

UTC Project Information	
Project Title	Crashworthiness Compatibility Investigation of Autonomous Vehicles with Current Passenger Vehicles
University	Texas A&M Transportation Institute
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Funding Source(s) and Amounts Provided (by each agency or organization)	\$107,000 – SAFE-D (Federal)
Total Project Cost	\$107,000
Agency ID or Contract Number	69A3551747115; 05-098
Start and End Dates	October 12, 2020 and November 12, 2021
Brief Description of Research Project	<p>This project will propose testing and evaluation criteria to investigate crash compatibility between autonomous and human-driven vehicles, with consideration of different potential crash scenarios. Finite element computer models will then be utilized to conduct predictive simulations investigating potential cases of impacts between human-driven and autonomous vehicles. Current regulations defining IIHS testing criteria will be investigated to determine how the newly proposed testing conditions might need to be modified to address the worst-case testing scenario, such as maximizing the potential for occupant compartment deformation and intrusion during the crash event. Testing evaluation criteria might also have to be modified to address potential different occupant compartment deformation or areas intrusion. Recently approved autonomous vehicles types on US roads do not have an occupant compartment. They are used instead for good distribution, requiring a different, more compact and stiffer design, with very little room for deformation during an actual crash. The research team is planning to investigate the current IIHS crash compatibility regulations and propose testing criteria for addressing crash compatibility between most vulnerable human passenger cars and different classes of autonomous vehicles, ranging from small (~1,800-lbs) to large (~10,000- lbs.) sizes. This project would support potential testing criteria to be proposed to complement the current testing needs for the IIHS by exploring the most critical among different impact scenarios (side, rear, frontal), with varying speeds and inclusion of virtual dummies (as human-vehicles occupants).</p>

<p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p>	<p>The product of this work will be a proposed testing and evaluation criteria protocol for consideration for investigation of autonomous vehicle crash compatibility. This protocol could be considered for incorporation in the current IIHS crashworthiness testing program. The project findings will be published in either the Journal of the Transportation Research Board or the journal "Accident Analysis & Prevention". In addition, the project methodology and results will be published as part of one Graduate thesis.</p> <p>The research team will prepare a paper for publication and presentation dissemination at the Transportation Research Board Annual Meeting. This conference is heavily attended by IIHS, FHWA, and NHTSA -- our intended audience. The research team will prepare a webinar presentation for dissemination through the Safe-D portal and potentially for the American Traffic Safety Services Association (ATSSA).</p>
<p>Impacts/Benefits of Implementation (actual, not anticipated)</p>	<p>N/A</p>
<p>Web Links</p> <ul style="list-style-type: none"> • Reports • Project website 	<p>https://safed.vtti.vt.edu/projects/vehicle-occupants-and-driver-behavior-an-assessment-of-vulnerable-user-groups/</p>