Thesis Project Portfolio

Pedestrian and Bicyclist Safety and Comfort on Water Street

(Technical Report)

Obstacles and Potential Improvements to the Experiences of Pedestrians and Bicyclists: A Comparison of Transportation Culture Between the United States and Europe

(STS Research Paper)

An Undergraduate Thesis

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In the US, many streets are designed with drivers in mind, and the needs of vulnerable roadway users, such as pedestrians and cyclists, are often not prioritized. As a result, the safety, comfort, and overall experiences of these users are frequently compromised. My technical project seeks to address these shortcomings through an analysis and redesign of Charlottesville's Water Street. As social and ethical considerations are crucial to keep in mind to understand the context of such infrastructure improvements, my STS research paper describes the need for national-level cultural changes as a means to improve the experiences of pedestrians and bicyclists.

In the technical portion of my thesis, my capstone team planned and evaluated alternative designs for Water Street in downtown Charlottesville, Virginia with the goal to improve safety and comfort for pedestrian and bicyclists using the corridor, while preserving driver throughput and on-street parking. Our final design, described in a plan set format, recommended keeping the existing sidewalks, narrowing the westbound shared travel lane (sharrow) for drivers and cyclists, and creating an eastbound bicycle lane with a striped buffer and protective barrier posts next to the eastbound vehicle lane. The final product also recommended improved pavement markings, signage, curb ramps, and the installation of rapid flashing beacons for pedestrian crossings.

Through my STS research, I concluded that, because of differences between transportation culture in the US and Europe, American cities seeking to improve to the experiences of pedestrians and cyclists must implement changes tailored to the country's history, values, and priorities, instead of looking to European cities for a standardized approach toward

making such improvements. Transportation stakeholders in the US should include increase their awareness and responsiveness toward the high rate of pedestrian and cyclist crashes, uphold the needs of vulnerable transportation users, communicate and follow roadway etiquette, and prioritize active mobility in transportation infrastructure development. While doing so, cities ought to recognize the societal and personal benefits of improved walking and cycling conditions, as exemplified by many locations in Europe.

As I completed my capstone project in conjunction with my STS research, I discovered the need to examine the problem of vulnerable roadway user experiences from two different, yet complementary, perspectives. Through redesigning Water St, I gained practical engineering and planning experience at a local level, while analyzing transportation cultural differences between the US and Europe allowed me to examine the problem more holistically, at a national level. When implemented comprehensively, roadway infrastructure improvements must be complemented by social and cultural considerations in order to best meet the needs of those who use them.

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