

Project Title: On the role of perceived safety concerns on public acceptance behavior of autonomous vehicles

Recipient/Grant (Contract) Number: Carnegie Mellon University, Grant #: 69A3552344811

Center Name: Safety21 National University Transportation Center for Promoting Safety

Research Priority: Promoting Safety

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PI Contact:

Project Partners:

- City of Edinburg

Research Project Funding: \$76,719.88

Project Start and End Date: 07-01-2023 to 06-30-2024

Project Description:

Despite the maturing road tests and limited commercial mobility services with autonomous vehicles (AVs), the existing behavioral research, surveys, and polls suggest that, to date, the public is largely reluctant or neutral to accept this emerging technology due to potential lurking failures and malfunctions in unexpected weather/road conditions and cyber-attacks. The persistence of this demand landscape for AVs, however, could curb the promising economic, societal, and environmental benefits of prevalent autonomous mobility. Proactive policy interventions are thus much needed early on to provide impetus for AV acceptance, which should be informed by an in-depth understanding of the AV acceptance behavior of the public in order to identify the determinants thereof and direct the policies towards appropriate population groups. In view of this, the main contribution of this proposed project is advancing this knowledge through a joint econometric modeling framework to unravel the impact on AV acceptance of individuals' perceived concern about AV safety, among other influential factors, while at the same time "endogenously" connecting the perceived safety concern to the individuals' characteristics and attitudinal profiles. Notably, the joint modeling framework can disentangle the "true" interdependencies between AV safety concern and AV acceptance from the effect of any unobserved factors that commonly influence both AV safety concern and AV acceptance behavior (i.e., endogeneity effects). Accommodating the endogeneity issue could help avoid inconsistent estimation results and in turn misleading policy recommendations. Moreover, since AV acceptance behavior is related to household vehicle decisions, the public latent preferences for vehicle attributes (e.g., vehicle cost, reliability, performance, and refueling) will also be accounted for. The proposed model will be estimated on an open dataset acquired from a stated preferences survey in the U.S.

Outputs:

The anticipated output of this research project includes a state-of-the-art econometric method implemented on an open stated preferences (SP) dataset.

Outcomes/Impacts:

The expected outcome of this research project is the capability enhancement in modeling the public acceptance behavior of the autonomous vehicle (AV) technology, which is a crucial input to directing proactive policy interventions towards appropriate population groups in order to promote the adoption of AVs. The anticipated impacts of this research project are 1) improved technology in informing policy decisions regarding whether and how the public would be concerned about the AV safety and its effect on the public acceptance of AVs; and 2) enlargement of the pool of trained transportation professionals at the nexus of transportation safety and travel behavior.