

CONSIDERATIONS IN AN AUTONOMOUS ERA

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Enter the autonomous age. Once the far-flung conception of a childhood storybook, the entry of autonomous technology into our daily lives is now becoming a common reality. Amid the dazzle of such innovative wonder, prudence warrants that we consider how to manage liability and ethics when things turn awry. With increasing adoption of autonomous technology, is the law capable of contending with a shift to this age? In this article, an assessment of potential manufacturer's liability will be examined.

The accepted taxonomy for the classification of autonomous vehicles has been categorized into six different stages.¹ This is outlined in the diagram below:²



¹ On-Road Automated Driving Committee, "Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles", *SAE International* (30 Sep 2016), online: <http://standards.sae.org/j3016_201609/> (accessed 2 Jan 2018).

² Brian Buntz, "What are the 5 Levels of Autonomous Driving?", *Internet of Things Institute* (22 Aug 2016), online: <<http://www.ioti.com/transportation/what-are-5-levels-autonomous-driving>> (accessed 2 Jan 2018).

At the highest level, vehicles operate at full automation, with limited to no driver intervention required in moving from point A to point B. Most vehicles presently on the road function at the lower end of this operating spectrum instead, requiring significant driver intervention.

However, an increasing range of vehicles available for sale have crept up the spectrum, offering assistance to drivers at Levels 1 and 2. For example, some vehicles are able to rely on radar sensors to navigate into parallel parking lots, while others offer adaptive cruise control and automatic emergency braking.

In the past few months, videos of vehicles equipped with highly autonomous functions have surfaced. They depict consumers, who purchased these vehicles from a particular American manufacturer, taking leisurely naps at the wheel, or in some cases leaving the driver's seat vacant while the car is in operation. It invariably begs the question – what happens when an accident occurs?

In 2016, a nuTonomy driverless vehicle collided into a lorry at one of the firm's testing grounds. This was headlined as the first accident in Singapore involving an autonomous vehicle. In a report, the *Straits Times* pointed to software glitches which affected how the vehicle detected and responded to other vehicles in the vicinity.³ As this issue was subsequently resolved, there was no need for a case to be raised.

Given the complex nature of such technology and its current, limited commercial availability, such a concern has yet to be highlighted by our local courts. In due time however, a number of considerations are likely to arise in regard to this field.

I. HOLDING A MANUFACTURER LIABLE FOR NEGLIGENCE

From a consumer's standpoint, a selling point for autonomous technology lies in the data collected by the manufacture and the software developed for each product. What distinguishes one manufacturer's product from the next is the sophistication and unique qualities offered. In other words, an autonomous vehicle is only as good as the manufacturer has programmed it to be.

³ Zhaki Abdullah, "Software Anomalies' to Blame for Driverless Car Accident", *The Straits Times* (25 Nov 2016), online: <<http://www.straitstimes.com/singapore/software-anomalies-to-blame-for-driverless-car-accident>> (accessed 2 January 2018).

The concept of a duty of care can be traced back to *Donoghue v Stevenson*⁴ [*Donoghue*], as well as the earlier case of *Heaven v Pender*⁵ [*Heaven*]. The cases themselves are black letter, but what is significant in *Heaven* lies in Brett MR's assessment⁶ that established an obligation between persons in the absence of a contract between them. Lord Atkin built upon this proposition in *Donoghue* with the notion of the neighbour principle. This cemented the existence of a duty of care between a manufacturer and a consumer, premised on the concept of persons who are so closely and directly affected by the act that the manufacturer ought reasonably to have them in contemplation. Clearly, the same principles are likely to apply to the relationship between manufacturers and purchasers of autonomous vehicles.

In Singapore, the landmark decision of *Spandek Engineering v Defence Science & Technology Agency*⁷ establishes the local approach in determining whether a duty of care exists. At the threshold stage, factual foreseeability of harm arising from the defendant's negligence is first evaluated. This is followed by an assessment of proximity and nexus between parties. In the subsequent case of *Anwar Patrick Adrian v Ng Chong & Hue LLC*⁸, the Court expanded the range of proximity factors to recognize knowledge, control, vulnerability, assumption of responsibility and reliance, as suggested by Professors David Tan and Goh Yihan.⁹ Finally, policy concerns have a determinative role in whether the imposition of a duty of care is negated.

In assessing the local position on a duty of care in relation to a consumer's claim against a manufacturer, the presence of a proximate relationship is likely uncontentious. However, the position on policy is likely to be probative with reasons both in favour of and against imposing a duty of care on manufacturers of autonomous vehicles.

At present, Singapore takes a favourable position toward research and innovation. This is reflected by strong investment in innovation from both the public and private sector, such that

⁴ *M'Alister (or Donoghue) (Pauper) v Stevenson* [1932] AC 562.

⁵ (1883) 11 QBD 503.

⁶ *Ibid.*, at p 507.

⁷ [2007] 4 SLR(R) 100.

⁸ [2014] 3 SLR 761.

⁹ In "The Promise of Universality: The *Spandek* Formulation Half A Decade On" [2013] 25 SAclJ 510.

“Singapore’s [Research and Development] efforts have led it to be consistently ranked in the top 10 in the Global Innovation Index.”¹⁰ Given this stance, policy may negate the imposition of a duty of care on manufacturers, in order to encourage innovation in a sandbox environment.

However, a comparative examination illustrates a variance in legislative attitudes toward liabilities arising from autonomous vehicles. Europe has launched several initiatives relating to Connected and Automated Driving.¹¹ In Belgium, liability on the part of the car manufacturer may be civil or even criminal, such that both the company and its directors may be prosecuted.¹²

A contrasting approach to liability has been taken on the other side of the globe. Recent amendments to the California Department of Motor Vehicles removed Section 227.38(b), which originally read:

“The manufacturer certifies that, to the extent the manufacturer’s autonomous technology causes the autonomous vehicle to be at fault in a collision, the manufacturer shall assume liability for damages caused by the autonomous vehicle in such collision, but subject to applicable law.”¹³

The subsequent amendment to excise part of this clause suggests that existing liability laws in California will apply instead, as no indication is given as to whether manufacturers assume liability for damages caused by autonomous vehicles. However, it is key to note that this regulation applies

¹⁰ Lim Chuan Poh, “From Research to Innovation to Enterprise: The Case of Singapore” in Soumitra Dutta, Bruno Lanvin, and Sacha Wunsch-Vincent, eds, *The Global Innovation Index 2016* (World Intellectual Property Organization) 133 at 138.

¹¹ Matthieu Relange, “At a Glance: Autonomous Vehicles, EU”, *Bird & Bird* (25 July 2017) <<https://www.twobirds.com/en/news/articles/2017/global/at-a-glance-autonomous-vehicles>> (accessed 04 March 2018)

¹² Jaward Aadel, “At a Glance: Autonomous Vehicles, Belgium”, *Bird & Bird* (25 July 2017) <<https://www.twobirds.com/en/news/articles/2017/global/at-a-glance-autonomous-vehicles>> (accessed 04 March 2018)

¹³ Cal. Code Regs. tit. 13, § 227.38(b), as indicated in the *Second Modified Express Terms* (California: Department of Motor Vehicles) at p 11, online: <https://www.dmv.ca.gov/portal/wcm/connect/aa08dc20-5980-4021-a2b2-c8dec326216b/AV_Second15Day_Notice_Express_Terms.pdf?MOD=AJPERES> (accessed 4 March 2018)

to driverless testing and public use rules for developing autonomous vehicles. As the focus is on the testing and development stage, it is thus appropriate to consider what may apply to products already available for purchase. Consequently, the lack of a global standard and its various ambiguities, raises the need to consider what may develop in our local environment.

Even with a duty present, the standard of care expected of makers of autonomous vehicles is also open at law. Typically, the standard of care is an objective assessment of what a reasonable person would do in the circumstance. This applies well in cases of negligence arising from human error or oversight. However, the multiplicity of benchmarks for the performance of autonomous vehicles suggests that unanimity on the applicable standard is yet settled.

Across the board, imposing a high standard of care for operators of vehicles has been a relevant policy consideration. From the traditional position reflected in *Nettleship v Weston*¹⁴ to the more recent case of *Ng Keng Yong v PP*,¹⁵ factors such as inexperience have failed to reduce the requisite standard of care. In Singapore, this posture has been further emphasized in *Public Prosecutor v Hue An Li*¹⁶. In his written judgment, Sundaresh Menon CJ reiterated the high standard of care expected,¹⁷ stressing determinedly that “[t]he starting point for sentencing in a s 304A(b) traffic death case is a brief period of incarceration for up to four weeks.”

Admittedly, the lack of global unanimity begs the question as to what standard manufacturers of autonomous vehicles should be subject to. Manufacturers might prefer a subjective standard as it allows for a more flexible approach to product development, but this tugs against the generally-accepted benchmark of an objective, reasonable manufacturer. Even this objective benchmark is left open for determination: while features such as reliability and functionality would generally be expected of traditional automobiles in the eyes of consumers, there is no global industry standard for autonomous vehicles on this front. This is likely to span a host of future dispute between policy makers and manufacturers. It probes at an incipient tension between protecting consumers by way of a higher objective standard, against a more relaxed approach which encourages innovation. As

¹⁴ [1971] 2 QB 691.

¹⁵ *Ng Keng Yong v Public Prosecutor and another appeal* [2004] 4 SLR(R) 89.

¹⁶ [2014] 4 SLR 661.

¹⁷ *Ibid*, at [61].

suggested by this article, one solution to address such ambiguity in the law, may be to draft legislation tailored to address such concerns.

II. CONTRACTUAL LIABILITIES OF A MANUFACTURER

A duty to take care in programming is likely to arise alongside other implied contractual warranties provided for by legislation in the *Sale of Goods Act*.¹⁸ Attempts to hold manufacturers liable will also likely be met with attempts to reduce or exclude liabilities, which also raise concerns as to whether statutes such as the *Unfair Contract Terms Act*¹⁹ [*UCTA*] apply. For example, dealers with Level 1 and Level 2-type vehicles for sale often require buyers to sign an exclusion of liability form, absolving them from liability in the event that the technology fails to act as it should. In determining whether a term of the contract has been breached, it is also appropriate to look for any warranties given by the manufacturer on how their product is meant to operate. Should negligent programming on the part of the manufacturer result in the causing of death or personal injury however, *UCTA*, as well as the *contra proferentem* rules suggest that such liability cannot be indemnified against.

III. POSSIBLE DEFENCES

What then happens, when a driverless vehicle operating at the higher end of the autonomous spectrum meets with an accident due to its *own* erroneous calculations?

From a manufacturer's point of view, this raises a possible defence of *novus actus interveniens* on the part of the driver in the law of tort. It is, for instance, at least arguable that a consumer's recklessness by sleeping in the driver's seat while the vehicle functions in autonomous mode on a congested expressway is so wholly unreasonable that it amounts to a *novus actus interveniens*. Admittedly, this is a slippery slope, given that the trajectory of autonomous vehicles aims to be less

¹⁸ Cap 393, Rev Ed 1999.

¹⁹ Cap 396, Rev Ed 1994.

dependent on human intervention. Hence, this area of the law is certainly one to watch, given the impending arrival of this technology and the inevitability of such a claim.

IV. CRIMINAL LIABILITIES OF THE MANUFACTURER AND OTHER ETHICAL CONSIDERATIONS

Shifting back to the scene of an accident, matters become more complicated when the circumstance develops to value human life. How would an autonomous vehicle contend with ethical choices, such as the dilemma of saving many at the expense of the few? In response to this trolley problem,²⁰ Professor Reich has questioned whether autonomous vehicles will “[o]ptimize for overall human welfare” when faced with the need to prioritize one human life over the other.²¹

Separately, this raises an interesting question in relation to the provisions of the *Penal Code*.²² As indicated by the preliminary section of the wording and scope of the *Penal Code*, the provisions criminalize the acts of natural and legal persons. In an extreme scenario that an autonomous vehicle runs over a pedestrian, applying many provisions of the *Penal Code* would stretch the realm of reality. This prompts for future development of the *Penal Code*, and encourages the drafting of more statutes pertaining to advanced technology.

Outside of the Penal Code, one such example has been the development of the *Cybersecurity Bill*,²³ in response to concerns brought about by the Fourth Industrial Revolution. As technology continues to disrupt the traditional world we know, the spill-over effects into the legal system demands changes that keep pace with the steep learning curve. This is especially in light of the progressively symbiotic relationship that autonomous technology and artificial intelligence will share with human beings.

²⁰ As raised by Professor Taylor Reich in Alex Shashkevich, “Stanford Scholars, Researchers Discuss Key Ethical Questions Self-Driving Cars Present”, *Stanford University* (22 May 2017), online: <https://news.stanford.edu/2017/05/22/stanford-scholars-researchers-discuss-key-ethical-questions-self-driving-cars-present/> (accessed 2 January 2018)

²¹ *Ibid.*

²² Cap 224, Rev Ed 2008.

²³ Bill No. 2 of 2018.

V. REGULATION

One response to increasing developments in this field has been in regulation via the *Road Traffic Amendment* in 2017.²⁴ This amendment addressed the testing of autonomous vehicles in Singapore, and paves the path toward future regulation and development governing the operation of autonomous technology. With Singapore poised as a technologically adept society, continued emphasis in this area of the law can encourage local growth in this field, while placing Singapore as an attractive hub for future innovation.

VI. REFLECTION

While this article merely scratches the tip of the iceberg, such concerns are likely to become increasingly prevalent. With the rise of autonomous technology and a growing global investment in artificial intelligence, the time is ripe to re-assess traditional areas of the law. On the cusp of the Fourth Industrial Revolution, the opportunities and need to be familiar with changing technology are certainly pressing. Appropriately, this encourages lawyers (and lawyers-to-be) to address and to understand the growing demands in this area.

²⁴ *Road Traffic Act* (Cap 276, 2004 Rev Ed Sing), as amended by the *Road Traffic (Amendment) Act* No. 10 of 2017.