

Date of Last Update (edit each time): **10/09/2020**

UTC Project Information	
Project Title	Lane Change Hazard Analysis Using Radar Traces to Identify Conflicts and Time-To-Collision Measures
University	Virginia Tech
Principal Investigator	Shane McLaughlin
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Funding Source(s) and Amounts Provided (by each agency or organization)	Safe-D (Federal): \$75,000 General Motors (Non-Federal): \$ 284,000
Total Project Cost	\$ 364,000
Agency ID or Contract Number	Grant No: 69A3551747115 Project: 05-082
Start and End Dates	Start Date: 11/01/2020 - End Date:7/31/2021
Brief Description of Research Project	<p>250 words max: Please provide an abstract for your proposed project for use on the Safe-D website and in the Research in Progress (RiP) database upon award. Include how the proposed research project relates to transportation safety as addressed by the theme and application area(s) identified below. Describe the impact on transportation safety (i.e. What is the safety problem? And how will this project address safety in this/these area(s)?).This project will mine an existing set of radar data surrounding real-world lane change events executed by drivers relying on both conventional mirror and camera-based systems. The data set provides valuable opportunities to develop computer-based algorithms for dealing with and managing radar traces to identify normative lane change signatures as well as conflict-based events (inappropriate lane changes, or lane changes executed with small time gaps). This research is expected to greatly contribute to the development of automated and partially automated driving systems by: 1) Developing and validating algorithms using radar trace data to classify “safe” and “unsafe” lane change situations which may be used to guide the implementation and management of automated lane change systems, 2) Helping to develop automated lane change systems that naturally mimic a good driver’s performance thereby increasing driver acceptance and comfort, and 3) Development of warnings to drivers operating with partially automated systems under situations where drivers need to assume control and guarding against inadvisable lane changes. Understanding how drivers manage lane changes under manual</p>

	<p>driving situations (e.g., time-to-collision judgements, conflicts, etc.) can therefore greatly enhance and aid in the development and implementation of automated lane change and driver warning systems.</p>
<p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p>	<p>Anticipated Deliverables for Project:</p> <ul style="list-style-type: none"> • Final Project Report (D) • Final Dataset and Metadata Uploaded to VTTI Dataverse (D) <p>Anticipated T2 Deliverables:</p> <ul style="list-style-type: none"> • Webinar to present project findings to industry group • Submit a manuscript for journal publication
<p>Impacts/Benefits of Implementation (actual, not anticipated)</p>	<p>With GM providing input during multiple points during the process of the project, it's expected that the results of this project will directly influence the industry development of technology for autonomous vehicles and other in-vehicle technologies.</p>
<p>Web Links</p> <ul style="list-style-type: none"> • Reports • Project website 	<p>https://safed.vtti.vt.edu/projects/lane-change-hazard-analysis-using-radar-traces-to-identify-conflicts-and-time-to-collision/</p>