

**Describe and discuss some of the challenges facing those charged with regulating driverless cars, and the strategies they might employ to deal with these challenges.**

The autonomous vehicle revolution is coming, and it stands to not be hampered. The evolution and development of this emerging technology must be legally embraced in order to facilitate the seamless transition to a 'new' modern world. The technological element of driverless cars is well under control, rather the issues arising predominantly regard their legal regulation. This paper will shed light on those issues, posing the challenges regulators will inevitably face, with an attempt to strategise and scrutinise potential solutions to these road blocks. The challenges encountered hold great complexity due to their occurrence in each phase of the vehicles. There are pre-road issues, issues on the road, and further issues when an accident may occur. Each of these elements require careful regulation in order to ensure driverless cars are utilised to their ultimate capacity. Intertwined with this are philosophical issues relating largely to ethics. This philosophical thought will be engaged with later in this paper. But first, the topic in point must be introduced.

A driverless car is essentially exactly what it sounds like. A vehicle that is either fully or semi autonomous requiring little to no action by the human occupant. The vehicle operates through software known as Artificial Intelligence (AI). AI is a difficult concept to define given the inherent human nature of 'intelligence'. However, for the purposes of proceeding with this paper, AI can simply be seen as being technological intelligence. Driverless cars can be placed on a spectrum ranging from those that require full human operation, to those requiring none. In the middle are models that have some autonomous features but still require hands on human action. This paper will predominantly deal with fully autonomous cars, making reference to semiautonomous vehicles throughout. It is important when discussing the regulation of these vehicles to maintain the constant underpinning of their purpose, in order to not miss the point with regulation. The paramount purpose of driverless cars is safety. These cars are proposed to be safer than their human operated

counter-parts.<sup>1</sup> Other purposes include convenience, accessibility, efficiency, and environmental benefits. These will be touched on throughout.

In terms of regulating this technology, there are great complexities. Regulators are faced with a technological advancement with challenges of a scope we cannot comprehend. They need to be sure to not overregulate and risk slowing innovation, but not underregulate and threaten civil rights.<sup>2</sup> The regulations must not be so stringent so as to impede on the purpose(s) of driverless cars, but cannot be so malleable that they are rendered ineffective. With that backdrop in place, I proceed.

The first issue I will address is the uncertainty of the risk we are facing in the introducing of driverless vehicles, which uncovers the problem of how to approach its regulation. How can one regulate for a risk that is uncertain? We cannot predict the future nor can we foresee all potential issues, there will always be cases that sit on the margins. One theory suggests that regulations should be perfected before allowing the cars on the road.<sup>3</sup> However, I argue that because the issues cannot be predicted they cannot be 'perfectly' legislated for. As with any area of law, there is constant growth and development over time with the hearing of borderline cases. This 'upstream' type approach also poses the risk of needless waiting before allowing the cars on the road. Alternatively, a 'downstream' approach holds its own risks in that regulation may be left too late. I propose that a strong system be established early on but with a 'work in progress' type nature. Meaning that regulations are sufficient to be effective but have the ability to be adapted as the technology matures.<sup>4</sup>

Following a chronological journey through the challenges faced, I will begin with the regulatory issues driverless cars encounter before being allowed on the road. By this, I am referring to the standard the vehicle must meet in a driving test. The question must be

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<sup>1</sup> Kristin Houser, "Tesla says autopilot is statistically safer than a human driver" *Futurism* (Online ed, April 10<sup>th</sup>, 2019)

<sup>2</sup> Aida Joaquin Acosta, "Practical lessons for regulating autonomous vehicles" (August 6 2018) <https://news.itu.int/autonomous-vehicles-regulation-lessons/>

<sup>3</sup> Michael Cameron, 'End of an Era' in Realising the potential of driverless vehicles (The New Zealand Law Foundation, 2018) 1 <[http://ndhadeliver.natlib.govt.nz/delivery/DeliveryManagerServlet?dps\\_pid=IE36321217](http://ndhadeliver.natlib.govt.nz/delivery/DeliveryManagerServlet?dps_pid=IE36321217)>.

<sup>4</sup> Aida Joaquin Acosta, "Practical lessons for regulating autonomous vehicles" (August 6 2018) <https://news.itu.int/autonomous-vehicles-regulation-lessons/>

asked as to how a driverless car could obtain a 'licence' as a new human driver would. The standard required to get this licence requires regulation. One could propose that the car merely meet the same criterion as that of a teenager obtaining their first licence. However, this fails when unveiling that human licences are issued on the assumption that the driver has underlying decision making abilities and skills that cannot be automated nor computerised.<sup>5</sup> This lack of common sense present in driverless vehicles supports the argument for a higher standard to be met. An example being that a human driver knows to pull over when emergency sirens are heard, but swerving off the road would likely go against the programming of a driverless car.<sup>6</sup> Because humans obtain licences on the pretence of common sense and knowledge, the licencing of driverless cars is a difficult task and a challenge regulators will inevitably face.

The warrant of fitness regime is well established in NZ and would likely only need slight modification to remain applicable here.<sup>7</sup> However, the duty of the owner to ensure the vehicle has a warrant of fitness should not be altered in my opinion. It has been submitted that as driverless vehicles become more common, roads should be adapted to accommodate this change. This would increase safety and make regulation easier in that the roads would be equipped for the cars. The gradual transitions of roads, akin to the movement of gravel to tar sealed roads, would aid effective regulation of this technology.

The issue at the forefront of regulators minds is how to distribute liability in the event of an accident. The liability must fall on either the manufacturer or the operator, but regulators must decide who. One way to regulate is a modified tort of negligence. This requires that there has been a breach of a duty of care in relation to foreseeable harm. Liability would be decided on a case by case basis dependent on who controlled the vehicle at the time of the accident (the driver, or the manufacturer). However, while this may appear to be straightforward and attractive in that it does not revolutionise the law, complexities arise as we delve deeper. Driverless vehicles are claiming to be safer than human drivers, so

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<sup>5</sup> Lin P. (2015) Why Ethics Matters for Autonomous Cars. In: Maurer M., Gerdes J., Lenz B., Winner H. (eds) *Autonomes Fahren*. Springer Vieweg, Berlin, Heidelberg

<sup>6</sup> Jennifer Bradley "Will you need a driving licence in the age of driverless cars?" *BBC News* (Online ed, 31<sup>st</sup> July 2017)

<sup>7</sup> Clause 8.9 Land Transport (Road User) Rules

presumably the standard they are held to should be higher. Regulators would face the challenge as to what this standard duty of care should be, the 'reasonable person' or the 'reasonable computer'? With a change in standard comes uncertainty, making a negligence standard less appealing.<sup>8</sup>

In the light of this, a strict liability scheme could be adopted, placing liability either strictly on manufacturers or operators. I propose that it makes more practical sense to place liability on the manufacturer in accordance with Michael Cameron's suggestions.<sup>9</sup> Cameron states that a strict liability regime would be effective in that it does not label the manufacturers as 'negligent' and would result in more prudent affording of costs. It also eradicates a fault based system, thus producing certainty. If a strict liability regulation were enforced, manufacturers could insure against liability by building compensation into the cost of the car, spreading expenses among dealers, and consumers. The premise for this system being that the accident occurred due to a defect in the vehicle resulting in the accident. This appears to be a fair way of dealing with damages. It would also encourage manufacturers to produce stellar products in order to minimise the likelihood of liability, thus resulting in a better overall vehicle.

The issue of imposing strict liability is that it may be too precautionary, discouraging innovation for fear of liability. Essentially, an accident is not an intended consequence of the driverless vehicle meaning that the cause of the action was unforeseen by the manufacturer. If they had foreseen such an outcome, they would have created the software to safeguard against it. Therefore, to impose a blanket ruling of liability would be to hold manufacturers liable for outcomes they could not foresee. This goes against well-established underpinnings of tort law.<sup>10</sup> Regulators must then decide between the importance of accessible, certain, predictable redress for victims, and imposing potentially harsh burdens on manufacturers.

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<sup>8</sup> John Danahar "Ethical rules for self-driving cars" *Eolas Magazine* (Online ed., March 2019)

<sup>9</sup> Michael Cameron, 'End of an Era' in Realising the potential of driverless vehicles (The New Zealand Law Foundation, 2018) 1 <[http://ndhadeliver.natlib.govt.nz/delivery/DeliveryManagerServlet?dps\\_pid=IE36321217](http://ndhadeliver.natlib.govt.nz/delivery/DeliveryManagerServlet?dps_pid=IE36321217)>. At p. 89

<sup>10</sup> Stephen Todd et al., *The Law of Torts in New Zealand*, 7th Edition (Thomson Reuters, 2016), 157–158.

Regulators must also grapple with the future of car ownership when deciding how to regulate driverless vehicles. If a scheme is followed in that the operator or owner is liable for damages, regulations will face trouble if ownership decreases and transportation becomes a service as opposed to an individually assumed responsibility. I will first pose a radical scenario, before applying the same methodology to a perhaps more fast approaching reality. If we predict that driverless cars are the way of the future, one could easily imagine an 'Uber' type service in which a driverless car is sent to your collection point, it drives you to your destination at a cost and then goes to collect its next passenger. The vehicle at this point is no longer in private ownership but rather a public good, so where does liability fall? It has been proposed, and I endorse the idea, that a no fault scheme be established akin to the ACC system. Based off the notion of a societal contract, or societal insurance scheme, the cost of any damages imposed are assumed collectively by the public.<sup>11</sup>

But the scenario need not be so ground breaking, I take a step back. If driverless cars take the roads en masse, the benefits to society are arguably enough to justify a societal insurance scheme.<sup>12</sup> Driverless cars increase safety, reduce accidents, reduce congestion, and have environmental benefits, all of which contribute to the greater good of the public. Such factors rationalise a collective insurance scheme, a system of no fault liability I condone, and propose as an alternative to a strict liability regime.

Another perplexing challenge that regulators face is the interaction of laws surrounding driverless cars with ethics. I pose a situation; a driverless vehicle is encountering a solid object on the road which would cause harm if hit, but to avoid the object the car must leave the road and collide with pedestrians on the sidewalk. A dilemma ensues, and the car must 'decide' whether to hit the object and injure the vehicles occupants, or injure the bystanders.<sup>13</sup> This is the sort of scenario that needs to be regulated, but who gets to decide which route the car should take? If the car is pre-installed to act a particular way, i.e. protect the occupants or protect the bystanders, who determines the programming? An

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<sup>11</sup> Thierer A and Hagemann R, 'Removing Roadblocks to Intelligent Vehicles and Driverless Cars.' (2015) 5(2) Wake Forest J L & Pol'y 339

<sup>12</sup> Michael Cameron, 'End of an Era' in Realising the potential of driverless vehicles (The New Zealand Law Foundation, 2018) 1 <[http://ndhadeliver.natlib.govt.nz/delivery/DeliveryManagerServlet?dps\\_pid=IE36321217](http://ndhadeliver.natlib.govt.nz/delivery/DeliveryManagerServlet?dps_pid=IE36321217)>.

<sup>13</sup> Lin P. (2015) Why Ethics Matters for Autonomous Cars. In: Maurer M., Gerdes J., Lenz B., Winner H. (eds) *Autonomes Fahren*. Springer Vieweg, Berlin, Heidelberg

automated vehicle cannot have moral considerations as a human driver would, so there arguably will be a default action taken, and this default action must be regulated.

A recent NZ case demonstrates another ethical challenge regulators will have to combat. Alex Mercer recently appealed his speeding fine to the High Court where he was acquitted on the basis that he exceeded the speed limit after weighing up his options and deciding to speed in order to avoid an accident. This is an illustration of ethics and the law not working in harmony, and shows one can at times act illegally whilst still acting ethically. If the situation were different and Alex Mercer was the occupant of a driverless car it is unclear how the vehicle would have reacted. If programmed to strictly follow the law, the car would not have exceeded the speed limit, likely resulting in an accident and subsequent injury. Justice Brewer in this case stated that driving is a “dynamic activity,” and one must make difficult decisions.<sup>14</sup> The basis for Mercer's acquittal was Land Transport (Road user) 2004 Rule 1.8, which states that one may be exempt if they acted to avoid death or injury.<sup>15</sup> I ask, will this rule apply to driverless cars? If so, how can it be ensured that a computerised system has the ability to weigh up these options within the ambit of the law and in pursuit of safety? Can a vehicular software imitate the “dynamic” nature of human driving? These are just some of the difficult questions regulators must engage with.

Patrick Lin advances this issue in questioning if, and if so, how, this ethical programming would differ in privately versus publicly owned cars.<sup>16</sup> The challenge regulators face here is that arguably the different classes of vehicle hold different priorities in terms of protection. A privately owned vehicle may be programmed to hold the occupants interests paramount, whereas a publicly good may not face this same obligation. Regulators must therefore decide, how they are going to regulate, and whether they can justifiably hold different ‘classes’ of vehicles to different standards.

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<sup>14</sup> Radio NZ, ‘Speeding while overtaking ruled legal in High Court appeal’ *Noted* (Online ed, August 19 2019)

<sup>15</sup> Clause 1.8 Land Transport (Road User) 2004

<sup>16</sup> Lin P. (2015) Why Ethics Matters for Autonomous Cars. In: Maurer M., Gerdes J., Lenz B., Winner H. (eds) *Autonomes Fahren*. Springer Vieweg, Berlin, Heidelberg

One solution proposed is that the cars are programmed to act ethically.<sup>17</sup> While ethics are predominantly subjective, one could argue a blanket ruling that in the case of pre-programmed driverless vehicles, ethics equal legality. For the most part, this poses a solution. But, there are often situations where a driver must ethically act illegally, so a driverless vehicle is faced with a conundrum. Programming a car to “slavishly follow the law” becomes impractical when situations arise such as having to cross the centre line to avoid a fallen branch, for instance.<sup>18</sup> So, I propose a hybrid should be constructed in which regulators set a law that is ethically informed.

When regulating, the purpose of driverless vehicles must remain at the forefront of decision making and reasoning. If driverless vehicles are heavily regulated, the risk stands that manufacturers will go as far as creating vehicles that are only semiautonomous and require human operation and intervention. This would occur if regulations are of a nature that encourages manufacturers to only invent driverless vehicles to the extent that they can pass liability onto the operator in the event of an accident. There is potential that such an outcome wholly defeats the purpose of this technology. For example, if the dominant purpose of driverless vehicles is that they are safer than human drivers then why should we encourage manufacturers to produce technology that requires the intervention of humans. It seems circular and non-sensical.

However, a different view could be taken that arguably a driverless car with the safeguard that a human *may* be required to step in still achieves the purpose of the technology. By this I mean that the benefits of safety, less congestion etc., could still be achieved, just coupled with the assurance that a human can fill the gaps of uncertainty in unforeseen circumstances. In saying that, if a vehicle rarely requires human intervention then what mechanisms would be in place to ensure the operator maintains focus to step in if required? But, if the technology is regulated too lightly, allowing full innovation, then complex cases will arise with painful and costly litigation for aggrieved parties. A middle ground must be

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<sup>17</sup> John Danahar “Ethical rules for self-driving cars” *Eolas Magazine* (Online ed., March 2019)

<sup>18</sup> Lin P. (2015) Why Ethics Matters for Autonomous Cars. In: Maurer M., Gerdes J., Lenz B., Winner H. (eds) *Autonomes Fahren*. Springer Vieweg, Berlin, Heidelberg

found in which innovation is encouraged, and the purposes of the cars are met, whilst promoting certainty and effectiveness within the law.

Another aspect of driverless cars that seeks to be regulated is the risk posed by including software in vehicles. Two risks primarily come to mind, that is the potential privacy infringements, and the threat of misuse of the vehicles.<sup>19</sup> First, as with any software, no matter how sophisticated, there is a chance it will be hacked. The issue this poses is that private information about peoples commonly followed routes can be obtained and misused, an undesirable circumstance. The second risk is misuse, specifically the car being hijacked or remotely controlled. Regulators must determine how this could be controlled. Patrick Lin suggests an automated message sent to police or the appropriate authorities, but with a system overhaul this may be ineffective.<sup>20</sup> Driverless vehicles are susceptible to misuse akin to that of drones, wherein the car may carry a bomb or other security threat and cause harm. This is attractive to perpetrators as there is no sacrifice of a driver. Such risks should be analysed and carefully regulated in order to ensure driverless cars retain optimal use and safety.

As I write this, sitting in my bed with a broken leg (a very minor disability in the scheme of things), I think about the benefits these cars could bring to the disabled community, and to situations of medical emergency. Imagine having a medical event in your driverless car while it takes you to the hospital, giving you medical advice on the way – theoretically with software installed there is no limit to the knowledge the vehicle could possess. The idea is exciting and if properly regulated will revolutionise the way we see transport today. The use of driverless cars could, and I argue *would* present solutions to many modern day challenges. If driverless cars are accommodated we would see more safety, less emissions, greater ride sharing, the ability to work during commute, more accessibility, and greater overall economic and social efficiency.

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<sup>19</sup> Michael Cameron, 'End of an Era' in Realising the potential of driverless vehicles (The New Zealand Law Foundation, 2018) 1 <[http://ndhadeliver.natlib.govt.nz/delivery/DeliveryManagerServlet?dps\\_pid=IE36321217](http://ndhadeliver.natlib.govt.nz/delivery/DeliveryManagerServlet?dps_pid=IE36321217)>.

<sup>20</sup> Lin P. (2015) Why Ethics Matters for Autonomous Cars. In: Maurer M., Gerdes J., Lenz B., Winner H. (eds) *Autonomes Fahren*. Springer Vieweg, Berlin, Heidelberg

If driverless vehicles are to take the roads, they will require careful regulation. Regulators internationally have a difficult task ahead in legislating for this technology, especially given the uncertainty of situations that may arise. I propose that an approach be taken that sets out clear regulations with a work in progress type model. Philosophically, regulators face the issue of not really knowing the questions that need to be asked. Answers cannot be provided or strategised if the questions are unknown. It is likely that such questions will eventuate as the technology matures, making it imperative that regulations can be moulded and sculpted to suit arising needs. In terms of liability for harm, a system should be established that is clear and certain in order to avoid costly litigation, and allow aggrieved parties to be properly compensated. The ethical dilemma adds another layer to the regulations that will be imposed. With regards to privacy, adequate safeguards will need to be enacted to avoid, or at least mitigate privacy breaches. Regulators certainly have their hands full with driverless car regulation, but this is not the first time the law has had to grapple with new concepts, and thus a solution will gradually eventuate.