UTC Project Information	
Project Title	Simulation-based approach to investigate the electric scooter rider protection during traffic accidents
University	VTTI Virginia Tech
Principal Investigator	Dr. Costin Untaroiu
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Funding Source(s) and Amounts Provided (by each agency or organization)	Safe-D (Federal): $130,000 VT match source (Non-Federal): $185,071 GHBMC match source (Non-Federal): $50,084
Total Project Cost	$365,155
Agency ID or Contract Number	Grant No: 69A3551747115 Project: 05-116
Start and End Dates	10/01/2020 – 03/31/2022
Brief Description of Research Project	This simulation-based study develops a better understanding of the injury mechanisms and injury risks for e-scooter during traffic accidents. A finite element model of a generic e-scooter is developed and then connected with a human finite element model in a rider posture in order to simulate the most common scooter accidents. Based on the injury data recorded in sensitivity studies performed using Design of Experiment (DOE), we expect to estimate possible reductions on rider injury risks in terms of maximum speed, use of various safety equipment, and using/avoiding sidewalks.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	According to our Data Management Plan (DMP), our deliverable will include: • Quarterly Reports • Bi-Annual Activity Surveys • Final Project Report 3/31/2022 According to our Education and Workforce Development (EWD) the tool s developed in this work will be implemented in • VT Graduate classes (e.g. BMES 6164: Comp Mod Impact Biomechanics and BMES 6174: Advanced Human modeling) • VT Undergraduate classes (e.g. ESM 2304 Dynamics and ME 3524 Dynamics Systems/ Vibrations According to our T2 Plan, our deliverables includes: • 2 journal articles

	• A webinar to present project findings to industry group.
Impacts/Benefits of Implementation (actual, not anticipated)	Based on results of virtual e-scooter impact simulations, the anticipated outcomes will include recommendations 1) for e-scooter design to improve rider safety, 2) for riders to use various safety equipment, and 3) for future standardized national policies (e.g. max speed, helmet requirement, riding on sidewalk etc.).
Web Links • Reports • Project website	https://safed.vtti.vt.edu/simulation-based-approach-to-investigate-the-electric-scooter-rider-protection-during-traffic-accidents-a-step-forward-for-safer-e-scooters-and-for-standardized-national-safety-policies/