CENTER FOR CONNECTED AND AUTOMATED TRANSPORTATION

UTC Project Information	
Project Title	Enhanced Methodology for Exploring Autonomy-enabled Multi-mode Regional Transportation
University	Purdue University
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Funding Source(s) and Amounts Provided (by each agency or organization)	CCAT: $90,000 $90,000 from Purdue University School of Aeronautics and Astronautics through an unrestricted gift from the Northrup Grumman Corporation $28,662 from Purdue University School of Aeronautics and Astronautics cost share.
Total Project Cost	$208,662
Agency ID or Contract Number	69A3551747105
Start and End Dates	1/1/19-12/31/21
Brief Abstract of Research Project	Increasing the level of autonomy in both small aircraft and automobile has the potential to generate greater efficiency and utility in multimodal regional transportation systems. In previous research, the PI and collaborators developed a computational analysis framework to assess the impact of aircraft technology advancement in electric propulsion and autonomy on the future of on-demand, regional air transportation system. A sensitivity analysis revealed increasing level of autonomy and an improved ride-sharing model (on the ground and in the air) could lead to significant increase in the total number of individuals who could afford this new mode of transportation. Activities in the proposed project would enhance our current computational framework with models for autonomous automobile option and thereby take a holistic approach to evaluate the impact of autonomy at a multi-modal level of operation. The end results will help identify the promising regions, via an optimization formulation, where enabling autonomy makes economic sense to the stakeholders. Outcome models, analysis, and metrics is expected to further increase the research community's ability to characterize the impacts of differing levels of autonomy as well as the synergistic benefit of a ride-sharing economy within the context of a multi-modal transportation system.
Most Relevant CCAT Research Thrusts	__X__ Enabling Technology __X__ Policy & Planning _____ Human Factors _____ Infrastructure Design & Management _____ Control & Operations __X__ Modeling & Implementation

Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	The project will produce the following two outputs. The plan to transition and implement these outcomes include both conference/journal publication and also sharing computational models and associated data with government and university collaborators, in particular with our government principal at NASA. • An enhanced computational analysis framework capable of examining autonomy at varying levels of fidelity for both ground and air and useful to analyze enabling impact of technology on multi-modal on-demand regional transportation architectures (and related operational concepts like ride-sharing).
Impacts/Benefits of Implementation (actual, not anticipated)	No implementation yet.
Web Links (Reports, Project website)	ccat.umtri.umich.edu purdue.edu/discoverypark/cav/nextrans/index.php