

Thesis Portfolio

Comparison of Connected Automated Vehicle to
Pedestrian Interaction Systems to Reduce Vehicle Waiting Times
(Technical Report)

Autonomous Vehicles and Pedestrians: A
Competition for the Future
(STS Research Paper)

An Undergraduate Thesis

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Bachelor of Science, School of Engineering

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Sociotechnical Synthesis

An issue that remains unfixed across the United States is the surge in pedestrian related injuries and fatalities over the past couple of years. Whether it is individuals on their way to work or parents walking their kids to school, pedestrians play an important role in society and it is important to keep them safe. As automobile technology becomes more and more advanced, specifically autonomous vehicle technology, the place in society for pedestrians is being threatened. This thesis analyzes the impact of autonomous vehicles and the importance of their relationship with pedestrians. The technical report takes a deep dive into how successful different detection technologies, ADAS and INSPEX within autonomous vehicles, will be at maintaining and/or bettering vehicular traffic flow while ensuring pedestrians are able to cross safely at an intersection. The University of Virginia team of engineers created a model of a standard city intersection in order to simulate the crossing of pedestrians and vehicles with the different types of detection systems. The team collected and analyzed data, after running the simulation, to look at how traffic flow was impacted by ADAS, Advanced Driver Assistance System which includes obstacle detection technology, and Integrated Smart Spatial Exploration System (INSPEX), which includes an A-B detection system. This study of the impact that AVs will have in society is the foundation for the socio-technical aspect of the thesis portfolio which studies the competition between AV promotor groups and pedestrians over their future role in society. The research analyzes the agendas and values of both sides in their competition to make society more beneficial for their groups. The goal of the research is to inform the audience of the two sides fighting for a future place in the way cities are constructed, better mobility and transportation access and how governments will play a role in helping them to achieve their agendas. These two sections of the thesis both share the characteristic of taking a look at the future relationship

between AVs and pedestrians and the importance of both in society. Many individuals are concerned about the safety of themselves in addition to their children and grandparents when AVs are introduced into society. Both sections are a response to the increases fatalities of pedestrians in todays society and the uncertainty of what impact AVs will play on that problem. One section is a detailed study of one aspect of AV technology that is worrisome to many individuals and the other is a broad overview of all the concerns that people share in addition to how the makers of the technology respond to those concerns in order to advance their own agenda.