



UTC Project Information	
Project Title	Design of urban landscape and road networks to accommodate CAVs Phase 1 + 2
University	Purdue University
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Funding Source(s) and Amounts Provided (by each agency or organization)	\$75,000 (USDOT) and \$69,750 (Purdue – Cost Share) - Phase 1 \$43,859 (Purdue) and \$61,282 (CCAT) - Phase 2
Total Project Cost	\$249,891
Agency ID or Contract Number	69A3551747105
Start and End Dates	8/1/2017-12/31/2021
Brief Abstract of Research Project	<p>Phase 1: The advent of connected and automated vehicles (CAVs) offers the promise of enhanced safety and mobility for travelers and enhanced efficiency for transportation system operations. CAVs will also have significant impacts on the form and function of the built environment. There is a need for transportation planners and policymakers to revisit existing urban landscape and road network design guidelines and develop new design guidelines to accommodate the transition to full adoption of CAVs in the future. The transition period can be classified into: initial adoption of CAVs at low market penetrations, mixed CAV and non-CAV traffic, and full adoption of CAVs. We will analyze and develop urban landscape and road network designs to accommodate CAVs that can maximize safety and comfort for all road users, including motorists, public transit users, cyclists and pedestrians. Then, these designs will be evaluated based on a stated preference survey of road users to understand their perceived safety and comfort levels. The similarities and dissimilarities of different types of road users’ preferences will also be studied using statistical and econometric methods. The results and insights will be used to develop urban landscape and road network design guidelines in a CAV environment.</p> <p>Phase 2: Recent developments in connected and autonomous vehicles (CAV)</p>

	<p>entails the need for developing new urban landscape and road network design guidelines to accommodate the transition to full adoption of CAVs in the future. This study will construct various urban landscape and road network designs developed in Phase 1 of the project in an interactive driving simulator environment to understand how drivers of CAVs and human-driven vehicles (HDVs) interact with other vehicles and the urban environment in these designs. We will evaluate the efficiency, safety and comfort levels of these designs from driver perspectives based on their behavior, psychological response through physiological factors (such as brain electrical activity and heart rate) and self-reported response to stated preference surveys in addition, we will also evaluate the impacts of different urban landscape and road network designs, and other contributing factors on the adoption of CAVs. The results and insights will be used to develop urban landscape and road network design guidelines in a CAV environment, and design policies to influence CAV adoption speed through implementing various urban landscape and road network designs.</p>
<p>Most Relevant CCAT Research Thrusts</p>	<p> <input type="checkbox"/> Enabling Technology <input type="checkbox"/> Planning and Policy <input type="checkbox"/> Human Factors <input checked="" type="checkbox"/> Infrastructure Design and Management <input type="checkbox"/> Control and Operations <input type="checkbox"/> Models and Implementation </p>
<p>Describe Implementation of Research Outcomes (or why not implemented)</p>	<p>None Yet. The research is in progress.</p>
<p>Impacts/Benefits of Implementation (actual, not anticipated)</p>	<p>None yet.</p>
<p>Web Links</p> <ul style="list-style-type: none"> • Reports • Project website 	<p>ccat.umtri.umich.edu</p>