Autonomous Driving Simulator Final Report

(Technical Report)

The Competing Place of Public Transportation and Autonomous Vehicles in Traffic Mitigation in

the United States

(Sociotechnical Research Paper)

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by

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Preface

What are the implications and potential contributions of public transit systems and robotic vehicles in mitigating traffic congestion in the United States? These methods of transportation have both exhibited promise in addressing the traffic problem. By analyzing each of these potential systems, a plan to delegate infrastructure funding can be devised.

How can Autonomous Driving Simulators be used to test autonomous vehicles before they are deployed on the road? The department for this project is Mechanical Engineering and the technical advisor is Tomonari Furukawa. This is a capstone project for Mechanical Design in collaboration with Emma Dalkin, Brian Luong, and Marlee Reinhard. The number of autonomous vehicles (AVs) on the road has grown exponentially in recent years, and is expected to keep growing with an estimated 3.5 million on the road by 2025. This growth is not without traffic accidents, sparking questions about the safety of testing AVs on public roads. The objectives of this project are to meet the demand for safety testing of AVs in virtual environments, provide realistic and challenging traffic environments for AVs to navigate, and equip the virtual car with sensors to maximize its vehicle identification abilities. If successful, the project will produce a prototype of an AV testing simulator that can be used by AV designers to test their algorithms.

How are proponents and critics of autonomous vehicles competing to influence their part in efforts to relieve traffic congestion in the United States? As the integration of AVs into daily life becomes a reality in America, there is a growing need for extensive research and legislation. Proponents of AVs such as the Coalition for Future Mobility believe that they will bring greater road safety, independence for the elderly and disabled, and increase productivity during travel. Groups such as the Autonomous Vehicle Industry Association, a coalition of AV companies, cite

that 90% of accidents are caused by human error such as impaired and reckless driving, which would be eliminated by AVs. One major opponent group is the Safe Street Rebels of San Francisco who want to move away from dependence on cars and oppose AVs due to the predicted increase in vehicle use. The Human Driving Association is another group that opposes AVs, but unlike the Safe Street Rebels, who are against car dependence altogether, believe that driving is a personal freedom. These groups work to influence Americans in a variety of ways, each using methods that are unique to their group as well as their interests.