CENTER FOR CONNECTED AND AUTOMATED TRANSPORTATION

Project Title	Ride-sharing with advanced air mobility	
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Most relevant CCAT research thrusts (choose all applicable)	__X__ Enabling Technology _____ Planning and Policy _____ Human Factors _____ Infrastructure Design and Management __X__ Control and Operations __X__ Models and Implementation	
Funding Request	$50,000 DOT sponsor dollars	
Matching Funds and Source (if any)	$50,000 from Purdue University School of Aeronautics and Astronautics through faculty AY cost sharing and graduate student support	
Total Project Cost	$100,000	
Contract Number	69A3551747105	
Project start/end dates	January 1, 2021 to December 21, 2021	
Project Abstract	In this project, we will investigate ride-sharing service using air and ground vehicles to improve efficiency and mobility in the transportation system of a metropolitan area. We will design and evaluate ride-sharing schemes that can potentially reduce the time and economical cost on urban commuters, increase the revenue of the transportation service provider, and boost local economics. Activities in the proposed project will include the development of a comprehensive mathematical model for the autonomous aerial ride-sharing service that capture the new characteristics in the futuristic ride-sharing system and the key components of related costs. Based on the new ride-sharing model, a distributed computational framework will be developed to accommodate the large problem size for practical real-time ride-sharing recommendations. Lastly, a	

	resilient variant of the distributed computational algorithm will be proposed and analyzed to mitigate systematic uncertainty and/or cyberattack in the ride-sharing system.
High-level implementation plan	The project will produce the following outcomes. The plan to transition and implement these outcomes include both conference/journal publication and sharing computational models and algorithms. • A mathematical model for rideshare in advanced air mobility. • A resilient and distributed optimization scheme that mitigates system uncertainties and/or cyberattacks. • Publications: The modeling and optimization scheme will be presented at a relevant transportation conference.
Project Metrics	• Number of papers presented at nationally and internationally renowned conferences • Number of journal papers published • Number of graduate student theses • Media stories and website hits • Number of public outreach events
Web Links: [leave blank until project approval]	ccat.umtri.umich.edu https://engineering.purdue.edu/ccat https://www.purdue.edu/discoverypark/cav/nextrans/index.php