

Examining drivers' behaviors to connected and automated vehicles

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Principal Investigator(s):

Hany Hassan

Louisiana State University

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Louisiana State University

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\$ 75,279

Assessing the interaction between drivers and connected and automated vehicles

It is envisioned that Connected and Autonomous Vehicles (CAVs) are the future of transportation as they will assist in minimizing some inefficiencies of current transport systems. CAVs or driverless vehicles are currently being developed in both commercial and research projects across the world and are expected to be publicly available soon. CAVs are expected to provide more accessible mobility options for all road users, especially older adults', and people with disabilities. It might be also a safe mobility option during the period of pandemic (e.g., COVID 19). However, it is not clear how drivers of conventional vehicles would interact with other human driven vehicles and autonomous vehicles in such a mix traffic environment especially at complex traffic areas (e.g., merging, and diverging areas). Indeed, it is expected that a mixed traffic network (including both CAVs and human-driven vehicles) would impose additional challenges to drivers (especially to older road users), which are necessary to be studied and remedied. Not only does studying the actual drivers' behaviors to other CAVs affect the safety of all road users, but also plays a significant role in acceptance and propagation of CAVs. In this regard, little is known about the acceptance of CAVs among different socio-demographic groups of drivers. Therefore, it is imperative to study the aforesaid issues before CAVs being publicly available to facilitate paving the success road for the CAVs. It is expected that this study will provide valuable insights about the actual driving behaviors and challenges of drivers in the most critical driving conditions in a mixed traffic environment containing both CAVs and other human driven vehicles.

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Objectives

The main objectives of this project are to: Examine how drivers will interact with other human-driven vehicles and CAVs under different traffic/road/environmental conditions; Investigate behaviors of drivers and passengers of autonomous vehicles to different levels of CAVs (semi and fully levels of vehicular automation); and explore the changes in the willingness and preferences of road users toward CAVs before and after participating in the driving simulator experiments.

Problem Statement

Connected and Automated Vehicles (CAVs) technology, in which vehicles communicate with other vehicles (V2V), roadway infrastructure (V2I), and pedestrians (V2P) in real-time, has recently drawn an increasing attention from governments, vehicle manufacturers, and researchers. CAVs are equipped with communication technologies to exchange information with other users on the road. CAVs are a new and transformative technology and they are rapidly evolving and



Figure 1. Louisiana State University driving simulator

Intended Implementation of Research

The results of this research will provide valuable insights regarding how drivers will interact with other connected and autonomous vehicles in a mixed traffic network which will be materialized in near future. These findings will provide transportation authorities in the united states and elsewhere with actionable measures/countermeasure that can help in better managing traffic conditions as well as improving the safety of all drivers.

Anticipated Impacts/Benefits of Implementation

Improving traffic safety of drivers and increasing their awareness regarding connected and autonomous vehicles.

Web links

- Tran-SET's website
<https://transet.lsu.edu/research-in-progress/>

Tran-SET

Tran-SET is Region 6's University Transportation Center. It is a collaborative partnership between 11 institutions (see below) across 5 states (AR, LA, NM, OK, and TX). Tran-SET is led by Louisiana State University. It was established in late November 2016 "to address the accelerated deterioration of transportation infrastructure through the development, evaluation, and implementation of cutting-edge technologies, novel materials, and innovative construction management processes".

Learn More

For more information about Tran-SET, please visit [our website](#), LinkedIn, Twitter, Facebook, and YouTube pages. Also, please feel free to contact Dr. Momen Mousa (Tran-SET Program Manager) directly at transet@lsu.edu.

