UTC Project Information	
Project Title	"Human Factors of Level 3 Automation: Surprise Event Response Evaluation: Snow White"
University	Virginia Tech
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Funding Source(s) and Amounts Provided (by each agency or organization)	VTTI: $350,000 Ford match source (Non-Federal): $1,700,000
Total Project Cost	$2,050,000
Agency ID or Contract Number	Grant No: 69A3551747115 Project: VTTI-00-033
Start and End Dates	Start Date: 01/05/21 End Date: 01/05/22
Brief Description of Research Project	Level 3 automation is the first automation level that turns over supervising the driving task to the vehicle. The extent that this capability will be wanted and used by drivers is likely driven at least in part by driver's ability and desire to do non-driving tasks for extended periods of time. This project will be an extension of previous Ford and VTTI collaborations to assess driver's response during a surprise event. A test platform, based on 2019 Edge and built as part of a previous collaboration, will be used to effectively provide drivers with a level 3 automation driving experience on a real-freeway at highway speeds.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	The final deliverables of the project will be final report, a research journal publication, the output of the Education and Workforce Development (EDW) plan, and the output of the Technology Transfer (T2) plan. The final report will be a short summary report that describes the research goals, research procedures, statistical comparisons between conditions (e.g., fatigued vs not fatigued), input from participants, and lessons learned. The work will also be summarized in a presentation format. If desired, the VTTI project team will travel to Dearborn, MI to present the results. Similar to the final report, a peer-reviewed journal publication will be submitted to describe the surprise event portion of the work.

	The EDW plan will result in the following output:
	• Support of an Industrial and Systems Engineering Master's student at Virginia Tech, Nicholas Britten
	• Activities of the project will allow Nicholas to:
	    ○ Collaborate on the project's IRB approval process through working on the development of the research design and procedures (Task 2)
	    ○ Collaborate with industry partners in the design and execution of a research study through involvement in the development of the research design and procedures (Task 2)
	    ○ Gain experience in the preparation and leading of data collection sessions through participation in execution of the study (Task 3)
	    ○ Gain experience in and knowledge of L3 technology, how drivers' use this technology, and how they react to takeover requests and other system alerts
	    ○ Gain experience writing and submitting a research paper to an academic journal
	• Generation of a graduate student focused module and a module targeting VTTI employees on human factors issues of training and control:
	    ○ VTTI training module(s) for operation of the study vehicle
	    ○ A graduate student focused learning module focused on the broader capabilities of L3 automation, and issues related to transfer of control.
	
	The T2 plan includes direct stakeholder involvement from Ford, specifically Ko Kurikawa who serves as the Ford Principal Investigator for the project. The outcome of the T2 plan will be:
	• Use of the study vehicle platform as a demonstration vehicle for the EDW products
	• Upload of the study results to the Safe-D portal and VTTI dataverse
	• Briefing of the final results for the industry partner
	• Publish the surprise event portion of the study in a peer-reviewed journal

Impacts/Benefits of Implementation (actual, not anticipated)	The anticipated impacts/benefits of the implementation of this project are in the areas of automated vehicles and driver factors and interfaces. The project will contribute to these areas by building an understanding of driver behavior and task preferences for L3 automation at highway speeds as well as drivers response to a surprise event during L3 automation through the completion of the on-road study. The results of this study are anticipated to add

	to the body of knowledge on driver behavior for L3 driving through the final report shared with the stakeholders and the peer-reviewed research journal publication.
Web Links • Reports • Project website	https://safed.vtti.vt.edu/projects/human-factors-of-level-3-automation-surprise-event-response-evaluation/