UTC Project Information	
Project Title	Safety Impact Evaluation of a Narrow Automated Vehicle-Exclusive Reversible Lane on an Existing Smart Freeway
University	San Diego State University
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Funding Source(s) and Amounts Provided (by each agency or organization)	Safe-D (Federal): $111,395 Match (Non-Federal): $117,109
Total Project Cost	$228,504
Agency ID or Contract Number	Grant No: 69A3551747115 Project: 04-101
Start and End Dates	03/22/2019 - 9/30/2020
Brief Description of Research Project	The main objective of this research is to evaluate the safety impact of an innovative infrastructure solution for safe and efficient integration of Automated Vehicle (AV) as an emerging technology into an existing transportation system. Filling the gap in the limited research on the effect of AV technology on infrastructure standards, this project will evaluate whether AVs could operate safely in a narrow lane next to regular traffic lanes on an expressway. Specifically, this study will investigate implications of adding a narrow reversible AV exclusive lane to the existing configuration of I-15 expressway in San Diego, resulting in a 9-feet AV reversible lane, and in both directions, two 12-feet lanes for HOV and FasTrak vehicles. Given the difference between the operation of AVs and human-driven vehicles and reliance of AVs on sensors as opposed to human capabilities, the question is can we provide narrower roadways with more efficient right of ways assuming AVs are more precise in lateral and longitudinal lane keeping behavior? To accomplish the goal of the project, the research team will conduct a series of research approaches including literature review, AV manufacturers product review, expert interviews, consumer questionnaire review, crash data analysis, and traffic simulation analysis. We will prepare practical recommendations and guidelines from the results of the study usable for practitioners and professional organizations pertaining to AV development.

Describe Implementation of Research Outcomes (or why not implemented)
 	
Place Any Photos Here
	1. Final report and data
	2. EWD plan
	  • Teaching module
	  • Student involvement
	  • Explore SDSU event
	  • Presenting to local Institute of Transportation Engineers (ITE) chapter
	3. T2 plan
	  • Project startup meeting with industry partner and champion
	  • Present study findings at the SDSU Student Research Symposium (SRS)
	  • Conduct public demonstration of the project findings at the Explore SDSU
	  • Conduct webinar to present project findings to stakeholders (Caltrans, SANDAG, etc.)
	  • Conference article (Expecting TRB)
	  • Journal article (Expecting Journal of Safety Science or similar)
	  • Present study findings at local transportation professional organizations (Expecting the Institute of Transportation Engineers (ITE))

Impacts/Benefits of Implementation (actual, not anticipated)	The outcome of this research will directly feed the implementation considerations and design specifications of an AV-exclusive reversible lane on I-15 smart corridor. In addition to local transportation agencies, it is expected that national transportation entities will be interested in the results of this project due to limited available knowledge and scientific research on new roadway standards and infrastructure considerations for AV technology integration in a safe and efficient manner. Moreover, as the AV infrastructure design is still in its early stages of development, the consumers of the project output will also include the automotive industry, researchers, students, and the general public.

Web Links
  • Reports
  • Project website
	https://www.vtti.vt.edu/utc/safe-d/index.php/projects/safety-impact-evaluation-of-a-narrow-automated-vehicle-exclusive-reversible-lane-on-an-existing-smart-freeway/