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**NAVIGATING THE LAW REFORM ROUTE FOR
DRIVERLESS CARS IN NEW ZEALAND**

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Abstract

Driverless cars are an emerging technology, which removes the human driver from transportation and allows the technology itself to drive the car. The introduction of driverless cars to New Zealand will give rise to a number of legal issues, as the new technology attempts to fit within an existing legal framework. There is a need to reform the law to accommodate autonomous vehicles, which raises questions of how to best complete such a law reform process. The introduction of driverless cars can be divided into two stages: the testing stage, and the public introduction stage. Each stage will require a different method of reform. At the testing stage, this paper submits that no law reform should be undertaken. Testing may be undertaken by manufacturers legally within the existing transport law of New Zealand, and any new legislative requirements may repel manufacturers, to whom New Zealand would appeal as a testbed due to its reputation with emerging technologies and favourable liability laws. At the public introduction stage, where driverless technology is made available for purchase by the general public, this paper submits that a new legislative scheme should be drafted, working in correlation with international standards used to ensure quality control of vehicles imported into New Zealand.

Key words: driverless cars; autonomous vehicles; law reform; emerging technologies

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I Introduction

Driverless cars are now a reality. Also known as autonomous vehicles, this technology seeks to remove the most unpredictable element on the road – the human driver – from the equation, enabling the vehicle itself to drive the human passenger from point A to point B. Such technology would revolutionise personal transport. Some predict that children born today will never need a driver’s licence.¹ Eventually there will be people whose only driving experience will be with driverless vehicles.² Self-driven vehicles will become a hobby, much like how horses are treated after the advent of motor vehicles as the predominant mode of transport.

However, the introduction of such technology will inevitably create questions of how driverless vehicles will be regulated under our current law. Emerging technologies can fit into the existing legal framework, but often will require new regulation and legislation to ensure their safe introduction into consumer’s everyday lives.

For driverless cars, there are two key phases which will require varying levels of law reform. The first stage is testing, when manufacturers will be able to test the driverless car technology on the public roads before sale to the general public. The second stage is the public introduction, when driverless cars are made available to the general public for purchase.

This paper, adopting the approach of the Ministry of Transport’s *Regulation 2025: Emerging Insights* report,³ will examine three possible solutions for reforming the law at both of these stages. The Ministry’s report suggests that lawmakers can leave the legislation as it is and only add additional law if risks materialise, rely on international law to manage new risks, or introduce domestic legislation to manage these risks.

Due to a desire for New Zealand to be a testbed for technology, and our liability schemes currently being favourable to manufacturers due to an absence of personal injury liability, this paper will conclude that is preferable for the current law to remain as it is for the testing phase of driverless cars. The current transport law, primarily the Land Transport Act 1998,

¹ Joanna Stern “Where Baidu is Heading with the Driverless Car” *The Wall Street Journal* (online ed, New York City, 8 June 2016).

² Sarah Aue Palodichuk “Driving into the Digital Age: How SDVs Will Change the Law and Its Enforcement” (2015) 16 *Minn JL Sci & Tech* 827 at 830.

³ Ministry of Transport *Regulation 2025: Emerging Insights* (August 2016).

is currently able to accommodate driverless cars if they are being used for testing purposes only.

However, this paper suggests that a new legislative scheme is preferable for the public introduction of driverless cars, in conjunction with the adoption of international standards to ensure quality of vehicles imported into New Zealand. This is due to the increased dangers of the technology's introduction to the general public, and the failure of current laws to be able to regulate public usage of driverless cars. An examination of common issues when legislating pre-emptively for emerging technologies, overseas jurisdictions' approaches to legislating in this area, and the current use of international standards allows the paper to conclude on the particulars of this preferable course for law reform in this area.

II An Introduction to Driverless Cars and their Legal Implications

An understanding of what driverless cars are, and the legal challenges that they pose, is necessary before considering the best possible method of reforming the law to regulate this new technology.

A What is a driverless car?

Autonomous vehicles attempt to remove the human element completely, ensuring that the human is only a passenger, rather than an active participant in the driving experience. Unsafe actions by human drivers the greatest risk on the roads today;⁴ over ninety percent of today's car accidents are caused by human error.⁵ Humans can get drunk, tired, make mistakes, or fail in their judgment. Robots will not – although there is the possibility that the technology will fail.

The United States' National Highway Transport Safety Administration (NHTSA) has created a hierarchy of automation levels, which outline the extent to which a particular

⁴ Stephen P. Wood and others "The Potential Regulatory Challenges of Increasingly Autonomous Motor vehicles" (2012) 52 Santa Clara L. Rev. 1423 at 1501.

⁵ Jerry Gurney "Imputing Driverhood: Applying a Reasonable Driver Standard to Accidents Caused by Autonomous Vehicles" (1 June 2016) Social Science Research Network <<http://ssrn.com/abstract=2796966>>.

vehicle is automated.⁶ Autonomous vehicles aim to achieve the status of Level 4, full self-driving automation, at which stage the vehicle performs all safety-critical driving functions and monitors roadway conditions for the duration of a trip.⁷

The benefits of driverless vehicles are vast. A driverless vehicle would have faster reaction times and a 360-degree field of vision,⁸ preventing most accidents and saving many lives. Societal costs of accidents – including days of work missed, property damage and hospital stays – will be minimised, saving the economy.⁹ Families will not suffer the same emotional toll of vehicle deaths.¹⁰ Driverless vehicles will reduce greenhouse gas emissions, by driving smartly and preventing traffic snarls caused by accidents.¹¹ Traffic congestion will decrease.¹² They will enhance transport access for disabled people,¹³ such as Steve Mahan, a blind man who test drove the Google Self-Driving Car.¹⁴ Human productivity will increase and hours wasted in traffic will decrease, as passengers can complete tasks in their vehicle rather than focusing on the road.¹⁵

Cars today already incorporate a number of autonomous capabilities to assist drivers and mitigate the human factor, such as forward collision avoidance systems, lane departure prevention systems and parking assist.¹⁶ Yet fully autonomous technology is already

⁶ James M. Anderson and others *Autonomous Vehicle Technology: A Guide for Policymakers* (RAND Corporation, California, 2016) at 2-3.

⁷ Anderson and others, above n 6, at 3.

⁸ Robert W. Peterson “New Technology – Old Law: Autonomous Vehicles and California’s Insurance Framework” (2012) 52 Santa Clara L. Rev. 1341 at 1342.

⁹ William J. Kohler & Alex Colbert-Taylor “Current Law and Potential Legal Issues Pertaining to Automated, Autonomous and Connected Vehicles” (2015) 31 Santa Clara High Techn. L.J. 99 at 109.

¹⁰ Kohler and Colbert-Taylor, above n 9, at 109.

¹¹ Dorothy J. Glancy and others *A Look at the Legal Environment for Driverless Vehicles* (National Cooperative Highway Research Program, Legal Research Digest 69, Santa Clara University School of Law, February 2016) at 3 and 77.

¹² Glancy and others, above n 11, at 3.

¹³ Kohler and Colbert-Taylor, above n 9, at 109.

¹⁴ Google “Self-Driving Car Test: Steve Mahan” (28 March 2012) YouTube <<https://www.youtube.com/watch?v=cdgQpa1pUUE>>.

¹⁵ Glancy and others, above n 11, at 3; Jeffrey R. Zohn “When Robots Attack: How Should the Law Handle Self-Driving Cars that Cause Damages” (2015) 2015(2) U. Ill. J.L. Tech. & Pol’y 461 at 471.

¹⁶ Annie Gray “Megatrends: Forget about the future - it’s already here” *New Zealand Management* (New Zealand, December 2015) at 9; Kohler and Colbert-Taylor, above n 9, at 100.

existent. Google has already self-driven over 1.8 million miles as of July 2016.¹⁷ Other traditional automotive manufacturers have invested heavily in autonomous technology, such as Ford.¹⁸ A company named Delphi has created parts to turn existing human-driven vehicles into autonomous self-drivers.¹⁹ Ridesharing companies such as Uber and Lyft have invested in developing ridesharing services of autonomous vehicles.²⁰ The technology is almost at the stage of deployment; what is now required is public acceptance and mass adoption of such technology.

Society will need to dispel any insecurities and psychologically accept being driven around by a robot.²¹ To hand over the reins to a robot will be a tough ask for many who have been conditioned to expect a human operator. Many drivers will likely stay with conventional human-driven vehicles for some time after the arrival of autonomous technology.²² Overcoming this fear will be made especially difficult by incidents such as Joshua David Brown's fatal crash while in a Tesla Model S on autopilot,²³ which will fuel incorrect beliefs that driverless technology is less safe than human drivers.

Driverless vehicles will also require many ethical conundrums to be solved before being released to the public. For example, manufacturers will have to program a driverless car with what to do in a situation where a vehicle must decide between killing its passenger or killing a group of pedestrians. While the utilitarian course of action would be to kill the passenger, killing one to save many, a robot that is programmed to kill its passenger may discourage buyers who believe their own safety should be more important than that of others.²⁴

¹⁷ "Google Self-Driving Car Project Monthly Report" (July 2016) Google Self-Driving Car Project <<https://static.googleusercontent.com/media/www.google.com/en//selfdrivingcar/files/reports/report-0716.pdf>>.

¹⁸ Daniel A. Crane, Kyle D. Logue and Bryce C. Pilz *A Survey of Legal Issues Arising from the Deployment of Autonomous and Connected Vehicles* (University of Michigan Law School, Michigan, April 2016) at 1.

¹⁹ Maurice Schellekens "Self-driving cars and the chilling effect of liability law" (2015) 31 *Computer Law & Security Review* 506 at 506.

²⁰ Crane, Logue and Pitz, above n 18, at 9.

²¹ Palodichuk, above n 2, at 827; Glancy and others, above n 11, at 19.

²² Glancy and others, above n 11, at 1.

²³ Brian Fung "The technology behind the Tesla crash, explained" *New Zealand Herald* (New Zealand, 2 July 2016).

²⁴ Jean-Francois Bonnefon, Azim Shariff and Iyad Rahwan "The social dilemma of autonomous vehicles" *Science* (Washington DC, 24 June 2016) at 1573.

B What are the legal implications of driverless cars?

Upon their initial introduction, driverless vehicles may inherit a legal framework designed for conventional human-driven vehicles,²⁵ unless the law is reformed first. Driverless vehicles could be forced into a system where they do not fit. Presently there is no New Zealand legislation specifically addressing driverless cars. There are various legal issues and implications which will need to be addressed upon the technology's introduction, however, to accommodate driverless cars safely and securely in New Zealand.²⁶

1 Liability

The primary concern is the applicability of current liability regimes to driverless technology. This is cited by industry analysts as a major impediment to widespread adoption of Level 4 autonomous technology.²⁷ Current tortious liability regimes place liability on the party at fault, which is the driver who has driven negligently. However, once the driver is removed from the situation, the question arises as to who is liable if a driverless vehicle crashes. Most commentators have come to a consensus that liability will shift from the driver to the manufacturer of the autonomous vehicle, focusing on alleged defects in the technology.²⁸ With an increase in manufacturer liability, there is the potential that this will impact on the development and adoption of such technology. This is particularly so in countries such as the United States, where the manufacturer will be liable for not only property damage but also personal injury.

Further issues will arise in terms of liability. Previously, a driver would solely be liable for his own negligence; however, if a manufacturer is liable, there will be a “web of technologies at work”, which means manufacturers of all separate components may face liability.²⁹ Questions will also arise in determining whether a driver who disables an automatic warning system, or deliberately ignores warnings that an autonomous vehicle is unsafe to drive, will be liable for any damage caused by the faulty vehicle.³⁰

²⁵ Glancy and others, above n 11, at 1.

²⁶ Glancy and others, above n 11, at 22; Kohler and Colbert-Taylor, above n 9, at 107.

²⁷ Kohler and Colbert-Taylor, above n 9, at 135.

²⁸ Glancy and others, above n 11, at 35-36.

²⁹ Crane, Logue and Pitz, above n 18, at 78.

³⁰ Crane, Logue and Pitz, above n 18, at 101; Peterson, above n 8, at 1358.

Products liability doctrines may become invoked more commonly in order to hold manufacturers liable. It is likely that laws relating to defective products will be invoked similarly as they are today with defective vehicles, but may also be applied in order to hold a manufacturer (rather than a driver) liable if an autonomous vehicle causes consequential property damage.

2 *Cyber-protection*

The co-ordination of data between driverless vehicles through a centralised infrastructure will raise privacy concerns.³¹ Driverless vehicles will contain a wealth of information regarding route history, the car's actions, and personal information and preferences. Concerns have been raised regarding government access to this personal data,³² especially in the context of police enforcement and commercial use of such data.³³ Such privacy issues are not unique to the driverless car context; in *United States v. Jones*, the United States Supreme Court found that police use of a GPS tracking device on a person's vehicle constituted a search and breach of reasonable privacy expectations under the Fourth Amendment.³⁴ Protection of user privacy will be a significant legal hurdle to overcome in the implementation of driverless vehicles.

A world of autonomous vehicles also presents cybersecurity and cyberterrorism risks. Cyberterrorism attacks could be launched through autonomous vehicles, which could be hacked remotely allowing external control of braking, acceleration and steering.³⁵ Technology evolves rapidly, with many possible interfaces able to serve as potential ports for intrusion,³⁶ making prevention of such attacks extremely difficult. Some commentators suggest that the hacking of multiple autonomous vehicles simultaneously could lead to a terror attack on the same scale as the 9/11 attacks.³⁷ Enhancing methods of prevention and criminal punishment in response will be required to ensure public feelings of safety.

³¹ Kohler and Colbert-Taylor, above n 9, at 120.

³² Kohler and Colbert-Taylor, above n 9, at 121.

³³ Palodichuk, above n 2, at 835; Kohler and Colbert-Taylor, above n 9, at 121.

³⁴ *United States v. Jones* 132 S. Ct. 945 (2012).

³⁵ Kohler and Colbert-Taylor, above n 9, at 132.

³⁶ Wood and others, above n 4, at 1467.

³⁷ Kohler and Colbert-Taylor, above n 9, at 133.

3 *Other concerns*

The current insurance system, based on driver insurance and focused on individual fault, will be transformed as liability shifts to the manufacturer. The insurers' business model will change as human error is removed, and legal liability shifts up the commercial chain.³⁸ The architecture for insuring autonomous vehicle systems will require significant research and development.

Some traditional traffic offences will be eliminated, while new traffic offences will be created.³⁹ Laws surrounding drink driving will need to be considered and revised, to determine whether a human passenger in an autonomous vehicle is legally able to be intoxicated;⁴⁰ this will likely depend on the extent of the technology, as once it reaches Level 4, there will be no issue with an intoxicated passenger. Current criminal offences will have to be reformulated and new crimes introduced;⁴¹ for example, a 'hit and run' offence seems unnecessary when the automated vehicle could refuse to leave the scene of an accident.⁴²

4 *Conclusion on legal implications*

This quick survey of legal issues arising from the widespread deployment of autonomous vehicles demonstrates the widespread effect of such technology. A wide range of legal areas will be affected, and need to be responded to through different statutes and regulations.

The issue therefore is determining the best possible path forward for New Zealand in response to driverless technology, and how to reform the law in the face of this impending technological overhaul.

As previously discussed, this paper will examine two distinct stages for driverless vehicles: testing and public introduction. Testing will involve manufacturers trialing driverless technology on public roads, before the technology is released for sale. Public introduction

³⁸ Glancy and others, above n 11, at 47 and 52.

³⁹ Palodichuk, above n 2, at 829.

⁴⁰ "Driverless Cars: Proposed Laws in Two Jurisdictions" (4 February 2016) TimeBase <<https://www.timebase.com.au/news/2016/AT045-article.html>>.

⁴¹ Glancy and others, above n 11, at 41.

⁴² Glancy and others, above n 11, at 43.

will occur when driverless cars are available for purchase by the general public. These separate stages will require different levels of reform, and therefore this paper will go on to consider what kind of reform will be necessary at each stage.

III Testing in New Zealand

The first stage for driverless cars in New Zealand potentially requiring reform is the testing stage. This section will explore why New Zealand is attractive as a testbed for driverless car manufacturers, for reasons including New Zealand's reputation as a popular testbed for emerging technologies and manufacturer-friendly liability laws.

A New Zealand as a testbed for emerging technologies

Looking generally at emerging technologies, New Zealand is often seen by market leaders as an ideal testbed for new technology. This is due to our geographic isolation, population density, our tech-savvy population, and similarities to American and European markets.⁴³ In *The Economist*, it was written that:⁴⁴

New Zealand's relative isolation means that if a product needs to be modified significantly to fix faults or make it more appealing to consumers, word of its teething troubles is less likely to spread, thereby discouraging customers elsewhere from trying the improved version. If a firm finds that a particular product, or a new feature added to an existing one, is a resounding flop in New Zealand, it can quietly be dropped without having much effect on the company's overall reputation.

New Zealand has already been the test site of numerous new transportation technologies. The Ministry of Transport co-funded trials with AraFlow Ltd to trial sensor and communications technologies for heavy vehicles, with the intention of better understanding ITS technology potential in New Zealand.⁴⁵ The New Zealand Civil Aviation Authority

⁴³ Rebekah Campbell "Why New Zealand is the perfect place to startup" (10 September 2013) <<http://www.rebekahcampbell.com/2013/09/10/why-new-zealand-is-the-perfect-place-to-startup/>>; Daniel O'Mahony "Kiwis as lab rats: international companies are testing their products on us" (7 October 2015) Idealog <<http://idealog.co.nz/venture/2015/10/kiwis-lab-rats-international-companies-are-testing-their-products-us>>.

⁴⁴ "Kiwis as guinea pigs" *The Economist* (online ed, London, 23 May 2015).

⁴⁵ Ministry of Transport "Trialing technology in New Zealand" (8 March 2016) <<http://www.transport.govt.nz/ourwork/technology/trialling-technology/>>.

successfully trialed the use of biofuel produced from African-sourced jatropha.⁴⁶ Google has trialed launches of its high-altitude, long-endurance Project Loon balloons from Tekapo and Alexandra, working with Airways and the Civil Aviation Authority; the project aims to provide internet access to rural and remote regions of the world.⁴⁷

An example of a major technology being trialed in New Zealand successfully is EFTPOS. Created in the United States in 1981, EFTPOS was first trialed in New Zealand at petrol stations in 1985. Although it got out to a faltering start, with ANZ and BNZ withdrawing from the EFTPOS trial in 1988, the creation of Electronic Transaction Services Limited allowed the establishment of a more robust and reliable network.⁴⁸ With this eventual success, EFTPOS was officially launched in New Zealand in 1989, and has now grown to become the most popular means of payment for New Zealanders.

With the country having an established history and reputation as a popular testbed for emerging technologies, manufacturers would likely be attracted to test driverless cars in New Zealand.

B The Government's position

The government wishes for New Zealand to be a testbed for emerging technologies such as driverless cars:⁴⁹

...the government intends to build on our reputation as a good place for international companies to undertake large-scale or long-term testing of technology. This is based on some distinctive aspects of New Zealand such as our appetite for new technology, our relatively small but well-educated population, our flexible regulatory environment, and our diverse landscape and climate.

The Ministry of Transport has released a report titled *Testing Autonomous Vehicles in New Zealand*,⁵⁰ which looks at the possibility of testing driverless vehicles in New Zealand and why it is beneficial. The report supports the testing of autonomous vehicles in New

⁴⁶ Ministry of Transport "Trialing technology in New Zealand", above n 45.

⁴⁷ Ministry of Transport "Trialing technology in New Zealand", above n 45.

⁴⁸ David Tripe and Struan Scott (eds) *Electronic Business and Technology Law (NZ)* (online looseleaf ed, LexisNexis) at [22.1].

⁴⁹ Ministry of Transport *Intelligent Transport Systems Technology Action Plan 2014-2018: Transport in the digital age* (May 2014) at 25.

⁵⁰ New Zealand Transport Agency "Testing Autonomous Vehicles in New Zealand" (18 February 2016).

Zealand, listing advantages such as supportive legislation which has no explicit requirement for a driver to be present for a vehicle to be used on the road, a wide range of climate and road conditions, an advanced winter testing facility for vehicles called the Southern Hemisphere Proving Ground, world-class universities and research centres, and the appeal of New Zealand lifestyle for workers.⁵¹ The report states that autonomous vehicle testing can occur anywhere on public roads, provided the public are kept safe and traffic is not impeded.⁵²

The report lists the legal obligations under the Land Transport Act 1998, s 7 to not drive recklessly or in a way that is dangerous to the public as being important for anyone wishing to test autonomous vehicles in New Zealand.⁵³ It also notes the power of police officers under s 113 to ensure safety on the roads, allowing them to stop any activity they perceive as unsafe.⁵⁴ Other requirements such as insurance, the creation of a safety management plan, test vehicle operator licensing, and vehicle standards are also listed in the report.⁵⁵

The Ministry of Transport has previously demonstrated a willingness to help the development of connected vehicle technologies, as evidenced by their co-funding of intelligent transport system technology trials.⁵⁶ The *Intelligent Transport Systems Technology Action Plan 2014-18* also outlined the government's intention to build on New Zealand's reputation as a testbed for emerging technologies.⁵⁷ The possibility of New Zealand as a test market was similarly noted in the *Disruptive Technologies* report, where it was stated that there are opportunities for New Zealand to market the West Coast or other regional towns as testing grounds for driverless cars.⁵⁸

⁵¹ New Zealand Transport Agency "Testing Autonomous Vehicles in New Zealand", above n 50, at 2.

⁵² New Zealand Transport Agency "Testing Autonomous Vehicles in New Zealand", above n 50, at 3.

⁵³ New Zealand Transport Agency "Testing Autonomous Vehicles in New Zealand", above n 50, at 4.

⁵⁴ New Zealand Transport Agency "Testing Autonomous Vehicles in New Zealand", above n 50, at 4.

⁵⁵ New Zealand Transport Agency "Testing Autonomous Vehicles in New Zealand", above n 50, at 4-6.

⁵⁶ "Connected vehicles and C-ITS" (8 March 2016) Ministry of Transport <<http://www.transport.govt.nz/ourwork/technology/specific-transport-technologies/road-vehicle/connected-vehicles/>>.

⁵⁷ Ministry of Transport *Intelligent Transport Systems Technology Action Plan 2014-2018: Transport in the digital age*, above n 49, at 25.

⁵⁸ Chartered Accountants Australia New Zealand and New Zealand Institute of Economic Research *Disruptive Technologies Risks, Opportunities – Can New Zealand Make the Most of Them?* (October 2015) at 31.

Fortunately, our prior reputation as a popular testbed for emerging technologies will help New Zealand achieve testing within our country as the government desires, although as discussed below, our liability regimes also would make New Zealand a desirable testbed for manufacturers.

C Liability in New Zealand

New Zealand's liability regimes are likely to be attractive to manufacturers, and a reason that New Zealand should promote itself as a potential testbed. One of the major issues with the development of driverless vehicles, as previously mentioned, is determining where liability will lie in the event of an accident. While current liability regimes find a negligent driver liable for an accident, it is likely that once the driver is removed, the liability will shift onto the manufacturer of the system. Manufacturer liability will therefore increase. However, liability is far more concentrated within the limited pool of manufacturers than in the wide pool of drivers, creating a much higher risk for manufacturers. It has been suggested that if a greater liability burden is placed on manufacturers by lawmakers, manufacturers may engage in a stand-off situation.⁵⁹ Uncertainty as to the sheer magnitude of liability risk may deter and delay manufacturers from introducing driverless technology.⁶⁰

The potential reason for high liability risks is the existence of personal injury liability in countries such as the United States. Mercedes, Google and Volvo have all shown a willingness to accept full liability for crashes involving their autonomous vehicles.⁶¹ While this is so, the immense liability that manufacturers could face cannot be understated, even with liability insurance.

However, in New Zealand, the existence of the Accident Compensation Corporation (ACC) would prevent personal injury liability, and instead, manufacturers would only be liable under products liability doctrines. This paper will now examine the relevant liability regimes, which make New Zealand preferable for manufacturers as a testbed for driverless technology.

⁵⁹ Anderson and others, above n 6, at 134.

⁶⁰ Anderson and others, above n 6, at 108.

⁶¹ Crane, Logue and Pilz, above n 18, at 2.

D Accident Compensation Corporation (ACC)

The presence of ACC in New Zealand would mean that a manufacturer, if held to be liable for any damage caused by a driverless vehicle, could avoid personal injury liability. This lack of liability may encourage the testing of driverless vehicles in New Zealand.

1 ACC in New Zealand

One of the guiding principles arising out of the initial Royal Commission of Inquiry in regard to ACC was the idea of community responsibility: that the community was responsible to assist those prevented from working due to injuries arising from accidents.⁶² It shifts the burden of injury from the sufferer of the personal injury, to be spread across the community of which they are a part.⁶³ Tennent notes transport as a major area where all members of society participate which often causes injury.⁶⁴ The whole community benefits from the transportation of goods and people, but these vehicles delivering people and goods also cause accidents and injury. As all people benefit from transport services, the reciprocal obligation is that all people must pay the resulting costs of injury caused by transport.⁶⁵ The same principle can be applied to driverless technology: all benefit from services of such transport, so all should pay for the costs of any injury caused.

ACC allows the community to assume responsibility for an injury, and therefore the injured person forgoes the right to sue. If an injured person was allowed to sue under ACC, it would result in the possibility of double compensation or unjust enrichment.⁶⁶ The prohibition of suing for personal injury in New Zealand is found in the Accident Compensation Act 2001, s 317(1)(a), which prohibits bringing proceedings “for damage arising directly or indirectly out of personal injury covered by this Act”.⁶⁷

For cover under the Act, there must be personal injury caused by an accident.⁶⁸ Personal injury expressly includes injury caused by a motor vehicle accident under s 35,⁶⁹ provided

⁶² Doug Tennent *Accident Compensation Law* (LexisNexis, Wellington, 2013) at 3.

⁶³ Tennent, above n 62, at 5.

⁶⁴ Tennent, above n 62, at 4.

⁶⁵ Tennent, above n 62, at 4.

⁶⁶ *Queenstown Lakes District Council v Palmer* [1999] 1 NZLR 549 (NZCA) at 555.

⁶⁷ Accident Compensation Act 2001, s 317(1)(a).

⁶⁸ Accident Compensation Act 2001, s 20(2)(a).

⁶⁹ Accident Compensation Act 2001, s 35.

the motor vehicle is being used for conveyance.⁷⁰ The costs of treatment are covered by the Act.⁷¹

However, there still exists a right to bring an exemplary damages claim for personal injury matters covered by the Act, as confirmed in *Couch v Attorney-General (No 2)*.⁷² The conclusion was reached that exemplary damages are only awarded if the defendant “has a conscious appreciation of the risk of causing harm and ran that known risk when he or she undertook the act or omission in question”.⁷³ Section 319 states that no legislation or rule of law prevents proceedings for exemplary damages for personal injury covered by the Act.⁷⁴

2 *An ACC-like system for the United States?*

A number of United States sources have recognised the potential issue with personal injury liability in the context of driverless vehicles, and have sought solutions to overcome the potential issue. Maurice Schellekens suggested that to shield manufacturers from direct liability claims of road users and the subsequent chilling effect that this liability would have on the development of driverless cars, a scheme giving road users adequate compensation through insurance could be created.⁷⁵

Jerry Gurney devised an alternative liability regime named the Immunity and Compensation Scheme to minimise liability imposed on manufacturers.⁷⁶ This would provide immunity for manufacturers as potential defendants, and create a system of compensation for victims of autonomous vehicle accidents. The key justification for such a system would be to prevent manufacturers being deterred from producing autonomous vehicles due to the risk of significant potential liability.⁷⁷ Gurney suggested that a flat surcharge would need to be imposed on driverless vehicles to pay for the scheme.⁷⁸ However, he noted that this may lead to fewer safe vehicles on the road, as safer vehicles

⁷⁰ Accident Compensation Act 2001, s 35(2)(b); see also *Accident Compensation Corporation v Downer New Zealand Ltd* [2012] NZACC 390.

⁷¹ Tennent, above n 62, at 161.

⁷² *Couch v Attorney-General (No 2)* [2010] NZSC 27, [2010] 3 NZLR 149.

⁷³ Tennent, above n 62, at 201; see *Couch*, above n 72, at [178].

⁷⁴ Accident Compensation Act 2001, s 319(1).

⁷⁵ Schellekens, above n 19, at 516.

⁷⁶ Gurney, above n 5, at 5-7.

⁷⁷ Gurney, above n 5, at 5.

⁷⁸ Gurney, above n 5, at 6.

would be more expensive and inhibit some purchasers from entering the market. He suggested that for this reason, the Immunity and Compensation Scheme should be a last resort.⁷⁹

This demonstrates a belief that an ACC-like system would protect manufacturers from personal injury liability in the United States, and that academics are trying to find ways to create such a system. Luckily, New Zealand has a ready-made system already in existence which makes it an attractive option for testing of autonomous vehicles.

3 ACC in the Driverless Cars context

Applying New Zealand's current ACC law to the driverless car context, a driverless car crash causing death or injury to a human passenger would be covered by the current Act. This would be personal injury per s 26(1) and s 35, and the crash would be an accident, per s 25(1)(a)(i), as the application of resistance external to the human body. The costs of treatment would be covered, and the manufacturer would not be liable for the personal injury. Their only possible liability would be for exemplary damages, if they had acted in a particularly reprehensible way deserving punishment per the majority's approach in *Couch (No 2)*.

Foreigners testing driverless vehicles in New Zealand would also be covered. Under the Act, a person not ordinarily resident in New Zealand would receive cover,⁸⁰ provided the injury was not suffered on board a ship or aircraft or other means of conveyance whilst coming to or leaving New Zealand or embarking or disembarking from such a vehicle.⁸¹

The presence of ACC in New Zealand therefore suggests New Zealand would be a country where manufacturers could test driverless vehicles, with a lesser risk of potential liability due to the lack of personal injury liability. The only liability manufacturers may be exposed to – beyond criminal liability – is products liability, as outlined below.

⁷⁹ Gurney, above n 5, at 7.

⁸⁰ Accident Compensation Act 2001, s 20(1).

⁸¹ Accident Compensation Act 2001, s 23.

E Products liability

While manufacturers of driverless cars would not suffer liability for personal injury due to ACC, they would still be subject to products liability doctrines, both statutory and common law.

1 Consumer Guarantees Act 1993

The Consumer Guarantees Act 1993 mandates minimum quality standards in respect of the supply of goods and services to consumers.⁸² The Act applies whenever goods (or services) are supplied to a consumer.⁸³ The Act outlines a number of guarantees owed to the consumer, for which the consumer has a right of redress if any such guarantee is breached.

The main policy reason for enforcing liability on manufacturers under the Act is because manufacturers have the greatest influence on the quality of their product.⁸⁴ Under s 2, a manufacturer is a person who carries on the business of assembling, producing, or producing goods.⁸⁵ Where the goods are manufactured outside New Zealand and the foreign manufacturer does not have an ordinary place of business in New Zealand, the definition includes the person who imports or distributes the goods.⁸⁶

Consumers can recover damages under the Act against a manufacturer for a reduction in value of the goods below purchase price resulting from a failure to meet a guarantee.⁸⁷ A consumer has a right of redress against a manufacturer if they breach the guarantee as to acceptable quality under s 6, the guarantee as to repairs and spare parts under s 12, any express guarantees under s 13, and when the goods fail to correspond with the description of the goods given by or on behalf of the manufacturer.⁸⁸

Importantly, a consumer with a right of redress can obtain damages from the manufacturer for foreseeable consequential loss under s 27(1)(b).⁸⁹ Consequential loss must be reasonably foreseeable. Such damages can be claimed whether or not the failure can be

⁸² Kate Tokeley (ed) *Consumer Law in New Zealand* (2nd ed, LexisNexis, Wellington, 2014) at 48.

⁸³ Tokeley, above n 82, at 50.

⁸⁴ Tokeley, above n 82, at 109.

⁸⁵ Consumer Guarantees Act 1993, s 2.

⁸⁶ Consumer Guarantees Act 1993, s 2.

⁸⁷ Consumer Guarantees Act 1993, s 27(1).

⁸⁸ Tokeley, above n 82, at 108; Consumer Guarantees Act 1993, ss 6, 12 and 13.

⁸⁹ Consumer Guarantees Act 1993, s 27(1)(b).

remedied, and regardless of whether the failure is of a substantial character.⁹⁰ The Accident Compensation Act 2001 bars any claims against manufacturers for personal injury or death caused by defective goods, however.⁹¹

There are exceptions as to manufacturer liability, found in s 26. This includes where the failure to comply with a guarantee of acceptable quality is due to the act or default or omission of any person other than the manufacturer.⁹² There is also an exception where the failure is due to a cause independent of human control, occurring after the goods have left the manufacturer's control.⁹³

2 *Tort of Negligence*

Alongside the Consumer Guarantees Act 1993, consumers may have a remedy for defective goods or services under the tort of negligence. The Consumer Guarantees Act was passed to alleviate some of the serious deficiencies in protecting consumers under both tort and contract law.⁹⁴ Despite these deficiencies, the tort of negligence is still a possible cause of action for a wronged consumer. Since *Donoghue v Stevenson*,⁹⁵ in which Lord Atkin formulated the proposition that a manufacturer of products owes a duty to the consumer to take reasonable care,⁹⁶ the consumer has had the ability to sue the manufacturer under the tort of negligence. This ordinary duty of care can be heightened, as the more dangerous the act, the greater the care that must be taken in performing it.⁹⁷

However, there are difficulties in suing under negligence. The courts have been seen as using an inflexible approach in applying the tort of negligence to manufacturers of dangerous and defective products.⁹⁸ The complexities of the law and subsequent lack of understanding of available rights and remedies may also prevent an informal complaint resolution by a lay consumer.⁹⁹

⁹⁰ Tokeley, above n 82, at 112.

⁹¹ Accident Compensation Act 2001, s 317.

⁹² Consumer Guarantees Act 1993, s 26(1)(a)(i).

⁹³ Consumer Guarantees Act 1993, s 26(1)(a)(ii).

⁹⁴ Tokeley, above n 82, at 46. For example, the rules of privity of contract meant that the consumer could not sue the manufacturer for breach of contract, only the supplier.

⁹⁵ *Donoghue v Stevenson* [1932] AC 562 (HL).

⁹⁶ *Donoghue v Stevenson*, above n 95, at 599.

⁹⁷ Stephen Todd (ed) *The Law of Torts in New Zealand* (7th ed, Thomson Reuters, Wellington, 2016) at 331.

⁹⁸ Tokeley, above n 82, at 46.

⁹⁹ Tokeley, above n 82, at 46.

3 Products liability in the driverless cars context

Under the Consumer Guarantees Act 1993, a manufacturer of driverless cars importing the vehicles in New Zealand would be a ‘manufacturer’ per s 2. This would mean that the manufacturer would be liable for any reduction in value or foreseeable consequential loss as a result of failure to meet a guarantee under the Act. If an autonomous vehicle was to crash, the manufacturer may be liable for any damage to the vehicle itself if it was owned by a consumer and any consequential damage to any other property caused by the crash that was reasonably foreseeable. There may also be a cause of action in negligence, if it could be proved that the manufacturer did not reach its duty of care in the manufacture of the driverless vehicle.

In the testing stages, this analysis would not be applicable, as the manufacturer has not yet sold the products and is merely testing the driverless vehicles themselves. However, after the public introduction when the vehicles begin to be retailed in New Zealand, the products liability doctrines would apply.

F Conclusion on testing

New Zealand is an attractive option for manufacturers to use as a testbed for driverless cars. We have an established reputation as a positive location for testing emerging technologies, and our liability laws would be beneficial for manufacturers to limit any possible liability, with no risk of personal injury liability. Similarly, products liability doctrines would not be applicable during the testing stage, as no product has been sold. Therefore, manufacturers would face little risk of liability, unless they were to be negligent or do something criminal.

While the Ministry of Transport believes that testing is allowed in New Zealand currently, to determine whether testing would be legally possible in New Zealand, an examination of the current legal framework that driverless cars would be covered by is required. This legal framework may require different levels of reform to accommodate first testing, and later the public introduction of driverless cars to New Zealand.

IV Is law reform required for driverless cars?

As previously discussed, driverless technology raises all kinds of legal issues and questions. Before determining whether these require law reform for resolution at either the stage of testing or the public introduction of driverless cars in New Zealand, it is necessary to examine the current state of the relevant laws applicable to this technology, and how the government believes that driverless cars will be accommodated by the current framework.

Bryant Walker Smith, an Associate Professor at the University of South Carolina School of Law, found in a widely cited 2014 article that current United States law would not prohibit autonomous vehicles, and although it may discourage their introduction or complicate their operation, autonomous vehicles were probably legal in the United States.¹⁰⁰

There has been no similar academic consideration of whether autonomous vehicles would be currently legal in New Zealand. It has been suggested by the New Zealand Transport Agency (NZTA) that our legislation does not explicitly require a vehicle to have a driver present for it to be used on the road, so a driverless vehicle could be tested on New Zealand roads today provided it met any testing requirements.¹⁰¹ This is a potentially simplistic analysis, and may not be applicable when there is widespread adoption of driverless cars.

This survey of the current law leads to a conclusion that while the current law will be able to accommodate testing, reform will likely be required for the public introduction of driverless cars.

A Transport law in New Zealand

The Land Transport Act 1998 is the statute predominantly responsible for promoting safe road user behaviour and vehicle safety, which may affect the implementation of autonomous vehicles in New Zealand. The key general provisions are found in ss 6-8. Section 6 states that “a person may not operate an unsafe motor vehicle on a road”.¹⁰² Section 8 states that “a person may not drive a vehicle, or cause a vehicle to be driven,

¹⁰⁰ Bryant Walker Smith “Automated Vehicles are Probably Legal in the United States” (2014) 1 Tex A&M L Rev 411 at 516.

¹⁰¹ New Zealand Transport Agency “Testing Autonomous Vehicles in New Zealand”, above n 50.

¹⁰² Land Transport Act 1998, s 6.

carelessly or without reasonable consideration for other persons”.¹⁰³ Section 7, perhaps most relevantly, states:¹⁰⁴

- (1) A person may not drive a motor vehicle, or cause a motor vehicle to be driven, recklessly.
- (2) A person may not drive a motor vehicle, or cause a motor vehicle to be driven, at a speed or in a manner which, having regard to all the circumstances, is or might be dangerous to the public or to a person.

Interestingly, these general responsibilities do not require that a person drives a vehicle, but rather may only “operate” or “cause a vehicle to be driven”, in order to be liable for an offence. The definitions of these words suggest that a human driver may not be necessary. “Operate” is defined in s 2 of the Act: “to drive or use the vehicle on a road, or to cause or permit the vehicle to be on a road or to be driven on a road, whether or not the person is present with the vehicle”.¹⁰⁵ This is a very wide definition, the word ‘use’ suggesting it encompasses more than just driving, and also extends to causing or permitting the vehicle to be on the road.¹⁰⁶ Per *Elliott v Grey*, ‘use’ of a vehicle on a road is possible without any driving of the vehicle.¹⁰⁷ To “cause” a vehicle to be driven requires knowledge that the vehicle is on or is being driven on a road.¹⁰⁸ It does not require that a defendant drives the vehicle themselves. The House of Lords held that to “cause” requires only “some express or positive mandate from the person ‘causing’ to the other person, or some authority from the former to the latter, arising in the circumstances of the case”.¹⁰⁹

These sections mean that there is no requirement for a human driver in order to commit an offence, but a human who uses a vehicle or causes it to be driven may be liable for such an offence. This suggests that a passenger in an autonomous vehicle potentially would be liable for causing the autonomous vehicle to be driven on the road. Depending on how we would wish liability to be structured, this may require further consideration.

¹⁰³ Land Transport Act 1998, s 8.

¹⁰⁴ Land Transport Act 1998, s 7.

¹⁰⁵ Land Transport Act 1998, s 2.

¹⁰⁶ *Becroft and Hall’s Transport Law* (online looseleaf ed, LexisNexis) at [LTA2.1].

¹⁰⁷ *Elliott v Grey* [1959] 3 All ER 733.

¹⁰⁸ *Becroft and Hall’s Transport Law*, above n 106, at [LTA2.1].

¹⁰⁹ *McLeod v Buchanan* [1940] 2 All ER 179 at 187.

Sections 11-12 are also relevant, as they require that a person may not drive or attempt to drive under the influence of drugs or alcohol.¹¹⁰ This may need to be reconsidered once vehicles reach full autonomy, as it is likely that drunk passengers will make no difference to how a vehicle is driven. However, the specification that the person under the influence must “drive”, as opposed to “cause a vehicle to be driven” or “use”, suggests a narrower construction and that a person who is merely a passenger of an autonomous vehicle may not fall under this legislation.

It has been suggested that it would be useful if lawmakers updated distracted driving laws to accommodate driverless technologies.¹¹¹ This is because one of the major benefits of driverless technology is the increased productivity of passengers who do not need to look at the road, and rather can check emails or take phone calls. In New Zealand, cl 7.3A of the Land Transport (Road User) Rule 2004 creates a ban on use of mobile phones while driving.¹¹² However, importantly the rule only applies to the “driver... while driving”, which is a narrower construction than “use”. This suggests that it will not apply to a passenger in an autonomous vehicle, and the law would not need to be reformed.

New Zealand is a signatory of the 1949 Convention of Road Traffic, acceding on 12 February 1958. Per Art. 8(1), “every vehicle... shall have a driver”.¹¹³ This driver should at all times be able to control their vehicle.¹¹⁴ Under Art. 4, driver “means any person who drives a vehicle... or who is in actual physical control of the same”.¹¹⁵ This is a potential legal challenge for the introduction of driverless cars in New Zealand, as although we do not have any express legislation requiring a motor vehicle to have a driver, our international obligations require consideration.

B New Zealand’s current approach to driverless technology

Both the NZTA and Ministry of Transport have already considered the legality of driverless cars in New Zealand and how such technology would fit into our current legal system. Driverless vehicles are seen as an integral part of the future of intelligent transport. The NZTA, the Ministry of Transport and the Government more broadly have all released

¹¹⁰ Land Transport Act 1998, ss 11-12.

¹¹¹ Anderson and others, above n 6, at 3.

¹¹² Land Transport (Road User) Rule 2004, cl 7.3A.

¹¹³ Convention on Road Traffic 125 UNTS 3 (opened for signature 19 September 1949, entered into force 26 March 1952), art 8(1).

¹¹⁴ Convention on Road Traffic, above n 113, at art 8(5).

¹¹⁵ Convention on Road Traffic, above n 113, at art 4.

reports and documents relating to the possibility of autonomous vehicles in New Zealand, which give insight into New Zealand's current stance on the issue and how these public bodies see the law requiring reform to meet the needs of this emerging technology.

In the *Intelligent Transport Systems Technology Action Plan 2014-18*, the Ministry of Transport stated their overall objective for an intelligent transport system is:¹¹⁶

an effective, efficient, safe, secure, accessible and resilient transport system that supports growth of our country's economy in order to deliver greater prosperity, security and opportunities for all New Zealanders.

The Ministry of Transport has considered the legal implications of driverless and connected vehicles in New Zealand, realising that they will present a range of new legal issues. Currently, the Ministry has been primarily focused on the possibility of testing in New Zealand:¹¹⁷

There are no obvious legal barriers to the deployment of autonomous vehicles for testing in New Zealand. Unlike some countries, New Zealand law has no explicit requirement for a driver to be present... The Ministry considers that, between the Police's general powers to ensure public safety, and the specific powers of the New Zealand Transport Agency to place conditions on the operation of vehicles (when the vehicles need permits to operate on our roads), there are sufficient controls in New Zealand to ensure the safety of testing of autonomous vehicles on public roads.

The Ministry has recognised the specific legal issue regarding liability in the event of an accident or offence.¹¹⁸ Similarly, in the Chartered Accountants' *Disruptive Technology* report, a survey of New Zealanders demonstrated dissension as to who should be held liable in the event of a crash;¹¹⁹ such issues would need to be ironed out before driverless cars be sold here.

¹¹⁶ Ministry of Transport *Intelligent Transport Systems Technology Action Plan 2014-2018: Transport in the digital age*, above n 49, at 5.

¹¹⁷ Ministry of Transport "Autonomous including driverless vehicles" (7 March 2016) <<http://www.transport.govt.nz/ourwork/technology/specific-transport-technologies/road-vehicle/autonomous-vehicles/>>.

¹¹⁸ Ministry of Transport "Autonomous including driverless vehicles", above n 117.

¹¹⁹ Chartered Accountants Australia New Zealand and New Zealand Institute of Economic Research, above n 58, at 34.

In the *Intelligent Transport Systems Technology Action Plan 2014-18*, it was stated that the government is currently reviewing key pieces of transport legislation, such as the Land Transport Act 1998 and the Civil Aviation Act 1990,¹²⁰ to determine whether these could be ‘future-proofed’ for likely intelligent transport system developments such as driverless cars.¹²¹ However, the Ministry of Transport acknowledged the difficulty of legislating preemptively:¹²²

It is not always possible, however, to anticipate future needs. It is therefore important that the government is flexible and able to respond quickly to ensure ITS technologies which offer significant benefits are able to be put in place as soon as possible.

To overcome these difficulties with legislating for emerging technologies, the Ministry is revising the current transport rule development process to speed up the ability to make rules.¹²³ The Ministry of Transport aimed to scan all transport legislation to identify unnecessary barriers to ITS technology deployment in New Zealand, and review legislation in light of the increasing introduction of autonomous vehicles, by 2015.¹²⁴ It proposed the creation of a specific rule to manage the testing of such vehicles.¹²⁵

Privacy issues of driverless technology have not explicitly been addressed by the Privacy Commissioner to date. However, a 1998 Report by the then-Privacy Commissioner Bruce Slane identified privacy issues relating to road reform and the recording of drivers’ details.¹²⁶ Slane noted that the “establishment of tracking technology for all motor vehicles in New Zealand would, if unconstrained by law or policy, provide the infrastructure for a massive slide towards a surveillance state”.¹²⁷ He recommended placing a statutory bar

¹²⁰ Civil Aviation Act 1990.

¹²¹ Ministry of Transport *Intelligent Transport Systems Technology Action Plan 2014-2018: Transport in the digital age*, above n 49, at 11.

¹²² Ministry of Transport *Intelligent Transport Systems Technology Action Plan 2014-2018: Transport in the digital age*, above n 49, at 11.

¹²³ Ministry of Transport *Intelligent Transport Systems Technology Action Plan 2014-2018: Transport in the digital age*, above n 49, at 11.

¹²⁴ Ministry of Transport *Intelligent Transport Systems Technology Action Plan 2014-2018: Transport in the digital age*, above n 49, at 11.

¹²⁵ Ministry of Transport *Intelligent Transport Systems Technology Action Plan 2014-2018: Transport in the digital age*, above n 49, at 25.

¹²⁶ B H Slane “Road Reform and Privacy: Which Way Forward?” (2 March 1998) Privacy Commissioner <<https://www.privacy.org.nz/news-and-publications/reports-to-parliament-and-government/road-reform-and-privacy-which-way-forward/>>.

¹²⁷ B H Slane, above n 126, at 1.4.

upon use or disclosure of personal information for purposes unrelated to the road pricing system.¹²⁸ While this was not specifically related to driverless vehicles, it demonstrates an awareness of privacy issues regarding the recording of driver information, which would be possible through autonomous vehicles.

During the research and writing of this paper, the Ministry of Transport released a report in August 2016 titled *Regulation 2025: Emerging Insights*.¹²⁹ The paper focused on the introduction of new transport technologies, such as driverless cars, and wished to determine the best regulatory approach for such technologies. The key question the report asked was whether the current regulatory system could simply be adapted, or whether a new system of regulation was necessary to respond to the future transportation.¹³⁰

The report ultimately concluded that the “current regulatory framework could be adjusted to deal with the emerging transport technologies”.¹³¹ It recommended a future path of ensuring an open regulatory system to allow for the development and deployment of new transport technologies; relying on international standards, supplemented where there are gaps by the development of a new regulatory system; and having government create an integrated intelligent transport system.¹³²

In this analysis, the report acknowledged that there were three potential methods to respond to the issues of new transport technologies: leave the legislation as it is and only add additional law if risks materialise, rely on international law to manage new risks, or introduce domestic legislation to manage these new risks.¹³³ These methods provide a good framework with which to analyse how the law should be reformed for the different stages of introduction of driverless cars.

C Driverless cars within the current law

The lack of requirement for a human driver to commit an offence under the Land Transport Act 1998 suggests that, in line with what Ministry of Transport believes, driverless cars will at least be able to be tested in New Zealand without need for legislative change. Our

¹²⁸ B H Slane, above n 126, at 3.7.

¹²⁹ Ministry of Transport *Regulation 2025: Emerging Insights*, above n 3.

¹³⁰ Ministry of Transport *Regulation 2025: Emerging Insights*, above n 3, at ii.

¹³¹ Ministry of Transport *Regulation 2025: Emerging Insights*, above n 3, at ii.

¹³² Ministry of Transport *Regulation 2025: Emerging Insights*, above n 3, at 16.

¹³³ Ministry of Transport *Regulation 2025: Emerging Insights*, above n 3, at 11.

law is already structured in such a way that driverless testing would be possible, as there is no explicit requirement for a human driver to be present, and would only need to comply with our current legal requirements, such as s 7, to test legally.

The current legal framework allows for manufacturers to easily test their vehicles, and any law reform could potentially create barriers which would prevent testing within New Zealand and repel manufacturers. A lack of laws specifically regulating driverless cars at the time of testing also allows greater flexibility later on, as it will not create any requirements formulated before the risks relating to the technology become apparent. Testing can allow issues to emerge, and later law reform can address such concerns.

The introduction of driverless cars to the general public in New Zealand may require further consideration. Decisions will need to be made around issues such as liability, and reform will be required for current law which will be inapplicable or inconsistent with driverless technology. This public introduction will therefore require law reform of the current legislation surrounding transport, to meet the changing standards of driverless cars. As discussed in the *Regulation 2025* report, this may be achieved either through relying on international law, or by developing our own legislative scheme.

To gain a holistic understanding of the best process for reforming the law in such a way, a number of considerations will need to be made. This paper will now consider issues surrounding reforming the law for emerging technologies such as driverless cars, and attempts by other jurisdictions to reform the law in this area, to gain lessons regarding the best practice for reforming the law for autonomous vehicles. Such lessons will inform the process of law reform required for the public introduction of driverless cars to New Zealand.

V Reforming the law for emerging technologies

It is change, continuing change, inevitable change, that is the dominant factor in society today. No sensible decision can be made any longer without taking into account not only the world as it is, but the world as it will be....¹³⁴

¹³⁴ Isaac Asimov as cited in Gary E. Marchant “The Growing Gap Between Emerging Technologies and the Law” in Gary E. Marchant, Braden R. Allenby and Joseph R. Herkert (eds) *The Growing Gap Between Emerging Technologies and Legal-Ethical Oversight* (Springer, Dordrecht, 2011) at 19.

The rapid pace at which technology evolves creates immense difficulties in its proper regulation. Law reform can be required to adapt to such emerging technologies, but will often force to legislators to regulate pre-emptively against a background of uncertain risks. Technology may not yet be fully developed, and there may be a lack of knowledge as to its full effects. New technological innovation may end up making previous law obsolete.

As autonomous vehicles are introduced into the marketplace, the precise content of its legal regulation is likely to remain unclear at first, and will probably take at least one wrong turn before heading in the right direction.¹³⁵ A large degree of uncertainties will coalesce, challenging the ingenuity of legislators. There will be a tension between proper regulation and law reform, and enabling the rapid progress and adoption of technology, which will influence how the law is reformed.

This section of the paper will examine generally the difficulties in legislating proactively for emerging technologies, and the risks associated with doing so. This will include looking at examples of previous emerging technologies which we now take for granted, and the difficulties legislators at the time faced in ensuring their regulation. The section will conclude by examining possible solutions to these problems, which may allow a stronger law reform process for emerging technologies. An understanding of such issues and solutions, and how they may both inhibit and aid the public introduction of driverless cars in New Zealand, will allow for greater comprehension of the best path for law reform of this new technology.

A Issues with legislating for emerging technologies

Against a background of uncertain risks and constantly evolving innovation and capability, a myriad of issues come to the fore as legislators attempt to reform the law for emerging technologies. Such technologies often provide unproven risks, and legislators may appear to be proceeding blindly.

¹³⁵ Kyle Graham “Of Frightened Horses and Autonomous Vehicles: Tort Law and its Assimilation of Innovations” (2012) 52 Santa Clara L. Rev. 1241 at 1241-1242.

1 *The pacing problem*

Braithwaite stated that “by design, law aims for stability whereas science aims at growth and transformation by revolutionary paradigm shifts”.¹³⁶ While the law does at least aim for incremental change, these two competing ideals clash as legislators attempt to reform the law for emerging technology. There is an inherent difficulty with the speed with which technology evolves and shifts, forcing the legal response to feel outpaced as laws enacted become outdated and constantly rush to keep up with the next wave of technological innovation. This is the “pacing problem”.¹³⁷

Law reform is constantly outpaced by technology, as regulation often addresses a snapshot that is quickly outdated by constant innovation.¹³⁸ A dissymmetry exists “between law and newly arising facts because the law has not anticipated these new facts and attempts to govern them with an antiquated grasp of their meaning”.¹³⁹ Gordon Moore, a past president of Intel, famously predicted in 1965 that the transistor count on microprocessors would grow exponentially, doubling every two years.¹⁴⁰ ‘Moore’s Law’ is therefore a demonstration of the exponential rate at which technology develops, providing difficulties for the law to keep pace. Rejeski used the Red Queen in Lewis Carroll’s *Alice through the Looking Glass* to demonstrate this problem, who says to Alice: “Now, here, you see, it takes all the running you can do to keep in the same place”.¹⁴¹ The government is left in a catch-22 situation: speed up and risk ill-considered actions and poorly conceived policies; or become irrelevant and incapable of regulating technological change.¹⁴²

The pacing problem exists in two capacities. Firstly, legal frameworks are generally based on static, rather than dynamic, views of society.¹⁴³ Legislation locks a legal position into a

¹³⁶ J. Braithwaite *Corporate Crime in the Pharmaceutical Industry* (Routledge & Kegan, London, 1984) at 311 in Colin Gavaghan “A whole new... you? ‘Personal identity’, emerging technologies and the law” (2010) 3 *Identity in the Information Society* 423 at 424.

¹³⁷ Andrew Askland “Introduction: Why Law and Ethics Need to Keep Pace with Emerging Technologies” in Gary E. Marchant, Braden R. Allenby and Joseph R. Herkert (eds) *The Growing Gap Between Emerging Technologies and Legal-Ethical Oversight* (Springer, Dordrecht, 2011) at xx.

¹³⁸ Askland, above n 137, at xiii.

¹³⁹ Askland, above n 137, at xix.

¹⁴⁰ Peterson, above n 8, at 1389.

¹⁴¹ David Rejeski “Public Policy on the Technological Frontier” in Gary E. Marchant, Braden R. Allenby and Joseph R. Herkert (eds) *The Growing Gap Between Emerging Technologies and Legal-Ethical Oversight* (Springer, Dordrecht, 2011) at 19.

¹⁴² Rejeski, above n 141, at 48.

¹⁴³ Marchant “The Growing Gap Between Emerging Technologies and the Law”, above n 134, at 23.

certain time, and judicial case law, while adaptable, is based on a system of precedent to provide predictability.

Secondly, legal institutions are slow in their capacity to adjust to technological change.¹⁴⁴ Regulations are quickly outdated and cannot be revised in a timely fashion,¹⁴⁵ as the procedure for Parliament to pass legislation is a lengthy one. Exacerbating this issue is the slow pace of the judicial system, which prevents the ability for judges to interpret existing law's application to changing technology; in *United States v. Microsoft*, the D.C. Circuit Court of Appeals noted the “enormous practical difficulties” of the legal system's slow response to rapidly evolving technology.¹⁴⁶

The pacing problem may create particular difficulties for law reform for driverless cars, as the technology is only new and is likely to develop quickly to respond to any initial difficulties and problems. The law will have to do its best to keep up.

An example of the pacing problem in relation to an emerging technology is the advent of railroads in the United States. Railroads built a new world, removing isolation and opening new frontiers.¹⁴⁷ But the *American Railroad Journal* in 1852 observed that the “introduction of railroads has been so recent, that legislation has by no means kept pace with their development, nor with the necessity of providing for the public safety”.¹⁴⁸ The technology was so new and revolutionary that the law was unable to respond and keep pace. Eventually, the principles relating to new tortious fact patterns litigated evolved with time, as judges began to understand the risks of the railroad.¹⁴⁹

¹⁴⁴ Marchant “The Growing Gap Between Emerging Technologies and the Law”, above n 134, at 23.

¹⁴⁵ Lyn M. Gaudet and Gary E. Marchant “Administrative Law Tools for More Adaptive and Responsive Regulation” in Gary E. Marchant, Braden R. Allenby and Joseph R. Herkert (eds) *The Growing Gap Between Emerging Technologies and Legal-Ethical Oversight* (Springer, Dordrecht, 2011) at 167.

¹⁴⁶ *United States v. Microsoft Corp.* 2001. 253 F.3d 34. (D.C. Cir.) at 49.

¹⁴⁷ Braden R. Allenby “Governance and Technology Systems: The Challenge of Emerging Technologies” in Gary E. Marchant, Braden R. Allenby and Joseph R. Herkert (eds) *The Growing Gap Between Emerging Technologies and Legal-Ethical Oversight* (Springer, Dordrecht, 2011) at 5.

¹⁴⁸ Glancy and others, above n 11, at 6.

¹⁴⁹ Glancy and others, above n 11, at 6.

2 *The scope of legislation*

When legislating for emerging technologies, issues arise as to the scope of the legislation, which can either be too narrow or too broad. By acting pre-emptively, the rules formulated may be a “poor fit” for the technologies that actually appear.¹⁵⁰

Laws that are constructed too narrowly may focus on technology that quickly outdates, and inappropriately “locks in” on this stage of inferior technology.¹⁵¹ Specific and predictable rules can often become overly rigid and narrow,¹⁵² often to the point where they become obsolete and inapplicable once the technology unquestionably improves. It has been suggested that such rigidity in early stages of development of driverless vehicles would not be advisable, and rather it is wiser to leave options and opportunities for further development open.¹⁵³

Sui generis laws are an example of such narrow legislative constructions. Sui generis laws treat a particular entity, activity or relationship to its own narrowly crafted legal regime.¹⁵⁴ A sui generis law can be constructed to apply specifically to a special form or stage of technological advancement. While specificity of laws is desirable, sui generis laws can create various difficulties. Their specificity may lead to a statute which appears incomplete, with gaps and uncertainties that would be avoided by using a more generalised regime.¹⁵⁵ Sui generis rules also assume a particular state of technology,¹⁵⁶ which means that a law can be outpaced by technology and quickly become obsolete as the technology in question is outdated and replaced by a newer model.

A New Zealand example of narrow legislation can be found in *Avowal Administrative Attorneys v District Court at North Shore*.¹⁵⁷ In this case, a Mr Petroulias was a former senior officer of the Australian Tax Office, but was believed to have been involved in

¹⁵⁰ Gavaghan, above n 136, at 423-424.

¹⁵¹ Marchant “The Growing Gap Between Emerging Technologies and the Law”, above n 134, at 27.

¹⁵² Gavaghan, above n 136, at 424.

¹⁵³ Glancy and others, above n 11, at 74.

¹⁵⁴ Lyria Bennett Moses “Sui Generis Rules” in Gary E. Marchant, Braden R. Allenby and Joseph R. Herkert (eds) *The Growing Gap Between Emerging Technologies and Legal-Ethical Oversight* (Springer, Dordrecht, 2011) at 78.

¹⁵⁵ Moses, above n 154, at 83.

¹⁵⁶ Moses, above n 154, at 86.

¹⁵⁷ *Avowal Administrative Attorneys Ltd v The District Court at North Shore* HC Auckland CIV 2006-404-007264, 22 December 2008.

promoting tax schemes which affected the tax bases of both Australia and New Zealand. The IRD sought access warrants to his premises under the Tax Administration Act 1994, s 16. Computer hard drives were searched, and information was accessed. An issue arose, however, as the s 16 power only referred to “books or documents”, which did not include computer hard drives. The District Court initially held that the law did not permit removal of a computer.¹⁵⁸

On appeal, the High Court discussed the phrase “book and document”. It found that, while the definition did not include computer hard drives, it did include “computer reels”:¹⁵⁹

It seems that the reference to “computer reels” in the reference to “book and document” under the Tax Administration Act 1994 has simply been lifted from the earlier provision in the Inland Revenue Department Act 1974 without any attempt to update it or to take into account that computer technology had evolved considerably over that 20 year period.

The Court found that the definition should be read to include ‘hard drives’. This reasoning was agreed with by the Court of Appeal.¹⁶⁰ The case demonstrates the issue with narrow legislation: the definition was so narrow, due to its early formation, that it may have prevented computers being covered under the Act – a ludicrous result, seeing as computer hard drives store a large amount of tax information currently. The Tax Administration Act now defines ‘document’ as “a thing that is used to hold, in or on the thing and in any form, items of information”,¹⁶¹ which is far more broad and encompassing.

Conversely, a law may be formulated that is too broad and general. The proper function of the law generally depends on its broad applicability.¹⁶² However, this broadness when legislating for technologies can have multiple unintended consequences.

Broad legislation may be too vague and unpredictable, leaving uncertainty as to the legality of certain actions in advance.¹⁶³ How the law will apply in certain situations and to new technologies is left unclear and uncertain.

¹⁵⁸ *Avowal Administrative Attorneys*, above n 157, at [20].

¹⁵⁹ *Avowal Administrative Attorneys*, above n 157, at [28].

¹⁶⁰ *Avowal Administrative Attorneys Ltd v The District Court at North Shore* [2010] NZCA 183.

¹⁶¹ Tax Administration Act 1994, s 3.

¹⁶² Askland, above n 137, at xiv.

¹⁶³ Gavaghan, above n 136, at 424.

Broad legislation may be so generalised that it becomes difficult to apply the law to the specific technologies it was intended to. For example, new steamboat technology in the 1830s led to a proliferation of high-pressure boiler explosions.¹⁶⁴ The United States passed 1838 legislation to counter this,¹⁶⁵ but it proved ineffective due to the vague drafting; for example, it did not impose any specific design requirements such as safety valves.¹⁶⁶

Legislation may also ultimately sweep more broadly than initially anticipated.¹⁶⁷ An example is early United States legislation regarding defamation claims against online service providers.¹⁶⁸ Section 230 of the Communications Decency Act of 1996 responded to judicial decisions holding an ISP as a ‘publisher’ for the purposes of defamation law, holding that no ISP would be the publisher of information created by another content provider.¹⁶⁹ While initially supposed to only protect the small number of bulletin boards in existence, the internet has increased exponentially in size and has meant that s 230 will routinely prevent tortious claims against website operators for content posted by third parties.¹⁷⁰

While it is likely that driverless car reform will be more specific than broad, such lessons in breadth may suggest to reformers to be wary of the impact of legislation and ensure careful drafting in order to have the desired effect rather than unpredicted outcomes.

3 Lack of knowledge

A major issue with legislating pre-emptively before technology has had a period with which to work out its issues is the lack of knowledge that legislators have when creating regulation for emerging technologies. Information regarding a new technology’s potential hazards is often quite limited,¹⁷¹ which can lead to law reform that doesn’t address the issues that the technology will present in the future. New technologies must be sufficiently

¹⁶⁴ Glancy and others, above n 11, at 4.

¹⁶⁵ An Act to Provide for the Better Security of the Lives of Passengers on Board of Vessels Propelled in Whole or in Part by Steam Ch 191, 5 Stat. 304 (1838).

¹⁶⁶ Glancy and others, above n 11, at 5.

¹⁶⁷ Glancy and others, above n 11, at 16.

¹⁶⁸ The Communications Decency Act of 1996, Pub L No 104-104, § 509, 110 Stat 133 (1996).

¹⁶⁹ Glancy and other, above n 11, at 15.

¹⁷⁰ Glancy and other, above n 11, at 15.

¹⁷¹ Graham, above n 135, at 1268.

understood before reforming the law around them, as a lack of knowledge may affect comprehension of their implications on safety.¹⁷²

Often the true risks of a new technology are not apparent until their widespread use. The introduction of automobiles, for example, led to the creation of a number of previously unimagined criminal offences, such as automobile theft, hit-and-runs, and driving while intoxicated.¹⁷³ Similarly, it is likely that the necessity for new offences relating to autonomous vehicles will only become apparent through their adoption and use by the general public.

The legislature's lack of comprehension of the technology can also lead to regulation which inhibits the industry. New Zealand's Telecommunications (Interception Capability and Security) Act 2013, for example, has been decried by commentators as not understanding the technology industry and requiring bureaucratic delay which inhibits fast reaction to changing situations.¹⁷⁴ Under the Act, telecommunications service network providers must now register with the GCSB and notify them if they make significant changes to their networks. This prevents rapid changing and creating of new network configurations, a process called Software Defined Networking and Network Functions Virtualisations (SDN/NFV). SDN/NFV is expected to become a necessary technology over the coming years, which will blossom into a billion-dollar industry. Normally, building new networks and changing them is a costly and tedious process; but SDN/NFV revolutionised the practice. Excitingly, New Zealand had been deployed as a SDN/NFV test zone for Google, a world-first project. But the bureaucratic requirements introduced under the Act led to Google's development being pulled from New Zealand. New Zealand missed out on the opportunity to be at the forefront of a revolutionary industry, and now we have missed our opportunity due to enacting the TISCA – a move which was warned against by submitters such as Microsoft and Google.¹⁷⁵ If legislators had been more educated on the consequences of such legislation and the technology it would inhibit, perhaps a different result may have been achieved and New Zealand would be the country earning billions in revenue with Google. This example reinforces the conclusion already drawn that the law should not be reformed for testing of autonomous vehicles, as it is possible that any

¹⁷² Askland, above n 137, at xv.

¹⁷³ Glancy and others, above n 11, at 11.

¹⁷⁴ Juha Saarinen "Juha Saarinen: The chilling effect of tech law" *The New Zealand Herald* (online ed, Auckland, 27 February 2015).

¹⁷⁵ Saarinen, above n 174.

additional legislative requirements may act to repel manufacturers from testing in New Zealand.

This lack of knowledge may be particularly pertinent in regard to the impact of driverless cars:¹⁷⁶

...with such a revolutionary product, enacting new laws would just be guessing. There is no way to anticipate how the vehicles will be used and what their function will be in the future.

Testing will hopefully iron out some of the uncertainties around driverless vehicles, however their widespread deployment will inevitably lead to unanticipated uses and consequences. Such things will be impossible to predict, and this lack of knowledge must be factored in when reforming the law for driverless technology.

4 Other potential issues

Various other issues surrounding legislating for emerging technologies also arise, although these are less drastic than the issues previously discussed.

Legislating pre-emptively for new technologies may have unforeseen long-term impacts on the development of the law relating to that technology, effecting future legislative development.¹⁷⁷ Laws enacted in an early stage of development can prove “stubbornly resistant to change”.¹⁷⁸ Such decisions can bind future decision-making, and force a legislator’s hand when reforming legislation to attempt to meet the ever-changing demands of evolving technology. This will be a major concern when legislating for driverless technology, where an area of such importance as transport will require constant development to adapt to changing circumstances and technologies. Criminal law is a good example of where future legislative development is limited by past reform decisions, as modifying crimes which have previously been enacted in a way that would “reduce the scope of an offense or lessen the attached punishment” would create an uproar from those already convicted under a previously harsher statute.¹⁷⁹

¹⁷⁶ Zohn, above n 15, at 480.

¹⁷⁷ Glancy and others, above n 11, at 16.

¹⁷⁸ Glancy and others, above n 11, at 44.

¹⁷⁹ Glancy and others, above n 11, at 44.

Legislative response to new technologies may at times come during a crisis, where there is significant media attention or public outcry that shocks the legislature into taking action.¹⁸⁰ Legislation can therefore be rushed – potentially under urgency – and not clearly thought through, compounding problems already discussed such as a lack of knowledge. Such legislation may only be revisited years down the track, creating a risk of outdated legislation that only remains in effect due to legislative inertia.¹⁸¹ This is unlikely to be an issue for driverless technology, which will probably be legislated for before its introduction, rather than due to a crisis such as a major crash or death.

Finally, legislative response to emerging technologies can lead to enforceability issues when inevitable legal action is brought in relation to the technology. The novel nature of emerging technologies can lead to courts focusing on similarities between the innovation and existing technology;¹⁸² it is likely that for autonomous vehicles, analogies will be drawn to existing human-driven cars due to a lack of judicial understanding. Such use of technological analogy may lead to existing rules which do not fit well with the new technology being applied.¹⁸³

B Possible solutions to such issues

While legislating pre-emptively for emerging technologies is wrought with issues, there are a number of possible solutions which could be used either alone or in combination to combat the problems. These solutions are likely to have varied levels of success if used in relation to driverless cars.

1 Waiting to reach a threshold before legislating

Instead of legislating before a new technology has entered the public consciousness, it may be preferable to wait until the technology has crossed an “impact threshold” before turning regulatory attention towards it.¹⁸⁴ This would require that the technology reached a particular standard of understanding, at which the law can be formulated with a greater comprehension of the risks and results of the technology, as opposed to legislating blindly before such risks become apparent. Legislators should develop an “earlier familiarity” with

¹⁸⁰ Marchant “The Growing Gap Between Emerging Technologies and the Law”, above n 134, at 23.

¹⁸¹ Marchant “The Growing Gap Between Emerging Technologies and the Law”, above n 134, at 23.

¹⁸² Graham, above n 135, at 1252.

¹⁸³ Glancy and others, above n 11, at 16.

¹⁸⁴ Askland, above n 137, at xv.

the technology, tracking its scientific development.¹⁸⁵ This would enable a greater understanding of the technology's issues and challenges that need to be legislated against, counteracting issues of lack of knowledge.

However, the likelihood of already under-resourced legislators maintaining constant review and understanding of all emerging technologies appears low. This solution may also be problematic, as it would require the technology to remain in use initially without any regulation. It is therefore not practical for driverless cars, where enforceable regulation will be required upon the technology's introduction to maintain public safety.

2 *Listing unknowns*

Initially, the issues plaguing a technology may not be immediately apparent. New offences brought about by the technology, such as the new driving offences after the introduction of the automobile, will remain unknown.

One way to counteract this lack of knowledge is to develop an evolving list of known unknowns.¹⁸⁶ This would be a list of all the areas surrounding the technology and its application which are currently unclear. Such a conscious appreciation of what is not currently known will force bureaucrats and legislators to continually turn their minds to such issues, provide a note for the future to refer back to the issues, and ensure that any regulations or legislation remains open-ended enough to encapsulate these unknowns once they become clear. This may be a positive step for driverless vehicles, but would require in-depth consultation with manufacturers and other experts as to the current known limits of the technology.

However, listing unknowns may be problematic, as it only encapsulates what legislators know that they do not know, not the unknown unknowns.

3 *Drafting in technology-neutral language*

The specificity of *sui generis* rules means they quickly outdate and are rendered obsolete once technology evolves. It may be preferable therefore to draft legislation in technology-neutral language,¹⁸⁷ which does not focus on a specific technology but is broader to allow

¹⁸⁵ Askland, above n 137, at xvi.

¹⁸⁶ Rejeski, above n 141, at 53.

¹⁸⁷ Moses, above n 154, at 89.

for applicability to future technologies also. Careful drafting can therefore enhance the ability of a law to withstand technological innovation.¹⁸⁸ This would work to counteract the pacing problem.

There are issues with such drafting however. As previously discussed, legislation that is too broad in its scope can be difficult to apply to specific technologies. Technology-neutrality may impact on legislation's clarity and operational effectiveness.¹⁸⁹

Moses cites the example of traffic laws as an area where a technology-neutral approach would not be appropriate.¹⁹⁰ Traffic legislation distinguishes between road-users based on their transport technology used, such as pedestrians, cyclists and automobiles. To draft language which didn't specify such modes of transport, and rather attempted to be more general in language employed in an attempt to enable rules to apply to future modes of transport, the laws would lack clarity and may lead to unforeseen negative effects in the future. This example demonstrates that technology-neutral language would not be an appropriate approach when legislating for autonomous vehicles.

4 Principles-based regulation

Rather than legislation focusing on specific technology and offences, it may be preferable to apply more generalised legislation which focuses on the purposes and goals to be achieved. Principles-based regulation would focus on desired outcomes, rather than specific rules.¹⁹¹ Ethical innovation and competition in developing areas of technology would be encouraged, rather than inhibited, by legislation.¹⁹² It “provides the flexibility, speed and dexterity to deal with fast-moving and diverse regulatory situations” that exist in the emerging technologies sphere, which traditional rule-based regulation can fail to achieve.¹⁹³

Principles-based regulation would ensure a greater likelihood that the purposes behind the legislation would be achieved, rather than legislation becoming obsolete and irrelevant due

¹⁸⁸ Moses, above n 154, at 90.

¹⁸⁹ Moses, above n 154, at 90.

¹⁹⁰ Moses, above n 154, at 90.

¹⁹¹ Ruth B. Carter and Gary E. Marchant “Principles-Based Regulation and Emerging Technology” in Gary E. Marchant, Braden R. Allenby and Joseph R. Herkert (eds) *The Growing Gap Between Emerging Technologies and Legal-Ethical Oversight* (Springer, Dordrecht, 2011) at 158.

¹⁹² Carter and Marchant, above n 191, at 157.

¹⁹³ Carter and Marchant, above n 191, at 164.

to specific technicalities which are not always essential to the overall purpose behind the legislation.¹⁹⁴ Such an approach would also allow greater flexibility to enable the legislation to adapt to rapidly changing technology and circumstances.¹⁹⁵ The durability of regulation would increase its ability to respond to change,¹⁹⁶ and would work to address the pacing problem.

Such an approach would also be a useful interim measure, to fill the knowledge gap that exists whilst the technology is in its early phases of development and implementation.¹⁹⁷ For example, the European Union adopted a code of practice for nanotechnology researchers based on general principles in the early stages of development whilst evidence to support more formal regulations could be put in place.¹⁹⁸

There are drawbacks to principles-based regulation. There is an inherent level of uncertainty associated with applying general principles to different situations, rather than specific rules.¹⁹⁹ Innovators and users of technologies may be uncertain whether their actions remain within the reach of the law. If drafted poorly, principles-based regulation may in fact fail to capture all new technologies if they fall outside its scope. It would also need to be decided who in fact determines whether the technology has met the principles.

Principles-based regulation may be a better form of reform for the initial testing stages of driverless cars, creating a code of best practice as an interim measure while the technology is in development. Conversely, the uncertainty surrounding principles-based regulation is unlikely to be desirable for the public introduction of driverless technology, where clear regulation as to how driverless cars are expected to be used in New Zealand is necessary.

5 *Temporary legislation*

Another possible solution is the use of temporary legislation. Temporary legislation is that which will expire at a specified date, called the ‘sunset provision’, unless affirmative

¹⁹⁴ Carter and Marchant, above n 191, at 160.

¹⁹⁵ Carter and Marchant, above n 191, at 157 and 161.

¹⁹⁶ Daniel Kalderimis, Chris Nixon and Tim Smith “Certainty and Discretion in New Zealand Regulation” in Susy Frankel and John Yeabsley *Framing the Commons: Cross-Cutting Issues in Regulation* (Victoria University Press, Wellington, 2014).

¹⁹⁷ Carter and Marchant, above n 191, at 165.

¹⁹⁸ Carter and Marchant, above n 191, at 165.

¹⁹⁹ Carter and Marchant, above n 191, at 162.

legislative action is taken prior to this date.²⁰⁰ This forces the legislature to revisit the issue, and to make any necessary revisions required,²⁰¹ taking into account new knowledge and developments.

Temporary legislation allows for greater flexibility of legislation, in its ability to adapt to changing circumstances. This provides a good counter for uncertainty surrounding emerging technologies,²⁰² and would work to mitigate the pacing problem and any initial lack of knowledge. One example of such legislation is the Video Camera Surveillance (Temporary Measures) Act 2011, which only applied to the use of covert camera surveillance as part of a search within the six months after the Act was passed.²⁰³

However, the central issue with temporary legislation is apparent: constantly revisiting and revising issues so soon after they are first addressed would take up a large amount of Parliamentary time, which is unlikely to be desirable for an already time-stretched legislature. Therefore, while it might in theory be a good idea for Parliament to constantly reconsider transport laws surrounding driverless cars as the technology develops, it is a very impractical and thus undesirable solution.

C Conclusion

The issues with legislating pre-emptively for emerging technologies generally are relevant in legislating for driverless cars. The pacing problem, the scope of legislation, and a lack of knowledge are all significant issues that will need to be addressed when reforming the law for autonomous vehicles.

However, most potential solutions to such issues have their drawbacks, and few are likely to be beneficial when legislating for driverless cars. Principles-based regulation may be useful in creating a code of conduct for testing regulation, and listing unknowns may provide some dividends. More creative legislative solutions may need to be posed by those with superior law reform capabilities.

While viewing these issues with reforming the law pre-emptively for emerging technologies in the abstract does have its uses, it may be easier to observe how other

²⁰⁰ Gaudet and Marchant, above n 145, at 178.

²⁰¹ Gaudet and Marchant, above n 145, at 178.

²⁰² Gaudet and Marchant, above n 145, at 178.

²⁰³ Video Camera Surveillance (Temporary Measures) Act 2011, s 5.

legislatures overseas have tackled similar issues in regards to driverless cars to gain a greater understanding of how to best approach the issue in New Zealand.

VI Overseas jurisdictions

Various overseas jurisdictions have already passed legislation reforming the law to accommodate autonomous vehicles. This section will examine such legislation, and draw lessons that can be learnt from other jurisdiction's law reform efforts to apply to New Zealand in reforming the law for the public introduction of driverless cars.

A United States

Currently the United States is the leader in passing legislation to accommodate autonomous technology. The NHTSA presume that operating autonomous vehicles on public roads is illegal in absence of specific laws authorising their use,²⁰⁴ however, Bryant Walker Smith suggests that their use on public roads and highways is legal, due to not explicitly being prohibited.²⁰⁵

The NHTSA has committed to creating a model state policy guidance, outlining best practice for addressing issues arising due to autonomous vehicles.²⁰⁶ Recently, the US Department of Transportation released guidelines for self-driving cars.²⁰⁷ This includes vehicle performance guidance for the safe design and deployment for automated vehicles, a Model State Policy to establish a national framework of laws and policy to govern automated vehicles, and both current and new regulatory tools that would be appropriate for regulating driverless cars.²⁰⁸ This demonstrates a long-term commitment from the government to ensure the safe introduction of the technology across the United States as a whole.

²⁰⁴ Kohler and Colbert-Taylor, above n 9, at 110.

²⁰⁵ Smith, above n 100, at 516.

²⁰⁶ Crane, Logue and Pitz, above n 18, at 35.

²⁰⁷ Sam Thielman "US to release driverless car guidelines and safety assessment" *The Guardian* (online ed, New York, 20 September 2016).

²⁰⁸ United States Department of Transportation *Federal Automated Vehicles Policy* (September 2016).

Most states that have passed legislation have focused on testing regulation, as opposed to general use, due to the existing unknown risks associated with the technology.²⁰⁹ This can lead to the express prohibition of the use of autonomous vehicles beyond the specified use of testing, such as in the Michigan law.²¹⁰ Nevada was the first State to authorise autonomous vehicles use on public roads in June 2011,²¹¹ with Florida enacting similar legislation in April 2012.²¹² Other States which have legislated for autonomous vehicles include California and Michigan, as has the District of Columbia.²¹³

Perhaps more interesting, however, is the legislation which has failed to pass. The legislation introduced in Arizona required a human to be seated in an autonomous vehicle, a requirement not present in other States' legislation.²¹⁴ Colorado's Bill was halted by considerable opposition from Google, who did not publicly outline its concerns.²¹⁵ In Oregon, legislators were concerned about the unforeseeable risks of autonomous vehicles, leading to the Bill failing to pass.²¹⁶ A 2013 New Hampshire Bill proposing an investigation of legislators into the use of autonomous vehicles in New Hampshire was declared 'Inexpedient to Legislate', effectively killing the Bill. New Jersey's legislation failed to clear committee, persuaded by comments from the Alliance of Automobile Manufacturers suggesting that any legislation would be premature, and state (as opposed to federal) regulations would create difficulties for the standardisation of technology in the wider market.²¹⁷

B Australia

South Australia passed the first Australian legislation aimed at introducing driverless cars, with the Motor Vehicles (Trials of Automotive Technologies) Amendment Act 2016 assented to in March 2016.²¹⁸ The Act is limited to allow trials of driverless technology to be undertaken within the state. Under s 134D, the Minister is able to authorise such trials.

²⁰⁹ Kohler and Colbert-Taylor, above n 9, at 120.

²¹⁰ Crane, Logue and Pitz, above n 18, at 24.

²¹¹ Kohler and Colbert-Taylor, above n 9, at 112.

²¹² Kohler and Colbert-Taylor, above n 9, at 114.

²¹³ Kohler and Colbert-Taylor, above n 9, at 115-117.

²¹⁴ Kohler and Colbert-Taylor, above n 9, at 118.

²¹⁵ Kohler and Colbert-Taylor, above n 9, at 118.

²¹⁶ Kohler and Colbert-Taylor, above n 9, at 119.

²¹⁷ Kohler and Colbert-Taylor, above n 9, at 119.

²¹⁸ Motor Vehicles (Trials of Automotive Technologies) Amendment Act 2016 (SA).

South Australia wanted to be ahead of the curve, and gain the benefit of an industry estimated to be worth \$90 billion by 2030.²¹⁹ The Act limits its scope to only address trials, having a “very strictly controlled process”.²²⁰ However, this was preferable, as it was seen as giving the government opportunity to work through the problems and unknowns associated with the new technology. The Parliament realised that this was in reality only a first step, and further legislation would be required for uses beyond testing:²²¹

Their widespread operation will pose complex legal challenges, especially to determine the liability in the event of any accident, and I think that is where the next step is.

But while the South Australian legislation passed, the equivalent in the Australian Capital Territory (ACT) did not. The Road Transport (Safety and Traffic Management) (Autonomous Vehicles Trials) Amendment Bill 2016 was negatived on 9 March 2016.²²² This Bill had a very similar legislative scope as the South Australian legislation, limiting the usage of autonomous vehicles to testing, which required approval from the Minister.

The limited scope was viewed as a fundamental problem by the ACT legislature, as future legislative amendments were necessary to allow autonomous vehicles to operate on ACT roads.²²³ It was believed that what was achieved by the Bill was already possible through ss 12-13 of the Road Transport (General) Act 1999, which permitted the Minister to grant an exemption for the trial of new technologies.²²⁴ The Bill was seen as a potential hindrance and impediment to the future adoption of autonomous technology.

It was suggested by Mr Alistair Coe, the Bill’s proposer and a member of the Opposition, that the reason the ACT government failed to support the legislation was not due to the Bill’s drafting, but because autonomous technology conflicted with the government’s goal of introducing a \$700 million light rail system to Canberra.²²⁵ He said that testing was needed before the “endpoint” of fully autonomous vehicles driving public passengers, and

²¹⁹ (22 March 2016) 53-2 SA Parliamentary Debates Legislative Council 3466 per Hon. D.G.E. Hood.

²²⁰ (22 March 2016) 53-2 SA Parliamentary Debates Legislative Council 3465 per Hon. D.W. Ridgway.

²²¹ (22 March 2016) 53-2 SA Parliamentary Debates Legislative Council 3465 per Hon. D.W. Ridgway.

²²² Road Transport (Safety and Traffic Management) (Autonomous Vehicles Trials) Amendment Bill 2016 (ACT).

²²³ (9 March 2016) ACT Parliamentary Debates Legislative Assembly 819 per Shane Rattenbury.

²²⁴ (9 March 2016) ACT Parliamentary Debates Legislative Assembly 820 per Shane Rattenbury.

²²⁵ (9 March 2016) ACT Parliamentary Debates Legislative Assembly 822 per Alistair Coe.

his legislation aimed to introduce testing measures to take a step towards the end goal.²²⁶ While it was limited, he noted that “legislation can easily be changed”.²²⁷

C United Kingdom

The United Kingdom’s Department for Transport stated in February 2015 that the current legal and regulatory framework was not a barrier to testing autonomous vehicles, as it was in other countries such as the United States.²²⁸ This meant that a “light-touch non-regulatory approach” which provided clarity for the industry in order to encourage further research and development, while maintaining safety, would be the most appropriate measure to allow entry of autonomous vehicles into the United Kingdom.²²⁹

In May 2016, a new Modern Transport Bill was announced in the Queen’s Speech.²³⁰ The Bill is intended to support the adoption of driverless technology, and adapt the legislative scheme to account for the legal challenges of the new technology. This is aimed at the introduction of autonomous vehicles generally, as opposed to just for testing.²³¹

D Conclusion

The experiences of these countries similar to New Zealand are able to provide lessons about the law reform process for driverless cars, and how to best avoid the same pitfalls that some fell into.

Different law reforms measures may be implemented for different stages of the development of the technology. This is demonstrated by the non-legislative measures for testing and then legislative reform for public introduction in the United Kingdom. The opinion of ACT – that legislative change was unnecessary for merely testing purposes, and would only be required later – also demonstrates this view different levels of technology

²²⁶ (9 March 2016) ACT Parliamentary Debates Legislative Assembly 823 per Alistair Coe.

²²⁷ (9 March 2016) ACT Parliamentary Debates Legislative Assembly 823 per Alistair Coe.

²²⁸ United Kingdom Department of Transport *The Pathway to Driverless Cars: A detailed review of regulations for automated vehicle technology* (February 2015) at 19.6-19.7.

²²⁹ United Kingdom Department of Transport, above n 228, at 19.9.

²³⁰ Alan Tovey “Bill announced in Queen’s Speech will help Britain become leader in driverless technology” *The Telegraph* (online ed, Great Britain, 18 May 2016).

²³¹ Mark Hemsted “The Modern Transport Bill” (20 May 2016) Clyde & Co <<http://www.clydeco.com/insight/article/the-modern-transport-bill>>.

introduction require different levels of law reform. This conclusion reinforces the position already reached by this paper that reforming the law for the testing of driverless cars is unnecessary, and law reform for their public introduction will become appropriate at a later stage.

When such reform is required for the introduction of driverless technology to the general public, any Bill must account for the current unknowns of emerging technologies. This can be seen in the South Australian and the majority of United States legislation, which focuses on testing primarily to allow governments to work through further issues later on. These unknown risks were the downfall of the Oregon and New Jersey legislation, so attempting to minimise fears surrounding them is essential. While the failed reform in ACT suggests that potentially such a limited reform may be viewed as a possible hindrance for future reform, the results of a broad approach may be too difficult to predict.

Accounting for unknowns aligns with earlier issues discussed in terms of legislating preemptively for emerging technologies. There is a lack of knowledge in this area, and the scope must not be too broad initially or else it will risk stunting future legislative development. Using some of the potential solutions proposed earlier to these issues may help to alleviate any potential concerns. For a small country like New Zealand however, working with other countries in regulating driverless technologies may be our best approach, as discussed below.

VII Importing regulatory standards

Beyond the lessons learnt from overseas attempts at reform, the development of the law relating to driverless vehicles in other countries may be important in our own law reform process. This is due to the ability to import regulatory standards based on overseas jurisdictions.

As a relatively small, geographically isolated nation, New Zealand does not often have resources to test all goods and services itself, in order to ensure quality and safety for the New Zealand market. Rather, New Zealand often relies on similar countries with which it has a close relationship – especially Australia, the United Kingdom, and the United States – from whom to derive regulatory standards. New Zealand will look to adopt and rely on the testing and regulatory standards of other nations, forgoing the creation of its own standards.

Due to our geographic isolation, New Zealand already relies on other countries from which to import regulatory standards in a wide variety of situations. For example, MedSafe, the New Zealand body responsible for importing medicines, has its own evaluation process for determining whether or not to import medicines into New Zealand. MedSafe does not test all medicines itself, but rather relies on the information given to it in the import application. The application is assessed against internationally established criteria; these include guidelines published by the European Medicines Agency, the US Food and Drug Administration, Health Canada and the International Conference on Harmonisation.²³² In a different industry, the Film and Video Labelling Body is responsible for classifying films with relevant rating labels.²³³ The Labelling Body cross-rates unrestricted films that have been rated as such in Australia or the United Kingdom, importing the equivalent rating label for New Zealand. It is only if a film has been restricted in Australia or the United Kingdom, or has not been classified there, that it will be submitted to the Office of Film and Literature Classification. More generally, Standards New Zealand is the national standards body, and will often develop solutions based on international standards.²³⁴

Like in these varied areas, international standards will inevitably be of major significance in the public introduction of driverless cars to New Zealand. Our country will be highly unlikely to produce its own driverless cars with our limited resources, and so will need to regulate what is imported into the country. Being unlikely to create our own standards for regulation due to a lack of knowledge, New Zealand will have to rely on other similar countries' standards in order to ensure our own quality control for safety and protection when driverless vehicles are introduced. Looking at current standards used for passenger vehicles, it is important to consider how such standards will be adopted in relation to autonomous technology.

A Current passenger vehicle standards

When importing a passenger vehicle into New Zealand currently, there are already a number of standards that the vehicle has to meet in order to be able to be imported. These

²³² "Safety Information – MedSafe's Evaluation and Approval Process" (4 July 2013) MedSafe <<http://www.medsafe.govt.nz/Consumers/Safety-of-Medicines/Medsafe-Evaluation-Process.asp>>.

²³³ "About us – The Film & Video Labelling Body" Film & Video Labelling Body <<http://www.fvlb.org.nz/nz/pages/about-us.html>>.

²³⁴ "International Engagement" (10 November 2015) Standards New Zealand <<https://www.standards.govt.nz/international-engagement/>>.

will vary depending on the date the vehicle was made on: the older the vehicle is, the less standards it generally has to meet.

The two most important standards are the frontal impact standard and the exhaust emissions standard.²³⁵ In addition to these, there are a number of other standards which may apply depending on the age of the vehicle. The standards are delegated legislation produced by the NZTA for the Minister of Transport.

However, within these New Zealand standards, the approved vehicle standards are imported from overseas jurisdictions. These all use overseas standards in order to determine what is acceptable to enter New Zealand. The approved exhaust emission standards recognised in New Zealand are those of Japan, the United States, Australia and Europe.²³⁶ Similarly, the approved frontal impact standards are those of Japan, the United States, Australia and Europe.²³⁷ In fact, the approved vehicle standards for various safety features of passenger vehicles currently come from Japan, the United States, Australia and Europe, including vehicle lighting,²³⁸ steering systems,²³⁹ seat and seat anchorages,²⁴⁰ and seatbelts and seatbelt anchorages.²⁴¹

B Considering standards for driverless cars?

In the *Intelligent Transport Systems Technology Action Plan 2014-18*, the Ministry of Transport identified fully autonomous vehicles as an intelligent transport system (ITS) which could soon revolutionise the concept of transport in New Zealand.²⁴² ITS technology was seen as a way of making transport safer, more efficient, more resilient and more sustainable.²⁴³

²³⁵ “Cars and passenger vehicles” New Zealand Transport Agency
<<https://www.nzta.govt.nz/vehicles/vehicle-types/cars-and-passenger-vehicles/#Class-MA>>.

²³⁶ Land Transport Rule: Vehicle Exhaust Emissions 2007, sch 1.

²³⁷ Land Transport Rule: Frontal Impact 2001, s 2.3(2).

²³⁸ Land Transport Rule: Vehicle Lighting 2004, sch 1.

²³⁹ Land Transport Rule: Steering Systems 2001, s 2.3(2).

²⁴⁰ Land Transport Rule: Seats and Seat Anchorages 2002, s 2.3(2).

²⁴¹ Land Transport Rule: Seatbelts and Seatbelt Anchorages 2002, schs 2-3.

²⁴² Ministry of Transport *Intelligent Transport Systems Technology Action Plan 2014-2018: Transport in the digital age*, above n 49, at 33.

²⁴³ Ministry of Transport *Intelligent Transport Systems Technology Action Plan 2014-2018: Transport in the digital age*, above n 49, at 4.

In order to fully embrace ITS technologies, the Government suggested that it needed to adopt standards to ensure the widest range of technologies could be imported and used in New Zealand.²⁴⁴ Noting that generally New Zealand looks to international bodies such as the International Organisation for Standardisation (ISO) to set standards, the Ministry of Transport worked with Standards New Zealand and ITS New Zealand to become part of ISO's ISO/TC 204 Intelligent Transport Systems.²⁴⁵ This Technical Committee is tasked with the scope of standardising “information, communication and control systems in the field of urban and rural surface transportation”, and is responsible for the overall system of infrastructure for ITS.²⁴⁶

This demonstrates New Zealand's already-developed awareness of the issues regarding ITS technologies such as driverless cars, and the requirements for the development of applicable standards. Such international standards will therefore be looked to in the future, once they have been fully developed.

The involvement with ISO suggests that New Zealand will look to embrace international standards for driverless technologies, rather than creating their own. This is expected due to New Zealand's lack of expertise in the area, and is in line with our current approach to passenger vehicles. It is likely that we will rely on the same countries as we already do with regard to overseas standards for regular vehicles: Japan, the United States, Australia and Europe. This paper believes that this is a very expedient approach, which will enable New Zealand to both keep our standards in line with our global neighbours whilst remaining at the forefront of safety and progress in terms of driverless technologies. As such, the need to import regulatory standards will therefore be a major element of the law reform for driverless cars at the stage of their public introduction.

VIII Recommended law reform process for driverless cars

This paper has concluded that at the testing stage, no law reform is required, due to our current laws already accommodating the possibility of testing and the need to attract

²⁴⁴ Ministry of Transport *Intelligent Transport Systems Technology Action Plan 2014-2018: Transport in the digital age*, above n 49, at 14.

²⁴⁵ Ministry of Transport *Intelligent Transport Systems Technology Action Plan 2014-2018: Transport in the digital age*, above n 49, at 14.

²⁴⁶ “ISO/TC 204 Intelligent transport systems” International Organisation for Standardisation <http://www.iso.org/iso/iso_technical_committee?commid=54706>.

manufacturers to New Zealand. However, the public introduction of driverless cars will require reform, which is likely to involve both a new legislative scheme and the adoption of international standards. The law reform process for driverless vehicles in New Zealand is not straightforward, and at this stage where potential risks of the technology remain unclear, it is difficult to predict the best approach for reform. However, using the information discussed previously, this paper submits the following potential law reform process as the best strategy currently available.

A The testing stage

New Zealand wishes to be at the forefront of this technological innovation, as a testbed for driverless car manufacturers. New Zealand is already recognised as ideal location for testing of new technologies, and the government has demonstrated its desire to be a testbed for autonomous vehicles. Our transport law would allow the testing of driverless vehicles, due to no explicit requirement under our transport legislation for a driver to be present in a vehicle. Our liability laws would also be beneficial for manufacturers, as they would not be exposed to personal injury liability during the testing phase due to ACC, nor products liability while the product is being tested.

It is recommended that no legislative reform is undertaken to accommodate testing within New Zealand. Our law is already structured in such a way that testing can happen, and driverless testing would only have to comply with our current legal requirements, such as the Land Transport Act 1998, s 7 requirement not to drive recklessly. The current situation allows for ease of entry for manufacturers to test, and any law reform could potentially create barriers which repel testing, similarly to what happened with the Telecommunications (Interception Capability and Security) Act 2013.

A lack of law reform at the time of testing also allows greater flexibility, as it will not create any requirements formulated before risks become apparent. Testing can allow risks to emerge, and later law reform can address these. This counteracts the issue in reforming the law for emerging technology of lack of knowledge; legislating too early can be seen as one reason new autonomous vehicle legislation failed in ACT, Oregon and New Jersey.

Potentially principles-based regulation may be created, to suggest a code of best practice for manufacturers testing in New Zealand.

B The public introduction stage

Once testing is complete and driverless vehicles are at a stage where they are ready for sale to the public, greater regulation will be required and therefore a process of law reform should be undertaken. This is comparable with the approach of the United Kingdom, who are introducing legislation for the widespread implementation of driverless technology, despite their law already allowing testing. Testing will hopefully have revealed any previously unknown risks, although it is likely that new risks will emerge as the technology is adopted by wider public use.

At this stage, legislation will need to be drafted to create clarity around any known risks. This will clarify the legal positions regarding issues such as the allocation of liability, privacy and cyberterrorism concerns. Products liability doctrines may need to be examined, with any legislation referring directly to applicable doctrines under the Consumer Guarantees Act 1993.

Such legislation must be wary of being too specific, or else the pacing problem could mean that the legislation quickly outdates or the scope of the legislation could be too narrow. To help prevent this result, the legislation should include a purposes section, which would outline the overall aims of the legislation, and requirements to interpret law in line with such purposes.

New Zealand should simultaneously look to overseas jurisdictions, and import regulatory standards created by those with greater resources such as the United States, Japan, Australia and Europe. These international standards should be used to monitor the quality of driverless vehicles being imported into New Zealand. Additionally, the standards set by the Technical Committee ISO/TC 204 Intelligent Transport Systems could be looked to and adopted.

However, it is important to remember that once the law is reformed, this will not be a finite end. The technology will give rise to new concerns and issues as the technology is more widely adopted. In addition, the technology will be constantly evolving, and the law will need to attempt to keep pace to ensure the safety of all New Zealanders. It is proposed that the NZTA and Ministry of Transport work together to monitor international technological and legislative developments regarding driverless cars, and attempt to ensure that legislation and regulation pre-empts any potential issues that arise.

IX Conclusion

The advent of driverless cars is likely to revolutionise transportation in our modern age. The technology will save lives and create a more efficient transport system, but will raise unique legal issues which will need to be addressed to ensure public safety and wide adoption of the technology.

This paper has divided the introduction of driverless cars into two stages: testing and the public introduction. Each stage may require different levels of law reform. The framework for these different levels of reform has been adopted from the *Regulation 2025* report, with the three options being leaving the law as it is, adopting international standards, or creating a new legislative scheme.

The testing stage is likely to require no new legislation, as the current legislative scheme is able to accommodate testing within New Zealand. New Zealand is an attractive testbed, due to our reputation with emerging technologies and our favourable liability regimes, and the government wishes to promote this to driverless car manufacturers as much as possible. Any new legislative schemes introduced may repel manufacturers, and as the current system is sufficient, it is preferable to leave it as is.

Upon public introduction, a more comprehensive scheme will be required to ensure the safety of New Zealanders and allow for a smooth transition to autonomous vehicles. This paper submits that a new legislative scheme addressing the key legal issues will be required, but the use of international standards to regulate technology imported into New Zealand is also desirable.

The road to reforming the law for emerging technologies is effectively a crystal ball gazing exercise. No-one can foresee what the future holds, or how a new technology will impact the world around it. It becomes important to remain flexible when determining how best to reform the law, and be open to constant changes as the technology develops and new issues come to the fore. Different stages of the technology's introduction may require different levels of reform. What worked for one new technology will almost certainly not work for another.

It is unlikely that the law reform approach suggested by this paper will be adopted, or even be feasible once new realities surrounding driverless car technology emerge. What is important is that a dialogue around the technology is created, with as many potential

solutions for reform posed as possible, and reformers demonstrate a desire to be flexible and change the law to best suit the changing times.

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