Demarco Cooper

Ms. Brockmiller

Emerging Technology 301

February 8, 2020

Future Transportation Technology: Self-Driving Cars

A self-driving car, also called an autonomous vehicle (AV), is a computer-controlled vehicle that can detect its surroundings and navigate without directions or control from people. It is designed to perform the same transportation functions as a traditional car.

In California and Nevada, self-driving cars are being tested on public roads in preparation for mass production in the near future. Whether consumers adopt AVs depends on the tradeoff between their benefits and drawbacks.

Three technologies are required to convert a regular car into an autonomous one (Pullen 37):

1. Global positioning system (GPS) – A high-definition GPS recognizes details such as curbs, lane markers, and street signs.
2. Sensor system – This sophisticated system collects data about dynamic road conditions.
3. Response system – The third system takes action such as steering or braking based on information from the other two systems.

Working together, the three technologies combine the power of computers to process vast amounts of data with the human ability to adapt to a changing environment.

The main potential benefit of AVs is safety. Human error is currently the sole cause of 57 percent of traffic accidents and contributes to 90 percent of them (Green). The Centers for Disease Control reports more than 33,800 deaths from motor vehicles per year (Centers for Disease Control). If AV technology can decrease or eliminate human error, the incidence of traffic accidents would decline significantly, saving lives and preventing serious injury.

The gains in safety could change the role of vehicles in the contemporary world. People would become passengers rather than drivers, responsible only for choosing the destination and possibly the route of the trip and could use travel time for beneficial activities. The elderly and people with visual and other physical impairments would experience greater mobility and independence.

The third major advantage of using AVs is related to the concept of platooning, or grouping vehicles to increase road capacity, which reduces traffic congestion and fuel consumption (Fagnant). When the lead AV accelerates after braking, for example, so do the other vehicles in the platoon, clearing an intersection more quickly. “The idea behind platooning is that cars equipped with sensors react faster and more reliably than a human can and thus are able to drive closer together to increase traffic flow,” according to an article in *Science News* (Wu).

The substantial benefits of AVs must be compared to their drawbacks. The cost of the new technology would be more than $100,000, a prohibitive expense for most car owners (Fagnant 9). Concerns regarding security and privacy also need to be addressed. A computer that can operate a vehicle needs to store a lot of data, some of it personal, making the data a target for hackers. If hackers can gain access to an AV computer, they can slam on the brakes, jerk the steering wheel, or accelerate suddenly, harming the passengers and disrupting traffic.

No longer relegated to science fiction, AVs may soon be fit for public roadways, triggering a major change in global transportation. Whether this change is for the greater good depends on how those in the transportation industry and in government resolve the drawbacks of AVs and help all vehicle owners enjoy the benefits.

Works Cited

Centers for Disease Control. *FastStats*. 2019. Web. 5 February 2017.

Fagnant, Daniel and Kockelman, Kara. "Preparing for a Nation of Autonomous Vehicles." October 2013. *Eno Center for Transportation.* PDF document. 5 February 2020.

Green, Mark and Senders, John. *Human Error in Road Accidents*. 2013. Web. 3 February 2020.

Pullen, John Patrick. "Driverless Cars." *Time Magazine* 24 February 2015: 35-39. Print.

Wu, Karen. "Look Ma, No Hands!" *Science News* (1997): 162-175. Print.