

Thesis Project Portfolio

Development of an Autonomous Platooning Campus Vehicle System

(Technical Report)

**Engineers' Responsibility to Mitigate Negative Sociopolitical Effects of Autonomous
Vehicles**

(STS Research Paper)

An Undergraduate Thesis

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Sociotechnical Synthesis

The University of Virginia, is a beautiful school. However, the hills and long walking distances between class create significant challenges for students with temporary or permanent physical disabilities. In light of this issue, the development of platooning golf carts was introduced as a possible solution. The goal would be to create a system with adjustable capacity by increasing or decreasing the number of follower carts in the platoon. Golf carts would be able to reach classrooms that the bus system could not and would provide more convenient transportation without the set stops the buses use. To reach this goal, it was necessary to build a self-driving vehicle which followed a leader cart. In this process, low level autonomy was also achieved. All of this development for the system is described in the Technical Report. However, this process raised questions regarding the feasibility of a fully autonomous system.

As a result, the STS Research Paper explores potential issues with autonomous vehicles. Using the framework technopolitics, the paper explores negative changes that autonomous vehicles may bring. Autonomous vehicles, like any technology, will shift the sociopolitical characteristics of the world. Through knowledgeable scholars' papers and discussions with researchers surrounding this field, a deeper understanding of the effects of autonomous vehicles is presented. These issues are then analyzed in order to provide a design goal for engineers developing this technology.

Based on the understanding of self-driving vehicles and issues found throughout the technical project, the STS research paper is mainly a literature review meant to expand upon the problems that autonomous vehicles may create in order to discuss solutions. These issues are all considered through the technopolitics framework to provide tangible consequences, which

implementing the advanced autonomous technology that the technical project explored would have on society.