

## LEGAL STATUS OF AUTONOMOUS VEHICLES: LEGAL LIABILITIES AND REGULATIONS

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### ABSTRACT

The transition to autonomous vehicles represents a paradigm shift in modern transportation, offering the potential to drastically reduce traffic fatalities that were caused by human error. However, the legal integration of self-driving technology presents profound challenges to traditional liability frameworks, which are fundamentally predicated on human agency, negligence, and control. This research paper provides an exhaustive and comparative analysis of the legal status of autonomous vehicles, focusing on the friction between legacy laws and advanced artificial intelligence. Utilizing the Society of Automotive Engineers (SAE) levels of automation, the study dissects the "responsibility gap" that emerges when the driving task shifts from a human subject to an automated software driven system. The paper evaluates the viability of transitioning from fault-based negligence to product liability, strict liability, and no-fault compensation systems. Furthermore, it conducts a comprehensive global review of emerging regulatory frameworks, detailing recent federal legislative efforts in the United States, the European Union's Artificial Intelligence Act and Product Liability Directive, the United Kingdom's Automated Vehicles Act 2024, Germany's pioneering ethical guidelines, and the infrastructural constraints within India's Motor Vehicles Act. Finally, the paper synthesizes recent jurisprudence—including high-profile litigation involving Tesla, Uber, and General Motors' Cruise—to illustrate how courts are currently adjudicating the failures of both driver-assistance technologies and fully autonomous fleets. Ultimately, the research concludes that the safe and equitable deployment of autonomous vehicles requires abandoning fragmented legal frameworks in favor of harmonized, strict-liability systems that ensure rapid victim compensation and establish clear corporate accountability.

**KEYWORDS:** Autonomous Vehicles, Legal Liability, Product Liability, Artificial Intelligence Act, Automated Vehicles Act 2024, Strict Liability, SAE Levels of Automation, Motor Vehicles Act, Negligence.

## 1. INTRODUCTION

For over a century, global transportation law has operated on a single, unwavering assumption: a physical human being is in direct control of the motor vehicle. Traffic codes, insurance models, and tort liability doctrines have been meticulously designed to evaluate human behavior, penalizing negligence, distraction, impairment, and slow reaction times. The rapid commercialization of autonomous vehicles and advanced driver-assistance systems is now systematically dismantling this foundational legal assumption. Traffic safety experts estimate that the widespread adoption of self-driving technology could reduce accident rates by 80% to 90%, primarily because human error—such as fatigue, intoxication, and inattention—accounts for over 90% of all vehicle collisions globally.<sup>1</sup>

Despite these overwhelming public health and productivity benefits, the integration of autonomous systems into public roadways raises complex legal and ethical dilemmas. When a machine makes an error that results in property damage or loss of life, the traditional legal mechanism of assigning blame to a “negligent driver” collapse. The central legal challenge surrounding autonomous vehicles is the allocation of liability: determining whether the human occupant, the vehicle manufacturer, the software developer, or the algorithmic system itself should be held legally and financially responsible.

This transition will not occur overnight. Society is entering a long and slow transition period where conventional human-driven vehicles and autonomous vehicles of varying capabilities will coexist on the same infrastructure and software. Consequently, lawmakers and courts must navigate a fragmented legal landscape and a clear road map. This research paper explores the evolving legal status of autonomous vehicles in simple English, breaking down the technical definitions that drive legal liability. It examines the theoretical shift from tort negligence to product and strict liability, analyzes global regulatory responses across key jurisdictions, and reviews landmark case laws from 2023 to 2025 that are setting early legal precedents for the future of Autonomous vehicles.

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<sup>1</sup> Laxmi Narayan, Autonomous vehicle market size to hit USD 5,439.46 billion by 2035 Precedence Research (2026), <https://www.precedenceresearch.com/autonomous-vehicle-market> (last visited Apr 2, 2026).

## 2. The Taxonomy of Automation and the "Responsibility Gap"

To establish legal liability, courts and regulators must first define what constitutes "autonomy." Global regulatory bodies uniformly rely on the taxonomy established by the Society of Automotive Engineers (SAE) International. Specifically, the SAE J3016 standard—recently updated in 2021 in close partnership with the International Organization for Standardization (ISO) to provide clarity for global regulators—serves as the universal benchmark.

The SAE framework divides vehicle automation into six distinct levels. These levels are not just engineering milestones; they act as precise legal demarcations that dictate when liability transfers from the human driver to the automated driving system.

**Table 1: SAE Levels of Automation and Liability Allocation.**

SAE Level	Automation Designation	Operational Description	Legal Liability and Responsibility
Level 0	No Automation	The human performs all dynamic driving tasks. The vehicle only provides warnings (e.g., blind-spot alerts).	<b>Human Driver:</b> Full liability under traditional negligence and traffic laws.
Level 1	Driver Assistance	The vehicle controls either steering or speed, but the human must perform the remainder of the driving task.	<b>Human Driver:</b> Full liability. The human is legally operating the vehicle.
Level 2	Partial Automation	The vehicle controls both steering and speed simultaneously. The human must constantly monitor the environment.	<b>Human Driver:</b> Full liability. Classified as a "Driver Support System." Driver distraction remains the legal fault.
Level 3	Conditional Automation	The vehicle performs all aspects of driving under specific conditions. The human must take over upon a system request.	<b>Shared/Transitional:</b> Manufacturer is liable while the system is engaged; liability shifts to the human during a handoff.
Level 4	High Automation	The vehicle performs all driving tasks in defined operational areas (geofencing). No human intervention is required.	<b>Manufacturer/Operator:</b> The system is entirely responsible. Human occupants are legally considered passengers.
Level 5	Full Automation	The vehicle performs all driving tasks under all roadway and environmental conditions.	<b>Manufacturer/Operator:</b> Absolute product or system liability. Human occupants bear no driving liability.

### 2.1 The Liability Rubicon and the Handoff Dilemma

The most critical legal boundary in the SAE taxonomy exists between Level 2 and Level 3. In Levels 0 through 2, the human occupant is legally recognized as the "driver," and the automation is legally classified merely as a driver support system. If an accident occurs while

a Level 2 system is engaged, courts consistently hold the human driver liable for failing to maintain situational awareness.

Level 3 introduces the concept of an automated driving system that relieves the human of the driving task, but requires a "fallback-ready user" who must take control if the system requests intervention. This creates the "handoff dilemma"—a highly ambiguous legal gray area. If a collision occurs within the few seconds it takes for a human to regain situational awareness and take the wheel, determining whether the fault lies with a defective machine interface or a negligent human response is incredibly difficult. Because of this liability friction, many automakers are bypassing Level 3 entirely to focus on Level 4 robotaxis, where the human is purely a passenger and liability is consolidated solely on the corporate operator.

Historically, international treaties like the Vienna Convention on Road Traffic required a human driver to be in control at all times. However, a 2016 amendment to the Convention now permits automated driving systems provided that human intervention or overriding is possible, marking a crucial shift in the international legal approach to automation.\

### **3. The Evolution of Legal Liability Frameworks**

When a human is no longer actively operating a vehicle, the legal theory used to compensate accident victims must evolve. The transition to autonomous driving fundamentally disrupts traditional tort law and forces the legal system to explore alternative liability models.

#### **3.1 From Negligence to Product Liability**

Under conventional legal systems, victims of car accidents seek compensation by proving that the other driver breached their duty of care through negligence. However, when an autonomous vehicle without a human driver causes an accident, there is no human behavior to evaluate against the standard of a "reasonable person". Consequently, legal actions must pivot toward product liability.

Product liability law allows plaintiffs to recover damages by proving that a product was defective in its design, manufacturing, or marketing. For autonomous vehicles, attorneys must argue that the software algorithm or the hardware sensors (such as LiDAR or radar) possessed a design defect that proximately caused the collision.

However, applying legacy product liability laws to advanced artificial intelligence creates a massive "responsibility gap". Modern autonomous vehicles rely on deep neural networks and

machine learning algorithms that are non-deterministic<sup>2</sup>, making real-time decisions that even their original developers cannot always perfectly trace or explain. If a plaintiff cannot explicitly point to a specific flaw in millions of lines of code, successfully proving a design defect under traditional evidentiary standards becomes a nearly insurmountable hurdle.

### **3.2 Strict Liability and No-Fault Compensation Systems**

To bypass the evidentiary barriers of traditional product liability, legal scholars and lawmakers are increasingly advocating for Strict Liability and No-Fault Compensation Systems.

Under a strict liability regime, the manufacturer of the autonomous vehicle is held financially responsible for any damage the vehicle causes while in autonomous mode, regardless of whether a specific software defect or negligence can be proven. The underlying legal philosophy is that the manufacturer is in the best position to absorb the costs of accidents, distribute those costs across its consumer base, and insure against the risks.

Furthermore, legal scholars have proposed models like the Manufacturer Enterprise Responsibility scheme, which would collect federal fees from automakers based on their market share and crash frequencies. Victims would file claims directly against a federally administered fund, functionally similar to the existing National Vaccine Injury Compensation Program in the United States. Alternatively, some scholars point to the Quebec No-Fault Compensation System in Canada as a viable model, where road accident liability allows victims to claim compensation directly without proving fault, streamlining the recovery process for autonomous vehicle incidents.

### **3.3 The Debate on Artificial Intelligence Personhood**

As autonomous systems become highly sophisticated, an academic and philosophical debate has emerged regarding whether an autonomous vehicle—or its artificial intelligence system—should be granted "legal personhood". Legal personhood is a legal fiction that grants an entity the capacity to enter into contracts, hold rights, and bear responsibilities, much like a modern corporation.

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<sup>2</sup> Spiekermann, S. (2022) What to expect from IEEE 7000: The first standard for building ethical systems, IEEE Technology and Society. Available at: <https://technologyandsociety.org/what-to-expect-from-ieee-7000-the-first-standard-for-building-ethical-systems/> (Accessed: 02 April 2026).

Proponents argue that endowing an autonomous vehicle with the status of an "electronic person" would solve the liability vacuum. The vehicle itself could hold its own insurance policy and be sued directly, shielding human owners from vicarious liability. In 2017, the European Parliament even explored civil law rules on robotics that considered electronic personhood. However, this concept faces significant resistance. Courts and legislative bodies globally are reluctant to endow machines with personhood, noting that AI systems lack moral agency and independent assets to pay judgments. Current regulatory developments are instead combining proactive risk management with traditional corporate liability.

**Table 2: Comparison of Liability Models for Autonomous Vehicles.**

Legal Framework	Basis of Liability	Burden of Proof	Primary Advantage	Primary Disadvantage
<b>Negligence</b>	Human error or breach of duty.	Plaintiff must prove duty, breach, causation, and damages.	Relies on well-established legal precedents.	Obsolete for Level 4/5 vehicles where humans do not drive.
<b>Product Liability</b>	Defective design, manufacturing, or warning.	Plaintiff must prove the software/hardware was inherently defective.	Holds technology companies accountable for rushed products.	Highly complex, expensive, and difficult to prove software defects.
<b>Strict Liability / No-Fault</b>	Occurrence of the accident while the system is engaged.	Plaintiff only needs to prove the vehicle caused the injury.	Swift compensation for victims without lengthy litigation.	May place heavy financial burdens on manufacturers early on.
<b>Legal Personhood</b>	The AI system is viewed as an independent actor.	Victim sues the vehicle's legal entity directly.	Protects human owners from unfair vicarious liability.	Controversial; machines lack moral agency and assets to pay.

#### 4. Global Regulatory Frameworks

Because the legal challenges of autonomous driving cannot be solved purely through the judicial interpretation of old laws, governments worldwide are aggressively drafting bespoke regulatory frameworks. These efforts vary widely, ranging from localized experimental pilot programs to comprehensive national statutes.

### 4.1 The United States: Federalism and State-by-State Patchwork

The regulatory environment for autonomous vehicles in the United States is defined by a deep tension between federal authority and state sovereignty. Historically, the federal government, through the National Highway Traffic Safety Administration (NHTSA), has regulated vehicle design and safety standards, while individual states have governed driver licensing, insurance requirements, and rules of the road.

This division has created a fragmented, state-by-state patchwork of regulations. This lack of harmonization causes regulatory arbitrage and creates significant legal uncertainty for cross-border commercial deployments.

**Table 3: Examples of State Liability Coverage Requirements for Highly Automated Vehicles**

US State	Operational Deployment Status	Specific Liability Coverage Requirements
<b>Alabama</b>	Level 4 and 5 permitted without a licensed driver in the vehicle.	\$100,000 (private), \$1 million (commercial entity), \$2 million (automated commercial motor vehicle).
<b>Arizona</b>	Level 4 and 5 permitted without a licensed driver.	Must have the exact same liability coverage required for non-automated vehicles under existing law.
<b>Arkansas</b>	Licensed driver required in vehicle for the first 6 months of operation.	Ranging from \$750,000 to \$5 million, depending on the vehicle type and its commercial purpose.
<b>California</b>	Level 4 and 5 permitted without a licensed driver in the vehicle.	Liability coverage of at least \$5 million is required.
<b>Colorado</b>	Level 4 and 5 permitted.	Specific liability coverage amounts are not explicitly addressed in automated vehicle statutes.

To address this fragmented landscape, the year 2025 has seen a surge in federal legislative initiatives aimed at creating a unified national framework. The Autonomous Vehicle Acceleration Act, introduced by Senator Cynthia Lummis, seeks to rapidly update federal safety standards specifically for Level 4 and 5 vehicles to enable faster adoption. Concurrently, the America Drives Act, introduced by Representative Vince Fong, proposes federal preemption over state regulations for autonomous commercial trucking. Furthermore, the AV Safety Data Act, introduced by Representative Kevin Mullin, mandates rigorous reporting to NHTSA regarding vehicle miles traveled, collisions, and interactions with law enforcement. Finally, the AV Accessibility Act, championed by Representative Greg Stanton, aims to enhance access to autonomous rideshare services for individuals with disabilities.

Despite industry support, these bills face pushback from labor groups demanding mandatory human safety operators in commercial vehicles to protect jobs and handle operational edge cases. Furthermore, federal oversight remains active, with the Department of Justice and the Securities and Exchange Commission recently initiating investigations into companies like Cruise following safety incidents.

#### 4.2 The European Union: The AI Act and Product Liability Directive

The European Union has adopted the most comprehensive and preemptive regulatory posture globally, approaching autonomous vehicles through the dual lenses of artificial intelligence governance and product safety.<sup>3</sup>

In 2024, the EU officially enacted the Artificial Intelligence Act, a landmark legislative framework that categorizes AI systems based on their potential threat to public safety and fundamental rights. Under this Act, the software powering autonomous vehicles is explicitly categorized as "high-risk". This classification places severe, proactive compliance obligations on automakers. Manufacturers must implement continuous risk management frameworks, ensure their training datasets are free from bias and errors, maintain robust cybersecurity protocols, and build fail-safe mechanisms ensuring human oversight. Furthermore, manufacturers must undergo rigorous third-party conformity assessments and maintain meticulous technical documentation. Financial penalties for non-compliance are severe, allowing regulators to levy fines of up to €35 million or 7% of a company's global annual turnover, alongside mandatory product recalls.

**Table 4: Implementation Timeline of the EU Artificial Intelligence Act.**

Implementation Date	Regulatory Phase	Impact on Autonomous Vehicle Manufacturers
August 1, 2024	Entry into Force	The AI Act officially becomes law across all 27 EU Member States.
February 2, 2025	Prohibitions Apply	Bans on unacceptable AI practices (e.g., social scoring, real-time biometric identification) take effect.
August 2, 2025	Governance Rules	Obligations for general-purpose AI models and data governance frameworks become fully applicable.
August 2, 2026	Full Applicability	The majority of the AI Act's provisions become fully applicable and enforceable.

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<sup>3</sup> Raviv, A. (2024) Event Data Recorders, Federal Register. Available at: <https://www.federalregister.gov/documents/2024/12/18/2024-29862/event-data-recorders> (Accessed: 03 April 2026).

Implementation Date	Regulatory Phase	Impact on Autonomous Vehicle Manufacturers
August 2, 2027	High-Risk Integration	Extended transition period ends for high-risk AI systems that are embedded into regulated products like vehicles.

Complementing the AI Act is the radically updated **Product Liability Directive (PLD)**, which entered into force in December 2024 with a transposition deadline of December 2026. Recognizing that old definitions of "products" were insufficient, the revised PLD explicitly categorizes standalone software, artificial intelligence systems, and over-the-air updates as products subject to strict liability. The directive establishes new defect triggers; for example, if an autonomous vehicle manufacturer fails to deploy a software update to patch a known cybersecurity vulnerability, and that vulnerability is exploited, the manufacturer is strictly liable. The PLD also broadens compensable damages to include medically recognized psychological harm and the destruction of non-professional digital data. Additionally, the EU Data Act (which came into force in January 2024, with major data access obligations applying in September 2025) will further regulate how the vast amounts of telemetry data generated by connected vehicles must be shared and accessed.

#### 4.3 The United Kingdom: The Automated Vehicles Act 2024

The United Kingdom has prioritized absolute legal clarity to foster innovation, culminating in the passage of the Automated Vehicles Act (AVA) 2024. Based on a comprehensive four-year review by the Law Commissions of England and Wales and the Scottish Law Commission, the AVA establishes an end-to-end framework for the safe deployment of self-driving vehicles on British roads. The Act requires the Secretary of State for Transport to prepare a Statement of Safety Principles to measure safety performance and outcomes.

The most revolutionary aspect of the UK's approach is its statutory allocation of liability.<sup>4</sup> The AVA strictly defines an autonomous vehicle as one authorized to drive itself safely without human monitoring. When the automated driving system is actively engaged, the AVA grants complete immunity to the human occupants. The human user is legally shielded from civil and criminal liability for driving offenses, meaning ultimate liability shifts to either the manufacturer or the operator.

<sup>4</sup> Wilson, O. (2026) Automated vehicles in the UK: What's coming down the road in 2026? Hogan Lovells. Available at: <https://www.hoganlovells.com/en/publications/automated-vehicles-in-the-uk-whats-coming-down-the-road-in-2026> (Accessed: 02 April 2026).

To handle financial compensation, the framework relies on the earlier Automated and Electric Vehicles Act (AEVA) of 2018. Under AEVA, the vehicle's motor insurer acts as the first point of compensation for victims. If an automated vehicle causes a collision, the insurer must swiftly compensate the injured party. Following the payout, the insurer is legally empowered to initiate recovery claims against the "Authorised Self-Driving Entity" (ASDE)—usually the vehicle manufacturer or software developer—if the accident was caused by a software defect. Furthermore, the AVA creates strict criminal offenses for corporate entities that withhold information from regulators or provide false data during the safety authorization process.

#### **4.4 Germany: The Pioneer of Level 4 Integration**

Germany has positioned itself at the forefront of autonomous vehicle legislation. In 2021, the German parliament passed the Act on Autonomous Driving, making Germany the first nation in the world to establish a statutory basis for allowing fully driverless vehicles (SAE Level 4) to operate in regular public traffic within defined areas. This was followed by the AFGBV ordinance in 2022, which regulated the operational requirements. Germany's regulatory progress is evident in its type approvals; in 2021, it granted the first approval for an Automated Lane Keeping System (ALKS) at 60 km/h, and in 2024, it issued an approval for speeds up to 95 km/h. Internationally, Germany aligns with UN Regulation No. 157, which was amended in January 2023 to extend the maximum speed for automated driving systems on motorways up to 130 km/h.

Crucially, Germany has confronted the ethical dimensions of artificial intelligence. The Federal Ministry for Digital and Transport established an Ethics Commission, which published the world's first ethical guidelines for automated driving algorithms. The guidelines legally mandate that in unavoidable collision scenarios (the classic "Trolley Problem")<sup>5</sup>, algorithms must prioritize the preservation of human life over the protection of property or animals. Furthermore, the software is strictly prohibited from discriminating between humans based on age, gender, race, or physical constitution when determining collision outcomes.

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<sup>5</sup> Hao, K. (2024) *Should a self-driving car kill the baby or the grandma? depends on where you're from.*, MIT Technology Review. Available at: <https://www.technologyreview.com/2018/10/24/139313/a-global-ethics-study-aims-to-help-ai-solve-the-self-driving-trolley-problem/> (Accessed: 02 April 2026).

#### 4.5 India: Statutory Constraints and Infrastructural Developments

While Western jurisdictions are rapidly updating their laws, India faces a profound legal vacuum regarding autonomous vehicles. The primary statute governing road transport, the Motor Vehicles Act (MVA) of 1988, is entirely incompatible with self-driving technology. Specifically, Section 109 of the MVA mandates that every motor vehicle must be constructed and maintained such that it is "always under the effective control of the person operating it". Because Level 4 and 5 vehicles lack a human operator exerting effective mechanical control, their deployment on Indian public roads currently constitutes a violation of federal law.

Furthermore, India lacks specific legislative provisions to address the "responsibility gap" for hardware or software failures, meaning liability under current Indian law can only be attached to a human driver. The existing automobile insurance system strictly underwrites hardware failure and driver error, completely omitting coverage for network failures, remote hacking, and algorithmic defects. There is also an absence of specific data privacy laws obliging autonomous vehicle operators to disclose location and telemetry data for post-accident investigations.

Despite these statutory hurdles, India is making infrastructural shifts to prepare for vehicle automation. The Motor Vehicles (Amendment) Act of 2019 updated definitions for "adapted vehicles" to foster research and innovation, although it stopped short of authorizing full autonomy. Acknowledging the severe impact of road traffic injuries, the Ministry of Road Transport and Highways (MoRTH) has mandated that starting in April 2026, newly introduced models of heavy passenger vehicles, buses, and trucks (categories M2, M3, N2, N3) must be equipped with Advanced Driver Assistance Systems (ADAS), such as Advanced Emergency Braking.

Additionally, the Indian government is rapidly expanding Automated Testing Stations (ATS) across the country to standardize vehicle fitness testing. The Central Motor Vehicles Rules mandate specific infrastructure for these testing facilities, requiring a minimum of 500 square meters for two or three-wheelers and 1500 square meters for heavy motor vehicles. These facilities must also possess cybersecurity certifications to ensure secure access to federal vehicle databases and include proper ventilation and fume extraction systems. These investments represent the technological infrastructure necessary to eventually certify automated driving systems, but comprehensive legislative amendments to the Motor Vehicles Act remain an urgent prerequisite before driverless testing can legally commence in India.

## 5. Recent Jurisprudence and Landmark Settlements (2023-2025)

While lawmakers debate future frameworks, the court systems are already being forced to untangle liability through aggressive civil litigation. Recent case law from 2023 to 2025 highlights a growing judicial skepticism toward automakers that attempt to deflect liability entirely onto human operators when utilizing advanced technology.

### 5.1 Level 2 ADAS Litigation: The Tesla Cases

Tesla has faced an onslaught of litigation surrounding its "Autopilot" and "Full Self-Driving" software. Because these systems are classified as SAE Level 2, Tesla's primary legal defense in accident litigation has historically been that the human driver is solely responsible for maintaining control and that the software is merely an assistance feature.

However, this defense is beginning to fail under strict judicial scrutiny. In a landmark October 2025 decision in Miami, a jury delivered a staggering \$329 million verdict against Tesla, finding its Autopilot system defective.<sup>6</sup> The plaintiff's attorneys successfully argued that the system's design was inherently flawed and created foreseeable dangers, rejecting Tesla's argument that the crash was entirely the result of driver distraction. This verdict signals a critical shift: juries are increasingly willing to hold manufacturers liable for defective design if the vehicle's marketing or interface lulls drivers into a false sense of security.

Faced with the unpredictability of jury trials, Tesla has also resorted to settling high-profile cases out of court. In April 2024, Tesla reached a confidential settlement with the family of Apple engineer Walter Huang, who was killed in a 2018 crash when his vehicle steered into a concrete barrier while on Autopilot. Similarly, Tesla settled with the family of Jovani Maldonado Garcia, a teenager killed in a 2019 Autopilot crash. By settling these cases, Tesla avoids establishing binding legal precedents that could definitively establish strict product liability for its driver-assist features across all jurisdictions.

### 5.2 Level 4 Robotaxi Litigation: Uber, Cruise, and Waymo

Litigation involving Level 4 autonomous fleets presents a different legal dynamic, as the corporate manufacturer is undeniably the sole operator of the vehicle.

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<sup>6</sup> Kolodny, L. (2025) Tesla must pay portion of \$329 million in damages after fatal autopilot crash, Jury says, CNBC. Available at: <https://www.cnbc.com/2025/08/01/tesla-must-pay-329-million-in-damages-in-fatal-autopilot-case.html> (Accessed: 02 April 2026).

The legal reckoning for fully autonomous vehicles began with a tragic 2018 incident in Arizona, where an experimental Uber self-driving test vehicle struck and killed a pedestrian. The vehicle's system failed to identify the pedestrian in time to brake. While the human backup driver later pled guilty to endangerment, the incident exposed the catastrophic failures in Uber's safety culture, leading to a swift financial settlement with the victim's family and illustrating how quickly innovation can turn deadly.

More recently, in August 2024, General Motors' autonomous division, Cruise, paid an \$8 million settlement to resolve a highly publicized lawsuit. In this incident, a pedestrian was struck by a human-driven car and subsequently thrown into the path of a Cruise robotaxi. The Cruise vehicle detected the initial impact and attempted to execute a safety protocol by pulling over, but tragically dragged the trapped pedestrian 20 feet in the process. This incident highlighted the severe liability risks of operational "edge cases" and resulted in the immediate suspension of Cruise's operating permits in California, along with investigations by the U.S. Department of Justice and the Securities and Exchange Commission.

Conversely, Alphabet's Waymo continues to expand its autonomous ride-hailing services across major cities like Los Angeles, Phoenix, and Austin. While Waymo boasts a strong safety record, minor collisions are inevitable in dense urban environments. For context, the city of Burbank, California, saw 596 people killed or injured in standard traffic collisions in 2022 alone. Legal experts note that while victims of autonomous crashes in these areas can sue Waymo for damages just as they would a human driver, these cases quickly transition from traditional auto insurance claims into highly complex product liability disputes over sensor calibration and algorithmic response times.

## 6. CONCLUSION

The commercial viability and societal acceptance of autonomous vehicles are deeply contingent upon the resolution of the legal ambiguities surrounding their operation. As technology matures from Level 2 driver-assist functionality toward fully autonomous Level 4 or Level 5 mobility, the global legal infrastructure must fundamentally transition away from the outdated model of human negligence.

A comparative analysis of international regulatory frameworks reveals divergent paths toward this future. The European Union is relying heavily on stringent compliance mandates through the Artificial Intelligence Act and an expanded Product Liability Directive, ensuring that

technology companies absorb the financial risk of software flaws and cyber vulnerabilities. The United Kingdom's Automated Vehicles Act offers a highly pragmatic solution by legally immunizing human occupants and channelling liability efficiently through an insurer-led compensation model that can recover costs from corporate entities. In contrast, the United States continues to hold on with a fragmented state-by-state patchwork, though recent 2025 federal legislative initiatives show promise in harmonizing safety data and commercial deployments. Meanwhile, jurisdictions like India remain severely constrained by legacy laws that mandate manual human control, necessitating urgent statutory reform to facilitate the testing and deployment of life-saving technologies.

Ultimately, the jurisprudence emerging from the recent Tesla, Cruise, and Uber settlements underscores a critical legal reality: the courts will not allow technology companies to privatize the profits of innovation while socializing the risks of algorithmic failures. To ensure a safe and equitable transportation future, lawmakers globally must prioritize legislative clarity. They must establish transparent, strict-liability systems where victims are compensated swiftly, insurance markets are capable of underwriting systemic software risks, and automakers are held to rigorous, ethical safety standards.