INVESTIGATING THE POTENTIAL IMPACT OF AV IN KENYA, FOCUSING ON ITS IMPLICATIONS FOR LIABILITY ATTRIBUTION.

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Declaration

I, **PONDO JOSEPH MIGOWA ROLAND**, do hereby declare that this research is my original work and that to the best of my knowledge and belief, it has not been previously, in its entirety or in part, been submitted to any other university for a degree or diploma. Other works cited or referred to are accordingly acknowledged.

Signed: .....

Date: 29th March 2024

This dissertation has been submitted for examination with my approval as University Supervisor.

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ABSTRACT

This dissertation investigates the legal landscape surrounding Autonomous Artificial Agents (AAAs), with a specific focus on autonomous vehicles (AVs) in Kenya. It explores the intricate challenges and opportunities associated with regulating AAAs, including liability attribution, safety standards, ethical considerations, and international cooperation. Drawing from international examples such as Germany and the United Kingdom, and considering Kenya's unique context, the study provides insights into effective regulatory frameworks for navigating the complexities of AI technology integration. Key recommendations include the development of AI-specific legal frameworks tailored to local contexts, prioritizing ethical considerations, fostering international cooperation, enhancing stakeholder engagement, and promoting safety and innovation. By adopting a comprehensive and adaptive approach to regulation, policymakers can navigate the legal implications of AAAs effectively while fostering innovation and safeguarding societal interests in the digital age.

LIST OF ABBREVIATIONS

AAA - Autonomous Artificial Agents

AEVA - Automated and Electric Vehicles Act

ADS - Automated Driving System

AVs - Autonomous Vehicles

DDT - Dynamic Driving Task

EDR - Event Data Recorder

EU - European Union

GPS - Global Positioning System

NTSA – National Transport and Safety Authority

NUIC - No-User-in-Charge

USA - United States of America

LIST OF CASES

Cristi v Civil Air Patrol (1967).

Fletcher v Rylands (1866) 1 LR.

Lopez v Metro Gov't of Nashville & Davidson Cty, 646 F Supp 2d 891 (MD Tenn 2009).

Siegler v Kuhlman (1972).

Smith v Lockhead Propulsion Co (1967).

Titchener v British Railways Board (1983) 1 WLR 1427.

LIST OF LEGAL INSTRUMENTS

Automated and Electric Vehicles Act, 2018 (UK).

European Parliament and Council of European Union,*General Data Protection Regulation*, (2016) (EU) .

Insurance (Motor Vehicles Third Party Risks) Act (1989).

Law Commissions Act, 1965 (UK).

Law Commission & Scottish Law Commission

National Transport and Safety Authority Act (2012).

The Road Vehicles (Construction and Use) Regulations, 1986, SI 1986/1078 (UK).

Traffic Act (Act No 19 of 2014).

Vienna convention on road traffic, 8 November 1968.

1.0 Introduction

1.1 Background

Vehicles used to be quite simple; their primary function was just transportation. As the globe and technology developed over time, a vehicle's primary function began to encompass comfort, safety, and convenience in addition to transportation. This prompted intensive study on enhancing cars and introducing new and improved technology and soon after, the concept of making vehicles autonomous was born.[1] These autonomous vehicles are sophisticated cars and in great demand as we move forward, prioritizing safety and improving everyday living. These cars are equipped with sensors for the surrounding environment, internet access, traffic law compliance, self-navigation, quick decision-making, pedestrian and passenger safety, parking, and other features. These devices are known as autonomous vehicles (Avs).[2] There has been a lot of excitement surrounding recent self-driving car demos by Google, Tesla, and others. These days, self-driving technology is included with every TESLA model.[3]

On the 9th of September 2009[4],Kenya ratified the 1968 Vienna Convention on road traffic, article 8 states that "every moving vehicle shall have a driver." [5]Traffic laws were generally framed based on this definition. For example, the Traffic Act of Kenya was framed based on this definition.[6] The Act defines a driver as any 'person' who drives or guides any vehicle or is in actual physical control of, any vehicle or cattle on any road" [7]. Although the AVs meet all necessary conditions for granting a driver's license under the Traffic Act section 31,we find that licensing of drivers from the requirements under the Act it can be presumed they were was made for natural persons. [8] Based on this, it was not anticipated that a vehicle would be on a road without a "driver" as conceptualized in the Act. .

In countries such as Germany, however, on July 28, 2021, the Act Amending the Road Traffic Act and the Compulsory Insurance Act (Autonomous Driving Act) permitted the use of

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[1]Parekh, Poddar D, Rajpurkar A, Chahal M, Kumar N, Joshi G,Cho W, 'A review on autonomous vehicles: progress, methods and challenges' *electronics* 2022, 11- https://doi.org/10.3390/electronics11142162 on 9 January 2023.

[2] Parekh, 'A review on autonomous vehicles: progress, methods and challenges' *electronics* 2022, 11- https://doi.org/10.3390/electronics11142162 on 9 January 2023.

[3] Faisal A, Kamruzzaman M, Yigitcanlar T, Currie G 'Understanding autonomous vehicles: a systematic literature review on capability, impact, planning and policy', *The journal of transport and land use* , 2019, 45–72 .

[4] *Vienna convention on road traffic*, 8 November 1968.

[5]*Vienna convention on road traffic*, 8 November 1968.

[6] *Traffic act* (Act No 19 of 2014).

[7] Section 2, *Traffic Act* (Act No 19 of 2014).

[8] Section 31, *Traffic Act* (Act No 19 of 2014).

motor vehicles with autonomous driving capabilities, or those that can operate a vehicle without a driver, a natural 'person'.[9] Similarly, in the United States (US),Federal motor vehicle safety officials have given the green light for the development and use of driverless cars without pedals or steering wheels.[10] Considering this, and with the entry of self-driving cars on our Kenyan roads, Kenya will eventually have to address to what extent the vehicles on the road without a "driver" as natural person are authorized to be on the road.

At the moment, the legal standards which human drivers are held to in Kenya include; licensing of drivers which mostly focuses on instructing drivers on safety procedures when operating a vehicle: deciphering regulatory signs, comprehending traffic laws, and determining the vehicle's fundamental operational capabilities in a variety of driving circumstances.[11]Also there is the age limit which must be adhered to, traffic rules to be followed and the vehicle condition which must be roadworthy.[12]

Based on the nature of Avs, majority of automakers are currently using the technology for a future line of self-driving cars where artificial intelligence will be used to drive or guide, or in actual physical control of vehicles on roads. As a result, a comprehensive framework for both human and automated drivers is necessary in order to address the possibility of granting legal personhood to autonomous vehicle "drivers" in Kenya. Furthermore, it will be able to define the legal standards for these entities ensuring accountability and safety on the roads, possibly necessitating adherence to similar legal standards as human drivers. This could be done by learning from Germany and the UK's legal frameworks by considering comprehensive regulations that address liability, safety, and ethical considerations while accommodating technological advancements in autonomous vehicles.

1.2 Statement of Problem

State the current legal standards in relation to the definition of a driver. However, the absence of legal standards for autonomous vehicle 'drivers' in Kenya creates significant liability challenges, hindering the safe and efficient deployment of AV technology on Kenyan roads.

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[9] Malterer M, 'Germany completes legal framework for autonomous driving | Federal cabinet approves new ordinance, Driverless commute' 19 April 2022 https://www.thedriverlesscommute.com/germany-completes-legal-framework-for-autonomous-driving/.

[10] Kolodny L, 'U.S. clears way for truly driverless vehicles without steering wheels', CNBC 11 March 2022 https://www.cnbc.com/2022/03/11/us-clears-way-for-driverless-vehicles-without-steering-wheels.html on 9 January 2023.

[11]section 23 ,*The traffic (driving schools, driving instructors and driving licenses) rules* (2020).

[12] The National Transport and Safety Authority (NTSA) website: https://www.ntsa.go.ke/.

This study investigates the potential impact of Avs in Kenya, focusing on its implications for liability attribution.

1.3 Research Questions

1. What extent would granting legal personhood to autonomous vehicle 'drivers' as such as AI entities impact liability attribution in the Kenyan context?
2. What legal standards should apply to autonomous vehicle 'drivers' in Kenya, and should they be held to the same legal standards as human drivers?
3. What lessons can Kenya learn from the current legal frameworks and regulations are applicable to autonomous vehicles across Germany and the United Kingdom (UK)?

1.4 Research Objectives

1. To examine the legal implications of granting legal personhood to AV 'drivers' as AI entities within the Kenyan legal framework.
2. To assess the inadequacies of the Kenyan legal framework for AVs.
3. To determine the best practices from Germany's and the UK's legal regimes governing AVs.

1.5 Hypothesis

1. Granting legal personhood to AVs would significantly impact liability attribution in Kenya.
2. Adopting a consistent legal standard for both human and autonomous vehicle drivers will facilitate the integration of AVs into the existing regulatory and transportation infrastructure, leading to a smoother transition to an AV-enabled future.

1.6 Justification of Study

The rapid development of autonomous vehicle (AV) technology is transforming the transportation industry globally. AVs have the potential to boost traffic efficiency, lessen congestion, and improve road safety. Yet, the deployment of AVs also raises important legal and regulatory challenges, particularly on the legal standards that should be applied to AV

'drivers'. This paper seeks to justify the need to conduct a study on whether autonomous vehicle 'drivers' should be held to the same legal standards as human drivers in Kenya.

Firstly, it is essential to conduct study on this topic in order to ensure public safety. As AV deployment on Kenyan roads grows, it is important to make sure that these cars are operated safely and don't endanger other road users. A well-defined legal framework is necessary to assure the safe functioning of AVs because they are expected to operate in a complex and unpredictable environment. Hence, this study shall identify the legal standards that should be applied to AV 'drivers' to ensure the safe and efficient operation of AVs on Kenyan roads.

Second, a study on this topic is essential because it is unclear what legal standards should be applied to AV "drivers" in Kenya. The Traffic Act, which specifies standards for driver licensing, vehicle registration, speed restrictions, and other driving-related issues, is just one example of the rules and regulations that make up Kenya's existing legal framework for human drivers.[13] However with the advent of AVs, it is unclear whether the current legal standards that apply to human drivers are suitable for AV "drivers" or whether new standards need to be developed. Therefore, this study shall help to provide guidance on the legal standards that should be applied to AV 'drivers' to ensure consistency in the legal framework and reduce confusion and ambiguity in the application of the law.

Thirdly, the study's findings could inform policy and decision-making processes related to the use of AV in Kenya. The deployment of AVs has the potential to revolutionize Kenya's transportation sector, but their secure and efficient operation depends on a well-defined legal and regulatory framework. Since AV technology is being developed and deployed in Kenya, this study shall help to ensure that the legal framework for AV "drivers" is compatible with that process.

Finally, the legal and regulatory challenges associated with AVs are not limited to Kenya and are being discussed globally. Hence, this research shall inform global best practices and broaden discussions of the legal and regulatory challenges related to AVs.

1.7 Conceptual Framework

Duty of Care

Firstly, the duty of care is a legal concept that requires individuals to act with reasonable care and caution in order to prevent harm to others. This duty applies to all drivers on the road, including both human drivers and automated cars.

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[13] *Traffic act* (Act No 19 of 2014).

Under the duty of care, drivers are expected to take reasonable precautions to avoid causing harm to others on the road. This includes following traffic laws, driving at safe speeds, and avoiding distractions while driving. If a driver fails to meet this duty of care and causes harm to others on the road, they may be held liable for the damages that result.

For automated cars, meeting the duty of care requires that they be programmed and operated in a manner that prioritizes public safety. This includes following traffic laws, adjusting driving behaviour based on road and weather conditions, and avoiding collisions with other vehicles, pedestrians, and obstacles on the road.

By holding automated cars to the same duty of care as human drivers, it helps to ensure that they are operating in a safe and responsible manner, and that they are not posing a risk to public safety. This promotes a level playing field for all drivers, as well as helps to ensure that individuals who are harmed by automated cars can seek legal recourse for damages caused.[14]

Secondly in On Liberty, John Stuart Mill famously argued that "the only purpose for which power can be rightfully exercised over any member of a civilised community, against his will, is to prevent harm to others".[15]This principle is referred to as the Harm Principle.

In order to ascertain the circumstances in which the state may lawfully compel an individual in order to keep them from harming others, the harm principle is typically applied. If autonomous vehicles are not subject to appropriate legal standards, there could be safety risks associated with their operation. This raises concerns about potential harm to passengers, pedestrians, and other road users.

In many jurisdictions, including Germany, the owner of an autonomous car is strictly liable for any damage the vehicle causes. This implies that the keeper is liable regardless of whether they were at fault or negligent. There are multiple ways in which this strict liability system aligns with the harm principle.[16] First, it emphasizes harm where rather than placing blame, the main focus is on making up for the harm that the victims have suffered. Secondly, it eases the burden on victims by reducing the requirement for them to prove the keeper's negligence. Finally, strict liability pushes keepers to take every step necessary to ensure the safety of their autonomous vehicles, which promotes safety.

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[14] Ryan M, *The future of transportation: Ethical, legal, social and economic impacts of self-driving vehicles in the year 2025*, Springer Nature, Netherlands, 2020.

[15] Holtug N, "The harm principle" *Ethical Theory and Moral Practice*, vol 5, no 4, 2002, 357–89.*JSTOR*, http://www.jstor.org/stable/27504250. Accessed 14 September 2023.

[16] Schütte, Béatrice and Majewski, Lotta and Havu, Katri, "Damages liability for harm caused by artificial intelligence EU Law in flux" Helsinki Legal Studies Research Paper Number 69, August 2, 2021 https://ssrn.com/abstract=3897839.

The state plays a crucial role in regulating the licensing of drivers in Kenya to ensure safety and to protect against harm. The Harm Principle's focus on state intervention to prevent harm may inform policymakers about the appropriate legal standards needed to strike a balance between autonomy and regulation of these autonomous vehicles in the interest of public safety and individual rights.[17]

Overall, the duty of care and the harm principle is a critical legal concept that supports holding automated cars to the same legal standards as human drivers. By doing so, it helps to promote public safety and prevent harm to others on the road, while ensuring that all drivers are held to the same standard of care and accountability.

1.8 Literature Review

1.8.1 Autonomous Vehicles and the legal personhood status

The term "person" does not always imply that the responsible party is a person. The person is instead a legal entity with its own capacities, responsibilities, and standards.[18]Overtime legal personhood as changed. Scholars such as Antonio and Monterossi are of the opinion that in the case of self-driving cars, legal personhood would specifically refer to the issue of liability.[19] Artificial agents could have the same legal liability as companies because they are established within a legal framework and are intangible entities.[20]As self-driving cars become more autonomous, they may qualify as legal entities as they are capable of expressing purpose, making decisions, taking action, and predicting outcomes.[21]Martin Petrin ,argues that AI will be superior to today's human-led governance.[22] Similarly other scholars such as

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[17] Taylor M, *The harm threshold and Mill's harm principle*, Springer ,2018.

[18] *Lopez v Metro Gov't* of Nashville & Davidson Cty, 646 F Supp 2d 891 (MD Tenn 2009).

[19]Novelli C, Bongiovanni G & Sartor G , "A conceptual framework for legal personality and its application to AI, jurisprudence"2022, 194-219, 10.1080/20403313.2021.2010936 .

[20] Lannì A and Monterossi M, 'Artificial autonomous agents and the question of electronic personhood: a path between subjectivity and liability', 26 Griffith Law Journal 563, 2018, 577.

[21] Lannì A and Monterossi M, 'Artificial autonomous agents and the question of electronic personhood: a path between subjectivity and liability'577.

[22] Petrin M, 'Corporate management in the age of AI University College London, Working Paper Number 3, 2019 https://papers.ssm.com/sol3/papers.cfm?abstract-id=3346722 on 14 September 2023.

Pepito and Li have proposed that the AI in AVs should be granted legal personhood as it will better assist in liability attribution.[23]

The first objective of this study will be to look into the personhood of AV drivers and from that I will be able to conclude whether AV drivers' can then be subjected to similar legal standards as human drivers are.

1.8.2 Potential legal liability of AVs

AVs are the future and as such it has led to the question of "who is liable in the case of a traffic accident," which has been brought up by both the NHTSA and the U.S. Department of Transportation.[24] Several ethical and legal scholars such as Tiffany Gruenberg believe that the best course of action for accidents involving self-driving cars is product liability.[25]However, she also states that product liability may produce expensive law suits. A driver may find it difficult to argue that a manufacturer should be held liable under this system because they, or other passengers in fully autonomous cars, are taking a risk when they ride in an autonomous vehicle, especially when those cars are sophisticated enough to be thinking for themselves in the same way that humans do.[26]Manufacturers could be able to point to potential "defects" in the artificial intelligence software as a result of the way the application responded to its surroundings or because it was unable to clearly explain what the car was thinking at the time. This is referred to as the black box problem.[27] The idea is that no one can grasp what the AI in the car is thinking and no one can genuinely grasp what it is thinking.[28]

Currently, autonomous vehicles are a product of their developers. According to Scherer, a software developer has no way of knowing how the AI will manage the duties and challenges that arise when it is deployed into the actual world because the machine will teach itself to

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[23] Pepito A, Vasquez BA and Locsin RC , 'Artificial intelligence and autonomous machines: Influences, consequences, and dilemmas in human care' D Jin (ed) *Reconstructing Our Orders*, Springer Nature Singapore Pte Limited and Shanghai University Press, 2018, 63.

[24] Department of Transportation, 'Preparing for the future of transportation: Automate vehicles' 28 September 2018, https://www.transportation.gov/av/3 on 14 September 2023.

[25] Gruenberg T, 'Driving cars will likely increase product liability litigation' The National Law Review,2019.

[26] Munakata, 'Fundamentals of the new artificial intelligence, 2 nd ed,2008, 1–2.

[27] Negnevitsky M, 'Artificial intelligence', 2 nd ed Pearson Education, London,2005, 14.

[28] Cress M, 'The black box problem' Artificial Intelligence Mania ,10 January 2019, http://artificialintelligencemania.com/2019/01/10/the-black-box-problem/ on 14 September 2023.

overcome obstacles in unexpected ways.[29]Similar to this, software engineers might not be able to quickly and systematically act to improve performance, according to Hohman and Chau.[30]

A new legal liability framework is essential to appropriately deal with the issue of liability for self-driving cars because developers have the potential to avoid liability through the defect route due to unknowns of artificial intelligence thinking, and the potential for drivers to avoid liability in fully autonomous vehicles where driving intervention is neither needed nor expected.

1.8.3 Mitigating product liability risk arising from AVs

1. Assumption of risk

Marchant and Lindor are of the opinion to ask consumers to sign waivers that then accept risks brought about by these AVs. They further claim that this move will encourage the manufacturers to innovate freely and even develop more improved AVs.[31]

2.Strict liability

Vladeck proposes a strict liability regime that presents a system of strict liability that is independent of notions of fault.[32] The argument that the vehicles are "ultra-hazardous" or "unreasonably risky" cannot be used to support a strict liability regime in this case for the simple reason that driverless vehicles are expected to be substantially less hazardous or risky than the items they replace. In fact, he anticipates that these devices won't malfunction because they are so highly developed technologically.[33] For these reasons, it will be essential to put in place a proper strict liability regime; one that does not rely on the risk-utility test or the reinstatement of the negligence standard for the simple reason that the injured party will find it difficult, if not impossible, to pass those tests.

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[29] Scherer M, 'Regulating artificial intelligence systems: risks, challenges, competencies, and strategies' 353-65.
[30] Hohman F, Kahng M, Pienta R and Chau D, 'Visual analytics in deep learning: An interrogative survey for the next frontiers,' IEEE Transactions on Visualization and Computer Graphics, 2018 https://arxiv.org/pdf/1801.06889.pdf on 14 September 2023.

[31] Marchant G and Lindor A, 'The coming collision between autonomous vehicles and the liability system' 52 *Santa Clara Law Review* 1321 ,2012.

[32] Vladeck D, 'Machines without principles: liability rules and artificial intelligence' 143.
[33] Vladeck D, 'Machines without principles: liability rules and artificial intelligence' 143.

1.8.4 Contribution

This study addresses a critical issue in the development and deployment of autonomous vehicles, which is the need for appropriate legal frameworks and standards to ensure their safe and responsible use. By examining whether autonomous vehicle drivers should be held to the same legal standards as human drivers in Kenya, the study contributes to the ongoing debate about the legal and ethical implications of autonomous vehicles and their impact on existing legal frameworks.

1.9 Methodology

My research is mainly doctrinal. From this, I wish to draw lessons from the different countries and their existing legal standards already set out in regulating AV drivers which are positive which can then be implemented in Kenya a I intend to use various primary and secondary materials including statutes, published reports, news articles, books and online materials on the topic of AVs.

I will also be doing legal analysis examining the current legal frameworks and regulations in a particular jurisdiction and assessing their adequacy or effectiveness. In this case, I will analyze the legal frameworks and regulations in the European Union and the USA and assess how well they address the unique features and capabilities of autonomous vehicles. This will involve reviewing existing laws and regulations and analysing case law.

1.10 Chapter Breakdown

The dissertation paper will consist of five main chapters, each of which will cover different aspects of the research questions.

The dissertation's introduction will be in this chapter. It includes information about the conceptual framework, which establishes the premise for the main claims made in the research. Also, it includes a literature review, problem statement, and research objectives.

Chapter 2 will explore to what extent would granting legal personhood to autonomous vehicle 'drivers' as AI entities impact liability attribution in the Kenyan context.

Chapter 3 will look at the inadequacies of the existing Kenyan legal framework when it come to AVs.

Chapter 4 will look at the current legal frameworks and regulations applicable to autonomous vehicles in Germany and UK and I will draw best practices from these regions and examine the legal standards applicable in Kenya.

My final chapter 5 will be on recommendations for Kenya's legal framework.

2.0 Exploring the Implications of Granting Legal Personhood to Autonomous Vehicle

2.1 Defining Artificial Autonomous Agents

Artificial autonomous agents (AAAs) are a broad category of AI entities that differ in their level of autonomy and ability to interact.[34] Although there are many different definitions, AAAs fundamentally demonstrate the ability to act independently, make proactive decisions, and engage with their surroundings, which raises important concerns regarding the subjectivity of the law to demonstrate the implications of this paradigm shift, first, let us define artificial autonomous agents. Next, we will look at their internal and external perspective.[35]

Some researchers have proposed breaking down the concept of autonomy into two main elements.[36] Firstly as a minimal capability of self-government and secondly as a minimal capability to take a value-oriented decision. The first capability coincides with the attitude to act without external control, while the second one is exclusively linked to the possibility of determining their own course of action in accordance with a kind of axiological order, even if that course of action was limited to reaching a particular goal or objective in line with a motivation that was solely functionalist.

Within their taxonomy, Franklin and Graesser have developed a definition of the expression autonomous agent, which in their opinion shall be understood as a system that is located within and a part of an environment that senses that environment and acts on it over time in pursuit of its own agenda and to affect what it senses in the future.[37] Although the authors acknowledge that using such a broad definition may result in the identification of an all-inclusive set, the main problem in the reasoning process we are currently developing is not so much a definition of an autonomous agent that is too inclusive as it is the division between the artificial and non-artificial worlds.

To summarise, when considering the internal and external, or social, aspects of AAAs, it might be useful to recall the definition offered by Chopra and White that an autonomous

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[34] Kuhn T, *The structure of scientific revolutions*, University of Chicago Press, Chicago,1996.
[35] Maes P, 'Designing autonomous agents: Theory and practice from biology to engineering and back' (ed), Massachusetts Institute of Technology Press, Massachusetts, 1990.
[36] Tzafestas, Spyros G, *Roboethics: A navigating overview*, Heilberg Springer ,2016.
[37] Stan F, Graesser A,'Is it an agent, or just a program?: A taxonomy for autonomous agents' in JP Müller et al (eds) *Intelligent Agents III Agent Theories, Architectures, and Languages,* Springer,1996,10.

artificial agent is one that has a comparatively higher degree of one or more of the following, firstly, the ability to operate without the direct intervention of humans or other agents, and to exert non-supervised control over its own actions and internal states and secondly, the social ability or capacity to interact with other artificial agents or with human beings.[38] This includes the ability to move about a virtual or physical environment, be representative, that is, to act as an intermediary or representative of another agent or person, and be proactive in initiating goal-directed behaviour. Somehow, when their systems have even a minimal degree of artificial intelligence installed, AAAs can be recognized as such given their cognitive, intellectual, and social skills.

2.2 Levels of Driverless Cars Autonomy

Understanding the different levels of automation is crucial for navigating the legal complexities. The first is being level 1. Here it is like a co-pilot assisting you[39].Driver assistance systems provide partial automation with features like adaptive cruise control or lane keep assist[40].However, the driver is firmly in control. The second level is level 2. There is partial automation where active safety features take a degree of the driving away.It includes features such as on-board cameras and radar sensors. These first 2 levels have been on our roads for the longest time.

Level 3 self-driving cars have conditional automation where the driver can take their focus off the road as the car takes over driving controls with the expectation that the driver will intervene when the car requests such intervention.[41] Levels 4 and 5 of self-driving cars are the most advanced in terms of artificial intelligence and autonomous use. In level 4 self-driving cars,the car takes over all aspects of driving even if the driver does not intervene.[42] Finally, Level 5 self-driving cars have full automation, where absolutely no driver intervention is needed.[43]In this paper, I am focusing on vehicles of level 5 automation.

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[38] Chopra S, White L , *A legal theory for autonomous artificial agents*, University of Michigan Press, Michigan,2011.
[39] Department of Transportation, 'Preparing for the future of transportation: Automate vehicles' 28 September 2018, https://www.transportation.gov/av/3 on 8 February 2024.
[40] Betz S, 'The top sixteen companies paving the way for self-driving car tech' BuiltIn ,17 September 2020, https://builtin.com/transportation-tech/self-driving-car-companies on 8 February 2024.
[41] Betz S, 'The top sixteen companies paving the way for self-driving car tech' BuiltIn ,17 September 2020, https://builtin.com/transportation-tech/self-driving-car-companies on 8 February 2024.
[42] Betz S, 'The top sixteen companies paving the way for self-driving car tech' BuiltIn ,17 September 2020, https://builtin.com/transportation-tech/self-driving-car-companies on 8 February 2024.
[43] Kurczewski N, 'Cars that are almost self-driving' US News ,22 October 2020, https://cars.usnews.com/cars-trucks/cars-that-are-almost-self-driving on 8 February 2024.

2.3 Legal Personhood and Liability

The person in personhood does not necessarily mean that the party liable is a person. This person is an entity with its own legal capabilities, standards and responsibilities.[44] A corporation being conferred legal status was considered a tool for public policy.[45] Humans create entities like corporations to serve common goals and adapt to the economy and society. However artificial and intangible, corporations have legal rights and responsibilities.[46] However, a machine is still a machine, even with specific responsibilities attached, and the people behind it remain ultimately accountable.

The main question surrounding self-driving cars and legal personhood is who is liable in case of accidents. Similar to corporations, self-driving cars could be treated as artificial entities with limited legal capacity for liability based on their level of autonomy.[47] As self-driving cars become more independent, their ability to make decisions, act, and anticipate consequences might justify considering them as legal entities.

2.4 Examining Legal Personhood for AI Entities

In this regard, it is recommended to grant legal personality to AAAs by those who believe that the discussion of the legal consequences of AAAs is long overdue and who want to manage this phenomenon and to reach a balanced evaluation of all the public and private interests at stake.[48] In this sense, the evolution of AAAs has affected the idea of legal subjectivity, its foundations, development, and capacity to adjust to shifts in the economy, society, and technology.

Frequently, the question of whether artificial entities can have personalities is often considered a pragmatic one, supported by contingent social and economic needs.

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[44] Department of Transportation, 'Preparing for the future of transportation: Automate vehicles' 28 September 2018, https://www.transportation.gov/av/3 on 8 February 2024.

[45] Lannì A , Monterossi M, 'Artificial autonomous agents and the question of electronic personhood: A path between subjectivity and liability' Griffith ,2018, https://doi.org/10.1080/10383441.2017.1558611 on 8 February 2024.

[46] Lannì A , Monterossi M, 'Artificial autonomous agents and the question of electronic personhood: A path between subjectivity and liability' Griffith ,2018, https://doi.org/10.1080/10383441.2017.1558611 on 8 February 2024.

[47]Habibovic A, 'Communicating intent of automated vehicles to pedestrians' Frontiers in Psychology ,7 August 2018, https://www.frontiersin.org/articles/10.3389/fpsyg.2018.01336/full on 8 February 2024.

[48] Pietrzykowski T , 'Legal Personhood' *Animals, Artificial Intelligence and the Unborn*, Kurki (eds) Springer,2017, 13.

Nevertheless, the application of dogmatic and scientific categories results in the attribution of personality being hypocritically presented as a neutral choice, especially among those who reject a form of legal subjectivity for AAAs.[49] Indeed, the growing interest of legal doctrines for such a category mainly moves from the need to assure legal remedies for damage caused by AAAs and their primarily due to the necessity of providing legal remedies for damage caused by AAAs and their behaviours'. The complex network of devices that creates these artifacts, along with their ability to operate and interact with the surroundings without the need for human intervention or additional machinery, gives rise to questions regarding the effectiveness of the legal system, specifically the regulations pertaining to civil liability, in addressing these matters. As mentioned above, it is very difficult to determine who should bear the responsibility for damages because of the ambiguity and complexity of the harmful behaviours and events. The main issue is determining to which party the responsibility should be assigned.

The need to ensure legal coverage for damage resulting from the actions of autonomous artificial agents, in this case, driverless cars, is the only factor driving the legal doctrine's newfound interest in this field.[50] Insofar as this paper is concerned, it is important to ask ourselves questions regarding the effects of AAAs on societal organisation and the challenge of providing a high level of social safety to individuals. The increased delegation of tasks and activities previously completed by human actors to these entities, as well as their gradual introduction into everyday relationships, have forced the legal system to deal with a new phenomenology of potential harm brought about by the acts of AAAs.[51] The most important thing to consider is the challenges associated with applying the conventional methods prescribed by law for attributing responsibility to a specific subject. A definitive link between the harm and a single author, a natural person or a legal entity, may be hampered by the complexity resulting from the integration of multiple sophisticated technological mechanisms, the unpredictable nature of the actions taken by artificial agents capable of learning from and actively interacting with their surroundings, and the lack of transparency that characterized the most complex artefacts.[52] Under the existing legal framework, the

[49] Haselager W Robotics, 'Philosophy and the Problems of Autonomy' Pragmatics & Cognition, 2005, https://philpapers.org/rec/HASRPA on 8 February 2024.
[50]Matthias A, 'The responsibility gap: Ascribing responsibility for the actions of learning automata' Ethics Inf Technol ,2004, https://doi.org/10.1007/s10676-004-3422-1 on 8 February 2024.
[51] Teubner G , 'Rights of non-humans? Electronic agents and animals as new actors in politics and law' 33 *Journal of Law and Society* 497, 2006 — https://doi.org/10.1111/j.1467-6478.2006.00368.x on 8 February 2024.
[52]Matthias A, 'The responsibility gap: Ascribing responsibility for the actions of learning automata' Ethics Inf Technol ,2004, https://doi.org/10.1007/s10676-004-3422-1 on 8 February 2024.

victim or society will be responsible for paying the costs of damage in cases of accidents that happen without the user's fault and are not the direct result of a product defect.

The American, British, and, most recently, European Union governments have begun to work on these issues in order to set the guidelines for regulating autonomous artificial agents. The debate has recently shifted from a doctrinal level to a legislative one, leading to the drafting of numerous formal acts, the majority of which are policy-oriented. A study known as Robolaw carried out in Pisa, is especially significant because it compiles the different approaches to the issue of artificial agent liability that have been proposed by the legal literature in recent years. It's clear from a quick scan of those documents that these proposals favour the ideas of objective liability and legal personhood. In order to increase the area of damage that can be objectively attributed to them, the first line of proposals sheds light on parties that may be involved in unlawful incidents, primarily the manufacturer, which includes software programmers and designers, and the owner-user.[53] It also highlights the producer's organizational structure's ability to manage and aggregate costs through insurance, as well as the producer's ability to train the machine and control its use. The former is expected to bear the costs associated with the incident. [54] The artificial agent and an object, whose relationship can only be explained in terms of property, possession, or custody, enter the system on an equal basis in each of the two reconstructions. On the other hand, some solutions try to reduce the responsibility gap by changing the analysis's axis according to the subject's classification. Normative ramifications of these solutions might include holding the most sophisticated agents responsible for any harm they may cause and recognizing them as electronic persons.[55]

This suggestion brings to mind a theological controversy that started in the 1990s and is certain to get more heated in the future.[56] The sides of this controversy appear to be tracing the boundaries of an ulterior dualism. The idea of autonomy, both cognitive and operational, concerning artificial agents is what drives the discussion and shapes the strategies used in arguments. Some writers thus extol the virtues of some of these artefacts' capacity to convey

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[53] European Parliament, 'Civil law rules on robotics, European Parliament resolution of 16 February 2017 with recommendations to the Commission on Civil Law Rules on Robotics' (2015/2103(INL).
[54] House of Commons, The Science and Technology Committee, Report: *Robotics and Artificial Intelligence*, 2016.
[55] European Parliament, Civil Law Rules on Robotics, principle number 59.
[56] Solum L ,'Legal personhood for artificial intelligences' 70 *North Carolina Law Review* 1231, 1992.

nascent but developing degrees of subjectivity and autonomy.[57] Such autonomy is sometimes understood as the ability to act and interact in one's own operating environment in accordance with schemes of instrumental rationality, and at other times it is understood to imply self-awareness or self-consciousness, which leads to free will and the identification of a moral agent.[58] In both cases, autonomy serves as the platform for the construction of legal subjectivity by narrowing the gap that separates the artificial agent and the human. Even though these systems are increasingly sophisticated compared to older ones or to simple automatic machines, their degree of autonomy is insufficient to support the legal system's access to the complex of actors. They argue that even in the absence of ontological properties like souls, consciousness, intentionality, feelings, or free wills, the agent would still be carrying out a program or exercising a freedom that its creators gave it.[59]

By highlighting the legal system's fictitious ability to apply to collective entities, certain doctrines ultimately refute these arguments and show that artificial agents can also have the same legal capacity as humans. The apparent gap between these viewpoints is not as clear-cut as it first seems, at any rate. The theoretical project of modernity and its anti-modern counterpart, anti-modernity, appears to be shared by them despite their diametrically opposed goals.[60] Both denialists and concessionists hold that reifying it is implicitly linked to the model of the individual actor, due to a long tradition, recalls, by immediate mental association, the human being.[61] This is interpreted as the parameter by which the legal order introducing new subjects is measured. In other words, the threshold between subject and object can be found alternatively in the human being's capacity for free will or in his juridical double, the natural person's legal capacity.[62] Applying such an individualistic conceptual framework, the interpreter must determine whether liability can be connected to the rational, instinctive, and habitual decisions made by the autonomous artificial agent.

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[57] Christophe Leroux et al Suggestions for a green paper on legal issues in robotics. Contribution to Deliverable D3.2.1 on ELS Issues in Robotics, http://www.eu-robotics.net/cms/upload/PDF/euRobotics_Deliverable_D.3.2.1_Annex_Suggestion_GreenPaper_ELS _ IssuesInRobotics.pdf. 2012.

[58] Herman T Tavani (2012) *Ethics and Technology: Controversies, Questions, and Strategies for Ethical Computing*, Wiley.

[59]Chopra S, White L , *A legal theory for autonomous artificial agents*, University of Michigan Press, Michigan,2011.

[60] Latour B ,'We have never been modern' Harvard University Press, 1993.

[61] Stone C ,'Should trees have standing?Toward legal right for natural objects' 45 *Southern California Law Review* 450,1972.

[62] Bertolini A, 'Robots as products: The case for a realistic analysis of robotic applications and liability rules' 5 Law, Innovation and Technology 214. doi: 10.5235/17579961.5.2.214 ,2013.

2.5 Implications for Kenyan Legal Framework

Giving AI "drivers" legal personhood has significant implications that should be carefully considered as Kenya grapples to incorporate autonomous vehicles into its transportation system. Firstly, granting artificial intelligence (AI) legal personhood would have significant legal ramifications since it would effectively recognize AI entities as legal actors with rights and obligations comparable to those of natural persons or legal entities. This would necessitate a clear definition of the scope of liability for AI, determining who bears responsibility for AI-related incidents, whether it's the AI itself, its creator, owner, or a combination thereof. Liability frameworks must be established in order to handle possible AI-related harms, such as mishaps involving driverless cars or mistakes made by automated decision-making systems.

Furthermore, granting AI legal personhood would necessitate the creation of new legal frameworks to control their interactions and behaviour. This means establishing guidelines for AI development, application, and safety in addition to oversight procedures to guarantee adherence to regulatory requirements.Ethical issues also arise because giving AI legal personhood presents difficult issues with consciousness, autonomy, and accountability. Treating AI as legal actors raises ethical concerns that need to be carefully considered, including the impact on society, potential biases, and decision-making abilities of AI.

In addition, recognizing AI as legal entities may have an effect on copyrights and patents, creating concerns about who owns the intellectual property produced by AI systems and how it ought to be licensed and safeguarded. The implications of AI legal personhood transcend national boundaries, requiring international legal framework coordination and harmonisation to handle cross-border concerns about AI development, application, and regulation.

2.6 Conclusion

There are many intricate issues at stake when navigating the relationship between AI technology and legal frameworks. This chapter adds to a nuanced understanding of the changing landscape of AI regulation and its effect on liability attribution by examining the implications of granting legal personhood to autonomous vehicle "drivers" in the Kenyan context.

3.0 Addressing the Inadequacies of the Kenyan Legal Framework for Autonomous Vehicle

The existing legal infrastructure, primarily designed to regulate human-driven vehicles, faces inherent challenges in effectively addressing the complexities and nuances of autonomous transportation systems. Decision-making algorithms, extensive lines of code, and machine learning algorithms that underpin AVs introduce a layer of opacity, making it difficult to ascertain how these vehicles will behave in various scenarios. Furthermore, the traditional notions of liability, certification, and insurance coverage may not fully align with the unique characteristics and challenges posed by AV technology.

In this context, Chapter 3 delves into the inadequacies of the current Kenyan legal framework in accommodating AVs, focusing on key areas such as safety certification, liability standards, and insurance mechanisms. Through an in-depth analysis of legal principles, international best practices, and emerging regulatory trends, this chapter aims to shed light on the gaps and shortcomings that need to be addressed to foster the safe and responsible integration of AVs into Kenya's transportation ecosystem.

3.1 Definition of a driver

Section 2 of the National Transport and Safety Authority Act defines a "driver" as "a person who drives or guides or is in the physical control of any vehicle on the road." [63]While this definition encapsulates the traditional understanding of a human operator behind the wheel, it fails to account for the emergence of autonomous driving systems and their role in vehicle operation. The exclusion of AV drivers from the legal definition poses significant challenges in terms of regulatory clarity, liability assignment, and accountability.[64] By limiting the definition to human drivers, the law overlooks the unique characteristics of AV technology and fails to provide clear guidance on the legal status and responsibilities of autonomous driving systems. What are these unique characteristics?

One of the primary concerns stemming from this oversight is the ambiguity surrounding liability in the event of accidents or incidents involving AVs. Without a clear legal

[63] Section 2, *National Transport and Safety Authority Act* (2012) this is a similar definition to that which under Section (2) of the Traffic Act
[64] *Law Commission & Scottish Law Commission.*

designation for AV drivers, determining culpability becomes a convoluted process, potentially leading to protracted legal disputes and uncertainty for all parties involved. Furthermore, the absence of recognition for AV drivers hampers efforts to establish comprehensive regulatory frameworks that address the specific needs and requirements of autonomous transportation systems. From licensing and certification to insurance and safety standards, the current legal framework falls short in providing adequate provisions for the safe and responsible deployment of AVs on Kenyan roads.

3.2 A Driving Test for Avs

Section 39 of the Traffic Act, which governs driving tests, fails to encompass the specific requirements and procedures essential for evaluating the capabilities of AVs.[65] The omission of provisions for AV driving tests within Section 39 poses significant challenges in ensuring the safe integration of autonomous vehicles into Kenya's transportation landscape. Unlike traditional driving tests tailored for human drivers, AVs necessitate specialized assessments that account for their unique technology, capabilities, and operational requirements.

To address this deficiency and facilitate the effective testing and certification of AVs, it is imperative to include the following testing mechanisms to have these AVs integrated into our already existing legal framework.

3.2.1 Scenario testing

This involves implementing a standardized "driving test" that autonomous vehicles must pass to gain approval for public roads.[66] This test, potentially incorporating both simulated and real-world driving scenarios, aims to assess AV performance based on predefined expectations for specific tasks. However, while this approach offers simplicity and familiarity, it cannot serve as the sole assessment method for autonomous vehicles.

A significant challenge in designing an effective driving test for AVs stems from a fundamental limitation of autonomous systems: their ability to transfer learned skills across different conditions or scenarios. Unlike human drivers who can adapt based on training and

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[65] Section 39, *Traffic Act* (Act No 19 of 2014).
[66] International Telecommunication Union, 'Focus group on AI for autonomous and assisted driving' International Telecommunication Union, 2019 https://www.itu.int/en/ITUT/focusgroups/ai4ad/Pages/default.aspx on 24 February 2024.

experience, AVs relying on deep learning or data-driven approaches may struggle to generalize their driving capabilities to new, unseen situations.[67] This is particularly true for perception systems, which are vulnerable to variations from the data used in their training.[68] For instance, studies have demonstrated that minor alterations, such as placing tape over stop signs, can disrupt the reliability of computer vision-based detection. Although advancements have been made in developing robust features for computer vision, ensuring generalizability remains a significant obstacle in certifying autonomous systems.[69]

Therefore, while an autonomous driving test is a valuable component, additional verification measures are necessary to comprehensively evaluate the capabilities of AVs across a diverse range of scenarios.

3.2.2 Certifying Components

An alternative approach to assessing the safety of autonomous vehicles involves conducting a detailed review of subsystems at an individual level, certifying each component separately to ensure proper operation. For instance, this method would entail testing the perception system's ability to accurately detect various objects such as cars, trees, signs, and pedestrians, with performance scored based on accuracy. One notable advantage of this approach is its ability to facilitate incremental updates, as only affected subsystems would require re-testing, potentially saving significant time and resources compared to certifying the entire vehicle based on billions of hours of on-road data.

However, this approach has a significant drawback: it overlooks potential safety issues that may arise from interactions between subsystems. An illustrative example of such a failure occurred during a crash involving an Uber vehicle in Tempe, AZ.[70] In this incident, the perception system inconsistently classified a pedestrian, resulting in the erasure of the

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[67] Azulay A, WeissY, 'Why do deep convolutional networks generalize so poorly to small image transformations?' *Journal of Machine Learning Research* ,2018, https://arxiv.org/pdf/1805.12177.pdf on 24 February 2024.

[68] Azulay A, WeissY, 'Why do deep convolutional networks generalize so poorly to small image transformations?' *Journal of Machine Learning Research* ,2018.

[69] Madry A, Makelov A, Schmidt L, Tsipras D & Vladu A, 'Towards deep learning models resistant to adversarial attacks in international conference on learning representations ,2018 https://hdl.handle.net/1721.1/137496 on 24 February 2024.

[70] Causland P , 'Self-driving uber car that hit and killed woman did not recognize that pedestrians jaywalk' NBC News ,2019 https://www.nbcnews.com/tech/tech-news/self-driving-uber-car-hit-killed-woman-did-not-recognize-n1079281 on 24 February 2024.

pedestrian's velocity trajectory with each new classification label. Despite the presence of a safety driver, external distractions prevented intervention. This instance highlights how interactions between the perception system and decision-making/control systems can compound unsafe behaviors. Given the impossibility of guaranteeing perfection in all systems, the cascading effects of errors or uncertainties present a significant challenge to ensuring the safety of autonomous vehicles.[71]

3.2.3 Holistic Certification

In contrast to scenario testing, which evaluates autonomous vehicle (AV) behavior on specific tasks, holistic certification takes a broader approach by using data-driven metrics to demonstrate safety. Potential metrics may include collision frequency or infractions of driving laws per mile.

In aviation, a key metric for safety is the chance of failure per hour, with a maximum standard set at 10−9 failures per hour. A similar standard could be established for AVs, requiring extensive testing,109 hours of driving, equivalent to billions of miles driven to meet aviation thresholds. Studies indicate that hundreds of millions to billions of miles of testing would be needed to confidently assess fatality, injury, and crash rates, with significantly more miles required to demonstrate performance surpassing human drivers.[72]

Simulation plays a crucial role in achieving the necessary test hours for AVs, yet it has limitations compared to real-world scenarios. While simulations can provide valuable insights, they may not fully capture visual appearance, underlying physics, or the behaviors of other vehicles. To address this, simulations should encompass a range of autonomous behaviors and be validated against real-world performance. Methods such as hardware-in-the-loop fault simulations, which introduce software problems at a higher rate, offer a promising approach to reducing the burden of proof for AV safety.[73]

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[71] Ono M, Williams B and Blackmore L, 'Probabilistic planning for continuous dynamic systems under bounded risk' *Journal of Artificial Intelligence Research* 46, 2013, 511–577 — https://doi.org/10.1613/jair.3893 on 24 February 2024.

[72] Waymo, 'Waymo safety report: On the road to fully self-driving' Waymo , 2018 https://waymo.com/safety/ on 24 February 2024.

[73] Jha S, Banerjee S, Cyriac J, Kalbarczyk Z and Iyer R, 'Fault injection for autonomous vehicles in 2018' 48th Annual IEEE/IFIP International Conference on Dependable Systems and Networks Workshops ,2018, 55–56 .

3.3 The relevance of consent in AV

Interactive digital interfaces in autonomous vehicles are expected to play a crucial role in providing drivers with information, particularly regarding safety and driver responsibilities.[74] These interfaces may also be utilized to establish operating conditions for the vehicle, including delineating liability. For instance, a condition might specify that the driver assumes legal responsibility for any accidents that occur while they are in control of the vehicle.[75] To ensure the legal validity of these conditions, drivers must comprehend and agree to be bound by them. Typically, drivers express their consent to these terms by selecting options like 'I agree' or 'I confirm' on the interface or verbally confirming before commencing their journey. This framework for communicating consent to legally binding conditions aims to facilitate the transfer of liability between driver and vehicle, thereby making the legal outcomes of accidents more predictable.

Consent is a familiar concept in various contexts, including online services where users must agree to terms of service and data processing practices. Legislation such as the General Data Protection Regulation (GDPR) in the UK and EU requires explicit consent before data processing.[76] Similarly, in face-to-face interactions like medical treatment, patients must provide informed consent after receiving information about risks and procedures.[77]

In the realm of autonomous vehicles (AVs), consent is utilized to allocate responsibility and liability. While not governed by the same legal frameworks as data protection or medical consent, the fundamental principle remains that individuals must be informed of relevant information and conditions before giving consent. This ensures that their agreement is made with full awareness of potential consequences, such as risks. Ultimately, consent signifies the individual's intent for the agreed-upon conditions to be legally binding.

In the UK, according to common law principles, parties like the driver and vehicle manufacturer can mutually agree on the conditions for operating a vehicle beforehand. Such voluntary agreements may entail the acceptance of known risks, governed by the legal

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[74] Global Forum for Road Safety, (2020) 'UNECE Global Forum for Road Safety' Eightieth Session, 3 March 2020. https://www.unece.org/fileadmin/DAM/trans/doc/2020/wp1/ECE-TRANS-WP1-Informal_document-MARCH-2020-7e.pdf on 24 February 2024.

[75] Miller F,Contracts,Wertheimer (eds), *The ethics of consent,* Oxford Press, New York,2009.

[76] European Parliament and Council of European Union,*General Data Protection Regulation*, (2016) (EU) .

[77] Beauchamp TL, Childress JF ,Principles of biomedical ethics, 5th edn, Oxford University Press,Oxford,2001.

doctrine of volenti non-fit injuria, meaning no injury is done to a willing person.[78] Under this doctrine, an individual who knowingly exposes themselves to harm cannot later make a claim against the other party. However, this agreement does not absolve liability for a vehicle with manufacturing defects.[79] This discussion specifically pertains to autonomous vehicles (AVs) that are not defective and operate within expected parameters. As partially automated vehicles, they may not be capable of self-driving in all conditions and may require the driver to take control at times, including in emergencies. When a driver agrees to operate an AV, they must be adequately informed about the associated risks and responsibilities, even if these may not be immediately obvious. Educating the driver about these risks is not only legally necessary but also beneficial for aligning the driver's perception of the vehicle's capabilities with reality.[80]

However, relying on interactive digital interfaces to inform drivers about risks presents its own set of challenges. Even if all relevant information regarding risk and legal conditions is presented as required, there's no guarantee that the driver will fully comprehend this information before giving their consent. This raises concerns about the validity of consent if drivers are unlikely to absorb the information presented to them electronically. If a driver later claims negligence against the AV manufacturer after an accident and successfully argues that they did not understand the risks they supposedly agreed to by consenting, the common law defense of volenti ,the state of mind necessary to voluntarily accept risk, would not be available to shield the manufacturer from liability.[81]

3.4 Proposing a Strict Liability Standard after Testing is Certified

In the realm of car accidents, the fundamental question of fault arises, often stemming from human error, which accounts for a staggering 94% of all crashes.[82] When pursuing legal action for negligence in a car accident, the injured party must establish duty, breach, causation, and damages.[83] Similarly, in accidents involving AVs, these negligence elements presumably apply to the operators or passengers responsible for the AVs. However, given the

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[78] Jaffey ,'Volenti non-fit injuria' *Cambridge Law Journal* 44,1985,87..
[79] *Titchener v British Railways Board* (1983) 1 WLR 1427.
[80] McLean S , 'Autonomy, consent and the law' Routledge, 2009.
[81] Jaffey ,'Volenti non-fit injuria' *Cambridge Law Journal* 44,1985,87..
[82] 'Hands off: The future of self-driving cars: Hearing on 114-16 Before the Senate Committee on Commerce, Science & Transport, 114th Congress 13 2016.
[83] Restatement (second) of torts , 519 ,1977.

complexity of AVs and the evolving legal landscape, there is a growing necessity for a more comprehensive form of liability.

One approach to addressing the complexities of liability in accidents involving AVs is to establish a higher level of responsibility, potentially through the application of strict liability.[84] This legal standard, which requires individuals to exercise the utmost caution to prevent harm, is applied to activities involving inherently dangerous instruments.[85] While not universally adopted, strict liability is recognized in various legal jurisdictions. Courts typically consider multiple factors when determining whether an activity warrants strict liability, including the degree of risk, likelihood and severity of harm, inability to mitigate risks, uncommonness of the activity, suitability of the location, and societal value versus danger.[86] While not all factors need to be met for an activity to be considered abnormally dangerous, it must pose a significant risk of physical harm to others and be unusual or abnormal. However, traditional examples such as handling volatile substances have been deemed abnormally dangerous, whereas courts generally do not classify operating standard automobiles as such.[87] The question arises as to whether AVs should be categorized as abnormally dangerous instruments. Unlike cases involving highly hazardous activities like testing rocket motors or transporting large quantities of gasoline, AVs may not necessarily meet the criteria for dangerous instrumentalities established in legal precedent.

3.4.1 Ordinary Cars and Liability Insurance

AVs fundamentally differ from inherently dangerous objects and do not align with the factors defining dangerous instrumentalities.[88] While accidents involving AVs may still occur, their primary purpose is to enhance road safety. Operating an AV is not akin to engaging in hazardous activities like testing rockets or speeding with a gasoline tanker. Instead, AV liability should be approached similarly to automobile liability, as indicated by case law.[89] Despite their operational differences, AVs and traditional vehicles function similarly on the

[84]Restatement (second) of torts , 519 ,1977.
[85]Restatement (second) of torts , 519 (1), 1977.
[86]Restatement (second) of torts , 520 ,1977.
[87] *Smith v Lockhead Propulsion Co*, (1967).
[88] Funkhouser K, 'Paving the road ahead: Autonomous vehicles,
products liability, and the need for a new approach' *Utah Law Review* 437, 2013, 451.
[89] Funkhouser K, 'Paving the road ahead: Autonomous vehicles,
products liability, and the need for a new approach' *Utah Law Review* 437, 2013, 451.

road and have the potential to cause comparable harm in accidents. Nonetheless, AVs warrant distinct treatment from conventional cars.

Determining the unique nature of AVs compared to standard cars and predicting court rulings in AV-related cases pose significant challenges due to the complexity of AV technology.[90] However, some examples offer insight. Courts tend to apply the dangerous instrumentality standard more frequently to activities that are unusual and hazardous.[91] Additionally, imposing strict liability on human operators of AVs could expedite the commercialization of AVs, as operators must quickly take control to prevent accidents.[92] Moreover, in states with AV legislation, legislatures have imposed higher liability minimums for AV operators compared to standard vehicles.[93] This indicates that operating an AV is considered a hazardous and unpredictable activity, requiring operators to adhere to elevated safety and caution standards. States appear to perceive AVs as posing a greater risk of danger compared to standard cars, as evidenced by their requirement for significantly higher insurance coverage for AVs. While acknowledging advancements in AV technology through increased testing, these states have eliminated the requirement for a human operator to be present in the "driver's seat" during autonomous operation.[94] However, this also renders AVs inherently "uncontrollable," as there is no human operator to intervene if necessary. Despite recognizing improvements in AV technology and their potential to enhance road safety, states remain cautious and apprehensive about AV safety.[95] Although AVs may not meet the criteria for dangerous instrumentalities, states still perceive them as hazardous and therefore advocate for higher liability standards.

3.4.2 Strict liability as a logical approach

AVs pose greater hazards compared to conventional cars. In response to the uncertainties surrounding AVs, state legislatures have opted for stringent standards to address the potential risks they pose. A suggested solution entails courts applying a strict liability framework as a precautionary measure against the various uncertainties associated with AVs. This approach

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[90] Hubbard P, 'Sophisticated robots: Balancing liability, regulation, and innovation' 66 *Florida Law Review* 1803, 2014.
[91] Restatement (second) of torts , 519 ,1977.
[92] House autonomy vehicle technology study committee, 'Final autonomous vehicle committee report, 2014.
[93] House autonomy vehicle technology study committee, 'Final autonomous vehicle committee report, 2014, 4.
[94] Duffy S and Hopkins J, 'Sit, stay, drive: The future of autonomous car liability, 16 *Southern Methodist University Science and Technology. Law Review* 453, 2013, 455.
[95] Duffy S and Hopkins J, 'Sit, stay, drive: The future of autonomous car liability,457.

mirrors the approach taken by courts when airplanes were initially introduced into widespread use.

3.4.3 Strict Liability Cases

AVs should be treated similarly to the special exception within strict liability that courts established for the advent of airplanes. This framework offers a more logical approach to addressing the liability issues associated with AVs. The concept of strict liability originates from English law, notably from the *Rylands v Fletcher* case.[96] In this case, the defendant's reservoir flooded nearby coal mines due to burst mining shafts, leading to the plaintiff's success under a newly developed theory of strict liability. Justice Blackburn's famous conclusion from the Court of Exchequer decision emphasized that individuals who introduce and retain hazardous materials on their property are responsible for any resulting damage if those materials escape and cause harm.[97] In essence, owning hazardous materials entails accepting the risk of potential harm to others, and therefore, liability is incurred if such harm occurs.

Scholars have observed that the concept of strict liability did not gain traction in U.S. courts early on.[98] Instead, it remained largely inactive until the 1970s, with a few exceptions.[99] One such exception is the application of strict liability for ground damage caused by aircraft, which serves as a notable point of comparison. The American Restatement of torts recognizes this carve-out for strict liability in cases of ground damage caused by aircraft.[100] The Restatement adopts the viewpoint that if a new, unique, and relatively unexplored industry causes harm or injury, it should be subject to strict liability. However, courts have generally been hesitant to embrace this approach, leading to confusion. For example, New York, both at the state and federal levels, initially accepted strict liability for aviation but has since moved away from it. In cases like *Cristi v Civil Air Patrol and T.L. Brunt v Chicago Mill & Lumber Co.*, courts have cited technological advancements and decreased fears regarding aviation as

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[96] Brown A, 'How autonomous vehicles will impact allocation of liability insurance and the resulting impact on the legal community' 95 *North Carolina Law Review* 29, 2016 , 43-47.
[97] *Fletcher v Rylands* (1866) 1 LR.
[98] Nolan V and Ursin E, 'The revitalization of hazardous activity strict liability, 65 *North Carolina Law Review* 257, 1987.
[99] Restatement (second) of torts , 285 - 293 ,1977.
[100] Restatement (second) of torts , 519 ,1977.

reasons for rejecting strict liability.[101]Initially a strict liability approach was adopted for aviation, however, many states have since deviated considerably from this stance, favoring a simpler negligence standard instead.However, there are still instances where courts apply strict liability in aviation cases. For example, in *Parcell v United States*, two Air Force planes crashed into a hill, resulting in the death of both pilots, destruction of the planes, and damage to surrounding property. Despite deliberating on a res ipsa loquitur theory to ascertain the crash's cause, the United States District Court for the Southern District of West Virginia ultimately found the defendant liable under a strict liability standard, irrespective of the actual reason for the crash.

3.4.4 AVs Are More Like Airplanes Than Regular Cars

The existence of compulsory insurance requirements for individual drivers underscores the necessity for a strict liability approach.[102] This perspective posits that strict liability is warranted to facilitate fair compensation for pedestrians or other motorists harmed by hazardous activities, while also spreading the financial burden of losses. Some form of liability insurance for regular drivers, should be mandated, which will lead to increased awareness among drivers regarding their coverage and the potential consequences of unsafe driving behavior.[103] The high insurance requirements for autonomous vehicle (AV) operators would likely make them particularly conscious of their insurance coverage. Some proposals, such as those from the RAND Corporation, suggest implementing a centralized system for AV insurance, while others argue that car manufacturers should bear the liability burden similar to airplane manufacturers in the event of a crash.[104] Consequently, AVs are suggested to be treated more akin to airplanes than conventional automobiles.

Similar to airplanes operating on autopilot, operators of AVs must maintain heightened vigilance.[105] Some authorities argue that while both pilots and drivers must be capable of making split-second decisions, pilots are likely to encounter fewer situations requiring this

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[101] *Cristi v Civil Air Patrol* (1967).
[102] Nolan V and Ursin E, 'The revitalization of hazardous activity strict liability, 65 *North Carolina Law Review* 257, 1987.
[103] Insurance Information Institute, 'Compulsory auto/uninsured motorists' Insurance Information Institute ,25 March 2017 https://www.iii.org/article/background-on-compulsory-auto-uninsured-motorists on 25 February 2024.
[104] Nolan V and Ursin E, 'The revitalization of hazardous activity strict liability, 65 *North Carolina Law Review* 257, 1987.
[105] Insurance Information Institute, 'Self Driving Cars and Insurance' Insurance Information Institute ,July 2016, http://www.iii.org/issueupdate/self-driving-cars-and-insurance on 25 February 2024.

skill compared to drivers. Additionally, pilots undergo extensive training on how to interact with automated systems. In contrast, in a standard car, the human driver is solely responsible for controlling the vehicle and must react promptly to hazards or issues.[106] This responsibility extends to aircraft pilots, who are required by federal regulations to manually control the aircraft during takeoff and when reaching a certain altitude during landing. Even when an aircraft is operating on autopilot, the pilot remains near the controls and can quickly resume manual control if needed.AVs present a distinct challenge as operators have limited time to intervene and override the computer system, especially in AVs that operate independently. Furthermore, the complexity of navigating numerous obstacles increases the potential dangers for AVs. Unlike airplane pilots, humans operating AVs would likely need to intervene much more frequently. Courts should recognize and consider this heightened risk associated with AV operations.[107]

3.4.5 Why AVs Should Be Applied Like the Strict Liability Framework of Early Aviation

When comparing AVs to aviation within the legal framework, parallels emerge, suggesting that AVs are indeed analogous to aviation. Similar concerns voiced by the authors of the Restatement regarding aviation can be applied in two ways.[108] Firstly, state legislatures tend to adopt cautious approaches and impose significant regulations on AV usage.[109] Secondly, the proportion of individuals operating AVs compared to those driving conventional cars is relatively small, forming a limited cohort.[110] Another compelling reason to hold AVs to a strict liability standard is the comparison drawn by commentators between aviation and ordinary automobiles.[111] Despite automobiles historically not being subject to strict liability principles, statistics show that more lives are lost per passenger mile in automobile accidents than in airplane accidents. This underscores the potential hazardous nature of automobiles, akin to the established principles favouring strict liability for aviation.

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[106] Insurance Information Institute, 'Self Driving Cars and Insurance' Insurance Information Institute ,July 2016, http://www.iii.org/issueupdate/self-driving-cars-and-insurance on 25 February 2024.
[107] Insurance Information Institute, 'Self Driving Cars and Insurance' Insurance Information Institute ,July 2016, http://www.iii.org/issueupdate/self-driving-cars-and-insurance on 25 February 2024.
[108] Nolan V and Ursin E, 'The revitalization of hazardous activity strict liability, 261.
[109] Nolan V and Ursin E, 'The revitalization of hazardous activity strict liability, 261.
[110] Bradshaw T, 'Self-driving car numbers double on California roadways' FIN. TIMES, 9 March 2017 http://www.ft.com/content/4377b4c0-0479-11e7-aa5b-6bb07f5c8e12 on 25 February 2024.
[111] Gregory C, Kalven H and Epstein R, Cases and materials on torts 502 ,3rd ed, 1977.

The comparison between automobiles and airplanes reveals a clear distinction in terms of commercial hazard.[112] Automobiles typically expose individuals to hazards inherent in everyday activities, while airplanes pose risks of significant harm, such as crashing into homes and workplaces, that are not routinely encountered in daily life. As highlighted in the Siegler case, individuals on the ground have limited means to avoid falling aircraft, emphasizing the heightened risks involved.[113] Although AVs may not have the potential for widespread damage like airplanes, they are still susceptible to accidents, often beyond the control of the operator. Implementing strict liability would hold car manufacturers accountable for any errors, irrespective of fault, thus acknowledging the significant technological advancement AVs represent in the automotive industry. Just as courts have scrutinized airplanes for their risks, they are likely to approach AVs with similar caution due to the uncertainties associated with new technology and their potential risks.

3.5 Insurance as a Compensation Mechanism

There is a pressing need to address insurance coverage for accidents involving AVs.[114] A key issue under discussion alongside liability and regulation is determining who should bear the burden of insurance premiums: vehicle owners or manufacturers. Given that accidents involving AVs in self-driving mode are attributed to the vehicle itself rather than the owner or occupant, liability may fall on the manufacturer, necessitating them to cover insurance costs. Currently, motor vehicle insurance is mandatory in most countries.[115] In Kenya we have the Insurance (Motor Vehicles Third Party Risks) Act of 1989 that requires all motor-vehicles to be insured against third party risks.[116]

Hashim and Omar propose the development of a distinct insurance scheme tailored for AVs, suggesting that manufacturers should procure insurance policies for these vehicles upon production.[117] The aim is to encourage manufacturers to enhance the safety of AVs by

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[112] Nolan V and Ursin E, 'The revitalization of hazardous activity strict liability,261.
[113] *Siegler v Kuhlman* (1972).
[114] Kouroutakis, 'Autonomous vehicles: Regulatory challenges and the response from Germany and UK'.
[115] Kassim A, Anwar K, and Hashim H, 'Advancement in vehicle safety in Malaysia from planning to implementation' Asian Transport Studies 4, 2017 https://www.researchgate.net/publication/321209695_Advancement_in_Vehicle_Safety_in_Malaysia_from_Planning_to_Implementation on 25 February 2024.
[116] Section 4, *Insurance (Motor Vehicles Third Party Risks) Act* [1989].
[117] Kassim A, Anwar K, and Hashim H, 'Advancement in vehicle safety in Malaysia from planning to implementation' Asian Transport Studies 4, 2017 https://www.researchgate.net/publication/321209695_Advancement_in_Vehicle_Safety_in_Malaysia_from_Planning_to_Implementation on 25 February 2024.

offering lower insurance premiums. It is proposed that premiums for AVs could be reduced compared to traditional vehicles due to the potential decrease in accidents resulting from human errors.[118] Kasim, Anwar, and Hizal suggest exploring the possibility of paying insurance premiums on a per-ride basis rather than annually, potentially using mileage tracked by the vehicles' built-in Global Positioning System (GPS) to determine premiums. In the European Union, AVs fall under the Motor Insurance Directives 2009/103/EC, mandating compulsory motor insurance coverage for all vehicles, including autonomous ones.[119] Channon, McCormick, Kalra, Anderson, and Wachs propose the implementation of a no-fault insurance scheme for victims of autonomous vehicle accidents, eliminating the need for claimants to prove negligence on the part of the defendant to seek compensation.[120]

The notion of 'no-fault' insurance can be interpreted in different ways. In many countries like Israel, New Zealand, Sweden, Australia, Canada, and the United States, individuals involved in accidents caused by others can seek compensation from their own insurance provider under a traditional 'no-fault' insurance system, without the need to go to court to establish fault of the wrongdoer.[121] This type of no-fault insurance applies to accidents involving human-driven vehicles. For instance, in certain U.S. states, accident victims can recover damages from their own insurer if the claim amount is below a specified threshold, while in other cases, they may need to pursue compensation from the at-fault party's insurer. The 'no-fault' principle is invoked when claimants can obtain compensation without resorting to lawsuits against wrongdoers, thus reducing litigation costs.[122] Liability is determined by insurance adjusters based on predefined rules rather than the fault of a driver under a negligence standard. Another interpretation of 'no-fault' insurance resembles the concept of strict liability, wherein the insurer for the owner or manufacturer of an autonomous vehicle involved in an accident compensates victims without the need for them to prove negligence on the part of the owner or manufacturer.[123] Channon and McCormick propose the

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[118] Kassim A, Anwar K, and Hashim H, 'Advancement in vehicle safety in Malaysia from planning to implementation' Asian Transport Studies 4, 2017 https://www.researchgate.net/publication/321209695_Advancement_in_Vehicle_Safety_in_Malaysia_from_Planning_to_Implementation on 25 February 2024.
[119] Channon M and Mccormick L, 'Look, No Hands!' *New Law Journal* 166, 2016, 12.
[120] Channon M and Mccormick L, 'Look, No Hands!' 12.
[121] Schellekens M, "No-fault compensation schemes for self-driving vehicles," Law, Innovation and Technology 2018 https://doi.org/10.1080/17579961.2018.1527477 on 25 February 2024.
[122] Kalra, Anderson, and Wachs, 'Liability and Regulation of Autonomous Vehicle Technologies, RAND,2009 https://www.rand.org/pubs/external_publications/EP20090427.html on 25 February 2024.
[123] Kalra, Anderson, and Wachs, 'Liability and Regulation of Autonomous Vehicle Technologies, RAND,2009 https://www.rand.org/pubs/external_publications/EP20090427.html on 25 February 2024.

establishment of a central fund to serve as the insurer, funded through premiums collected from purchasers of AVs. While this form of no-fault insurance simplifies the liability issue surrounding AVs, Channon and McCormick express concerns about potential complexities, such as determining each purchaser's contribution to the fund and managing the fund itself. Additionally, it is anticipated that a no-fault scheme could be costly, as the absence of litigation typically results in higher payouts.[124]

3.6 Conclusion

In conclusion, ensuring the safety of autonomous vehicles (AVs) involves navigating complex legal, regulatory, and technological landscapes. The challenges presented by the opacity of decision-making algorithms, the need for comprehensive testing, and the determination of liability necessitate thoughtful consideration and innovative solutions. Frameworks such as scenario testing, component certification, and holistic certification offer valuable approaches to evaluating AV safety. However, each has its limitations, highlighting the need for a multifaceted approach that combines rigorous testing, continuous validation, and real-world data analysis.

The concept of consent plays a crucial role in delineating responsibilities and liabilities between drivers and vehicle manufacturers. While interactive digital interfaces can facilitate the communication of consent, challenges remain in ensuring that drivers fully understand the risks associated with operating AVs.

Proposing a strict liability standard for AV accidents provides a logical framework for addressing uncertainties and allocating responsibility. Drawing parallels with early aviation, AVs can be treated as inherently risky instruments, warranting higher standards of care and accountability from manufacturers and operators alike.Insurance mechanisms tailored for AVs offer potential avenues for managing liability and compensating victims of accidents. Whether through traditional insurance models, no-fault schemes, or centralized funds, addressing insurance concerns is essential for fostering confidence in AV technology and promoting its widespread adoption.

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[124] Engstrom F, ‘When cars crash: The automobile’s tort law legacy’ *Wake Forest Law Review* 53 ,2018, 293.

In essence, achieving AV safety requires a collaborative effort involving policymakers, industry stakeholders, researchers, and the public. By embracing innovative testing methodologies, establishing clear legal frameworks, and implementing robust insurance mechanisms, we can pave the way for a future where autonomous vehicles contribute to safer, more efficient transportation systems.

4.0 Best practices from Germany's and the United Kingdom's (UK) Legal Regimes Governing Automated Vehicles

Both Germany and the UK's legal frameworks for autonomous vehicles (AVs) provide valuable best practices for my research on liability attribution in Kenya. Germany's "Autonomous Driving Act" directly demonstrates a specific legal structure governing Level 4 AVs, showcasing licensing, testing, and an evolving liability landscape that shifts away from driver-centric models. On the other hand, the UK's Automated and Electric Vehicles Act (AEVA) emphasizes how non-driver entities are integrated into the framework and focuses on liability arrangements among insurers, owners, and operators. These examples showcase the complexities of shifting liability and potential gaps in areas like data security. These factors are crucial for this analysis as they explore how to adapt these concepts to the Kenyan context and establish a robust legal framework that accounts for the unique implications of AV integration.

4.1 Germany

4.1.1 World's First Level 4 Law

In 2021, Germany made notable advancements in autonomous vehicle technology when it passed the first laws worldwide pertaining to Level 4 AVs.[125] This law, followed by a February 2022 ordinance, aims to regulate the operation and deployment of these vehicles while adapting existing traffic regulations to accommodate them in everyday traffic.[126] The law, officially known as the "Act Amending the Road Traffic Act and the Compulsory Insurance Act (Autonomous Driving Act)," permits cars with particular automated features to drive themselves in certain zones when a human driver is not present.[127] The Federal Ministry of Transport and Digital Infrastructure, one of the relevant public authorities, is in charge of approving both the vehicles and these designated operating zones. This development is not surprising given Germany's history of leading the way in AV development. This commitment is amply demonstrated by the federal government's 2015 Strategy for Automated and

[125] Gesley J, 'Germany: Road traffic act amendment allows driverless vehicles on public roads' Library of Congress ,2021, https://www.loc.gov/item/global-legal-monitor/2021-08-09/germany-road-traffic-act-amendment-allows-driverless-vehicles-on-public-roads/ on 12 February 2024.

[126] Malterer M, 'Germany completes legal framework for autonomous driving | Federal cabinet approves new ordinance, Driverless commute' 19 April 2022 https://www.thedriverlesscommute.com/germany-completes-legal-framework-for-autonomous-driving/.

[127] Malterer M, 'Germany completes legal framework for autonomous driving | Federal cabinet approves new ordinance, Driverless commute' 19 April 2022 https://www.thedriverlesscommute.com/germany-completes-legal-framework-for-autonomous-driving/.

Connected Driving, as well as continuing real-world testing programs led by the Federal Ministry of Transport and Digital Infrastructure.[128] Notably, The Road Traffic Act was amended in 2017, allowing for the legal transfer of vehicle control to fully or highly automated systems.[129]In essence, Germany's recent actions represent a culmination of years of effort, signalling their clear intention to pave the way for the testing, regulation, and eventual deployment of Level 4 AVs for public use on real roads.

Germany's groundbreaking law for Level 4 AVs delves into several crucial areas. Firstly, it establishes a clear path for obtaining an operating licence, complete with detailed testing specifications.[130] Secondly, the law meticulously outlines the requirements and specifications that specific AV models must meet before receiving approval for public road use. Additionally, it defines the registration process for AVs.[131] One of the most significant aspects of the law is its clear delineation of responsibilities for various stakeholders. This includes manufacturers, operators, and other involved parties. Furthermore, the law lays out comprehensive testing requirements that AVs must undergo. It also establishes a framework for addressing administrative and civil offences related to AV operation. Finally, the law ensures safety and functionality by specifying the technical requirements and indicators that AVs must adhere to.[132] In essence, this law stands out as one of the most thorough and comprehensive regulations for Level 4 AVs globally.

The Road Traffic Act amendments from 2021 established a rigorous three-step process for Germany's AV approval procedure. Applying for an operating license with the Federal Motor

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[128] Malterer M, 'Germany completes legal framework for autonomous driving | Federal cabinet approves new ordinance, Driverless commute' 19 April 2022 https://www.thedriverlesscommute.com/germany-completes-legal-framework-for-autonomous-driving/.

[129] Gesley J, 'Germany: Road traffic act amendment allows driverless vehicles on public roads' Library of Congress ,2021, https://www.loc.gov/item/global-legal-monitor/2021-08-09/germany-road-traffic-act-amendment-allows-driverless-vehicles-on-public-roads/ on 12 February 2024.

[130] Gesley J, 'Germany: Road traffic act amendment allows driverless vehicles on public roads' Library of Congress ,2021, https://www.loc.gov/item/global-legal-monitor/2021-08-09/germany-road-traffic-act-amendment-allows-driverless-vehicles-on-public-roads/ on 12 February 2024.

[131] Gesley J, 'Germany: Road traffic act amendment allows driverless vehicles on public roads' Library of Congress ,2021, https://www.loc.gov/item/global-legal-monitor/2021-08-09/germany-road-traffic-act-amendment-allows-driverless-vehicles-on-public-roads/ on 12 February 2024.

[132] Gesley J, 'Germany: Road traffic act amendment allows driverless vehicles on public roads' Library of Congress ,2021, https://www.loc.gov/item/global-legal-monitor/2021-08-09/germany-road-traffic-act-amendment-allows-driverless-vehicles-on-public-roads/ on 12 February 2024.

Transport Authority is the first step..[133] Next, various authorities, designated by a complex web of laws, are responsible for approving specific AV models for operation within defined geographic areas. These designated areas are also meticulously defined by another set of laws. Finally, to receive final approval for actual road use, AVs must obtain both an operating licence and a permit specifically authorising operation within the designated area. In simpler terms, before hitting the road, AVs must navigate this multi-step approval process, ensuring they meet all the requirements for both licensing and operation within specific geographic zones. The focus is not, solely, on the driver but all the parties involved in guiding and having actual physical control of the AV on the road. Over and above legal provisions in the AV law, Germany has ethical considerations to govern the various relationships with AV.

Germany boasts a long-standing legacy in the automotive industry, with renowned brands like Volkswagen and Mercedes-Benz leading the charge. Recognizing the potential of automation, the German government has prioritised its development within the transportation sector. The Federal Ministry actively strives to refine the regulatory framework for autonomous driving. To assess the impact of the recently implemented AV law, the Ministry plans to evaluate its effectiveness in 2023, focusing on infrastructure advancements and data security compatibility.[134] It's important to note that this law serves as a temporary solution until internationally standardised regulations are established. Germany's active participation in shaping international standards, evident through their white paper contributions, further solidifies their position as a pioneer and driving force in the realm of automated and connected driving.

4.1.2 Action Plan (ethics)

To address social and environmental concerns surrounding Level 4 and 5 autonomous vehicles, Germany established the Ethics Commission on Automated and Connected Driving in 2017.[135] This commission proposed 20 key recommendations, the central one of which was

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[133] Federal Ministry for Digital and Transport, 'Germany will be the world leader in autonomous driving' Federal Ministry for Digital and Transport ,2021 https://bmdv.bund.de/SharedDocs/EN/Articles/DG/act-on-autonomous-driving.html on 12 February 2024.

[134] United Nations Economic Commission for Europe, 'Working party on automated/autonomous and connected vehicles- introduction' UNECE.org, https://unece.org/transport/vehicle-regulations/working-party-automatedautonomous-and-connected-vehicles-introduction on 12 February 2024.

[135] Federal Ministry for Transport and Digital Infrastructure, 'The federal government's action plan on the report by the ethics commission on automated and connected driving (ethical rules for self-driving computers)' Federal Ministry for Transport and Digital Infrastructure, 2017

to prioritize human safety over property damage and animal welfare. [136] The commission recommends programming vehicles to avoid giving one person priority over another in unavoidable situations where human injury is imminent.

Recognizing the importance of public understanding, the commission advocated for awareness and educational campaigns. These initiatives would aim to inform the public about emerging transportation technologies, emphasising the importance of privacy and human dignity. The commission expressed ethical concerns regarding the potential for complete vehicle connectivity and centralised control, highlighting the risk of pervasive surveillance and manipulation.[137] Ultimately, they emphasised the importance of individual autonomy, allowing people to choose whether or not to embrace these technological advancements.

Germany's government wholeheartedly embraced the recommendations put forth by the Ethics Commission[138]. Recognizing the dynamic nature of technology and the need for evolving regulations, they outlined a comprehensive action plan to address ethical concerns surrounding AVs. The plan prioritises continuous evaluation and updates to the legal framework, ensuring it effectively governs different levels of automation. Another important area of focus is data sovereignty, empowering users with control over data collection and usage while balancing the needs of personal privacy protection with those of technology advancement. To guarantee adherence to ethical standards, the plan mandates independent safety assessments by neutral third parties before AV deployment. Additionally, it emphasises further research on "dilemmatic scenarios" involving unavoidable harm, spearheaded by a public sector institution.

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https://bmdv.bund.de/SharedDocs/EN/publications/action-plan-on-the-report-ethics-commission-acd.pdf?__blob=publicationFile on 12 February 2024.

[136] Federal Ministry for Transport and Digital Infrastructure, 'The federal government's action plan on the report by the ethics commission on automated and connected driving (ethical rules for self-driving computers)' Federal Ministry for Transport and Digital Infrastructure, 2017 https://bmdv.bund.de/SharedDocs/EN/publications/action-plan-on-the-report-ethics-commission-acd.pdf?__blob=publicationFile on 12 February 2024.

[137] Federal Ministry for Transport and Digital Infrastructure, 'The federal government's action plan on the report by the ethics commission on automated and connected driving (ethical rules for self-driving computers)' Federal Ministry for Transport and Digital Infrastructure, 2017 https://bmdv.bund.de/SharedDocs/EN/publications/action-plan-on-the-report-ethics-commission-acd.pdf?__blob=publicationFile on 12 February 2024.

[138] Federal Ministry for Transport and Digital Infrastructure, 'The federal government's action plan on the report by the ethics commission on automated and connected driving (ethical rules for self-driving computers)' Federal Ministry for Transport and Digital Infrastructure, 2017 https://bmdv.bund.de/SharedDocs/EN/publications/action-plan-on-the-report-ethics-commission-acd.pdf?__blob=publicationFile on 12 February 2024.

Despite promoting educational campaigns and aiming for wider accessibility, the plan clarifies that AV adoption remains a personal choice, not a mandatory obligation.[139] Recognizing the global impact of AVs, Germany actively advocates for international standardisation, striving to incorporate their ethical framework into international agreements. Finally, they expedite legislation solidifying the principle of prioritising human safety above all else. This ensures that AVs are programmed to avoid accidents involving human harm, and in unavoidable situations, no individual is prioritised over another.

4.1.3 Liability

The arrival of AVs on public roads will necessitate a significant shift in how Germany approaches liability and insurance for automotive accidents.[140] The current legal system operates under the assumption that human error or defective vehicle manufacturing is the cause of over 90% of accidents.[141] Under this system, section 823 (1) German Civil Code and Road Traffic Act hold drivers and vehicle keepers liable for damages, with the possibility for drivers to demonstrate their innocence.[142] Notably, European Union regulations known as the Product Liability Directive 85/374/EEC have an impact on product liability laws because they impose strict liability on manufacturers for defects in their products.[143] In essence, the existing system assigns civil liability to drivers and vehicle keepers for their actions, while

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[139] Federal Ministry for Transport and Digital Infrastructure, 'The federal government's action plan on the report by the ethics commission on automated and connected driving (ethical rules for self-driving computers)' Federal Ministry for Transport and Digital Infrastructure, 2017 https://bmdv.bund.de/SharedDocs/EN/publications/action-plan-on-the-report-ethics-commission-acd.pdf?__blob=publicationFile on 12 February 2024.

[140] Eber M, 'Civil liability for autonomous vehicles in Germany, prepared for 21st congress of the international academy of comparative law, 2022, https://deliverypdf.ssrn.com/delivery.php?ID=936024072000095005120103106095064011005045010029091017099010092127097003126008003007045048040054026046000080086011077024117028030017092083016104126074086011105064091021073024127087005087109108122078014098019119066078029018096077124087072105123102065092&EXT=pdf&INDEX=TRUE on 12 February 2024.

[141] Paradies M, 'Is human error the cause of 94% of vehicle accidents? Would automation stop these crashes?' TapRoot, 5 Jan 2022 https://www.taproot.com/is-human-error-the-cause-of-vehicle-accidents/ on 12 February 2024.

[142] Eber M, 'Civil liability for autonomous vehicles in Germany, prepared for 21st congress of the international academy of comparative law, 2022, https://deliverypdf.ssrn.com/delivery.php?ID=936024072000095005120103106095064011005045010029091017099010092127097003126008003007045048040054026046000080086011077024117028030017092083016104126074086011105064091021073024127087005087109108122078014098019119066078029018096077124087072105123102065092&EXT=pdf&INDEX=TRUE on 12 February 2024.

[143] Eber M, 'Civil liability for autonomous vehicles in Germany, prepared for 21st congress of the international academy of comparative law, 2022, https://deliverypdf.ssrn.com/delivery.php?ID=936024072000095005120103106095064011005045010029091017099010092127097003126008003007045048040054026046000080086011077024117028030017092083016104126074086011105064091021073024127087005087109108122078014098019119066078029018096077124087072105123102065092&EXT=pdf&INDEX=TRUE on 12 February 2024.

holding manufacturers strictly liable for product defects that cause accidents. However, the advent of autonomous vehicles (AVs) makes it necessary to reevaluate this framework because it raises a much more complicated question regarding who is responsible for an accident involving an AV.

Germany's legal system regarding fault in car accidents is undergoing a significant shift with the arrival of AVs. Currently, section 18(1)(1) of the Road Traffic Act holds the human driver of a Level 3 AV liable for any damages caused, unless they can prove they were not negligent and met all awareness requirements. This differs from Levels 4 and 5 AVs, where the Autonomous Driving Act of 2021 removes driver liability from the equation.[144]However, it's important to note that the Vienna Convention on Road Traffic requires some form of human intervention mechanism even in highly automated vehicles. This creates a potential grey area, as the specific circumstances surrounding an accident involving a Level 4 or 5 AV with a human driver could still lead to liability questions.

The rules for who is responsible for accidents involving self-driving cars are complex and differ depending on the specific laws in place. While traditional traffic laws might hold human drivers accountable, things get murkier with highly automated vehicles. Germany's civil code, for instance, doesn't explicitly require a human driver to be present when assigning liability for accidents.[145] However, as the technology advances and cars become more autonomous, it seems less reasonable to blame the passenger for crashes.[146] This is particularly true for vehicles classified as Level 4 and 5, which are completely autonomous and do not require a driver. According to some experts, owners of these vehicles may not

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[144] Eber M, 'Civil liability for autonomous vehicles in Germany, prepared for 21st congress of the international academy of comparative law, 2022, https://deliverypdf.ssrn.com/delivery.php?ID=936024072000095005120103106095064011005045010029091017099010092127097003126008003007045048040054026046000080086011077024117028030017092083016104126074086011105064091021073024127087005087109108122078014098019119066078029018096077124087072105123102065092&EXT=pdf&INDEX=TRUE on 12 February 2024.

[145] Eber M, 'Civil liability for autonomous vehicles in Germany, prepared for 21st congress of the international academy of comparative law, 2022, https://deliverypdf.ssrn.com/delivery.php?ID=936024072000095005120103106095064011005045010029091017099010092127097003126008003007045048040054026046000080086011077024117028030017092083016104126074086011105064091021073024127087005087109108122078014098019119066078029018096077124087072105123102065092&EXT=pdf&INDEX=TRUE on 12 February 2024.

[146] Eber M, 'Civil liability for autonomous vehicles in Germany, prepared for 21st congress of the international academy of comparative law, 2022, https://deliverypdf.ssrn.com/delivery.php?ID=936024072000095005120103106095064011005045010029091017099010092127097003126008003007045048040054026046000080086011077024117028030017092083016104126074086011105064091021073024127087005087109108122078014098019119066078029018096077124087072105123102065092&EXT=pdf&INDEX=TRUE on 12 February 2024.

even be considered "drivers" under the law as it stands, which could potentially relieve them of all responsibility in the event of an accident.

In addition to the driver, the technical supervisor, the vehicle keeper, and the manufacturer, three other parties are recognized by German law with regard to vehicles.[147] Additionally, there might be liability for IT service providers under the Telemedia Act, focusing on data efficiency, reliability, and cybersecurity rather than automotive malfunctions. Regarding the technical supervisor, this individual has the authority to deactivate the AV and approve alternative actions in emergencies, aligning with the Vienna Convention on Road Traffic. However, it's not mandatory for the technical supervisor to be physically present inside the vehicle, raising questions about compliance with the Autonomous Driving Act 2021 and the Vienna Convention. Presently, the liability of a technical supervisor is governed by general principles under the Civil Code, subject to proof of breaching a duty by the injured party. It is unclear exactly who is liable under section 18 (1)(1) of the Road Traffic Act until the technical supervisor's duties and qualifications are formally established.[148]

Under current law, an injured party can hold the vehicle keeper accountable for damages according to the Road Traffic Act. Simply put, the law identifies the vehicle keeper as the person who uses the vehicle, regardless of ownership, and exercises control over it. The Act, section 7, imposes strict liability on vehicle keepers, meaning they can be held responsible even if they were not directly driving at the time of the incident. Engaging automated features while driving does not exempt the vehicle keeper from liability, nor does malfunctioning technology qualify as an unavoidable event. Furthermore, driving functions are not considered force majeure since they are not caused by external factors. In essence, the legal responsibility of a vehicle keeper remains unchanged amidst the development, deployment, and regulation of autonomous vehicles.

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[147] Eber M, 'Civil liability for autonomous vehicles in Germany, prepared for 21st congress of the international academy of comparative law, 2022, https://deliverypdf.ssrn.com/delivery.php?ID=936024072000095005120103106095064011005045010029091017099010092127097003126008003007045048040054026046000080086011077024117028030017092083016104126074086011105064091021073024127087005087109108122078014098019119066078029018096077124087072105123102065092&EXT=pdf&INDEX=TRUE on 12 February 2024.

[148] Eber M, 'Civil liability for autonomous vehicles in Germany, prepared for 21st congress of the international academy of comparative law, 2022, https://deliverypdf.ssrn.com/delivery.php?ID=936024072000095005120103106095064011005045010029091017099010092127097003126008003007045048040054026046000080086011077024117028030017092083016104126074086011105064091021073024127087005087109108122078014098019119066078029018096077124087072105123102065092&EXT=pdf&INDEX=TRUE on 12 February 2024.

In Germany, manufacturers can be held liable in certain cases, similar to the legal framework in the United States.[149] They may face strict liability or liability for wrongful acts. Strict liability, where the manufacturer is responsible for damages without proof of negligence or intentional misconduct, is governed by the Product Liability Act. However, this still necessitates the presence of a defect and unlawful behaviour on the part of the manufacturer. Thus, a defect in the product that caused harm must have been caused by an error on the part of the manufacturer. In contrast to negligence, which requires harm to be reasonably foreseeable, this requirement does not require foreseeability. Section 823(1) of the Civil Code requires a breach of legally protected interests, which is not satisfied by this aspect, which typically involves intentional or negligent actions.

According to section 1(4)(1) Product Liability Act, it has established safety obligations for manufacturers, shifting the burden of proof to plaintiffs. The Automated Driving Act 2021 mandates AV manufacturers to conduct risk assessments, including cybersecurity checks, and adhere to standardised safety assessments. Amendments to section 1e (2) the Road Traffic Act requires AVs to have accident-avoidance systems and comply with traffic rules.[150] In unavoidable damage situations, AVs must prioritise protecting human lives. The Act also outlines requirements for AV authorization, such as risk-minimised modes and automatic defect reporting to a technical supervisor. Manufacturers are liable similarly to non-autonomous vehicles but with added responsibilities for establishing safe automated driving systems, implementing cybersecurity measures, and anticipating complex traffic scenarios.

Though there is practically no case law regarding these highly or fully AVs because now is when these cars are being rolled out into the German roads, Germany is taking steps to

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[149] Eber M, 'Civil liability for autonomous vehicles in Germany, prepared for 21st congress of the international academy of comparative law, 2022, https://deliverypdf.ssrn.com/delivery.php?ID=936024072000095005120103106095064011005045010029091017099010092127097003126008003007045048040054026046000080086011077024117028030017092083016104126074086011105064091021073024127087005087109108122078014098019119066078029018096077124087072105123102065092&EXT=pdf&INDEX=TRUE on 12 February 2024.

[150] Eber M, 'Civil liability for autonomous vehicles in Germany, prepared for 21st congress of the international academy of comparative law, 2022, https://deliverypdf.ssrn.com/delivery.php?ID=936024072000095005120103106095064011005045010029091017099010092127097003126008003007045048040054026046000080086011077024117028030017092083016104126074086011105064091021073024127087005087109108122078014098019119066078029018096077124087072105123102065092&EXT=pdf&INDEX=TRUE on 12 February 2024.

reform its legal regime to clarify user's legal obligations, the vehicle keeper, the manufacturer and the technical supervisor.

Germany has established itself as a leader in AV legislation by taking a comprehensive and structured approach.This is exactly what Kenya needs. Their framework covers various aspects like licensing, testing, and ethical considerations, aiming for safe and responsible AV development. This focus on safety is evident in their regulations for accident avoidance systems and clear liability frameworks. Additionally, Germany actively participates in international collaboration, potentially shaping future global standards for AVs.

However, this thoroughness comes with its own challenges. The multi-step approval process and involvement of various stakeholders can make the system complex. Moreover, new technology creates uncertainties, leaving aspects like the technical supervisor role unclear. Finally, the current limitations to designated areas hinder wider AV integration.

4.2 United Kingdom

In the United Kingdom, the main law dictating the registration and use of autonomous vehicles (AVs) is the Automated and Electric Vehicles Act 2018 (AEVA), which also establishes the regulatory framework for AV oversight.[151] The Secretary of State for Transport is authorized to issue future regulations and decide which AVs are allowed on UK roads. The AEVA establishes liability agreements among insurers, owners, and operators of AVs. The AEVA (Commencement No.1) regulations 2021 sections 1 through 8 gave the Secretary of State for Transport the power to identify AVs that are authorized for use on roads and to set up insurance requirements for their use.[152] Additionally, the Road Vehicles (Construction and Use) (Automated Vehicles) Order 2022 amended the Road Vehicles (Construction and Use) Regulations 1986 to permit AV drivers to access information displayed on in-vehicle screens while the vehicle is operating autonomously.[153]

Since the enactment of the Automated and Electric Vehicles Act (AEVA), the Secretary of State for Transport in the United Kingdom has engaged in extensive consultations with stakeholders but has not yet implemented further regulations or permitted the operation of

[151] *Automated and Electric Vehicles Act,* 2018 (UK).
[152] *Automated and Electric Vehicles Act,* 2018 (UK).
[153] *The Road Vehicles (Construction and Use) Regulations*, 1986, SI 1986/1078 (UK).

AVs on public roads.[154] The Highway Code was updated by the Department for Transport to include specific requirements for AV operators. In addition to the Centre for Connected and Autonomous Vehicles publishing a Code of Practice for Automated Vehicle Trials, a number of regulatory bodies have published reports on autonomous vehicles (AVs), including the Law Commission of England and Wales and the Scottish Law Commission.[155] These efforts demonstrate the UK government's interest in facilitating AV testing on public roads, although widespread deployment beyond testing environments has not been authorised. Presently, UK legislation primarily focuses on establishing registration and insurance frameworks for AVs, with less emphasis on addressing data security or technological requirements in detail.

4.2.1 Existing Legal Regimes

The Automated and Electric Vehicles Act (AEVA) is the primary legislation governing autonomous vehicles (AVs) in the United Kingdom, comprising three main parts.[156] Part 1 mandates the Secretary of State for Transport to maintain a list of AVs eligible for operation on UK roads and defines an automated vehicle accordingly.[157] It also establishes liability frameworks for insurers, owners, operators, and those affected by AV accidents. Part 2 pertains to electric vehicles and gives the Secretary of State for Transport regulatory authority over the establishment and operation of charging and refuelling infrastructure.[158] Part 3 outlines procedures for promulgating regulations under the Act, specifies effective dates for different provisions, and determines the territorial application within the UK.[159] Additionally, the Highway Code, managed by the Department for Transport, includes both advisory road safety information and legally binding rules. Its latest update on July 27, 2022, introduces specific requirements and responsibilities for AV operators.[160] An additional document titled Code of Practice for Automated Vehicle Trials has been released by the government-affiliated Center for Connected and Autonomous Vehicles, which is housed under the Departments of

[154] Department for Transport, 'The Highway Code', 27 July 2022 https://www.gov.uk/guidance/the-highway-code on 12 February 2024 .
[155] Section 1 & 2, *Law Commissions Act*, 1965 (UK).
[156] Section 1(4), *Automated and Electric Vehicles Act,* 2018 (UK).
[157] Section 1(4), *Automated and Electric Vehicles Act,* 2018 (UK).
[158] Section 1(4), *Automated and Electric Vehicles Act,* 2018 (UK).
[159] Section 1(4), *Automated and Electric Vehicles Act,* 2018 (UK).
[160] Department for Transport, 'The Highway Code', 27 July 2022 https://www.gov.uk/guidance/the-highway-code on 12 February 2024 .

Business, Energy and Industrial Strategy and Transport. It provides guidelines regarding legal requirements as well as recommended practices for AV testing on public roads.[161]

4.2.2 Definition of a Driver

In their Joint Report, the Law Commissions discuss the civil liability provisions within the AEVA, which pertain to incidents caused by a listed vehicle operating in a self-driving mode as defined by the AEVA itself. The AEVA defines "driving itself" as the vehicle operating in a mode where it doesn't require control or monitoring by an individual.[162] The Code of Practice for Automated Vehicle Trialing defines a driver as someone who can control the vehicle's speed and direction, even when it's in automated mode.[163] The Report also examines the SAE taxonomy's concept of the Dynamic Driving Task (DDT), which involves sustained motion control of the vehicle and detection and response to objects and events in the driving environment.[164] Building on this, the Report defines key terms, the Automated Driving System (ADS) is the combination of software and hardware capable of performing the entire DDT, an automated vehicle is one equipped with an ADS capable of performing the DDT within certain operational design domains (ODDs); and an ADS feature is part of an ADS designed for a specific ODD.[165]

Instead of a single driver, the Report introduces three new legal actors. Firstly, the Authorised Self-Driving Entity (ASDE).[166]Typically the vehicle manufacturer or software provider seeking authorization for self-driving features. The ASDE is generally responsible for self-driving vehicles on Great Britain's roads and is required to report issues to regulators. Secondly, the User-in-Charge which is where there is a human present in the vehicle while it's driving itself.[167] Unless specifically authorized for use without one, the report suggests that all self-driving cars have a user-in-charge. If the ADS requests it, the user-in-charge may need to take over driving if they are qualified to do so. The user in control is not accountable for

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[161] 'Code of Practice: automated vehicle trialling'Centre for Connected & Autonomous Vehicles, https://www.gov.uk/government/publications/trialling-automated-vehicle-technologies-in-public/code-of-practice-automated-vehicle-trialling on 12 February 2024.
[162] *Law Commission & Scottish Law Commission.*
[163] 'Code of Practice: automated vehicle trialling'Centre for Connected & Autonomous Vehicles, https://www.gov.uk/government/publications/trialling-automated-vehicle-technologies-in-public/code-of-practice-automated-vehicle-trialling on 12 February 2024.
[164] *Law Commission & Scottish Law Commission.*
[165] *Law Commission & Scottish Law Commission.*
[166] *Law Commission & Scottish Law Commission.*
[167] *Law Commission & Scottish Law Commission.*

dynamic driving during the activation of the ADS feature, and they cannot be prosecuted for any associated offenses The third is the No-User-in-Charge (NUIC).[168]These are features authorised for use without a user-in-charge. When engaged, the vehicle is overseen by a licensed NUIC operator, typically an organisation rather than an individual. NUIC operators are expected to respond to alerts from the vehicle and handle any problems encountered, including collisions.

4.2.3 Statutory Definition of Driving Itself

Section 1, Subsection 8 of the AEVA defines the term "driving itself" as the operation of a vehicle in a mode where it doesn't require control or monitoring by an individual, as established by interpretive rules within the statute.[169] However, according to the Law Commissions' report, the key issue lies in determining when an individual doesn't "need to monitor" the vehicle.[170] Based on feedback received during Consultation Paper 3, the Law Commissions concluded that an Automated Driving System (ADS) feature should only be considered self-driving if human monitoring of the driving environment, vehicle operation, or driving behaviour is not required.[171] Additionally, individuals should not be relied upon to respond to events unless prompted by a transition demand.[172]

4.2.4 Governmental Policy Papers Regarding AVs

Even though they are not legally binding, policy papers are useful resources for summarizing public policy initiatives in a given jurisdiction. To help the UK government accomplish a number of objectives pertaining to automated vehicles, the Centre for Data Ethics and Innovation published a policy paper in August 2022 titled "Responsible Innovation in Self-Driving Vehicles".[173] These goals include enhancing accessibility, reducing driver errors, curbing emissions, and bolstering the UK economy, with a focus on providing regulatory clarity to manufacturers in the automated vehicle sector.[174] Notably, the paper responds to the

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[168] *Law Commission & Scottish Law Commission.*
[169] Section 1(8), *Automated and Electric Vehicles Act,* 2018 (UK).
[170] *Law Commission & Scottish Law Commission.*
[171] *Law Commission & Scottish Law Commission.*
[172] *Law Commission & Scottish Law Commission.*
[173] 'Responsible innovation in self-driving vehicles , Centre for Data Ethics & Innovation, 19 August 2022,https://www.gov.uk/government/publications/responsible-innovation-in-self-driving-vehicles/responsible-innovation-in-self-driving-vehicles on 12 February 2024.
[174] 'Responsible innovation in self-driving vehicles , Centre for Data Ethics & Innovation, 19 August 2022,https://www.gov.uk/government/publications/responsible-innovation-in-self-driving-vehicles/responsible-innovation-in-self-driving-vehicles on 12 February 2024.

Joint Report of the Law Commissions and aims to offer detailed recommendations for a new safety framework for self-driving vehicles, along with strategies for managing regulatory interdependencies.

Another significant document outlining the UK government's objectives and strategies concerning automated vehicles is "Connected & Automated Mobility 2025, realising the benefits of self-driving vehicles in the UK."[175] Published in August 2022 by the Secretaries of State for Transport and Business, Energy & Industrial Strategy, this report details the government's response to the recommendations put forth by the Law Commissions'.[176] It commits to establishing a new legislative framework for safe self-driving vehicles based on these recommendations and sets out a timeline for the deployment and harmonisation of autonomous vehicles on UK roads.

The timeline within "Connected & Automated Mobility 2025" anticipates several regulatory milestones, including the removal of responsibility from vehicle occupants by 2024, signalling approval of an insurance regime where occupants are not liable for accidents occurring while the vehicle is in self-driving mode.[177] Additionally, it foresees the development of approval and authorization processes for automated vehicles, along with in-use regulation and incident investigation procedures by 2025.[178]

4.2.5 Requirement for a Safety Driver During Testing

According to the Code of Practice for Automated Vehicle Trialling published by the Centre for Connected and Autonomous Vehicles, testing automated vehicle technology on UK roads

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[175] Secretary of State for Transport & Security of State for Business Energy & Industry Strategy, 'Connected & automated mobility 2025: Realising the benefits of self-driving vehicles in the UK' https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1099173/cam-2025-realising-benefits-self-driving-vehicles.pdf on 15 February 2024.

[176] Secretary of State for Transport & Security of State for Business Energy & Industry Strategy, 'Connected & automated mobility 2025: Realising the benefits of self-driving vehicles in the UK' https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1099173/cam-2025-realising-benefits-self-driving-vehicles.pdf on 15 February 2024.

[177] Secretary of State for Transport & Security of State for Business Energy & Industry Strategy, 'Connected & automated mobility 2025: Realising the benefits of self-driving vehicles in the UK' https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1099173/cam-2025-realising-benefits-self-driving-vehicles.pdf on 15 February 2024.

[178] Secretary of State for Transport & Security of State for Business Energy & Industry Strategy, 'Connected & automated mobility 2025: Realising the benefits of self-driving vehicles in the UK' https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1099173/cam-2025-realising-benefits-self-driving-vehicles.pdf on 15 February 2024.

is allowed as long as it complies with local regulations.[179] The requirement is that trial operators have to designate an operator or driver, both inside and outside the vehicle, who is ready and able to take over control of the vehicle when necessary. Additionally, the vehicle must be roadworthy and have appropriate insurance coverage. During trials conducted on public roads or in other public areas, the Code recommends the presence of a licensed and trained safety driver or operator to supervise the vehicle continuously, ensuring compliance with traffic regulations and ready to intervene if the automated driving system requires manual override.[180]

4.2.6 Requirement for Remote Driver/Operator

The Code of Practice specifies that the safety driver or operator, whether inside or outside the vehicle, must possess the capability to promptly resume control of the vehicle if necessary. It also emphasises that for remote-controlled trials, these individuals should be aware of potential risks associated with remote access, such as communication delays or network issues, and be prepared to address them. Furthermore, the Code mandates that safety drivers or operators must hold the relevant driving licence for the trial vehicle, even if it operates entirely in automated mode.[181] If the trial vehicle is a prototype with no clear licence category, the Code expects the nearest equivalent conventional licence to be held. Additionally, organisations conducting trials must establish clear guidelines for safety driver and operator conduct, including rules regarding alcohol and drug usage beyond legal requirements. Safety drivers and operators are obligated to adhere to all traffic laws, such as obeying speed limits and exchanging insurance information in case of accidents, and refrain from distracting behaviours like using display screens while driving. Moreover, the Code emphasises the importance of safety drivers and operators being mindful of their actions' impact on other road users, including maintaining appropriate gaze direction to avoid causing distractions.

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[179] 'Code of Practice: automated vehicle trialling'Centre for Connected & Autonomous Vehicles, https://www.gov.uk/government/publications/trialling-automated-vehicle-technologies-in-public/code-of-practice-automated-vehicle-trialling on 12 February 2024.

[180] 'Code of Practice: automated vehicle trialling'Centre for Connected & Autonomous Vehicles, https://www.gov.uk/government/publications/trialling-automated-vehicle-technologies-in-public/code-of-practice-automated-vehicle-trialling on 12 February 2024.

[181] 'Code of Practice: automated vehicle trialling'Centre for Connected & Autonomous Vehicles, https://www.gov.uk/government/publications/trialling-automated-vehicle-technologies-in-public/code-of-practice-automated-vehicle-trialling on 12 February 2024.

4.2.7 Data

The authors of the Joint Report by the Law Commission and Scottish Law Commission acknowledge that their focus did not extend to addressing most issues related to data protection and privacy.[182] They mention the requirement for both conventional and automated vehicles sold in the EU to be equipped with Event Data Recorders (EDRs), yet highlight limitations in EDRs' effectiveness, particularly in recording incidents involving vehicles colliding with smaller objects like motorcycles or pedestrians.[183] To address these shortcomings, they reference UN Regulation 157, which introduces a Data Storage System for Automated Vehicles (DSSAD) capable of recording relevant data during automated driving events. However, the report largely avoids delving into data and privacy concerns due to its specific scope.[184]

The Centre for Data Ethics & Innovation policy paper examines data privacy and sharing in the context of AV regulations.[185] It outlines how AVs can collect and process personal data, including location data and health information of occupants, and discusses relevant UK laws governing data processing. The paper considers the need for user consent for data processing and explores consent requirements in scenarios involving automated vehicles.[186] Additionally, it addresses the collection of personal data from individuals outside the vehicle, such as through facial recognition technology, emphasising compliance with data protection laws and the necessity of legitimate interests assessments. Furthermore, the paper discusses data protection principles such as data minimization and data protection by design, recommending techniques for anonymizing facial image data to mitigate privacy risks. It also highlights compliance requirements for AVs under existing legislation, such as transparency requirements in the UK GDPR and regulations governing surveillance cameras.[187] Lastly, the paper suggests that regulators should clarify obligations for AV entities under relevant laws,

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[182] *Law Commission & Scottish Law Commission.*
[183] *Law Commission & Scottish Law Commission.*
[184] UN Regulation 157, *Uniform provisions concerning the approval of vehicles with regard to Automatic Lane Keeping Systems,* E/ECE/TRANS/505/Rev3/Add 156.
[185]'Responsible innovation in self-driving vehicles , Centre for Data Ethics & Innovation, 19 August 2022,https://www.gov.uk/government/publications/responsible-innovation-in-self-driving-vehicles/responsible-innovation-in-self-driving-vehicles on 12 February 2024.
[186]'Responsible innovation in self-driving vehicles , Centre for Data Ethics & Innovation, 19 August 2022,https://www.gov.uk/government/publications/responsible-innovation-in-self-driving-vehicles/responsible-innovation-in-self-driving-vehicles on 12 February 2024.
[187]'Responsible innovation in self-driving vehicles , Centre for Data Ethics & Innovation, 19 August 2022,https://www.gov.uk/government/publications/responsible-innovation-in-self-driving-vehicles/responsible-innovation-in-self-driving-vehicles on 12 February 2024.

particularly distinguishing between different categories of AV data for law enforcement purposes.

4.2.8 Safety During the Testing and Operation of AVs

As of July 27, 2022, the Highway Code outlines responsibilities for individuals in self-driving vehicles. While the vehicle is autonomously driving in suitable conditions, individuals are not accountable for its actions and may divert their attention from the road or engage with the vehicle's infotainment system.[188] However, certain obligatory rules still apply even when the vehicle is in autonomous mode:

1. The driver must be in a condition fit for driving, adhering to rules regarding sobriety and drug use.[189]
2. The vehicle must meet legal requirements, including having necessary certifications, taxation, insurance, and being roadworthy. The driver is responsible for passengers and cargo.[190]
3. Engaging in illegal activities, such as using a handheld mobile phone, is prohibited.[191]

Additionally, new mandated regulation is introduced that is exclusive to autonomous vehicle operators and states that the vehicle must give the operator enough warning for a safe transition in the event that it needs to return control. Drivers must be prepared to resume control promptly when prompted by the vehicle.[192]

4.2.9 General Liability Framework and Insurance Policy Requirements

Section 2 of the Automated and Electric Vehicles Act (AEVA) addresses liabilities in cases where an autonomous vehicle (AV) is involved in an accident. It is applicable when an insured person or another individual sustains damage while the autonomous vehicle is

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[188] Department for Transport, 'The Highway Code', 27 July 2022 https://www.gov.uk/guidance/the-highway-code on 12 February 2024 .
[189] Department for Transport, 'The Highway Code', 27 July 2022 https://www.gov.uk/guidance/the-highway-code on 12 February 2024 .
[190] Department for Transport, 'The Highway Code', 27 July 2022 https://www.gov.uk/guidance/the-highway-code on 12 February 2024 .
[191] Department for Transport, 'The Highway Code', 27 July 2022 https://www.gov.uk/guidance/the-highway-code on 12 February 2024 .
[192] Department for Transport, 'The Highway Code', 27 July 2022 https://www.gov.uk/guidance/the-highway-code on 12 February 2024 .

operating on a public road in Great Britain.[193] If the vehicle is insured at the time of the accident, the insurer is responsible for the damages. However, if the vehicle is not insured by section 143 of the Road Traffic Act 1988, because section 144(2) of the Road Traffic Act creates exemptions or because it's in the service of the Crown, the owner of the vehicle bears liability.[194]

Damage, as defined in Subsection (3), includes death, personal injury, and property damage, excluding damage to the AV itself, goods carried for hire or reward, or property under the control of the insured person or the AV's operator. Subsection (4) limits the recoverable amount for property damage arising from a single accident involving an AV.[195]

A crucial provision is outlined in Subsection (6), which states that liability under this section cannot be limited or excluded by the terms of an insurance policy or otherwise.[196] This provision ensures that insurance policies covering AVs cannot shift liability to the insured person, thereby establishing a level playing field in terms of liability.

4.2.10 Unauthorised Software Alterations and Failure to Update Software

Under certain circumstances relating to software updates and modifications of autonomous vehicles (AVs), insurers may limit their liability under Section 4 of AEVA. Subsection (1) permits insurers to exclude or limit liability if an accident occurs due to prohibited software alterations made by the insured person or their knowledge, or if safety-critical software updates are not installed.[197]

Software alterations and updates are defined in Subsection (6), with updates deemed "safety-critical" if using the vehicle without them would be unsafe. Subsection (2) specifies that the rule on prohibited software alterations applies to insured persons who are not the policyholders only for alterations known to be prohibited under the policy at the time of the accident.[198]

Subsection (4) allows insurers to recover amounts paid to non-insured persons injured in accidents resulting from prohibited software alterations or failure to install safety-critical updates, if authorised by the policy.[199] Subsection (5) applies this provision to insured persons

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[193] Section 2(1), *Automated and Electric Vehicles Act,* 2018 (UK).
[194] Section 2(2), *Automated and Electric Vehicles Act,* 2018 (UK).
[195] Section 2(3), *Automated and Electric Vehicles Act,* 2018 (UK).
[196] Section (6), *Automated and Electric Vehicles Act,* 2018 (UK).
[197] Section 4(1)(a), *Automated and Electric Vehicles Act,* 2018 (UK).
[198] Section 4(2), *Automated and Electric Vehicles Act,* 2018 (UK).
[199] Section 4(4), *Automated and Electric Vehicles Act,* 2018 (UK).

who are not the policyholder and knew of the prohibited alterations at the time of the accident.[200]

The UK prioritises testing and establishing regulations before widespread AV deployment. This cautious approach involves extensive stakeholder consultations and provides guidance through documents like the Code of Practice. Their framework focuses on user safety by outlining responsibilities and ensuring safe transitions between automated and manual control. Additionally, the AEVA establishes clear liability frameworks for accidents, providing clarity for various parties involved.

While this approach has the potential to foster safe and responsible AV development by addressing ethical concerns and public trust, it comes at the cost of slow progress. The focus on testing and regulations can delay widespread public deployment. Additionally, the UK's legal landscape still has uncertainties, especially regarding data privacy and software updates. Furthermore, their framework currently focuses more on registration and insurance, with less emphasis on technical aspects and data security.

4.3 Comparative Analysis

The legal frameworks governing autonomous vehicles (AVs) in Germany and the United Kingdom exhibit notable similarities and differences, each reflecting the unique regulatory approaches of their respective jurisdictions. In Germany, groundbreaking legislation introduced detailed regulations for Level 4 AVs, establishing a rigorous three-step approval process for their operation. This process entails obtaining an operating licence, approval for specific AV models, and permits for operation within designated areas. Conversely, the United Kingdom's Automated and Electric Vehicles Act (AEVA) serves as primary legislation for AVs, focusing on registration, insurance frameworks, and liability arrangements.

Regarding liability attribution, both Germany and the UK address the complex issue of assigning responsibility in AV accidents. In Germany, liability involves an intricate interplay between insurers, vehicle owners, manufacturers, and technical supervisors. Manufacturers

[200] Section 4(5), *Automated and Electric Vehicles Act,* 2018 (UK).

can be held accountable for product defects, while vehicle keepers have strict liability for damages, regardless of their direct involvement in accidents. In the UK, the AEVA establishes liability arrangements among insurers, owners, operators, and affected parties, with insurers primarily responsible for damages if the vehicle is insured.

The impact of legal personhood is also evident in both jurisdictions' frameworks, albeit with some differences. Germany's approach recognises various legal actors, including manufacturers, technical supervisors, vehicle keepers, and users-in-charge, with clearly defined roles and responsibilities. In contrast, the UK's legal framework acknowledges insurers, owners, operators, and AV manufacturers as key parties, but the roles of technical supervisors and users-in-charge are less explicitly delineated.

Drawing lessons for the Kenyan context, it becomes evident that establishing a clear legal framework tailored to local needs and priorities is paramount. Kenya should collaborate with stakeholders to develop comprehensive regulations addressing AV operation, testing, liability, and insurance requirements. Prioritising safety considerations, promoting public awareness, and monitoring international developments will also be crucial steps in shaping Kenya's approach to AV governance and regulation.

4.4 Conclusion

In conclusion, the legal frameworks for autonomous vehicles (AVs) in Germany and the United Kingdom represent significant strides towards regulating this emerging technology. Germany's pioneering legislation for Level 4 AVs sets a precedent for comprehensive regulation, while the United Kingdom's AEVA establishes a robust foundation for AV governance. Both jurisdictions address complex issues such as liability attribution and the impact of legal personhood, albeit with varying approaches.

The comparative analysis highlights the importance of tailoring regulatory frameworks to local contexts while considering international best practices. Lessons learned from Germany and the UK provide valuable insights for other jurisdictions, including Kenya, embarking on their journey towards AV regulation. To ensure the safe, responsible, and inclusive integration of AVs into global transportation systems, governments, industry stakeholders, and the general public must continue to collaborate as AV technology develops.

5.0 Recommendations and Conclusion

5.1 Introduction

In the context of Kenya's evolving transportation landscape, the absence of legal standards for autonomous vehicle "drivers" poses significant challenges, particularly regarding liability attribution. This chapter concludes an investigation into the potential impact of autonomous vehicles in Kenya, focusing on their implications for liability. Guided by specific research questions, this study has explored the feasibility of granting legal personhood to AI entities as AV "drivers," examined existing legal frameworks in Germany and the UK and considered the applicability of such standards in the Kenyan context. Through an in-depth analysis, this chapter provides insights and recommendations aimed at addressing the identified challenges and facilitating the responsible integration of autonomous vehicles on Kenyan roads.

5.2 Recommendations

5.2.1 Amendment of Section 39 of the Traffic Act on Driving Tests

Kenya's road infrastructure plays a crucial role in facilitating the safe operation of autonomous vehicles. Therefore, in addition to road development initiatives, specific procedures and criteria for conducting driving tests for AVs must be established by the National Transport and Safety Authority (NTSA).

Firstly, driving tests for AVs should be conducted by qualified examiners with expertise in autonomous vehicle technology and operation. These tests should evaluate the AV's ability to interpret traffic signals, navigate various road conditions, respond to emergencies, integrate with existing infrastructure, comply with traffic laws, and ensure the reliability of autonomous driving systems.

Secondly, the NTSA may require manufacturers or operators of autonomous vehicles to provide documentation and evidence demonstrating the AV's capability and performance. Additionally, the NTSA should conduct on-road evaluations of AVs to validate their performance in real-world driving conditions. Periodic review and updating of driving test

procedures and criteria are essential to reflect technological advancements, regulatory changes, and emerging safety standards.

5.2.2 Amendment of Section 4 and 5 of the Insurance (Motor Vehicles Third Party Risks) Act 1989

This Act must be amended to address the insurance needs of autonomous vehicles. I propose that owners or operators of AVs should obtain insurance coverage against third-party risks from authorized insurers. Additionally it will be required that a certification of AV readiness and compliance with regulatory standards is provided prior to receiving insurance coverage.

5.2.3 Amendment of Section 2 NTSA Act 2012

The definition of "driver" within the NTSA Act 2012 should be expanded to encompass autonomous vehicle systems. The proposed amendment is based on Germany's definition of driver which defines it as "a person or an autonomous vehicle system that operates, guides, or is in control of any vehicle on the road."

5.3 Conclusion

In navigating the legal landscape surrounding AAAs, particularly in the realm of AVs, it becomes evident that a nuanced and proactive approach to regulation is imperative. Throughout this dissertation, I have explored various dimensions of AI-specific legal frameworks, ethical considerations, international cooperation, stakeholder engagement, and the promotion of safety and innovation. In synthesizing these discussions, several key insights emerge, underscoring the importance of comprehensive and adaptive regulatory frameworks in addressing the multifaceted challenges and opportunities presented by AVs.

Firstly, the development of AI-specific legal frameworks is essential to provide clarity, accountability, and legal certainty in the regulation of AVs. By defining liability standards, accountability mechanisms, and oversight frameworks tailored to the unique characteristics of AI systems, policymakers can ensure that parties are held responsible for their actions while fostering trust and confidence in the adoption of AI technologies. Additionally, incorporating ethical considerations into regulatory frameworks is paramount to uphold

principles of transparency, fairness, and respect for human rights and dignity. By embedding ethical guidelines and principles into AI regulation, policymakers can promote responsible AI development and deployment while mitigating risks and safeguarding societal values.

Furthermore, international cooperation and collaboration are crucial in establishing consistent standards and regulations for AVs across borders. By engaging with international partners, sharing best practices, and harmonizing regulatory approaches, countries can address cross-border challenges and promote responsible AI governance on a global scale. Additionally, stakeholder engagement plays a pivotal role in shaping AI regulation, ensuring that diverse perspectives and interests are considered in decision-making processes. By fostering dialogue, collaboration, and consensus-building among government agencies, industry stakeholders, civil society organizations, and the public, policymakers can develop regulatory frameworks that reflect the interests and values of all stakeholders involved.

Moreover, promoting safety and innovation is central to the regulation of AVs, striking a balance between ensuring public safety and fostering technological advancement. By implementing rigorous testing and certification processes, encouraging research and development initiatives, and providing incentives for innovation, policymakers can promote the responsible development and deployment of AI technologies while mitigating risks and maximizing societal benefits. Additionally, continuous monitoring, evaluation, and adaptation of regulatory frameworks are essential to keep pace with technological advancements and emerging challenges in the AI landscape.

In conclusion, addressing the legal implications of AVs requires a holistic, forward-thinking, and collaborative approach to regulation. By developing comprehensive and adaptive regulatory frameworks, prioritizing ethical considerations, fostering international cooperation, engaging stakeholders, and promoting safety and innovation, policymakers can navigate the complexities of regulating AVs effectively while fostering innovation and safeguarding societal interests. As countries like Kenya embrace AI technologies, it is essential to prioritize the safety, privacy, and welfare of citizens while harnessing the transformative potential of AVs to drive economic growth, enhance quality of life, and address societal challenges. Through concerted efforts and collaborative initiatives, policymakers can position their countries as leaders in responsible AI deployment, contributing to the advancement of society in the digital age and beyond.

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