

A Self-driving Car Crashes: Who is responsible?

*By: John Loh

I. INTRODUCTION

1 On the morning of 29 July 2021, Tesla delivered its first batch of “Model 3” cars to Singapore. This marked the American electric carmaker’s official entry into the Singapore car market.¹ This news was met with much excitement as Tesla cars not only offers a cleaner form of transportation but also comes equipped with advanced self-driving capabilities.² For instance, Tesla cars can automatically change lanes, stop at traffic lights and stop signs, and navigate to take the right exit on expressways.³ Given that such new technologies now afford drivers a more “hands-off” driving experience, some have questioned whether such drivers should still be responsible when an accident occurs.⁴

2 Indeed, this question has increasingly perplexed regulators around the world as self-driving cars become more commercially available.⁵ Likewise, as Singapore welcomes the use of self-driving cars,⁶ the time is ripe to address this question of liability. To that end, this article seeks to inform self-driving car owners (who may be private consumers, public agencies, or research organisations) of their exposure to liability in the event of an accident.

II. DISCUSSION

3 The discussion section will be split into three parts. The first part will begin by defining the scope of self-driving cars. The second part will provide a background of the current regulations surrounding the use of self-driving cars in Singapore. The third part will explore how liability is attributed in a self-driving car accident.

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¹ Christopher Tan, “Tesla delivers first cars in Singapore five months after opening sales portal here” *The Straits Times* (29 July 2021) <<https://www.straitstimes.com/singapore/transport/tesla-delivers-first-cars-in-singapore-five-months-after-opening-sales-portal>> (accessed 16 September 2021).

² Tesla website <<https://www.tesla.com/support/autopilot>> (accessed 16 September 2021).

³ *Ibid.*

⁴ Simon Chesterman, “Artificial Intelligence and The Problem of Autonomy” NUS Law Working Paper 2019/016 (September 2019) (“Chesterman”) at p 3.

⁵ Law Reform Committee, Singapore Academy of Law, *Report on the Attribution of Civil Liability for Accidents Involving Autonomous Cars* (September 2020) (“Law Reform Committee Report”) at paras 1.6 (Chairmen: The Honourable Justice Kannan Ramesh and Charles Lim Aeng Cheng).

⁶ *Id.*, at para 1.5.

A. *What is a self-driving car?*

4 A self-driving car is a vehicle that can navigate traffic with little to no human input, by sensing and analysing data from its surroundings.⁷ According to the Society of Automotive Engineers International, self-driving cars can be broadly classified into two categories.⁸

5 The first category of self-driving cars can perform automated functions like accelerating, braking, and steering. However, the driver must remain engaged with the driving task and be prepared to resume control at any time.⁹ The Tesla cars described in the introduction fall within this category.¹⁰

6 The second category of self-driving cars can perform all driving tasks autonomously, such that the driver need not monitor the driving environment and may direct his attention elsewhere.¹¹ These cars are often termed as truly “driverless”.

7 As seen, the scope of self-driving cars covers cars with varying degrees of automation.

B. *How are self-driving cars currently regulated in Singapore?*

8 In Singapore, self-driving cars of the first category (such as Tesla cars) are permitted on roads, and drivers are not required to obtain additional licences or permits to operate them.¹² As such, the liability issue continues to be regulated by existing legal principles on traffic accidents.

9 On the other hand, self-driving cars of the second category are only allowed on Singapore roads if specific authorisation from the Land Transport Authority (LTA) is obtained.¹³ Presently, LTA only grants such authorisation for research and development, and testing of automated vehicle technology.¹⁴ For example, from January to April 2021, LTA approved a trial whereby two driverless bus services operated in Singapore Science Park 2 and

⁷ Law Reform Committee Report, *supra* n 5, at para 1.14.

⁸ Society of Automotive Engineers, *Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles J3016 APR2021* (2021) (“SAE”).

⁹ *Ibid.*

¹⁰ Tesla website <<https://www.tesla.com/support/autopilot>> (accessed 16 September 2021).

¹¹ SAE, *supra* n 8.

¹² Road Traffic Act (Cap 276, 2004 Rev Ed) s 2; See also *Singapore Parliamentary Debates, Official Report* (7 February 2017) vol 94 at p 65 (Mr Ng Chee Meng, The Second Minister for Transport).

¹³ Road Traffic (Autonomous Motor Vehicles) Rules 2017 (“RTAMVR”) rr 4(1) and 7(1)(a)(i).

¹⁴ LTA website <https://www.lta.gov.sg/content/ltagov/en/industry_innovations/technologies/autonomous_vehicles.html> (accessed 16 September 2021).

on Jurong Island respectively.¹⁵ The trial was conducted by ST Engineering, in collaboration with SMRT and SBS Transit, to collect real-world data for future commercial deployment of driverless buses in Singapore.¹⁶

10 To ensure the safe conduct of these trials, LTA will often: (a) limit the specific geographical areas in which the approved testing may be conducted and (b) require a qualified safety driver to be seated in the vehicle to monitor its operation and take over control if necessary.¹⁷

11 Additionally, LTA requires the person conducting the trial to have in place liability insurance before testing may commence.¹⁸ Such liability insurance should cover the self-driving vehicle owner's liability for any death, bodily injury, or damage to property caused by the use of the self-driving vehicle.¹⁹ If such insurance cannot be obtained, the person conducting the trial must place a security deposit of at least S\$1.5 million with LTA to cover any accident claims.²⁰

C. How is liability attributed in a self-driving car accident?

12 Since the two categories of self-driving cars are regulated differently, the question of who should be responsible in a self-driving car accident will be considered in turn for each category.

(1) Attribution of liability for the first category of self-driving cars

13 For self-driving cars of the first category, they continue to be regulated by existing legal principles on traffic accidents. Traditionally, liability for operating a motor vehicle is primarily imposed on the driver of the vehicle since he has control over the vehicle's movements.²¹

¹⁵ Clement Yong, "Pay to ride driverless buses in two areas of Singapore" *The Straits Times* (26 January 2021) <<https://www.straitstimes.com/singapore/transport/pay-to-ride-on-driverless-buses-in-two-areas-until-april-30>> (accessed 6 October 2021).

¹⁶ *Ibid.*

¹⁷ RTAMVR, *supra* n 13, r 9.

¹⁸ RTAMVR, *supra* n 13, r 14.

¹⁹ Road Traffic Act (Cap 276, 2004 Rev Ed) s 6C.

²⁰ RTAMVR, *supra* n 13, r 15.

²¹ Jerrold Soh, "Towards a control-centric account of tort liability for automated vehicles" (2021) *Torts Law Journal* 1–34 ("Jerrold Soh") at 13–15.

14 The term “primarily imposed” means that the driver can escape liability if he is able to successfully raise a defence, for example, by showing that the accident was wholly due to the fault of the victim or a third party.²²

15 As discussed, for the first category of self-driving cars, the driver is required to always monitor the driving environment and be prepared to resume control of the vehicle at any time while the car’s automated functions are engaged.²³ It follows that the driver ultimately remains in control of the car’s movement. Thus, liability is primarily imposed on the driver when an accident occurs.²⁴

16 This position was illustrated in the case of the first pedestrian fatality involving a self-driving car.²⁵ On a Sunday night in March 2018, Elaine Herzberg was pushing her bicycle across Mill Avenue in Tempe, Arizona when an Uber test vehicle travelling at 40 mph crashed into her leading to her death.²⁶ At the time of the crash, the safety driver, Rafaela Vasquez, was streaming an episode of “The Voice” even though she was required to be prepared to resume control of the vehicle if necessary.²⁷ Subsequently, Ms Vasquez was charged with negligent homicide since she was in control of the vehicle and could have avoided the crash.²⁸

(2) *Attribution of liability for the second category of self-driving cars*

17 Turning to the second category of self-driving cars, policy makers have mandated insurance coverage to aid in the settlement of accident claims during the testing phase.²⁹ However, they have not directly addressed the question of liability. Thus, this part will consider how policy makers will likely attribute liability by applying existing legal principles on traffic accidents. Insights from other countries will also be briefly examined.

18 As discussed, the driver of self-driving cars of the second category need not monitor the driving environment and may direct his attention elsewhere while in the vehicle. This means

²² Chesterman, *supra* n 4, at p 12.

²³ See n 9 of the main text above.

²⁴ Chesterman, *supra* n 4, at p 9.

²⁵ Greg Bensinger and Tim Higgins, “Uber Suspends Driverless-Car Program After Pedestrian Is Killed” *The Wall Street Journal* (20 March 2018) <<https://www.wsj.com/articles/uber-suspends-driverless-car-program-after-pedestrian-is-killed-1521551002>> (accessed 6 October 2021).

²⁶ *Ibid.*

²⁷ David Shephardson, “Safety driver in fatal Arizona Uber self-driving car crash charged with homicide” *Reuters* (16 September 2020) <<https://www.reuters.com/article/uber-selfdriving-idUSKBN26708P>> (accessed 6 October 2021).

²⁸ *Ibid.*

²⁹ See n 18 of the main text above.

that the driver is not in control of the car's movement. Under existing legal principles,³⁰ the driver should not be primarily liable in an accident.

19 Instead, the car's manufacturer should be primarily liable in an accident. This is because the car's manufacturer developed the artificial intelligence (AI) self-driving system which controls the car's movements. The AI self-driving system controls the car by analysing data from the car's surroundings to make decisions as to navigation and accident-avoidance.³¹

20 Indeed, if the car's manufacturer can successfully raise a defence, its liability should be reduced. This can be done, for example, by showing that damage was also caused by the fault of the victim or the driver.³²

21 The position that the car's manufacturer should be primarily liable for accidents has been adopted in Germany and the United States (US). In Germany, liability for self-driving car accidents is decided according to the Product Liability Directive.³³ Under the Directive, manufacturers are liable for any product defects which include lapses in safety which a consumer is entitled to expect.³⁴ Similarly, in the US, manufacturers are liable for self-driving car accidents under product liability laws where liability is based on defects in the safety design of a product.³⁵

22 However, attributing liability on manufacturers using product liability laws is not without problems. In particular, it is often difficult to show that a defect existed within the vehicle's AI self-driving software and that defect caused the accident. This is because the AI self-driving system uses complex algorithms that employ a wide range of datasets.³⁶ Thus, pinpointing the exact software flaw that caused the accident is a complicated inquiry. Moreover, manufacturers are often reluctant to disclose their AI software algorithms even for

³⁰ See n 21 of the main text above.

³¹ Law Reform Committee Report, *supra* n 5, at para 1.14.

³² *Id.*, at para 3.5.

³³ *Ethics Commission: Automated and Connected Driving*, Federal Ministry of Transport and Digital Infrastructure (June 2017); Council Directive 85/374/EEC of 25 July 1985 on the Approximation of the Laws, Regulations and Administrative Provisions of the Member States concerning Liability for Defective Products ("Product Liability Directive").

³⁴ Law Reform Committee Report, *supra* n 5, at para 3.9; See also "Product liability and recalls in Germany", *Pinsent Masons* (10 January 2019) <<https://www.pinsentmasons.com/out-law/guides/product-liability-and-recalls-in-germany>> (accessed 16 September 2021).

³⁵ *Id.*, at para 3.23–3.24.

³⁶ *Id.*, at para 5.16.

investigations as these algorithms are considered trade secrets.³⁷ Therefore, identifying a defect within the vehicle's self-driving software that caused the accident is an uphill challenge.

23 Perhaps not surprisingly, the Singapore Law Reform Committee remarked that whether manufacturer liability should be adopted in Singapore is far from clear.³⁸

III. CONCLUSION

24 In summary, this article has explored self-driving car owners' exposure to liability in the event of an accident. For owners of the first category of self-driving cars who are generally consumers, the driver of the car will be primarily liable in an accident. However, for owners of the second category of self-driving cars who are currently research organisations, policy makers have yet to decide who should be primarily responsible in an accident.

25 Nonetheless, as Singapore welcomes the private use of truly "driverless" cars, further clarification on the question of liability is anticipated. Until then, it appears that the common consensus, at least in Germany and the US, is to hold the car's manufacturer liable.

³⁷ Jerrold Soh, *supra* n 21, at 21.

³⁸ Law Reform Committee Report, *supra* n 5, at para 5.29.