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AUTONOMOUS VEHICLES AND WAY FORWARD: ANALYSING THE EXISTING LAWS AND EMPHASISING THE NEED FOR NEW LAWS

AUTHORED BY - S YESESWINI

ABSTRACT

With the advent of autonomous vehicles, we get a step closer to the technological and revolutionary future, humankind has always envisioned. The Autonomous vehicles (AV) and Autonomous Electric Vehicles (AEV) have revolutionized the transportation industry and every car manufacturer like TATA, Mahindra, MG including startups like Minus zero and Swaayatt Robots are now investing significantly on research, time and money to launch these vehicles in the Indian Market.

The consumers are often misled through advertisements, which generally focus only on the brighter side of these vehicles, eventually tempting them to purchase these vehicles. The consumers, though enthusiastic and receptive to such innovations, often fail to anticipate the grave dangers that shall entail due to manufacturing defects. Privacy concerns also reach a whole new level when it comes to autonomous vehicles since they receive, store and manage sensitive information's of the human driver.

However, in a developing country like India, autonomous vehicles need to be introduced safely in the backdrop of exhaustive laws and policies. There are different levels of autonomous systems and each mandate a different set of legal actions when they are involved in accidents to assign liability. Laws and policies need to be revised and revisited with evolving technology in the modern world.

A novel technology like autonomous vehicles mandates the enactment of laws exclusive to it. The success of these vehicles largely depends on the Manufacturers, Government and Car owners to ensure a smooth transition, by understanding the physical and legal environment in India. This article aims to explore the different levels of autonomous vehicles, the onus of liability in the events of unfortunate accidents, the magnitude of data that is compromised by such vehicles and the Global Perspective delineating the specific legislations introduced in US and UK.

INTRODUCTION

In 2019, the Road Transport and Highways Minister Nitin Gadkari said autonomous driving would not be allowed in India because the government is not going to promote any technology that comes at the cost of jobs and has reaffirmed it on several occasions. Today, there are several cars offering ADAS Level 2 features and with Tesla's first showroom opened in Mumbai, driverless cars cruising on the Indian roads is not a far-fetched dream anymore. However, it is necessary to analyse whether our present legislations are capable to adapt to the changing times as technology progresses further.

Technology is accelerating at a rapid pace in the modern times and laws and policies addressing the crucial points of law must be developed. In the future, when autonomous cars are firmly established in India, several questions of law might blossom, if, exclusive laws addressing the safety, liability and data protection are not enacted.

According to the report of the Society of Automotive Engineers (SAE) International, six levels of driving automation spanning from no automation (Level 0) to full automation are discussed (Level 5).

Level 0: No driving automation as the title suggests, at this level the vehicle possesses no automated driving features, but that doesn't necessarily exclude driver assistance features. Indeed, the driving experience is entirely in the hands of the driver, but the vehicle is equipped with a system which provides momentary driving assistance, such as warning signals or emergency safety actions.

Examples are ABS, ESP, cruise control, blind spot warning, automatic emergency braking, frontal collision warning, lane departure warning Driving is 100% manual.

Level 1: The vehicles are equipped with a system which supplies constant assistance during acceleration, braking and steering, whilst the driver is both involved and attentive. Also in this instance the driver has the task of driving the vehicle and monitoring the system, which however - if activated - can perform steering, acceleration and braking functions.

Examples are electronic adaptive speed regulator, or adaptive cruise control, lane keeping assistance or lane centring assistance

Level 2: Level 2 (partial) automation refers to 'the driving mode-specific execution by one or

more driver assistance systems of both steering and acceleration/ deceleration using information about the driving environment and with the expectation that the human driver performs all remaining aspects of the dynamic driving task.’

Dynamic driving task includes the operational (steering, braking, accelerating, monitoring the vehicle and roadway) and tactical (responding to events, determining when to change lanes, turn, use signals, etc.) aspects of the driving task, but not the strategic (determining destinations and waypoints) aspect of the driving task. Driving mode is a type of driving scenario with characteristic dynamic driving task requirements (e.g., expressway merging, high-speed cruising, low-speed traffic jam, closed-campus operations, etc.).

This applies to a large share of the autonomous vehicles that are on the market today. They are equipped with advanced driving assistance systems (ADAS), and this provides continual assistance both regarding acceleration/braking and in steering, whilst the driver is 100% attentive and involved with the possibility however of handing over control of combined longitudinal and lateral functions.

Level 3: Level 3 (conditional automation) is ‘the driving mode-specific performance by an automated driving system of all aspects of the dynamic driving task with the expectation that the human driver will respond appropriately to a request to intervene.’

The vehicles have “environmental detection” capabilities and can make informed decisions for themselves, such as accelerating past a slow-moving vehicle. But they still require human attention. The driver must remain alert and ready to take control if the system is unable to execute the task. System handles all aspects of Automation driving while driver remains available to take over driving if the system can no longer operate.

Level 4: Level 4 (high automation) reads as ‘the driving mode-specific performance by an automated driving system of all aspects of the dynamic driving task, even if a human driver does not respond appropriately to a request to intervene.’

This level of automation doesn’t require any human interaction in most circumstances. They will be limited to certain areas (geofencing) where speed limits are low and the roads are easy to read.

Level 5: Narrative definition of Level 5 (fully autonomous) system reads as ‘the full-time performance by an automated driving system of all aspects of the dynamic driving task under all roadway and environmental conditions that can be managed by a human driver’ while

This is the very highest level of automation due to the advanced technologies employed. Indeed, they require no human intervention and not even emergency manual intervention, whatever the driving conditions or the state of the roads. For this reason, the vehicles are not equipped with pedals or a steering wheel. Therefore, a person could come on board and literally undertake any activity whilst totally ignoring the driving situation.

Part I of this article addresses the techno-legal conundrum when an accident occurs involving an autonomous vehicle. It poses several legal and ethical issues such as to who is ultimately liable for accidents involving autonomous vehicles; essentially re-visiting the concept of negligence.

Part II deals with the risk of misleading advertisement of autonomous cars, followed by recommendations for a safe introduction to consumers. Manufacturers must refrain from manipulating their customer base and develop transparency, since, it involves risking the life of humans in the hands of artificial intelligence, depending on the levels of automation.

Part III concerns about data protection and privacy; the laws surrounding it and the need for an exclusive law on data protection since autonomous vehicles inherently operate on several sensitive information of the consumer.

Part IV delineates the Global Perspective by discussing the laws enacted in US and UK addressing Autonomous vehicles and assigning liability.

PART I – TECHNO-LEGAL CONUNDRUM BEHIND AUTONOMOUS VEHICLES

The autonomous vehicle (AV) market in India is developing steadily, with a concerted effort from both well-established industry titans like Mahindra and Tata Motors as well as forward-thinking startups like Minus Zero, [Swaayatt Robots](#), [Flux Auto](#), and [Flo Mobility](#). Mass production of autonomous cars in India might prove to be dangerous if implemented in the backdrop of out-dated laws and policies, which are ultimately not exhaustive to cover all possible situations.

1.1. THE MOTOR VEHICLES ACT AND ITS AMENDABILITY

The Motor Vehicles Act, 1939 (“MV Act”), mandates that a motor vehicle may not be driven without a driving license. Secondly, no person under the age of 18 is allowed to drive a motor vehicle. The MV Act places the responsibility on the owner of the vehicle to ensure that the provisions mentioned above are complied with. The question that arises is whether such

responsibilities of the ‘owner’ of the vehicle would still exist in the age of autonomous cars. Appropriate amendments would have to be made to the MV Act allowing for a select sort of license for autonomous vehicles.

Given that most of the functions of an autonomous vehicle, if not all, would be controlled by internal processors, the question also arises whether people below the age of 18 would be allowed to ‘operate’ the said vehicle. Another issue that requires attention pertains to the requirement of registration of cars as provided in the MV Act, as per the procedure mentioned in Section 41. Importantly, the State Government, under the MV Act currently holds the power to restrict the use of vehicles ‘in the interest of public safety’, as well as make regulations for the driving of motor vehicles. It is, therefore, a possibility that states might differ on the regulations that govern autonomous cars depending on the traffic and road conditions.

The MV Act initially provided for the award of compensation on the principle of “fault” only. The Supreme Court in *Manushri Raha v. B.L. Gupta*¹, as well as the Law Commission of India, had recommended the introduction of “no-fault” liability which was subsequently not incorporated. In the amended MV Act of 1988, Sections 140 to 144 provide for the award of compensation resulting from an accident arising out of the use of motor vehicles. The compensation in the above-mentioned sections will be based on the principle of “No-fault”. Section 144 for MV Act, 1988 prescribes the amount of compensation of Rs. 50000 for Death and Rs. 25000 for permanent disability. But in the case of *Haji Zakaria v. Naoshir Cama*², a very important question arose, whether defendant can be held liable for compensation even with no rash or negligent driving involved? – The supreme court was of the view that no liability can be imposed on the owner of the vehicle if there is an absence of Negligence. So, if we apply this rationale on the accidents involving self-driven cars, the accident if occurred due to manufacturer negligence and not by the owner of the car, then the manufacturer would be held liable.

The proposed amendments to the “MV Act” of 2017, implemented in 2019, have witnessed the insertion of Section 2B In 2019³, the Road Transport and Highways Minister Nitin Gadkari

¹ 1977 AIR 1158

² AIR 1976 AP 171

³ Shub Jaiswal and Myank Agarwal, ‘The Fast And The Injurious: Legal Impediments That Await Self-Drive Vehicles In India’, IRALR, <https://www.iralr.in/post/the-fast-and-the-injurious-legal-impediments-that-await-self-drive-vehicles-in-india/>

said autonomous driving would not be allowed in India because the government is not going to promote any technology that comes at the cost of jobs and has reaffirmed it on several occasions. Today, there are several cars offering ADAS Level 2 features and with Tesla's first showroom opened in Mumbai, driverless cars cruising on the Indian roads is not a far-fetched dream anymore. However, it is necessary to analyse whether our present legislations are capable to adapt to the changing times as technology progresses further.

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⁴ SAE International, 2021. J3016_202104: Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles.

more driver assistance systems of both steering and acceleration/ deceleration using information about the driving environment and with the expectation that the human driver performs all remaining aspects of the dynamic driving task.’

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Level 5: Narrative definition of Level 5 (fully autonomous) system reads as ‘the full-time

⁵ Prakash, S. K., & Kishore, V. S. (2023). *Critical Legal Analysis on Rights and Liabilities when Using Artificial Intelligence in Autonomous Vehicles* (Doctoral dissertation, Alliance University).

performance by an automated driving system of all aspects of the dynamic driving task under all roadway and environmental conditions that can be managed by a human driver’.

This is the very highest level of automation due to the advanced technologies employed. Indeed, they require no human intervention and not even emergency manual intervention, whatever the driving conditions or the state of the roads. For this reason, the vehicles are not equipped with pedals or a steering wheel. Therefore, a person could come on board and literally undertake any activity whilst totally ignoring the driving situation.

The MV Act enlarges the scope for promotion of innovation and development in the field of engineering and mechanically propelled vehicles which could be liberally interpreted to include within its ambit autonomous vehicles and their testing on roads as such. A sound proposal for the formation of the National Transportation Policy talks about promotion of competition, innovation and greater efficiency in transportation for addressing the current and future challenges in Section 66A (1)(v) and (vii). Making a move towards automation, the Act in Section 56(2) provides for automated testing of vehicles before they could be granted the fitness certificate. Also, by the authorization provided by the act in Section 215 B(2)(e), the National Road Safety Board has the power to advise the Central Government with regard to promotion of new vehicle technology. Hence, what could be concluded is that no explicit mention of autonomous vehicles could be seen in the Act, but however the Act has certain above-mentioned provisions which implicitly promote the innovation in technology consistent with the evolving times.

I.2. THE CONCEPT OF NEGLIGENCE IN AUTONOMOUS VEHICLES.

The concept of negligence is essential in assigning liability in accidents involving autonomous vehicles. It is pertinent to note in this juncture that several factors contribute to assigning liability; however, separate concepts of negligence are required to be framed since every level of autonomous vehicles are unique in their aspect.

The concept of negligence is quite clear pertaining to level 1 and 2 cars, but with level 3 cars confusion arises. Moreover, no-fault liability can exist in these situations where the driver/owner is ultimately liable for the accident caused but, it is hard to assign it in case of level 3 and 4 vehicles as the situation is complex.⁶

⁶ Pete Bigelow, ‘Why Level 3 automated technology has failed to take hold’, Rubber news, (July 24, 2019 12:34 PM), <https://www.rubbernews.com/automotive/why-level-3-automated-technology-has-failed-take-hold>

The critical difference between level 2 and level 3 driving system is driving tasks and human intervention. In level 3, it is expected that a human driver will respond to a request to intervene, but in level 2, the system requires constant supervision and monitoring.

Once, Level 3, sometimes called "conditional automation," seems like a natural step in the evolution of automated technology, a progression beyond today's driver-assist systems in which drivers retain responsibility for vehicle operations and a precursor to self-driving vehicles. Main Part of the problem lies with delineation of responsibility. With Tesla's Autopilot and General Motors' Super Cruise, both Level 2 systems are in the market today, which makes it clear that regardless of functionality, humans remain responsible for all driving operations. In Level 4 self-driving system the burden is shifted on the manufacturer as the Human occupants have zero roles.

Level 3 is a middle ground, where responsibility can be exchanged between human and machine. When systems are in control, humans are still required in case the system encounters a situation it cannot handle. Those handoffs, and the notion of a human backup, bring forth a series of questions and challenges.

While a system drives, can a human backup check email or watch a video? How do manufacturers ensure there is no mode confusion? What series of audio, visual and haptic cues should be used to alert a human driver they need to retake control? How long should they be given to do so? How should vehicles monitor the readiness of humans to accept a handoff? What happens if they do not accept that exchange?

Level 3 pushes the boundaries on what is expected of the human, and it makes it difficult to discern 'Am I driving or riding?' on a moment-to-moment basis. Humans simply may get used to comfort and fail to accept the takeover request.⁷ Implementing Level 3 will necessitate a rethinking of user interfaces already developed for driver-assist systems and a more collaborative approach to sharing the driving task. An example: If it starts raining while a Level 3 system is engaged, the system could alert its human backup that conditions are becoming more demanding.

⁷ G. Contissa, F. Lagioia, G. Sartor, Liability and automation: legal issues in autonomous cars, *Netw. Ind. q.*, | 20 (2018)

Handover must be done gradually and not in an abrupt manner, which might prove to be fatal in several cases. Humans do not always respond to stress well and those few seconds might pressurise them and create havoc resulting in unfortunate incidents.

I.3. THE COMPLEX MECHANISM OF HANDOVER AND ITS IMPLICATIONS

Handover is very complicated when it involves level 3 automated systems. Because of the liability involved in that handover and there is quite a bit more work to do on Level 3 systems. Manufacturers end up in a situation where they have to under all circumstances handle a safe stop, and it might not always go in the right path.

Driver-monitoring systems have emerged as a crucial component of any system involving human drivers. By monitoring hand position on a steering wheel or tracking eye movements with in-cabin cameras, systems can ensure a human is paying attention. Nevertheless, they have limitations.⁸

Determining how to measure the cognitive readiness of humans to retake responsibility has been the subject of new research. However, there is neither consensus nor regulation on how long drivers should be given to accept a handoff. For Traffic Jam Pilot, Audi had estimated drivers would be ready in 10 seconds. Others believe the time needed is considerably longer. "The driver should not need to be reactivated faster than a couple of minutes," Volvo CEO Hakan Samuelsson said in November 2020. "Otherwise, it is a hazardous system. If you cannot do that, you have a pilot-assist system like you have today, which requires total supervision at all times by the driver."

If driver-monitoring systems have become necessary to enable Level 3, they also represent something automakers prefer to avoid — cost. Because automakers accept liability when their systems are in charge, testing and validation costs will be more expensive, as will be additional hardware on vehicles in the form of computing power and redundancy of actuators. Audi added front-facing lidar as part of its Traffic Jam Pilot package; it remains unclear whether others will follow.⁹

⁸ Visconti P, Rausa G, Del-Valle-Soto C, Velázquez R, Cafagna D, De Fazio R. Innovative Driver Monitoring Systems and On-Board-Vehicle Devices in a Smart-Road Scenario Based on the Internet of Vehicle Paradigm: A Literature and Commercial Solutions Overview. *Sensors*. 2025; 25(2):562.

⁹ Pete Bigelow, 'Why Level 3 automated technology has failed to take hold', *Automotive news*, (July 22, 2019), <https://www.autonews.com/shift/why-level-3-automated-technology-has-failed-take-hold/>

As these issues are sorted out, automakers are rolling out more and more advanced driver-assist features. Many in the industry have latched onto the unofficial term "Level 2 Plus," which conveys the idea that functionality of driver-assist systems is improving. At the same time, automakers are stopping short of accepting liability associated with Level 3.

The legal issue behind this would be ultimately assigning liability if a human driver fails to respond to a take over the request; indeed, he is liable for the accident caused but several ethical questions need to be answered before coming to this conclusion effectively.¹⁰

With level 4 systems, the handing over does not work as in level 3. In level 4, the system does send a takeover request at extreme situations, but the autonomous system can handle the entire drive even if the driver does not respond to a request to intervene. With level 5, the concept of taking over request does not exist because no driver is required, and the driver's seat in itself does not exist in the first place. Thus, no liability can be fastened on the driver.

PART II – MISLEADING ADVERTISEMENTS ON AUTONOMOUS VEHICLES:

II.1. IMPACTS OF FALSE ADVERTISING: A CONSUMER POINT OF VIEW

Section 2(1)(r) of the Consumer Protection Act, 1986 of India is as follows:

‘(r) “unfair trade practice” means a trade practice which, to promote the sale use or supply of any goods or for the provision of any service adopts any unfair method or unfair or deceptive practise including any of the following practices, namely:

- (1) the practice of making any statement, whether orally or in writing or by visible representation which;
 - (i) falsely represents that the goods are of a particular standard, quality, quantity, Grade composition, style or model.

In the digital age, visual ads featuring vehicles showcasing their prominent features and ease in driving are common, however in the case of autonomous vehicles entering the market with no solid legislation backing them, false and misleading advertising may result in accidents. Laws concerning misleading advertisements find its place not only in the consumer protection act, 1986 and but also in the rules that have been laid down by the Advertising Standard Council

¹⁰ Beatriz Botero Arcila, ‘AI liability in Europe: How does it complement risk regulation and deal with the problem of human oversight? Computer Law & Security Review, Volume 54, 2024, 106012, ISSN 2212-473X,

of India, ASCI which advertisers are bound to adhere to.

What happens if the advertisements are distorted in the case of autonomous vehicles? It might seem too much of a hypothetical situation, but humans tend to mimic advertisement on a substantial rate. If the advertisement, even remotely instils something which cannot be done while driving an autonomous car – depending on its automation, like browsing the web, texting and such; the driver will follow the same in real life. Not all the advertisements can be dismissed off as non-reality and ignored as there is a thin line between what a human brain perceives to be puffery and what it considers real.

Therefore, misleading advertisements can manipulate the customer base and the autonomous vehicles can be perceived differently than what it actually is can lead to dangerous situations risking their life. It is necessitated that Automakers need to take liability in these cases and thoroughly explain the legal consequences during the purchase of the vehicles to ensure such mishaps based on visual advertisements. Successful launching of autonomous vehicles along with policies backed up is necessary to ascertain the importance of assigning liability in complex cases. The following recommendations are pertinent to ensure the safe introduction of autonomous vehicles in a developing economy wherein not everyone is well-informed with using novel technology.

II.2. SUGGESTIONS FOR MANUFACTURERS

1. Guidebooks

It is essential to introduce autonomous cars in India by first giving the public at large an idea of what is an autonomous car and slowly, introducing them to different levels and helping them in making the best choice.

2. Detailed instructions

Critically detailed and intricate instruction both in visual medium and audio, is needed. In some cases, follow up might be necessary on this to educate prospective customer base fully to make them prepared for the training sessions that follow.

3. Training sessions

Following the detailed instructions, training sessions need to be conducted to carry out in-depth research in this field of observing human behaviour. This is especially required in the case of autonomous vehicles in the range of level 3 to level 5.

Failure to educate the customers might prove to be fatal as advertisements do not always

tend to depict the real-life scenarios.

4. Observing the right take over request timing

One of the vital aspects of dealing with autonomous cars, mainly level 3 is finding out the perfect take over request timing. This can only be done in careful settings mimicking the Indian environment as every situation mandates individual attention. Several automobile manufacturers have researched on their own but when introducing in India, it calls for special attention as roads are not uniform everywhere and take over request can range from 10 seconds to several depending on the situation.

Level 4 automated systems face this problem too. There exists only one way to overcome this drawback. Before mass production of autonomous vehicles in India, uneven and crowded streets must be made right. However, without such efforts it can be effectively stated that autonomous vehicles can be launched only at special zones to boost revenue.

5. Impeccable testing

Testing is an integral part for the introduction of any technology in this world. With this novel technology, testing is the place where defects get highlighted and give the manufacturers a head start in the production and commercialisation of autonomous vehicles.

Testing of autonomous vehicles in the Indian climate might reveal some imperfections which will need to be addressed and bridged before mass production and commercial release of highly automated vehicles.

Having dealt about implementation, it is essential at this juncture to keep in mind the significant disadvantage which India might encounter apart from specific legislations would be road structure – as most of the Indian roads are poorly designed and almost always crowded which might lead to accidents if autonomous vehicles come into play. The downside of introducing autonomous cars will be a severe layoff to driver employees – but on the larger scale of things, it can be concluded that autonomous cars serve a higher purpose and bring home many advantages than disadvantages. It becomes essential to enact exclusive laws and policies to govern their existence, lest they might become obsolete.

PART III – ANALYSIS IN LIGHT OF PERSONAL DATA PROTECTION ACT 2023

III.1.PRIVACY CONCERNS IN AUTONOMOUS VEHICLES¹¹

As the development and testing rates of self-driving cars are progressing, the prospect of privately owning autonomous cars is nearing. Several countries like U.S.A, U.K, Europe have enacted laws for governing these technologies. Industry experts believe that autonomous vehicles will be commercially available in the next five years.¹²

This area explores the privacy issues that should be addressed before they are fully commercialized.

A. LOCATION DATA

Location data is necessarily used in autonomous vehicles for various purposes such as navigation, destination information, route information, speed and time travelled, etc. Location features also exist in traditional vehicles which are in use as of today to provide real-time traffic updates, set routing preferences by avoiding tolls and highways and any additional information required regarding the trip.¹³

(i) SENSITIVITY OF LOCATION DATA

A data set that associates location data and travel data with additional information from owner and passenger information could provide innumerable uses (easy driving, traffic planning, reducing congestion, higher safety standards). However, on the other hand, this may also collect and save personal information if the data is retained over a longer time.

These privacy concerns subsist both on individual and societal aspects. This technology has already climbed its curve in the United States. But slowly there came problems and several regulations and laws were enacted to govern technology. One landmark judgement that had a major impact on privacy related issues was *US v. Jones*¹⁴ wherein it was held that “Location information generates a precise, comprehensive record of a person’s public movements that reflects a wealth of

¹¹ The Privacy Implications of Autonomous vehicles, Norton Rose Fulbright, (2017), <https://www.dataprotectionreport.com/2017/07/the-privacy-implications-of-autonomous-vehicles/>

¹² Chesterman, S. (2020). Artificial intelligence and the limits of legal personality. *International & Comparative Law Quarterly*, 69(4), 819-844.

¹³ Tracking & Hacking: Security & Privacy Gaps Put American Drivers at Risk, (2015), [http:// www. markey. senate. gov/ news/ press- releases/ as- wireless- technology- becomes- standard- markey- queries- carcompanies- about- security- privacy](http://www.markey.senate.gov/news/press-releases/as-wireless-technology-becomes-standard-markey-queries-carcompanies-about-security-privacy)

¹⁴ 565 U.S. 400 (2012)

detail about her familial, political, professional, religious, and sexual associations”. The New York Court of appeal also stated that an individual’s location and destination information can reveal a vast amount of details about his/her private trips. These private trips may include visits to the psychiatrist clinic, abortion clinics, strip clubs, criminal attorney’s office, AIDS treatment Center, union meetings, restaurants, a gay bar and worship places. The ability to identify the present location and storage of historical travel data of an individual can make them more vulnerable to physical harm or stalking if the information ends up in the wrong hands.

(ii) MARKETING

From a commercial perspective, location data combined with personal information can be used for marketing purposes. These data sets can enable a marketer to figure out information about where the passenger lives, works, eats, shops. This can also help them gather details about income levels and spending habits. This might seem shocking to most of us, as we assume our data to be safe, secure and encrypted. However, it is the other way around. These kinds of data tracing are already being carried on by famous companies such as Google, Facebook and both have faced lawsuits on gathering information of passengers by using behavioral tracking of cookies. These data sets may also be used to provide in-vehicle customized advertising with our likes and dislikes which the marketers can easily trace out with the help of our travel data. These advertisements will be shown on mobile phones, car screens or any other screens linked to our location data.

(iii) SOCIETAL CONCERNS¹⁵

The collection and sharing of location data impacts an individual’s “reasonable expectation of privacy”. The US Supreme Court in *U.S v. Jones* held that warrantless attachment of GPS to a vehicle leads to violation of defendant’s right to the expectation of privacy. However, this judgement was way before the launch of autonomous vehicles. Justice Sotomayor stated another important paradigm under the third-party doctrine. This doctrine states that ‘an individual has no reasonable expectation of privacy in information he has voluntarily disclosed to third parties.’ Justice Sotomayor recognised that this doctrine is ill-suited to this digital age and moreover stated that individuals reveal a great deal of information

¹⁵ Beiker, S. A. (2012). Legal Aspects of Autonomous Driving, Santa Clara Law Review.

in the process of carrying out mundane tasks and it needs to be addressed accordingly. This view seems to be more precise and needs to be adopted in India soon.

B. SENSOR DATA

All autonomous vehicles and the latest human-driven vehicles contain various sensors to collect information about the surroundings and to enhance the safety of their passengers. The various kinds of sensors include LIDAR to collect information about the vehicles and objects around the car, cameras, thermal imaging devices and radar. These devices help the autonomous vehicle recognize the objects, calculate the distance and take actions precisely.

These sensors also assist the vehicle in collecting information about the driving habits, destination information and other sensitive data without the knowledge and consent of the owner. This data could eventually lead to ownership disputes based on the images captured. Hence, the companies which engage in a broad collection of data should also include higher standards of safety.

C. VOICE RECOGNITION¹⁶

Voice recognition has become an essential feature in many electronic devices. This sensor has also been installed in an autonomous vehicle for easier communication between the passengers and the car. Passengers consider this as advanced technology but alas this ends up creating space for more trouble than the other sensors. Enabling voice recognition is equal to giving out details of our private communication to third parties as this is precisely what it does. Many customers in the U.S. have raised concern about this feature.

To overcome this setback in future India now being aware of the problems that major countries like the US and EU are facing should enact regulations to address it. India should enact a law for voice recognition even in phones, laptops and other electronic gadgets. However, this law would not apply to autonomous vehicles, but it can aid manufacturers in assessing the legal situation and tie up with third parties to process the data in a compatible manner.

¹⁶ Sachdev, Sumeet & Macwan, Joel & Patel, Chintan & Doshi, Nishant. (2019). Voice-Controlled Autonomous Vehicle Using IoT. *Procedia Computer Science*. 160. 712-717. 10.1016/j.procs.2019.11.022.

D. THIRD PARTY DATA USAGE

In 2014, Jim Farley, the Global Vice President of marketing at sales at Ford, had told the customers of an electronic show that “We know who breaks the law when they are doing it and also what they are doing as there is GPS tracker installed in the car. However, we do not give out the information.” Farley’s remarks prove the vulnerability of the data collected and processed. It highlights privacy implications which we are prone to shortly.¹⁷

Moreover, such information is beneficial in various sectors. The legal sector may view this issue from two perspectives, *first* would be the privacy concerns that are on the rise and the *second* would be the use of such information for tracking traffic violations and accidents. The insurance sector may use this data to investigate the cause of the accident and monitor the driving habits and reduce or increase the premiums accordingly. The news and media would take this information to publicize and create awareness among the other users.

E. BIOMETRIC DATA COLLECTION

Since autonomous vehicles are highly experimental at this time, it proves to be reasonably challenging to analyze the personal data that ought to be collected. However, taking instances from other countries where these cars are in use, we can gather more details. Apart from the tracking of location data, it also collects personal information directly from the passengers.

The autonomous vehicle is a body shielded with AI features and featuring augmented reality technology. These features provide a personalized experience for the users. Passengers get carried away by the feature “personalized” so that it makes their works simpler, and all they got to do would be to sit and enjoy the drive. Later, they get frustrated when they realize their data’s are being compromised.

The problem here is that the word “personalized” gets two different interpretations. From the passenger’s view, they think a personalized experience is where the data is collected but is end-to-end encrypted. On the other hand, for a manufacturer, only if he shares the data with several other distributors, the personalized service can be experienced by the passenger. After they share the data, they take the defense of the clickwrap agreement for which the passenger clicked “I agree”. The consent here

¹⁷ Phil Lebleu, ‘Ford exec backpedals after saying it tracks drivers’, CNBC, (2014), <https://www.cnbc.com/2014/01/09/ford-exec-backpedals-after-saying-it-tracks-drivers.html>

becomes a matter of concern, and the user is left with no options to claim liability from the manufacturer.

This situation might seem hypothetical, but it would soon be reality in India if no proper regulations are made now. After a decade of e-commerce capturing the markets, only recently, e-agreements were made enforceable. After the enforceability of e-agreements (clickwrap agreements), several disputes with the consent being invalid came into limelight.

III.2. ADDRESSING THE PRIVACY ISSUES IN AUTONOMOUS VEHICLES:

1) ANONYMISATION¹⁸

Data from autonomous vehicles should be anonymized, and also steps should be taken so that it should not be easily re-identified. In the process of providing personalized experience, the data controller will need to share the data with various service providers. In this case, sending the data anonymously for processing will help maintain a secure process. Details of the passenger/driver cannot be easily identifiable, which will keep his preferences and personal transactions safe and unknown. This is one solution for manufacturers to exclude themselves from privacy litigation, which will save them a whole lot of money, time and remarkable tags.

2) PRIVACY BY DESIGN

This is a new approach launched by top companies to maintain a unique standard of security. This system follows three guidelines:

- Conduct a risk assessment test regularly
- Reduce the level of data collected and maintained
- Before any product is launched keep a check on the security measures

This approach aims to build secured vehicles at the time of manufacturing rather than working on the defects at a later time. These kinds of vehicles which inculcate such systems tend to last longer than those which enter the market with defective security measures.

3) INDUSTRY GUIDANCE

Companies involved in the manufacturing of autonomous vehicles tend to take help from other industry resources. For example, a US-based company, Alliance of

¹⁸ Marco Muller-ter Jung, 'Data Protection for Connected and Autonomous Vehicles', Dotmagazine, (2019), <https://www.dotmagazine.online/issues/on-the-road-mobility-connected-car/making-connected-cars-safe/data-protection-for-connected-cars>

Automobile Manufacturers and the Association of Global Automakers have established unique Consumer Privacy Guidelines that enable customers have a secured data transmission and also it utilizes innovative technologies to provide privacy.

4) NOTICE AND CONSENT

Notice and consent prevail as a framework for any valid agreements. If the consent is not free and caused by other forces, it undermines the level of privacy. Consent is providing a choice, when you hinder it you hinder privacy. For electronic devices, consent is provided through e-wizards, checkboxes or pop-up messages. Obtaining consent becomes easy in those cases, but for autonomous vehicles, data is collected and processed continuously which poses a problem. Asking for consent for every single data collected would slow down the mechanism.

Being mindful on these types of challenges, we need to understand that choice is not necessary for every instance when the processing of data is consistent with the consumer's reasonable expectation. Hence, precise details of the data collected and processed should be informed regularly on a timely basis to the consumer to carry forward a smooth process.

5) LEGISLATION

Laws need to be framed to create a surveillance mechanism which enables the government to protect the autonomous vehicle data from third parties. Laws need to be stringent and empowering to keep a check on the data processing issues. The data processing in autonomous cars is far higher than all the electronic devices, as it is a continuous process. AVs are vulnerable to cyber-attacks and hacking due to their reliance on interconnected systems and communication networks. Weak cybersecurity measures and the absence of regulatory standards for securing AVs pose significant risks to passenger safety and data integrity.

Now, from the perspective of autonomous vehicles, how effective can this Digital Personal Data Protection Act, 2023 be in protecting the users? To understand this, we shall delve deep into this law.

III.3 KEY FEATURES OF THE DIGITAL PERSONAL DATA PROTECTION ACT 2023

The General Data Protection Regulation (GDPR) is a European Union law designed to give individuals more control over their personal data and to harmonize data protection regulations across the EU. GDPR is a landmark legislation in the field of Data Protection with many countries adopting similar principles and India being one among them has also drawn

inspiration from GDPR. The DPDP Act focuses on safeguarding digital personal data within India and also balances the rights of individuals to protect their data with the need for lawful data processing.

The key features of the DPDP Act and GDPR will be explained with references to autonomous vehicles.

1. Lawfulness, fairness and transparency principle [Art 5 (1) (a) GDPR]

[Sec (4) of DPDP Act] – Legitimate use and Lawful purpose

To understand this law, we need to familiarize ourselves with three terms data fiduciary, data principal and data processor. Data fiduciary is a person or an entity who can determine the purpose of the processing of data. Data principal is the individual to whom the personal data belongs to. Data processors are the persons on behalf of the data fiduciary who processes the data.

The data processor should process only legally processable data. The data fiduciary, while sending the personal data to the data processor, should uphold fairness and anonymity to make it secure. All these processes should be transparent and should happen with the knowledge of the Data principal. Any harm caused or leak of personal information should be immediately intimated to the data principal.

Following these guidelines will provide a more secure way of data transmission by way of consent. Consumers will no longer have to be afraid as they will be notified about the processing of data, if it is not followed they can approach the court on lack of transparency and claim for liability, if any arises.

2. Purpose Limitation [Art 5(1)(b) GDPR]

[Section 6 and 7 of DPDP Act] – Legitimate use

An extensive amount of data is fed into autonomous vehicles. They keep processing every second. They are developed with AI technologies, machine learning and deep learning. Machine learning is an application of artificial intelligence (AI) that provides the system with the ability to learn and improvise upon experience without being explicitly programmed automatically. Deep learning is a subset of machine learning in artificial intelligence (AI) that has networks capable of learning unsupervised from data that is unstructured or unlabeled. This is the mechanism which continuously happens in an autonomous system which challenges the principles of purpose limitation.

The purpose limitation principle prevents misuse of data as it allows data to be processed only for which consent has been obtained. This does not pose a problem for big data repurpose unless the purpose and processing are compatible of data. The uses

of the data collected may fit tightly with the initial purposes but with further processing, the purpose may slightly differ. The fact that this data is used for other purposes does not necessarily mean that it is incompatible; it needs to be carefully assessed based on a case-to-case basis.

The remedial actions to prevent the conflict from widening would be to organize a portal and provide information regarding the latest updates on new purposes, adequate information for data principals and getting their consent for further processing.

3. **Data Minimization [Art 5 (1)(c) GDPR]**

[Section 6 of PDPB] – Limit Data to specified purpose

Autonomous vehicles should restrict their collection of data to a minimum level, and it be limited to such personal data as is necessary for such specified purpose as stated in the Act. In general, the mechanism of machine learning depends mainly on the collection and processing of data. During tests, autonomous vehicles generate 4 to 6TB of data per day, which is equivalent to data generated by 6,200 internet users.

The issue of minimizing the data not only includes reducing extensive data processing but also provides space to analyze whether the data used is excessive or appropriate. Every manufacturing company should harmonize their data collection with this principle.

This aims at processing data only that is relevant, adequate and limited to what is necessary. The companies should follow a three-step process to decide whether the data collected is excessive or not. The three steps are; firstly, to create a portfolio for the required data and the services provided, secondly, analyzing the need in the collection of data and lastly, the resources available to process the same. Assessing these three steps would give fair distinction between excessive and necessary data for the data processors.

The remedial action would be to limit the quality of data if not restrict in collecting it. For example, blurring the faces captured by the external sensor cameras. This would secure the privacy of the passengers as well as the trespassers.

4. **Accuracy [Art 5(1)(d) GDPR]**

[Section 8(3) of PDPB] – Completeness, Accuracy and Consistency

The data quality should be maintained and kept accurate. The data will be outsourced to third parties to provide better services. While outsourcing, it becomes the responsibility of the data fiduciary to ensure that the data's are not misused or leaked to any unauthorized person. The processing of the data should be secured and within

limitations. Processing data beyond the scope will lead to violation of privacy.

The remedial action for this would have an end-to-end transcription process between the data fiduciary and data processor. Any unauthorized usage should be immediately intimated to the users through their connected device like mobile phone.

5. **Storage Limitation [Art 5(1)(e) GDPR]**

[Section 8 and 17 of PDPB Act] – Erase data if retention is not required

To protect the personal data, the data stored should not be stored longer than required. However, personal data can be stored longer if needed for purposes like research, statistical analysis or public interest with valid consent obtained from the data principal. To delete personal data after its use or have short retention periods might seem too advantageous for the data principal but will undermine the potential benefits arising out of such technological advancements. This is because only by outsourcing these data to several other third parties, the advancements and benefits enriched by the passengers will continue to be available.

Though this can become complicated, a necessary remedy would be to arrange, govern, and manage the data correctly. This would provide clarity to ascertain which needs to be stored for further use and which can be deleted.

6. **Lawful Consent - [Section 5 of PDPB Act]**

Consent is the fundamental part of an agreement. In autonomous vehicles, consent for new updates or features will be obtained through e-agreement formerly known as clickwrap agreements. The passengers mostly click the 'I agree' tab in excitement but later regret when their personal data is no longer personal. To provide a solution to this, obtaining consent shall follow specific criteria given under the data protection Act.

For the consent of the data principal to be valid, it must be-

- (a) FREE, concerning the standard provided under section 14 of the Indian Contract Act 1872. It should not be obtained by coercion, undue influence, fraud, misrepresentation or mistake. The person giving the consent should give it on his interest. Autonomous vehicles provide a click-wrap agreement where the user to enhance his experience, has no other option other than to click the 'I agree' tab.
- (b) INFORMED, the Data principal should be provided with all information about the new features and also its impacts. On the sale of the car or during updates in the AI system, the data fiduciary provides information only regarding the features and its advantages. They fail to give information about the processing of data which makes the data principal carried away by its feature and make them fall as prey to it.

- (c) SPECIFIC, the consent obtained for data processing should be specific with regard to purposes of the processing. They should also process data only for which they have obtained consent.
- (d) CLEAR, the agreement should be clear and well comprehensible by a reasonable person. It should not be technical which only an expert in that field will be able to understand. This is a vital aspect of an agreement.
- (e) CAPABLE OF BEING WITHDRAWN; Autonomous vehicles fail to equalize the ease of withdrawing consent with that of providing consent. They give a lengthy procedure to withdraw consent while giving consent is just a click of a button.

PART IV – GLOBAL PERSPECTIVE AND LEGISLATIONS

IV.1.LAWS IN US:

At the federal level, a key law governing autonomous vehicles is [H.R 3388](#), the Safely Ensuring Lives Future Deployment and Research In Vehicle Evolution Act, which was passed on 9 June 2017. The law provides that States can enact laws regarding automated vehicles if they are identical to federal standards, effectively paving the way for state-level legislation. Moreover, the law required the Department of Transport to conduct safety assessments and establish a Highly Automated Advisory Council.

State AV statutes can be divided into three broad categories: 1) statutes that accommodate the piloting and testing of current AV technology, as seen in places such as California and New Mexico; 2) States with statutes, somewhat theoretical in nature, which approve the use of Avs and the relevant standards has been met; and 3) states with no statute whatsoever.

The California Consumer Privacy Act is the most extensive law protecting consumer privacy in the U.S. The CCPA governs the collection and handling California residents' personal information. Pursuant to CCPA, businesses which may include AV rental or ride sharing services must provide consumers with certain rights regarding their personal information. California's regulations for autonomous vehicles are managed by the Department of Motor Vehicles (DMV). AVs may be operated on public roads for testing purposes, if there is a licensed vehicle operator seated in the driver's seat monitoring the safe operation of the AV and capable of taking immediate manual control of the vehicle in the event that the automated driving system fails. AVs may not be operated on public roads for purposes other than testing unless the vehicle manufacturer submits an application to the California Department of Motor

Vehicles (DMV), the application is approved.¹⁹

Nevada passed SB-220, which includes a similar opt out of sale right to CCPA. Virginia's Consumer Data Protection Act enables consumers to opt out of sales of personal information. Michigan law requires AV manufacturers to make publicly available a privacy statement disclosing its data handling practices in connection with the applicable participating fleet. Likewise, several states have enacted laws authorising the vehicles subject to getting permit and testing requirements. Regulatory variations in each State presents certain challenges to the manufacturers. However, all laws being enacted in consistence with the Federal laws there will exist certain basic common requirements across all States.

IV.2. LAWS IN UK:

The Automated Vehicles Act 2024 received Royal Assent on 20 May 2024. It provides a framework for the safe integration of autonomous vehicles (AVs) into society (potentially as early as 2026) and paves the way for further investment opportunities in the UK market alongside growing public support and consumer optimism. The UK already has a strong reputation for self-driving technologies. According to the Government, approximately 70% of global automotive sector companies that source self-driving technologies do so from the UK market.

The Act provides the following main features²⁰:

1. Safety Framework and Standards

The Act introduces an authorisation process for self-driving vehicles. AVs will be required to undergo a self-driving test to ensure safety benchmarks are met. These will be outlined in the Secretary of State's Statement on Safety Principles. Crucially, AVs must enhance road safety, instead of contributing to current safety standards. The safety principles that will be included in the Statement on Safety Principles. They also require the Secretary of State to consult organisations that appear to them to represent the interests of AV manufacturers, road users, and road safety. The Act also gives the Secretary of State powers to amend existing legislative regimes (such as type approval legislation) to achieve the aims of the framework legislation.

¹⁹ [California Consumer Privacy Act of 2018](#) (CCPA)

²⁰ [George Mason](#), [Jonathan Speed](#), [Russell Williamson](#), 'The UK's Automated Vehicles Act - unlocking opportunities for UK investment and innovation in the automotive sector', Bird & Bird (2024), <https://www.twobirds.com/en/insights/2024/uk/the-uks-automated-vehicles-act-unlocking-opportunities-for-uk-investment-and-innovation>

2. Legal liability

New concepts are incorporated in the Act which address the delineation of legal liability. These are outlined below.

a) Authorised self-driving entities (ASDEs): Once a vehicle successfully passes the self-driving test, it will be classified as an ‘authorised automated vehicle’. For every authorisation granted, there must be a designated entity known as the ‘authorised self-driving entity’ (ASDE). This entity has ultimate responsibility for ensuring the AV consistently complies with the requirements of the self-driving test and any accompanying requirements that the Secretary of State imposes. These entities will be the companies developing the cars (or potentially the software suppliers) and not individual users.

b) User-in-charge (UiC): The Act makes a distinction between authorised AVs equipped with ‘user-in-charge’ (UiC) features and those that do not. UiC features mean those where a user can intervene during a journey. When a vehicle has these features there will be specific authorisation criteria around the requests that trigger user intervention and the transition periods during which intervention is required. How the transition requests are delivered, the duration of transition periods, and how the vehicle safely handles situations where a user fails to intervene are addressed in the Act.

A non-UiC journey is one where the AV drives itself for the whole or any part of a journey. In these cases, the ASDE will be legally liable in the case of an incident. AVs that undertake no-UiC journeys will need a licensed operator. The licensed operator’s role will be to ensure the safe operation of the vehicle. They will be responsible for matters like ensuring the vehicle is insured and detecting and resolving issues during the journey, for example responding to breakdowns. Ultimately, however, the ASDE retains responsibility for how the vehicle drives.

The Act grants immunity from liability to UiCs in specific circumstances, outlines exceptions to immunity, and establishes when a user will be liable as the legal driver of the vehicle. To avoid unfair responsibility being placed on UiCs, ultimate responsibility for automated driving behaviour (when the non-UiC feature is engaged, or the engaged UiC feature fails to alert the UiC to take control) lies with the ASDE. This grants the UiC immunity from road traffic offences when the vehicle is driving itself. When the vehicle is being driven by the UiC, it is treated as a conventional vehicle. The liability position as regards drive assist features (for example cruise control) remains the same, meaning the driver will continue to be liable for incidents that arise while using those

features.

3. Consumer protection

- a) **Marketing:** The Secretary of State has the power to regulate how self-driving cars are marketed. This is aimed at preventing consumers from being misled into believing a vehicle is fully self-driving when it actually just includes driver assistance features. There is an outright prohibition on using specific terms, expressions, symbols, and marks other than for marketing authorised automated vehicles. There are also restrictions on the overall presentation of marketing communications to limit confusion regarding the varying degrees of autonomous capabilities.
- b) **Investigations:** The Act provides the government with regulatory and enforcement powers – including the ability to conduct broad investigations if a self-driving car is found to be involved in a road traffic incident. The Act further provides for the modification of road traffic offences, so that they apply to the context of self-driving vehicles as they would apply to the driver of a standard car.
- c) **Sanctions:** There will be new sanctions and penalties, including fines, requirements to take corrective action, suspension of operation and criminal offenses in serious cases.
- d) **Automated Passenger Services:** AVs that carry passengers (for example, taxis), will need a permit from the Secretary of State.

CONCLUSION

The Autonomous Vehicles with Level 2 already in the market, it is of no doubt they are surely going to capture the entire market by 2030, and traditional cars will cease to exist. The technological advancements in autonomous vehicles will continue to increase and consumer's attention will be gained slowly but steadily as it has already generated an enormous level of excitement through advertisements.

However, all technologies have their setbacks, in the same way, Autonomous vehicles have a lot of legal complications, that are to arise upon its launching. All these issues should be studied, analysed and laws empowering them should be enacted.

EU, and US have struggled considerably to settle the chaos and conflicts between the manufacturers and consumers. Following this, the European Parliament has recently mentioned

that Autonomous Sector is newly emerging and needs immediate Global rules to safeguard its citizen's rights and also to ensure that the benefits of consumers and the effort put in by the manufacturers should not go unnoticed.

India is currently travelling on the same path which other countries did, and it is time we implement policy measures specifically addressing the autonomous vehicles. The issues related to negligence, consumer protection, privacy concerns should be carefully examined before commercialising the vehicles. MV act should be suitably amended to include provisions for autonomous vehicles. The Advertising Standards Council of India (ASCI) should thoroughly verify the advertisements released by the autonomous cars and stricter regulations must be put in place to ensure that the consumers don't get carried away by the visualising effects. The buyers cannot be expected to be 'experts' in this field, and it is the duty of manufacturers to provide accurate information to them. This should be strictly mandated by the Government.

Apart from both these acts, separate policy measure can be enacted for Autonomous Vehicle as it is a vast and swiftly growing field. Technology has no boundaries; the law needs to demarcate the boundaries and limit it from creating destructive impacts. Autonomous Vehicles are just like remote cars; the remote here is the Law.

Laws should always precede technology, be stringent and capable of ruling the technology!

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