Thesis Portfolio

Gravity Powered Light
(Technical Report)

Sustainable Transportation: A Sociotechnical Analysis
(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science
University of Virginia • Charlottesville, Virginia

In Fulfillment of the Requirements for the Degree
Bachelor of Science, School of Engineering

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1 Sociotechnical Synthesis

My STS research paper investigates traffic from a sociotechnical perspective. First, I dive into the historical decisions that have attributed to our highways' conditions today. I then research solutions from a pragmatic perspective, keeping in mind that you can't expect everyone to get on board with public transportation. The answers range from intelligent transportation systems (ITS), autonomous cars, new tolling methods, to societal change, and they're all packaged up into a framework that could one day lead to a sustainable transportation system.

While my STS topic is not related to my technical thesis, they both contribute to the overall goal of sustainability. The subject of my technical report is a Gravity Powered Light that I implemented with four others for the 2019-2020 school year. The target audience for the device is campers and outdoor enthusiasts. While rechargeable batteries are popular in flashlights, we wanted to create a system without batteries, which would eliminate the risk of cells left in the wilderness. The report first gives an introduction to the device; we discuss our design methods and goals. We then show a detailed engineering design of our product that goes over every part of the light. Lastly, there is a cost analysis section that goes over our budget, projected manufacturing cost, and projected sales price, under the assumption that we would have been able to create our final design.

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