**What does it do? (600 words)** What is the state of the art of this new technology?

Autonomous vehicles drive and navigate themselves. Autonomous cars drive people to their destination on the best possible route accounting for current traffic and roadworks. Also, other than cars on the road, trucks can do the same with the freight they carry. Aerial drones can make personal, smaller scale deliveries, be it for food or mail. In essence, autonomous vehicles move things around without any direct human control. All decision making is done by the vehicle or the network the machine is part of. State of the art autonomous road vehicles avoid collisions with pedestrians and other road vehicles with greater success than their human counterparts. Autonomous vehicles do not suffer any of the human impairments such as tiredness or driving under the influence. State of the art vehicles have better and faster judgment than humans would in any given situation. Emergency services can also be taken to the area they are needed by autonomous vehicles. Freight, public transport, personal transport can all be replaced with autonomous vehicles.

**What can be done now?**

Autonomous vehicles are being used in automated warehouses to sort items into containers for shoppers who ordered them. This removes the need for human workers to do the same thing, who would only be much slower and make mistakes. This technology is much like a traditional shop but instead of human shoppers, the packing of goods is done by machines.

There are self-driving cars on the road now, but with people still behind the wheel in case of emergencies. This automation technology can also be used to make self-driving trucks. This will only work on the main roads, and not in the delivery dock of warehouses and shops, so human control is still necessary. This will significantly decrease drive fatigue, or could be used in conjunction with drivers to keep the truck moving even when the driver is sleeping.

Uber Eats is currently using aerial autonomous vehicles to transport food to people. This same technology can be used to deliver mail and packages instead of traditional postal services and couriers. Automating the delivery will also on the time it takes deliver packages, especially for short distance postage.

**What is likely to be able to do be done soon (say in the next 3 years)?**

Development of self-driving cars is being made aimed at decreasing the severity of collisions. Improvements on pedestrian detection and avoidance are being made, in the near future self-driving cars are likely to be better drivers than humans, and possibly even match the number of human drivers on the road. Packages to retrofit traditional cars can be made, lowering the cost of self-driving cars. Self-driving cars can also make road travel more accessible to disabled people who depend on mobility equipment, letting them be more self-sufficient.

The postal service could implement autonomous transport of packages and mail using existing technology. This will likely be a mixture of small autonomous aerial craft and self-driving vehicles. Some human interaction is still required to load and unload the packages to the person’s house, but the transportation can be done without any human interaction.

**What technological or other developments make this possible?**

Technologies that made autonomous road vehicles possible are cameras, network infrastructure, sensor technologies such as lidar and radar, AI and laser light radar. All of these work together for the vehicle to gather information on it’s surroundings and then process that information to travel without collisions. AI interprets the data these instruments gather. Network infrastructure lets these vehicles communicate to work together, further reducing collisions with other autonomous vehicles. This also allows for the vehicle to gather data on its surroundings such as speed limit and traffic lights. Sensors allow for greater situational awareness.

Technologies that make warehouse automated vehicles possible are AI to organise and manage all the vehicles to keep them working cohesively together and to automate the process. Automated guided vehicles are required to move the inventory around the warehouse – these follow a set path and have additional sensors to avoid manually controlled vehicles. Autonomous mobile robots are similar to Automated guided vehicles however they rely on sensors and have no set path to take. These vehicles use sensors and AI to understand their surroundings. Drones use the same technology as Autonomous Mobile Robots, and using GPS technology they can be used in long distance deliveries.

**What is the likely impact? (300 words)** What is the potential impact of this development? What is likely to change?

Which people will be most affected and how?

Will this create, replace or make redundant any current jobs or technologies?

The impact of this technology is mainly on the general public, as autonomous vehicles make transportation far more convenient. With more self-driving cars on the road, there will be significantly less crashes and fatalities will be lower. Autonomous vehicles are also more efficient drivers than humans, lowering the overall traffic on the road. This makes being on the road safer and more convenient. Public transportation could have a network of autonomous vehicles that operate much like taxis. In order to have vehicle sharing capabilities cities will need space and infrastructure to accommodate this. Passenger loading areas or on street parking is required to increase turnover. With vehicle sharing parking plans will be altered. With less cars in idle, there will be less need for parking spaces. This means more land for buildings, increasing population densities in cities. Most people (59% according to Transportation Research Procedia) who currently own cars for personal transport would rather have their own autonomous vehicle than just use one. Once there are a significant number of autonomous vehicles on the road this is likely to change as the cost of using one will be much lower than owning one. Less people will want to own an autonomous vehicle for personal transportation. With autonomous vehicles transporting goods, postage and freight hauling will take less time and cost less.

People with mobility, and people with conditions that disallow driving such as epileptics, issues are most effected by this technology. They will be less dependant on caregivers for transportation, allowing much greater freedom and self-sufficiency. The general public will also benefit form autonomous vehicles, as transportation will cost less. Fewer people will need to own a car, and therefore save money on maintaining one. Over long distances, the benefit of driverless cars is greater still. Less injuries and fatalities will occur on the road. Legislation will likely change to support autonomous vehicles once they are better drivers than the average human. The law will likely favour autonomous vehicles, lowering the cost of registration. Easier travel at a lower cost with greater safety lead to a population with greater time and money, stimulating the economy with more disposable income not spent on transportation.

This technology will very likely replace public transportation, taxis, Uber drivers and postal service drivers. The postal service will still have someone aboard the vehicle to handle loading and unloading of the packages. Public transportation is made redundant with this technology. Either busses will become autonomous vehicles, or there will be less demand on the public transport system as vehicle sharing is very likely.

**How will this affect you? (300 words)**

In your daily life, how will this affect you?

What will be different for you?

How might this affect members of your family or your friends?

On a day to day basis, getting to and from places become far more convenient. People will no longer need to pay attention to the road, and can relax or work while traveling instead. The interior of the autonomous vehicle could be redesigned to accommodate these activities. Personally, this would make traveling to see family that live hours away will become far more convenient. Public transportation does not connect close to either destination. Autonomous vehicles would allow for rest on the trip, will provide greater comfort and will be far safer.

Things that would be different for me when this technology is widespread are personal transportation and package delivery. Personally, I would use an autonomous vehicle over a traditional car. The convenience factor far outweighs the joys of driving and overall is far safer. Package delivery times would decrease and would make eCommerce and mCommerce much more accessible. Most of my shopping would be done this way. I would prefer not to go into shops when I could order things online. When autonomous vehicles are introduced to my workplace, then I would likely lose my job.

Some of my friends do not have a licence. These people will no longer require licences to have access to the convenience of the car. This allows them to have access to jobs that would ordinarily require the employee to have a licence. Those who do not have a licence will also be able to see their family more often. All inconvenient trips for these people will become accessible, and they will no long will have to walk to the limited public transportation network. All activities such as shopping and going to activities become far easier to accomplish.

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