UTC Project Information	
Project Title	Pre-crash Multi-vehicle Experimental Analysis Using a Networked Multiple Driving Simulator Facility
University	Ohio State University
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Funding Source(s) and Amounts Provided (by each agency or organization)	US DOT RITA: $468,634.15 Ohio State University Matching Funds: $305,956.40
Total Project Cost	$805,330.00
Agency ID or Contract Number	DTRT13-G-UTC47
Start and End Dates	O9/30/2013 – 09/30/2017
Brief Description of Research Project	To evaluate human performance and resulting crash safety, UTC will develop a robust simulation facility in which multiple vehicles interact; some of these vehicles will be driven by people, some will be autonomous, and some will be autonomous to varying levels, with people in the driver's seat but disengaged to various levels from the actual driving of the vehicle. Although a single simulator can be used to create scenarios that involve other programmed autonomous, semi-autonomous, and non-autonomous vehicles, it provides only an approximation of the level of unpredictability and uncertainty encountered when multiple human drivers are operating in the same environment—as is the case in real-world driving. The ability to create a virtual driving environment simultaneously accessed by three or more human drivers allows a much closer approximation of reality, with its attendant risks. Therefore, a key enabling first step will be to develop a network of driving simulators that can interoperate to conduct multi-driver tests. We will leverage three existing simulator facilities at OSU, UW, and UMass, all of which are from the same vendor, Realtime Technologies, to design and execute common scenes and scenarios. In addition, we will purchase desktop simulator units from Realtime Technologies for IUPUI and NCA&T, so that all five institutions are able to contribute to the experiment designs and access experiment data. The initial selection of safety applications to be evaluated is based on results from NHTSA's Crash Imminent Test Scenarios and Safety Pilot Model Deployment. The safety applications will include Forward Collision Warning (FCW), Lane Change/Blind Spot Warning (LCW/BSW), Emergency Electric Brake Light Warning (EEBL), and Intersection Movement Assist (IMA). This project will enable testing of drivers with autonomous vehicle systems with an unprecedented capability in multi-driver and multi-vehicle

	interaction studies. In addition, this project will generate "standard" scenarios that can be shared with the transportation research and education community. Research Objectives: • Year 1: Create simulation network and evaluate safety of initial selections from the NHTSA Safety Pilot Model Deployment. • Year 2: Design collaborative multi-vehicle experiments, and use the networked simulation environment to test hypotheses and collect/analyze data for multi-vehicle scenarios.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	Pending project completion.
Impacts/Benefits of Implementation (actual, not anticipated)	Pending project completion
Web Links • Reports • Project website	http://citr.osu.edu/CrIS/wp-content/uploads/CrIS_UTC_PPPR_Final_Draft_043014.pdf http://citr.osu.edu/CrIS/?page_id=87