Pedestrian and Bicycle Safety and Comfort Along Water Street

(Technical Report)

How Have Transportation Infrastructure Designs Discriminated Against Low-Income and Diverse Communities in the United States?

(STS Research Paper)

An Undergraduate Thesis Portfolio
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SocioTechnical Synthesis

The Water Street corridor in downtown Charlottesville has been identified as an area of interest by the Virginia Department of Transportation for the lack of safety it provides for pedestrians and bicyclists. In order to improve these conditions, my Capstone team has redesigned the corridor to include bicycle lanes, pedestrian lights, and other kinds of safety measures. A series of factors had to be considered when designing the new corridor since it will impact a variety of people, including drivers, bicyclists, and pedestrians, and how they interact with each other on a daily basis. A final design alternative was to be selected using user-testing data from a VR environment, however, this was not possible due to COVID-19. Therefore, the final recommended alternative was selected based off a Multi-Criteria Analysis and a white paper was written to describe how user-testing would have been analyzed. In relation to this Capstone project, my STS research paper investigates how transportation infrastructure designs have discriminated against low-income and diverse communities. The theories of technological politics, actor network, and discriminatory technologies have been applied to analyze these designs for discriminatory properties. The theory of technological politics was used to determine the political consequences of these designs while actor network theory was used to evaluate the reflection of human values onto nonhuman designs. On the other hand, the theory of discriminatory technologies was used as an evaluative framework to analyze the specific case studies in order to reveal their discriminatory characteristics. Two case studies were evaluated and compared for the purpose of this research. The first case study involves two communities that are separated by a highway in Baltimore that are clearly divided by race and economic status. The second case study involves my own personal investigation of the Water Street corridor that has been redesigned for my Capstone project. Through this research, I found that transportation infrastructure designs in fact can discriminate against low-income and diverse communities and that these communities face adverse consequences due to these discriminatory designs. This research paper and Capstone project deal with the safety and equality of all people in regards to transportation infrastructure, and are an indication of the much larger societal issues that are present in our nation today.