Autonomous vehicles

What does it do?

Autonomous vehicles, cars that can be driven without the need of a driver. Although it may seem that we are very close to see them used in widespread, that is not the case. Each year, many different companies like Mercedes, Nissan, and Toyota develop newer and more advanced autonomous vehicles. Although the cars are definitely getting much smarter, and the technologies are getting more advanced, it is still not widely available to the general populous. Currently, autonomous vehicles are simply not able to turn a profit, resulting in their inability to compete with the regular vehicle market..

There are few cities in the USA, such as Phoenix and Boston, which are currently running experiments for pick up and drop of of regular passengers in autonomous cars. Such test can be done currently in different parts of the world to collect more data. A large amount of data is needed for autonomous cars to safely roam the streets and such data takes quite some time to acquire. There is also the inherent risk of accidents when conducting such experiments. Such risk need to be taken into account when experimentation of autonomous vehicles are conducted as it may cause severe injuries or even death.

In the next few years, more test will be conducted in selected areas to collect more data. Autonomous vehicles will also be allowed only in specific areas, meaning they are unable to freely travel wherever they wish. Such vehicles would have constraints on them that limit their use in more densely populated areas such as populated urban areas and college campuses. The main reason for this is due to safety, but also there is a technology barrier which disallows the free, unrestricted travel of autonomous vehicles.

There are three main technologies that allow autonomous vehicles to work: sensors, connectivity, and software/control algorithms. Sensors required for autonomous driving are already widely used in more sophisticated safety features for vehicles such as, lane-keep assistance, blind-spot monitoring and forward collision warning. Other sensors required for the safe navigation of the autonomous vehicle include radar, ultrasonics, and camera provided input. Connectivity allows the autonomous vehicles to have access to data such as the latest traffic, surface conditions, construction, weather, maps, adjacent cars and road infrastructure This data is very important as it is used to monitor the surrounding operating environment of the car to avoid hazardous conditions or anticipate sudden breaks. Software/control algorithms are required to use the data obtained from both sensors and connectivity to make certain decisions such as braking, steering, speed, and route guidance. The algorithm is the most complex part of autonomous vehicles, the algorithm must be able to handle multiple simple and complex driving situations flawlessly. The software used to implement such algorithms must be robust and fault-tolerant as the slightest of errors can be fatal to either the passenger or pedestrians. The combination of the three technologies allow for autonomous vehicles to work. Although it is far from perfect, constant advancement in the technologies used in autonomous vehicles will allow it to compete with more mainstream vehicles.

What is the likely impact?

In the best case scenario, the full implementation of autonomous vehicles would reduce cost of transportation due to fierce competition, easier mobility for those who are elderly or disabled, transportation will be quicker as cars can communicate with each other, traffic lights would no longer be needed, air pollution and greenhouse gasses will be greatly reduced assuming almost all autonomous vehicles would be either electric or hybrid.

The first major change would be the decline in accidents. With autonomous vehicles, the human error aspect of driving is removed, thus the overall number of mistakes made would be lowered, resulting in lower accident rates. The way goods and people are transported would also change. Manual labour such as truck drivers or taxi drivers are no longer needed and would be replaced with the more efficient autonomous vehicles. Overall traffic would be improved due to how perfect the autonomous vehicles would operate.

Many people will be affected by this technological advancement. All transportation would be cheaper as labour cost involved would eliminated. Accidents would decline highly as automated cars can ferry passengers even if they are intoxicated or tired, miscommunications between drivers would be few as vehicles will be able to communicate amongst each other. Those in the oil industry would see a decline in oil demand, assuming most automated vehicles would be electric or hybrid.

Almost all occupations requiring driving would be obsolete. Taxi drivers would be replaced by autonomous cars that can ferry passengers around the clock without needing to rest. Same goes for truck or lorry drivers that can transport goods across the country only needing to stop to either refuel or recharge. If the technology is advanced enough it might even replace the jobs of those who pilot boats or planes. This would make the human use of GPS redundant as the data can be sent directly to the car instead.

How will this affect you?

Daily life overall will be much more efficient. Deliveries for online goods that I purchase would have a lowered delivery fees and would also arrive faster. Same goes with the cost of taking public transport as trams would also most likely be automated. With cheaper public transport, it might allow me to explore more of Victoria as I rarely leave the CBD. There might be more overnight transportation services as well which would be very suitable to a night owl like myself.

Autonomous vehicles will be very useful for my grandparents. As they get older, driving gets very tiring for them, however, they would still like to get around, meet up with friends and moving around as it makes them feel younger. Autonomous cars would overcome this issue allowing my grandparents an easy way to travel around. My parents who are both working are usually very busy and end up eating a fast food chain, passing by the drive through on the way home. With lower cost of transportation, food delivery would be a lot cheaper making it a more viable option for them to eat slightly healthier.

https://www.fi.edu/science-of-selfdriving-cars

https://www.theverge.com/2018/1/30/16950726/state-of-autonomous-car-self-driving-ces-detroit-2018

https://www.accessscience.com/content/potential-impacts-of-self-driving-cars/BR0512171