**Autonomous Vehicles**

**What Does It Do?**

Autonomous vehicles are better known as self-driving cars. They are vehicles which replace all or some of the human driving factor with electrical and mechanical devices (Faisal et al. 2019). Autonomous vehicles depend on multiple software, AI and different disciplinarians such as computer science, electrical engineering, and mechanical engineering to be designed and built (Singh & Saini 2021). Caldwell and Hendrickson (2020) state that every autonomous vehicle should be fitted with sensors, cameras and lidar to detect obstructions on the road and built-in navigation systems to remember lane geometry and road signs. Sensors and cameras not only detect obstructions, but they should also have the ability to build a picture to distinguish pedestrians, cyclists, other moving and stationary vehicles for a safer travel experience (Piper 2020). To combat changes in weather, temperature or any external changes, environmental sensors should be fitted to identify temperature and precipitation to adjust its systems accordingly to the driving conditions in real-time (Caldwell and Hendrickson 2020).

With multiple technological issues and research still going underway with building safe autonomous vehicles, it’s unclear when self-driving cars will be available to consumers and emerge as a norm. Although self-driving vehicles are not currently available for purchase in consumer markets, recent Tesla car models are all geared with self-driving capabilities. Tesla uses the Autopilot feature which uses cameras to detect objects, steer the car, brake automatically, and keep the car within road lanes, but constant engagement with the car is required to avoid fatal accidents (Metz & Boudette 2021).

There are currently on-going trials and experiments with autonomous vehicles, such as driverless shuttles for airports and campuses, ride-hailing services as well as delivery robots in different areas (Caldwell & Hendrickson 2020). UK based company Oxbotica has been trialling driverless taxis in the UK and Europe while China based company AutoX has already launched its driverless taxis in Shanghai, China and are expected to expand these services to other cities in the next couple of years (Cusack 2021).

Many companies promise autonomous vehicles will be available in the near future for the consumer market. However, there is more involved in autonomous vehicles than mechanical, engineering, and technological advancements. Raue et al. (2019) indicates, there are overall safety concerns and reliability issues with technology including unexpected occurrences such as hacking, personal data tracking and equipment failure. Questions involved in the decision-making processes of autonomous vehicles also continue to be researched and further studied. Metz and Boudette (2021) claim that autonomous vehicles should be subjected to further real-life data and training in its reactions and decision-making procedures to real-life obstacles and sudden occurrences before they should be available to the consumer market. Therefore, although currently there are vehicles with autonomous features available, it is unlikely that complete autonomous vehicles will be accessible in private homes in the near future.

**What is the likely impact?**

Autonomous vehicles are expected to have substantial impacts to road safety, time and efficiency, cost of travel, and in the manner of travel. Faisal et al. (2019) conveys autonomous vehicles will “facilitate dynamic ridesharing” which will “guarantee high traffic capacity and vehicle density and reduce traffic congestion”. Ridesharing will give people the option to share ownerships of cars which will be a financial alleviation due to the shared costs of maintenance, ownership, and other legal fees (Meyer et al. 2017). With companies offering driverless taxi services, there is a likelihood of more people without personal cars which will save expenses that is currently being used towards owning and maintaining a personal vehicle. In this way the number of cars on the road will be reduced, which will free up traffic congestion and parking spaces in urban areas which can be utilised for other operations (Faisal et al. 2019). However, driverless taxi services will result in decreased job prospects for taxi and ride-sharing drivers since autonomous vehicles are expected to provide better services and lower fees compared to traditional taxi services (Faisal et al. 2019).

Although many researchers expect traffic congestion to be reduced, Meyer et al. (2017) proposes another theory that there may be an increase in traffic since autonomous vehicles will open up travel for children, elderly, people with disabilities, and other user groups who currently do not hold a driver’s license. Faisal et al. (2017) justifies the reliability and comfort provided will assist in expansion of cities and towns, generating more work in the real estate and building industries. It is also predicted that more employees will consider long commutes since autonomous vehicles will allow multitasking on the road which validates the theory of urban sprawls. Singleton (2019) anticipates that “if travellers can make better use of their time in AVs, they may be willing to drive more, farther, and for a longer time”. Autonomous vehicles are expected to contribute to saving time with other features such parking and valet. Consumers will be able to use the time required to look for parking spots and walking from their car to their destination towards other tasks if autonomous vehicles can achieve that purpose instead (Faisal et al. 2019). Current valet drivers will see a reduction in work as it will be replaced by driverless cars taking on the role itself.

Other than time saving elements and heightened convenience, autonomous vehicles are predicted to create a safer driving environment. Caldwell and Hendrickson (2020) explain “since a high fraction of vehicle crashes are caused by driver errors, driverless vehicles have the potential for significantly improving roadway safety.” Autonomous vehicles equipped with multiple sensors, cameras and radars will be better at lane changes, lane keeping, queue assists and crash avoidance as elements such as tiredness and distractions will be mitigated. The need of these features in autonomous vehicles will see increased job prospects in the IT and engineering industry including artificial intelligence engineers, mechanical engineers, electronical engineers, data analysts, data scientists, intelligence designers and more.

**How will this affect you?**

Autonomous vehicles will have a definite impact on my daily life. Many times, I have chosen my work based on how long it takes to commute to work. However, if I could multitask while commuting to work in comfort and without the lack of space and noise that must be tolerated on public transports, I would be more willing to find work outside of the city and further from home. In contrast, autonomous vehicles would open options to friends and family who live further from the city to commute to the CBD with less hassle and without being stuck in traffic, dealing with rude or cranky drivers.

This new technology will also impact many of my friends and family who are elderly, are caring for elderly parents, have children and other members of the family who cannot drive. Since autonomous vehicles will offer driverless taxi services which are affordable, friends and family could use the time they use to drive family members in other ways needed. However, this will affect friends or people who are currently working as taxi drivers, since they will possibly lose their jobs when driverless taxis will start becoming more common and popular. On the other hand, friends who are working as engineers or in the IT sector, will increasingly find career development opportunities.

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