
TORTIOUS LIABILITY IN DRIVERLESS (AUTONOMOUS) VEHICLES: A CRITICAL ANALYSIS WITH SPECIAL REFERENCE TO INDIA

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ABSTRACT

The rise of autonomous vehicles (AVs) represents a major shift in transportation, with significant implications for legal systems worldwide. Traditional tort law, which is largely premised on human fault and negligence, faces serious challenges when applied to driverless cars that rely on artificial intelligence rather than human control. This paper examines how existing tort doctrines—particularly negligence, strict liability, and product liability—interact with autonomous vehicle technology. It argues that conventional frameworks are insufficient to address the complexities introduced by AI-driven decision-making. Through a doctrinal and comparative analysis, with special emphasis on Indian law, the paper proposes a hybrid liability model that combines strict liability, product liability, and regulatory oversight. The study further highlights the need for legislative reform in India to ensure victim compensation, technological accountability, and legal clarity.

Keywords: Autonomous Vehicles, Tort Law, Strict Liability, Product Liability, Artificial Intelligence, Motor Vehicles Act, India.

1. Introduction

Technological developments in artificial intelligence have begun to reshape the landscape of modern transportation. Autonomous vehicles, once confined to theoretical discussions, are now actively being tested and deployed across several jurisdictions. These vehicles promise improved road safety, enhanced efficiency, and reduced dependence on human drivers. Given that a substantial proportion of road accidents are attributed to human error, the shift toward automation appears both logical and desirable.¹

However, the legal consequences of this transition are far from straightforward. Tort law, which traditionally governs liability for road accidents, is deeply rooted in the idea of human fault. When a driverless vehicle is involved in an accident, the absence of a human decision-maker complicates the attribution of liability. This raises a fundamental question: how should the law respond when harm is caused not by a person, but by an algorithm?

This paper seeks to address this question by critically examining existing tort principles and evaluating their suitability in the context of autonomous vehicles. It also explores how Indian law, despite lacking specific legislation on the subject, may adapt to these emerging challenges.²³⁴

2. Research Methodology

This study adopts a doctrinal and comparative legal research methodology, which is widely used in legal scholarship to analyse evolving areas of law. The research primarily relies on secondary sources, including statutes, case law, policy papers, Law Commission reports, and contemporary academic literature.

The doctrinal component involves a close examination of existing legal principles governing tortious liability, particularly negligence, strict liability, and product liability. These principles are critically evaluated to determine their applicability in the context of autonomous vehicles.

¹ James M. Anderson et al., *Autonomous Vehicle Technology: A Guide for Policymakers* 5 (RAND Corp. 2016).

² National Highway Traffic Safety Administration, *Critical Reasons for Crashes Investigated in the National Motor Vehicle Crash Causation Survey 2* (2015)

³ James M. Anderson et al., *Autonomous Vehicle Technology: A Guide for Policymakers* 3–7 (RAND Corp. 2016).

⁴ Kyle Colonna, *Autonomous Cars and Tort Liability*, 4 Case W. Res. J.L. Tech. & Internet 81, 83–85 (2012).

3. Recent Global Developments in AI Liability Law.

The past two years have witnessed significant legal and regulatory developments in the field of artificial intelligence, particularly concerning liability frameworks. These developments reflect a growing recognition that traditional tort law must evolve to address AI-driven systems, including autonomous vehicles.⁵

3.1 The European Union: A Risk-Based Regulatory Model

One of the most important developments is the enactment of the European Union Artificial Intelligence Act (2024), which establishes a comprehensive regulatory framework for AI systems. The Act adopts a risk-based approach, categorizing AI applications based on their potential impact on safety and fundamental rights. Autonomous vehicles fall within the category of “high-risk AI systems,” thereby subjecting them to strict compliance requirements.⁶

While the AI Act primarily focuses on ex ante regulation (preventing harm through compliance obligations), it indirectly shapes liability by imposing standards related to safety, transparency, and accountability. However, it does not itself create a complete liability regime, leaving gaps that must be filled by other legal instruments.⁷

In parallel, the European Union introduced a revised Product Liability Directive (2024/2853), which modernizes existing product liability rules to account for digital and AI-driven products. This directive expands the scope of liability to include software and AI systems, thereby strengthening consumer protection.

Scholarly analysis suggests that these developments collectively move toward a risk-based or strict liability model, supported by mandatory insurance and compensation mechanisms.

3.2 Regulatory Uncertainty and Policy Debate in Europe

Despite these advancements, regulatory uncertainty persists. Recent negotiations within the EU have revealed disagreements over the scope and application of AI rules, particularly concerning high-risk systems. Ongoing debates include whether certain sectors should be exempt from

⁵ W. Page Keeton et al., *Prosser and Keeton on the Law of Torts* § 30 (5th ed. 1984).

⁶ *Supra*

⁷ Restatement (Second) of Torts § 281 (Am. L. Inst. 1965).

strict AI regulations and whether compliance burdens may hinder innovation. Additionally, some provisions of the AI Act—especially those relating to high-risk systems—have been delayed to allow for further refinement and industry adaptation.

These developments highlight the tension between innovation and regulation, a recurring theme in AI liability discourse.

3.3 United Kingdom: Statutory Recognition of Autonomous Liability

The United Kingdom has taken a more direct legislative approach through the Automated Vehicles Act, 2024, which explicitly addresses liability in the context of self-driving vehicles. The Act introduces the concept of an “authorised self-driving entity,” placing responsibility on manufacturers or operators when vehicles are functioning in autonomous mode.⁸

This marks a significant shift away from driver-centric liability models and reflects a clear policy decision to allocate responsibility to technological actors rather than users.

3.4 Global Trends: Toward Harmonized Liability Frameworks

Across jurisdictions, a number of common trends can be identified:

1. Shift from fault-based to risk-based liability
2. Increasing reliance on product liability and strict liability principles
3. Recognition of the need for mandatory insurance mechanisms
4. Growing emphasis on transparency and explainability in AI systems

At the same time, scholars note that regulatory approaches remain fragmented, with different jurisdictions adopting varying standards and frameworks.

This fragmentation underscores the need for international harmonization, particularly given the cross-border nature of technology and commerce.

⁸ Bryant Walker Smith, *Proximity-Driven Liability*, 102 Geo. L.J. 1777, 1785–1788 (2014).

3.5 Implications for India

For India, these global developments provide valuable guidance. The EU's risk-based model and the UK's statutory approach both offer potential templates for reform. However, India must tailor its approach to its own legal and socio-economic context.

Given the existing emphasis on compensation and social welfare in Indian law, a hybrid model combining strict liability and no-fault compensation may be particularly suitable.

4. Conceptual Foundations of Tortious Liability

Tort law is primarily concerned with civil wrongs that result in harm to individuals. The central aim is compensatory—restoring the injured party, as far as possible, to the position they were in before the harm occurred. The traditional framework of negligence requires the establishment of four key elements: duty of care, breach of that duty, causation, and damage.⁹

The landmark case of *Donoghue v. Stevenson* laid the foundation for modern negligence law by introducing the “neighbour principle,” which emphasizes foreseeability and proximity. This principle has since guided courts in determining liability in a wide range of situations, including motor vehicle accidents.¹⁰

In the context of conventional driving, the application of negligence is relatively straightforward. A driver owes a duty of care to other road users, and failure to exercise reasonable caution may result in liability. However, this framework presupposes human control, an assumption that does not hold true for fully autonomous vehicles.

5. Autonomous Vehicles and the Disruption of Legal Norms

Autonomous vehicles operate through a combination of sensors, data processing systems, and machine learning algorithms. These systems enable the vehicle to perceive its surroundings, make decisions, and execute actions without human intervention. Depending on the level of automation, the role of the human occupant may range from active control to complete passivity.¹¹

⁹ Regulation (EU) 2024/1689 (Artificial Intelligence Act).

¹⁰ Directive (EU) 2024/2853 on Liability for Defective Products.

¹¹ Automated Vehicles Act 2024, c. 10 (U.K.).

This technological shift disrupts traditional legal assumptions in several ways. First, it removes the human driver from the decision-making process, thereby undermining the basis of fault-based liability. Second, it introduces multiple actors into the liability framework, including manufacturers, software developers, and data providers. Third, it raises questions about predictability and control, particularly in relation to machine learning systems that evolve over time.

As a result, the application of conventional tort principles becomes increasingly complex.

6. Negligence and Its Limitations in Autonomous Contexts

Negligence remains the dominant basis of liability in tort law. However, its application to autonomous vehicles is fraught with difficulties.

One of the primary challenges is the absence of a clearly identifiable wrongdoer. In a fully autonomous vehicle, there may be no human driver whose conduct can be evaluated against a standard of reasonableness. Even in partially automated systems, the extent of human control may be minimal, making it difficult to establish breach of duty.¹²

Another issue concerns the standard of care. It is unclear whether autonomous systems should be judged against the conduct of a reasonable human driver or against a higher technological benchmark. If the latter approach is adopted, it could lead to unrealistic expectations and increased liability for manufacturers.

Furthermore, proving negligence in the context of complex algorithms presents significant evidentiary challenges. The proprietary nature of software systems often limits access to critical information, thereby placing plaintiffs at a disadvantage.

These limitations suggest that negligence, while still relevant, cannot serve as the sole basis of liability in autonomous vehicle cases.

7. Product Liability as an Alternative Framework

Product liability offers a more suitable framework for addressing harm caused by autonomous vehicles. Unlike negligence, which focuses on conduct, product liability is concerned with the

¹² U.K. Law Commission, *Automated Vehicles: Final Report* (2022).

safety of the product itself.

Under this framework, liability may arise from design defects, manufacturing defects, or failure to provide adequate warnings. In the case of autonomous vehicles, design defects are particularly significant, as errors in programming or decision-making algorithms can directly lead to accidents.

Holding manufacturers accountable for defective products aligns with the broader objective of consumer protection. It also incentivizes companies to invest in safer technologies and rigorous testing processes.¹³

However, product liability is not without its limitations. It may not adequately address situations where accidents result from complex interactions between the vehicle and its environment, rather than from a specific defect. Additionally, attributing liability among multiple contributors to the system can be challenging.¹⁴

8. Indian Legal Framework and Judicial Trends

India does not yet have a dedicated legal regime for autonomous vehicles. Nevertheless, existing laws and judicial decisions provide valuable insights into how liability may be addressed.

The Motor Vehicles Act, 1988, establishes a hybrid system combining fault-based and no-fault liability. Provisions such as Sections 140 and 163A allow victims to claim compensation without proving negligence, reflecting a shift toward a more welfare-oriented approach.

Judicial decisions further reinforce this trend. In *Kaushnuma Begum v. New India Assurance Co.*, the Supreme Court recognized that liability in motor vehicle accidents may arise even in the absence of negligence. Similarly, in *Smt. Mallawwa v. Oriental Insurance Co.*, the Court emphasized the importance of ensuring compensation for victims, regardless of technical complexities.¹⁵

More recent cases continue to prioritize victim compensation and expand the scope of liability.

¹³ id

¹⁴ Supra 11

¹⁵ *Kaushnuma Begum v. New India Assurance Co.*, (2001) 2 SCC 9 (India).

Courts have also shown a willingness to apply principles of vicarious liability, holding employers and insurers accountable for the actions of drivers.

These developments suggest that Indian law is gradually moving toward a framework that is compatible with strict liability principles.¹⁶

9. Law Commission Reports and Policy Direction

Although the Law Commission of India has not specifically addressed autonomous vehicles, its reports on motor vehicle law reforms highlight key policy priorities. These include the need for efficient compensation mechanisms, stronger insurance frameworks, and reduced reliance on fault-based litigation.¹⁷¹⁸

The 198th Law Commission Report, in particular, underscores the importance of ensuring fair and timely compensation for accident victims. This emphasis aligns with the requirements of autonomous vehicle regulation, where traditional fault-based approaches may prove inadequate.

There is a clear need for future Law Commission studies focusing specifically on artificial intelligence and liability. Such initiatives would play a crucial role in shaping a coherent legal framework for autonomous vehicles in India.

10. Challenges and the Need for Reform

Despite the adaptability of existing principles, significant challenges remain. The current legal framework assumes the presence of a human driver and does not account for AI-driven decision-making. There is also a lack of clarity regarding the allocation of liability among multiple stakeholders.¹⁹

To address these issues, legislative intervention is essential. Laws must be updated to recognize autonomous vehicles, define liability standards, and establish regulatory oversight mechanisms. Without such reforms, legal uncertainty may hinder both innovation and victim

¹⁶ *Smt. Mallawwa v. Oriental Insurance Co.*, (1999) 1 SCC 403 (India).

¹⁷ Law Commission of India, 198th Report on Motor Vehicles Act (2006).

¹⁸ Law Commission of India, 85th Report on Claims for Compensation under Chapter 8 of the Motor Vehicles Act (1980).

¹⁹ *Id*

compensation.²⁰

11. Conclusion

The emergence of autonomous vehicles represents a fundamental shift in the relationship between technology and law. Traditional tort doctrines, while still relevant, are insufficient to address the complexities introduced by AI-driven systems.

A balanced approach is required—one that combines elements of negligence, product liability, and strict liability, supported by robust regulatory frameworks and insurance mechanisms. In the Indian context, existing legal principles provide a useful foundation, but significant reforms are necessary to ensure clarity, fairness, and accountability.

As autonomous technology continues to evolve, the law must adapt accordingly. The challenge lies not only in addressing current issues but also in anticipating future developments, thereby ensuring that legal systems remain responsive and effective in a rapidly changing world.

²⁰ id

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