
Self driving cars in Australia. Are they ethical?

There was once a time when technology was more of a blessing than a curse. This began to change around 1990 when the latest round of globalisation began. The power of capitalism is racing ahead, and the power of technology is racing ever faster. Today, I introduce to you driverless cars. Driverless cars are fast becoming reality. Just as computers did, driverless cars will change the way we live. And like any other innovation, it would free up time for more creative thinking. In recent years, we have seen small improvements to our cars, making them more automated. GPS and Bluetooth features will play a big role while driving our cars as GPS's will navigate for us without us having to use a map, and Bluetooth allows us to go hands free to concentrate on driving.

So, is a fully autonomous car good or should we rethink our morals and stick to normal driving? Figure 1: Scenario for value shifts in the auto industry, 2015–2030 In the Australian market, Ford's Focus, Volkswagen's Golf and Tiguan and others (including Lexus and Toyota models) have the technology installed. High-end brands such as Mercedes-Benz and Google are exploring and harnessing the power of driverless cars. Therefore, Australia is at the centre of this technological revolution. There will be enormous disruption to established business models across multiple industries, both in Australia and globally. Australia offers the ideal market to test, produce and refine autonomous vehicles. Autonomous vehicles are already being tested on highways and roads, and commercial production has been flagged as three to five years away by most of the major car manufacturers. For example: 40% of Volvo's Drive Me project was expected to deliver 100 self-driving cars to customers by 2017. Google expects to have its self-driving cars delivered between 2017 and 2020 According to industry estimates, by 2020 the autonomous vehicle market will be worth US\$87 billion. (AUD\$118 Billion) By 2040 autonomous vehicles could represent 40% of all vehicles on the road.

It is clear to see that if driverless cars exceeded expectations, we would be in to see big profits and revenue made with all of the sales. This is a problem in Australia as Uber has now created an Autonomous: Map of Australia where driverless cars have been approved, trials have started/are beginning.

We can see that in most states, trials are underway at it is predicted (as stated before) that over 40% of cars in the road by 2040 will be driverless. A recent article 7 News stated that the NSW government has funded over 10 million dollars in the development and testing of more trials in the technology. Transport Minister Andrew Constance said the technology will "change the playing field" and provide new opportunities for personalised transport services. "The technology is here and we are going to make sure we are ready to embrace it," he said. New

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laws were introduced in 2017 to allow trials of connected and automated vehicles in NSW. The first trial under the legislation - a shuttle bus - has already begun at Sydney Olympic Park. Transport for NSW will administer the fund, which will condone \$2.5 million a year over four years. The use of technology and automated systems to assist drivers is not new. Anti-lock brakes have been commercially available since the 1970s. Electronic stability control systems, which help drivers to avoid crashes by automatically selecting which wheels to use for braking when a driver loses control of their car, became commercially available in the 1990s and are now mandatory in Australia for newly manufactured passenger vehicles. Developing self-driving cars externally means to replace a human, who today is performing the complex tasks of driving, with a computer system executing the same tasks. Figure 3 shows both variants and allows a comparison.

There is an important difference. While humans continuously learn, for example from their mistakes or misbehaviour, automotive software might be confined to slow updates. Approaches with self-adaptive software, such as machine learning approaches, which learns and reacts immediately, aim to overcome this constraint. Road signs for example, which are new to the self-driving car's software, present a risk as they can pass unnoticed/uninterpreted, while they could be understood by a human through context/interpretation. Also unexpected and dangerous situations, like an attack or threat near or even against the vehicle might not be correctly interpreted by a self-driving car compared to a human. They could also mean greater mobility for people who cannot obtain a licence to drive, such as the elderly, the disabled and children. The economic aspects might be seen as the highest priority. Using cheap equipment might lead to wrong decision-making and in a self-driving car, it would be impossible to interfere with the decisions made. Assuming that wrong decision may lead to a loss of human lives or property, having chosen a cheap component could therefore be ethically and morally unsuitable.

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