs, this Article concluded that performance-oriented standards—assessing whether an AV drives more safely than a conventional vehicle—will work around unpredictable preemption questions. In this case, this Article predicted that there would be fewer design–specific standards that may give rise to implied preemption. Nonetheless, design–specific standards will certainly occur at some point and will necessitate complicated analysis to determine any implied preemption, such as an analysis of the regulatory framework, the objectives of federal regulation, and the federal agency's position.

More importantly, this Article showed one possibility where preemption could play a crucial role in the future. If the threat of future litigation becomes too great for AV manufacturers, federal preemption could limit AV manufacturers' liability for compensation

Robotics", **Maryland Law Review**, Year: 2011, Vol: 70, No: 3, p. 576 (proposing that Congress should safeguard manufacturers of robotic platforms from legal suits for what consumers do with their personal robots).

to injured plaintiffs. Such limited protection for producers has been employed in the past and may be provided for AV manufacturers if they need it in the future.

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