CENTER FOR CONNECTED AND AUTOMATED TRANSPORTATION

UTC Project Information	
Project Title	Facilitating electric propulsion of autonomous vehicles through efficient design of a charging-station network
University	Purdue University
Principal Investigators	Samuel Labi and Mohammad Miralinaghi
PI Contact Information	Nextrans Center, 3000 Kent Avenue, W. Lafayette, IN 47906 labi@purdue.edu, smiralin@purdue.edu; 765-637-6038
Funding Source(s) and Amounts Provided	CCAT: $75,000 Delft University: $75,000
Total Project Cost	$150,000
Agency ID/Contract #	69A3551747105
Start and End Dates	January 1, 2019 to December 31, 2021
Brief Abstract of Research Project	For a vehicle to be truly autonomous, it needs to be propelled by a power type that does not require human effort to transfer the power into the vehicle manually. For this reason, electric propulsion is increasingly being considered as a viable and practical alternative to the internal combustion engine (ICE). Another benefit of electric propulsion is the reduction of vehicular emissions. Electric automated vehicles (EAVs) that have zero-occupancy can simply be sent to electric charging stations for recharge. This research is developing a framework for efficient design of a network of electric charging stations that can promote AVs. In this framework, the transportation planner seeks to gradually install electric charging stations at repurposed existing gas stations and/or at new locations. The framework considers the anticipation of an ICEV-to-AV transition phase where the existing gas stations will be decommissioned gradually in favor of electric charging stations. The framework is also considering two trip-making scenarios: intracity trips that capture traffic congestion, and intercity trips that are characterized by long distances.
Most Relevant CCAT Research Thrusts (choose all applicable)	___X__ Enabling Technology ___X__ Policy & Planning _____ Human Factors ___X__ Infrastructure Design & Management ___X__ Control & Operations ___X__ Modeling & Implementation
Describe Implementation of Research Outcomes (or why not implemented)	Not yet implemented. Research is in progress.
Impacts/Benefits of Implementation (actual, not anticipated)	Not yet implemented. Research is in progress.
Web Links (Reports, Project website)	ccat.umtri.umich.edu purdue.edu/discoverypark/cav/nextrans/index.php