UTC Project Information	
Project Title	Assessing Alternative Approaches for Conveying Automated Vehicle 'Intentions'
University	Virginia Tech, Virginia Tech Transportation Institute
Principal Investigator	Zachary Doerzaph (VTTI)
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Funding Source(s) and Amounts Provided (by each agency or organization)	Safe-D (Federal): $188,468 VTTI Urban Expansion match source (non-federal): $186,000
Total Project Cost	$374,468
Agency ID or Contract Number	Grant No: 69A3551747115 Project: 03-082
Start and End Dates	04/10/2018-10/10/2019
Brief Description of Research Project	The project will focus on the development and evaluation of an augmented reality interface integrated into a dynamic HMI intended to increase situational awareness of the driving system and environment. Users will experience the enhanced HMI system in a transit-like, automated vehicle across realistic scenarios while gauging situational awareness, response selection, response performance, and comfort. As a secondary focus, the project will explore different emergency stop mechanisms for the automated vehicle, of which the user has full control, in the event that there is a system failure in either the vehicle's control or sensing mechanisms.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	Throughout the lifecycle of the project, a number of deliverables will be completed, with the most notable being: • Final UTC report • Final dataset Through the implementation of the EWD plan, the following will be generated: • Thesis • Module about HAV safety for Dr. Doerzaph's course in Advanced Vehicles • Technical material for ISE classes dealing with HMIs • K-12 demos about machine vision/HMI for outreach events

	Through the implementation of the T2 plan, the following will be accomplished:
	- Framework on which to build mixed reality interfaces for vehicle to human communications - Journal publications focusing on automated vehicles or HMIs - Demos of experiment/HMI system - Project briefing highlighting experiment - Presentation of key findings - Guidelines on future development of HMI in order to standardize the industry
Impacts/Benefits of Implementation (actual, not anticipated)	This HMI system will allow for safer operation of highly automated vehicles by insuring drivers can easily monitor and understand the proposed actions of the vehicle and allow them to use this relevant information to appropriately react to adverse conditions. Especially in the field of transit, this type of intuitive vehicle understanding is vital to ensuring user safety since they take more of a passenger role, rather than driver. Users must also feel as if they have the ability to override the vehicle and take control in the event of a system failure. Emergency stopping mechanisms will be tested within the study to determine if they make the user feel more "in control". The combination of interface and the emergency stop mechanism will help to facilitate an appropriate level of trust between the automated vehicle and users.
Web Links • Reports • Project website	