Research on the Division of Tort Liability in Driverless Vehicle Accidents

Rui Diao*

Law School of Gansu University of Political Science and Law, Lanzhou, China

*k792caolian@qq.com

Abstract

Driverless vehicles significantly liberate drivers from manual control, reduce traffic accident risks, and safeguard public safety and property security. Yet, due to the system-controlled nature and imperfect legal regulations, the division of tort liability in driverless vehicle accidents remains ambiguous, necessitating an adapted accountability framework. Based on clarifying the conceptual scope of driverless vehicles, it is essential to delineate shifts in liability proportions for traffic accidents compared to traditional vehicles, adjust and introduce compulsory liability insurance for driverless driving modes, and appropriately strengthen manufacturer obligations. Considering the transitional historical phase of driverless vehicles, an applicable criterion of liability framework for traffic accidents should be established and substantiated. The burgeoning driverless vehicle technology remains in flux regarding both technical standards and application paradigms. Delineating tort liability must not only operate within existing legal frameworks but also judiciously balance between regulating risks of emerging technologies and fostering their innovative development, thereby supporting the driverless vehicle sector and safeguarding public legal rights.

Keywords

Driverless vehicle, division of tort liability, principal liability, criterion of liability, compulsory liability insurance.

1. Introduction of the Issue

The deepening application of driverless driving technology has fundamentally disrupted the rigid driver-vehicle command chain, substantially reducing uncontrollable factors while enhancing driving efficiency and safety metrics. However, the probability of traffic accidents persists at non-zero levels. Conversely, as adoption increases, driverless vehicle accidents have occurred with increasing frequency. In December 2024, a Waymo Robotaxi collided with a Serve robot crossing a street in Los Angeles. Although Waymo's driving system promptly identified the delivery robot and initiated emergency braking, the collision still occurred at low speed. Local regulations lack clear liability allocation guidelines for driverless vehicle accidents, and the U.S. judicial authorities' investigation and liability determination for this incident remain in the negotiation phase. It is a stark manifestation of rapid technological advancement outpacing legal frameworks.

Similar situations exist in China. Some scholars argue that since driverless vehicles do not require continuous human control, which are predominantly governed by the onboard intelligent driving systems, it is reasonable to interpret traffic accidents through product liability and assign tort liability accordingly. However, the division of tort liability in driverless vehicle accidents presents complexities, which is hard to resolve through singular interpretive approaches. It necessitates clarifying the conceptual scope of driverless vehicles, rethinking evaluation criteria for their operational status, investigating determinants impacting accident

liability allocation, and drawing on China's legislative frameworks and experiential insights to advance a coherent liability framework[1-7].

2. Conceptual Clarification of Driverless Vehicles

There has been a conceptual conflation of "driverless vehicles" and "autonomous vehicles". Some scholars rigidly define driverless vehicles as systems that completely eliminate human intervention, achieving full automation without human operators. From this perspective, driverless vehicles become functionally indistinguishable from robots. Such a definition, however, stems from a perspective that narrowly focuses on the absence of drivers, which is a static viewpoint failing to encompass the full conceptual scope of driverless technologies.

2.1. Definition of Driverless Vehicles

China's *Intelligent Vehicle Innovation Development Strategy* issued in 2020 clarifies the conceptual scope of intelligent vehicles. Building upon this foundation, this study adapts the intelligent vehicle concept to define driverless vehicles as motor vehicles equipped with advanced sensors and other devices, utilizing artificial intelligence and other new technologies, which are entrusted to perform hazardous and complex tasks under specific conditions or any circumstances by assuming partial or full vehicle control. They possess highly or fully autonomous driving capabilities and function as intelligent mobile spaces and application terminals.

Similarly, by applying the definitional framework of intelligent vehicles from the *Intelligent Vehicle Innovation Development Strategy* to autonomous vehicles, it was found that their concepts require minimal modification. Motor vehicles equipped with advanced sensors and other devices, utilizing artificial intelligence and other new technologies, possessing certain autonomous driving capabilities, and progressively evolving into intelligent mobile spaces and application terminals. Through this comparative analysis, the conceptual scope of driverless vehicles is thereby clarified.

The core research focus on driverless vehicles within electronic science and technology academia fundamentally resides in motion control. From this perspective, the distinction between driverless and autonomous vehicles becomes evident. Both involve operators relinquishing partial vehicle control and delegating authority to automated systems for task execution, yet their critical divergence lies in the magnitude of residual human oversight retained. It is apparent that autonomous vehicles conceptually encompass driverless vehicles. This study contends that driverless vehicles are not wholly divorced from human intervention precisely because of this oversight differential.

According to the Society of Automotive Engineers (SAE) classification framework, driverless vehicles are broadly categorized into two types, with the conceptual dilemma centering on "human-supervised control" versus "fully autonomous operation". "Human-supervised control" necessitates personnel engagement in monitoring, intervention, or operational input during automated driving to ensure safety and reliability. In contrast, "fully autonomous operation" denotes complete decoupling from human activity during vehicle operation. This study contends that regardless of potential reversion to human-supervised control due to environmental or conditional constraints, any vehicle achieving fully autonomous operation within specific operational phases should be classified as a driverless vehicle[8-12].

2.2. Technical Hierarchical Classification Standards for Driverless Vehicles

Discrepancies in classification criteria ultimately lead to divergent regulatory determinations. In 2021, China's recommended national standard *GB/T 40429-2021: Classification of Driving Automation for Vehicle* was formally promulgated. Compared to the one issued by SAE-International, this standard's classification framework is more tailored to the Chinese

automotive landscape. The standard categorizes automotive driving technology into six levels from L0 to L5 by distinguishing between the degree of dynamic driving tasks that can be performed by a vehicle's automated driving system, based on the primary and secondary status of the system and driver (safety officer) involvement in control during the execution of the driving task as the measurement element. (See Table 1)

Table 1. Vehicle Automation Classification

	Level(L0-L5)	Level Definition	Function	Driver's Control Authority
Driver-Assisted Vehicles	L0	Safeguarding Functions	Capable of sustained execution of partial object and event detection and response within the DDT.	Minimal automation.
	L1	Partial Driving Assistance	Sustained execution of either lateral or longitudinal vehicle motion control within the ODD.	Driver and system jointly execute the DDT.
	L2	Driving Assistance	Sustained execution of both lateral and longitudinal vehicle motion control within the ODD.	Driver and system jointly execute the DDT.
	L3	Conditional Automation	Sustained execution of the entire DDT within the ODD.	Human driver must assume control when system issues a takeover request.
Autonomous Vehicles	L4	High Automation	Sustained execution of the entire DDT and DDT fallback within the ODD.	No driver response required. System achieves MRC automatically.
	L5	Full Automation	Sustained execution of the entire DDT and DDT fallback under all roadway conditions.	Driver becomes passenger. No intervention required.

Currently, L0 through L3 fall under the category of driver-assisted systems, where automated technologies support but do not replace human driving tasks. In contrast, levels L4 and L5 constitute the domain of autonomous vehicles capable of full self-driving operations.

L4 represents the highly automated driving mode, characterized by advanced autonomy. The system must be capable of issuing a human takeover request when approaching operational design domain (ODD) limits, experiencing dynamic driving task (DDT)-related system failures, or other vehicle malfunctions. If the driver fails to respond or actively requests a minimum risk condition (MRC), the vehicle control system shall automatically achieve it. System control authority is relinquished only when either the MRC is attained or full human-supervised control is established. This requirement constitutes the sole distinction between L4 and L5 levels. L5 imposes no ODD constraints, enabling activation of fully autonomous operation under any environmental or situational conditions to perform all DDT. Consequently, users permanently retain the passenger status, merely requiring periodic verification of the vehicle's operational readiness.

3. Division and Proportional Shifts in Tort Liability Subjects for Driverless Vehicle Accidents

This study endorses the denial of independent legal personality for autonomous vehicles, which forms the foundation of this analysis. Furthermore, it contests the reduction of liability attribution solely to product liability frameworks. The manufacturing and operation of driverless vehicles involve producers, users, and owners, each bearing distinct obligations that generate corresponding liabilities. Consequently, the subject liability for driverless vehicles constitutes an aggregate of multiple legal responsibilities.

Although driverless vehicles exhibit the complexity of "car minus driver", their essence remains within the motor vehicle category. The division of tort liability for traffic accidents involving such vehicles may be achieved through a nuanced adaptation of traditional ways. This framework includes two primary liability attributions, product liability and fault-based liability. The distinctive features of tort liability allocation for driverless vehicle accidents manifest particularly in the proportional adjustment of subject liability.

3.1. Rising Proportion of Liability for Manufacturers

Distinct from conventional vehicles, driverless vehicles undergo structural transformations. Some even eliminate control interfaces like steering wheels and horns. When an accident occurs under full system control, it can be inferred that the vehicle itself constitutes the primary causative factor, thus attributing liability to the manufacturer. The term "manufacturer" encompasses designers, producers, and suppliers of control systems and hardware and software components, who bear obligations to recall, repair, or update defective products when necessary. Damages arising from manufacturer defects fall within the scope of product liability. Additionally, if sales-related issues constitute the primary defect cause, liability may be pursued against sellers under Article 40 of the *PRC Product Quality Law*.

Furthermore, data-collecting sensors underpinning driverless vehicles remain highly exposed to external communications, creating opportunities for vehicle manufacturers or unauthorized intruders to remotely tamper with or update data, either to evade liability or sabotage the vehicles. Unauthorized intrusion into vehicle control systems is not exclusive to driverless vehicles. Automated vehicles at L1, L2, or L3 levels also face such risks. If hackers intruding into the system act as tortfeasors, they shall bear corresponding civil liability. Where such intrusions constitute criminal acts, they may additionally face charges under relevant provisions of the Criminal Law. However, if the primary issue arises from design defects in the control system software, it may also fall within the scope of product liability.

The distinction between traditional and driverless vehicle accidents lies not in whether product liability falls within the scope of primary liability considerations, but rather in the probability of such liability being implicated during responsibility allocation, specifically, the proportion of product liability. In traditional vehicle accidents, product liability rarely constitutes the primary responsibility. Fundamentally, this stems from the immense number of traditional accidents, over 250,000 traffic accidents occurred in China in 2024 alone. According to 2021 statistical data, over 95% of these accidents resulted from driver operational errors, with 2.5% attributable to poor road conditions or weather, and the remaining 2.5% caused by technical malfunctions. In contrast, driverless vehicles predominantly operate in fully autonomous states, significantly reducing the possibility of human error and lowering overall accident rates. Consequently, the proportion of accidents primarily attributable to product liability becomes high.

3.2. Declining Proportion of Liability for Owners and Users

Vehicles at L5 operate entirely beyond user control, transforming drivers into passengers who no longer bear tort liability for traffic accidents. In contrast, L4 vehicles still require driver intervention when necessary. Concurrently, driverless vehicles impose heightened inspection obligations on the intelligent control system itself. Given the substantial extinction of users' duty of care during operation, it is more reasonable to reorient their obligations toward maintaining vehicle hardware and software, and inspecting control systems. Failure to fulfill these obligations constitutes actionable fault, classified under fault-based liability within the dual liability framework.

Compared to traditional vehicles, users of driverless vehicles experience a reduced duty of care regarding direct driving operations, while their obligations concerning control systems, hardware, and software maintenance increase. Owing to the lower probability of control system errors, the proportion of fault-based liability borne by owners or users in driverless vehicle accidents decreases comparatively.

Driverless vehicles remain in a phase of rapid development, with L4 constituting a transitional product. In the future, drivers of L4 vehicles will inevitably be phased out, though the specific form of this replacement remains debated. From the perspective of subject liability, whether superseded by producers, initiators of driverless operations, or the vehicle keeper as determined by the "operational control" and "beneficial interest", the gradual elimination of error potential in driving tasks will ultimately cause the fault liability borne by owners and users of driverless vehicles in traffic accidents to approach zero.

3.3. Adjustments and Enhancements to Compulsory Liability Insurance for Driverless Vehicles

The insurance system serves as a fundamental safeguard mechanism in modern "risk society". Pursuant to Article 76 of the *Road Traffic Safety Law of the People's Republic of China*, when traffic accidents occur involving motor vehicles, insurance companies shall first bear liability within the coverage limits of compulsory third-party liability insurance and the terms stipulated in specific liability insurance contracts. In recent years, however, traditional compulsory traffic accident liability insurance has proven inadequate for driverless vehicles. The risk elements of compulsory liability insurance may need transformation, necessitating updates to premium and coverage scope.

Given the operational independence of driverless vehicles in fully autonomous mode, defects in hardware and software, including manufacturing assembly and system design, may warrant recourse against manufacturers under Article 1202 of the *Civil Code of the People's Republic of China* governing product liability. However, some scholars contend that directly applying product liability frameworks to system defects may not be optimal. Since control systems possess artificial intelligence self-learning capabilities, their decision-making logic resembles human cognition, rendering even programming experts unable to fully explicate their operational pathways. Requiring driverless vehicle manufacturers to assume full liability for uncontrollable and unforeseeable circumstances would impose excessive burdens. As Kenneth S. Abraham and Robert L. Rabin assert, the product liability regime for automotive manufacturers will become obsolete and inapplicable. This position finds legal grounding in Article 41(2)(3) of the *PRC Product Quality Law*, which exempts manufacturers from liability for design defects undetectable by contemporary scientific and technological standards at the time of product circulation. However, beyond inherent system failures, driverless vehicle control systems face external intrusions and interference that undoubtedly heighten traffic accident risks. Shifting these risks to vehicle owners or users would indirectly amplify uncertainties faced by driverless vehicle consumers, likely deterring them from purchasing and utilizing such vehicles. This can severely impede industry development. To protect users,

owners, and other involved parties in accidents while preventing unreasonable risk shifting and encouraging technological innovation, structural reforms to compulsory liability insurance are essential. Given the incompatibilities between driverless and traditional vehicle insurance frameworks, the following adjustments can be considered.

First, a new insurance category specifically for driverless vehicle control systems can be established, which is underwritten by manufacturers or mandates joint coverage by manufacturers, owners, and users at reasonably apportioned rates. Such rates shall be determined based on comprehensive factors, including beneficiaries' profit margins and evidentiary accessibility. In scenarios with ambiguous subject liability, involving product manufacturers in insurance coverage serves as a pragmatic makeshift for damage compensation, mitigating complexities from multi-source hardware and software modules which prolongs subject liability determination, litigation, and recourse difficulties, while reducing forensic costs. By obviating the need to conclusively prove system defects, it substantially lowers evidentiary burdens for both parties, thereby fundamentally enhancing the protection for users, owners, and accident victims. Second, a cybersecurity compulsory liability insurance tied to driverless vehicle control system safety can be introduced. This provides relief to victims during cybersecurity incidents, functionally analogous to third-party liability insurance.

Furthermore, factors impacting the safety of driverless vehicle control systems remain indeterminate, necessitating potential revisions to premium calculation though the precise adjustment remains unclear. Notably, projections indicate that the US auto insurance market will contract to $40 billion by 2040 due to the disruptive impact of driverless vehicles. Given their superior safety compared to conventional vehicles, the underwriting risks, premiums, and even the market scale and revenue for compulsory liability insurance may progressively diminish.

4. Application and Justification of Criterion of Liability for Driverless Vehicle Accidents

Criterion of liability serves as the foundation for resolving tort liability allocation, guiding the construction and application of the entire tort law framework. Regarding the application of criterion of liability to artificial intelligence across domains, some scholars argue against generalized liability approaches, advocating for a risk-based typological approach. This way focuses on establishing strict liability for high-risk AI systems, applying presumption of fault for limited-risk scenarios, and maintaining fault-based liability for low-risk contexts, thereby achieving dynamic equilibrium between technological risk and legal accountability. This study endorses this perspective.

Within the L4 and L5 driverless vehicle classifications, tort liability for L5 accidents can exclusively be product liability, establishing a fixed liability subject. In contrast, L4 scenarios entail greater complexity, where product liability and fault-based liability of users and owners may coexist. Given this distinction, diverse criterion of liability should apply to different cases, broadly categorized as accidents between two driverless vehicles, accidents involving driverless and conventional vehicles, and accidents involving driverless vehicles and non-motorized road users.

4.1. Liability between Driverless Vehicles: The Fault Liability Principle

Traditional vehicle accidents and driverless vehicle accidents exhibit no substantial divergence in unlawful conduct or harmful consequences. Analysis should therefore focus exclusively on two factors influencing the criterion of liability, the causality between conduct and resulting harm, and the fault attributable to the actors themselves.

In traditional vehicle accidents, the conduct of users is basically the direct factor causing damages, that is, the causality between such conduct and accidents is "presence" or "absence". However, the less influence of human control in driverless vehicles and the more contribution of other factors transform this causality into a quantitative assessment from qualitative determination to proportional allocation. When accidents occur between driverless vehicles, both parties need quantitative causality evaluation to achieve a balance in attribution. Crucially, the analysis of causality remains inextricably linked to the fault assessment of user conduct.

Traditional vehicles share equal legal status and obligations with no inherent disparity. Article 76 of the *Road Traffic Safety Law of the People's Republic of China* explicitly prescribes the application of the fault liability principle to accidents involving conventional vehicles. In this way, it is justified to apply the fault liability principle to accidents involving two driverless vehicles. When driverless vehicles operate via intelligent systems, primary consideration must be given to vehicular deficiencies, such as flawed system design, algorithmic errors, or product defects. If the accident or damage results from product defects in one party's vehicle, liability should be with the corresponding manufacturer. If both vehicles exhibit product failures, the manufacturers should apportion liability according to their respective degrees of fault. This approach is fully consistent with the fault liability principle.

After excluding product defects, further analysis must focus on potential faults attributable to human actors. In collisions between conventional vehicles, determining whether a party's conduct is negligence depends on assessing breach of the duty of care standard. It diverges into two ways, the subjective fault and the objective fault. Traditional traffic accident frameworks, with their well-established, matching legal regulations and strong stability, accommodate the objective fault principle. However, at the current nascent stage of driverless vehicle technology, objective benchmarks for fault assessment remain ambiguous. Product standards and legal norms are underdeveloped, while duty of care requirements for users vary significantly across vehicle capabilities, rendering the "reasonable user" standard hard to uniformly apply. Although the subjective fault principle accounts for the specificity of different driverless vehicles and their users, it faces limitations in judging real mental states.

The law cannot overlook responsibility shifts induced by subjective factors, yet must simultaneously address objective dimensions. A subjective-objective fault principle involving both perspectives may offer a more adapted framework for driverless vehicles.

4.2. Liability between Driverless and Traditional Vehicles: The Presumption of Fault Principle

Article 1165(2) of the *Civil Code of the People's Republic of China* stipulates that, where the law presumes the actor to be at fault, the actor shall bear tort liability if unable to prove the absence of fault. The presumption of fault principle shifts the burden of proof from the victim to the injuring party, effectuating a reversal of evidentiary obligations.

The burden of proof and the capacity to adduce evidence are linked, whereas the latter often correlates with proximity to evidence. Assigning the primary burden of proof to the party with superior evidentiary capacity owing to closer proximity to evidence enhances judicial efficiency, reduces evidentiary costs, and mitigates inequalities by safeguarding vulnerable parties. Consequently, the 2019 amended *Provisions of the Supreme People's Court on Evidence in Civil Procedures*, without explicitly mentioning "reversal of burden of proof" or "defendant's burden of proof", indirectly embodies the essence of burden-shifting through its rules on admissions.

This study advocates applying the presumption of fault principle to liability allocation between driverless and conventional vehicles. Specifically, the burden of proof should initially rest with driverless vehicle producers or users to demonstrate the absence of hardware and software defects. Given the technological sophistication of autonomous vehicles, conventional vehicle manufacturers and users often occupy a disadvantaged position regarding technical expertise

and information access channels. Requiring them to decipher complex algorithmic black boxes, especially when even tech companies struggle to elucidate AI decision-making mechanisms and where algorithms may be trade secrets, imposes unjust evidentiary burdens to establish causal links between driverless system decisions and accidents. Conversely, driverless vehicle developers and manufacturers possess inherent technical proficiency to substantiate their claims through authoritative documentation such as quality certification reports, accident liability determinations, or post-accident technical inspection protocols.

Subsequently, upon confirming the absence of vehicular defects, the burden of proof shifts to the user of the driverless vehicle to demonstrate whether improper operation occurred. Having undergone comprehensive training and prolonged usage, users are presumed to comprehend fundamental operational protocols. Reversing the burden of proof facilitates more efficient evidence collection, alleviating burdens for conventional vehicle users who typically occupy a disadvantaged position, while imposing heightened obligations on driverless vehicle parties. This dual approach enables comprehensive self-justification by driverless vehicle operators, thereby enhancing the precision of tort liability allocation in traffic accidents.

4.3. Liability between Driverless Vehicles and Non-Motorized Road Users: The Strict Liability Principle

Article 76(2) of the *Road Traffic Safety Law* shifts the liability basis for infringements against non-motorized road users and pedestrians from no-fault liability to a special presumption of fault. However, dissent persists regarding whether the amended provision can be an application of presumption of fault. Judicial practitioners typically maintain that this clause remains no-fault liability, while some scholars argue that even with the exemption for "intentional collision by non-motorized road users or pedestrians", the provision's connotation aligns with presumption of fault. Considering these perspectives, this study endorses that, even if the provision cannot be seen as purely presumption of fault, categorizing it as no-fault liability remains untenable.

Throughout the evolution from inception to widespread adoption, conventional vehicles once confronted such dilemmas. During the nascent stage of automotive development, minimal ownership and underdeveloped legal frameworks led to conventional vehicles being categorized under hazard-based liability within strict liability doctrines, being excessively hazardous to non-motorized road users and pedestrians. As noted by the Legislative Affairs Commission of the NPC Standing Committee *in Interpretations and Practical Guidelines for the Road Traffic Safety Law of the People's Republic of China*, the 2007 amendments primarily refined the criterion of liability for civil liability in traffic accidents, indirectly corroborating this historical trajectory. As technological and societal progress advanced, conventional vehicle ownership surged, accompanied by increasingly sophisticated legal frameworks and standardized driver training and supervision mechanisms. Consequently, the perceived hazardous attributes of conventional vehicles gradually diminished. With their integration into daily life, society no longer panics at such accidents. Consequently, the determination of tort liability reverts to the fault of the parties involved in the accident.

Driverless vehicles are currently mirroring the developmental trajectory experienced by conventional vehicles decades ago. Following Baidu Apollo's launch of the Apollo Go Robotaxis, technical flaws have emerged. In July 2024, one such taxi collided with a pedestrian, triggering significant controversy. The immature state of Robotaxi technology has led automotive engineers to speculate that mature driverless driving may only be achieved around 2030.

Similar to traditional vehicles, driverless vehicles have significant disparities in external conditions compared to non-motorized road users and pedestrians, rendering the latter more vulnerable to harm. Moreover, driverless vehicles possess high-speed and heavy-load attributes that entail substantial hazards. Concurrently, the current low adoption of driverless

vehicles, fragmented technological development, and incomplete legal frameworks collectively amplify their risk toward pedestrians and non-motorized road users. This creates a chasm between the consensus on driverless vehicles' superior safety and their intrinsic hazardous nature.

A comparative analysis of legislative amendments reveals that the current *Road Traffic Safety Law* places greater emphasis on fault. In contrast, the prior version stipulated that, where accidents occur between motor vehicles and non-motorized road users or pedestrians, the motor vehicle party shall bear liability. This earlier formulation did not highlight the fault of non-motorized road users or pedestrians, merely allowing for reducing the motor vehicle party's liability only when they violated traffic safety laws and regulations. Critically, violations of traffic laws and regulations do not equate to an absence of fault, whose concepts diverge in legal severity. Furthermore, such liability reduction was conditional upon the motor vehicle driver having taken necessary avoidance measures. This framework is a classic form of strict liability.

This study contends that adopting the strict liability from the earlier *Road Traffic Safety Law* could bridge the gap between societal expectations of driverless vehicle safety and their inherent hazards. Driverless vehicles maintain a dominant position relative to non-motorized road users and pedestrians who lack safeguards such as legal protections, skill training, and supervision mechanisms. This asymmetry requires imposing heightened duties of care on driverless vehicles to ensure the safety of all traffic participants. Applying strict liability, where responsibility accrues regardless of fault, better protects vulnerable road users, alerts manufacturers and operators to their obligations, and simultaneously bolsters public confidence in driverless vehicle technology.

Certainly, if investigations confirm evidence that traffic accidents result from intentional acts by non-motorized road users or pedestrians, such as extreme cases of suicide or self-harm, or maliciously fabricating accidents to extort compensation, driverless vehicles may be exempt from liability under the existing law, thereby avoiding unjust liability arising from others' malicious conduct.

5. Conclusion

New problems and risks are often tacitly permitted as developmental costs. Building upon comparative analysis of traditional vehicle liability frameworks and existing theories, while fully accounting for the distinctive attributes of driverless vehicles, this study elucidates the conceptual framework for tort liability allocation in driverless vehicle accidents through two dimensions, principal liability and criterion of liability. The following core points are proposed. Firstly, proportional shifts in accident liability should be clarified while updating compulsory liability insurance to incorporate manufacturer obligations and cybersecurity safeguards. Secondly, the application of fault-based liability, presumption of fault, and strict liability principles should be delineated across diverse accident scenarios involving driverless vehicles.

It is an undeniable reality that the institutional and legal frameworks governing driverless vehicles remain incomplete. Maintaining risks arising from technological immaturity within socially acceptable thresholds constitutes a prudent imperative during this transitional phase. This discourse aims to catalyze consideration of driverless vehicle challenges, thereby propelling the industry toward robust and sustainable development.

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