UTC Project Information	
Project Title	Pavement Perspective on AV Safety through Optimizing Lateral Positioning Pattern
University	Texas A&M Transportation Institute and Virginia Tech Transportation Institute
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Funding Source(s) and Amounts Provided (by each agency or organization)	Safe-D (Federal): $278,394 Match (Non-Federal): $141,740
Total Project Cost	$ 420,134
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Start and End Dates	September 2017-December 2018
Brief Description of Research Project	Automated vehicles (AV) and connected vehicles (CV) are coming at a rapid pace with many potential advantages including fewer traffic collisions and increased accessibility. However, one aspect of AV/CV that has not received enough attention is AV/CV lane choice and positioning pattern. Currently, AV positions itself within a lane by keeping a fixed distance from the lane marker or other reference. From the pavement perspective this channelized traffic will create deeper wheel path ruts which potentially can lead to an increased risk of vehicle hydroplaning and other safety problems in wet weather conditions. This research project will evaluate this issue from a pavements perspective and develop guidelines for reducing AV/CV hydroplaning potential through optimizing a lateral wheel positioning pattern and designing more rut resistant pavement surfaces.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	Expected Research Outcomes: • Research report and final presentation; • Papers for TRB automated vehicle symposium; • Computer animations of AV/CV-Pavement Rut-Vehicle Hydroplaning and what-if guidance for countermeasures. Additionally, a white paper will be developed for AV/CV designers or developers to recommend the best use of the travel lane and optimal lateral positioning patterns. Implementation: • Develop training course materials: The anticipated research findings could be used to develop an educational module

	(corresponding to 1 week of classes) for pavement design and traffic engineering. Then these courses could be shared with other institutions through the subcommittee on Education of the TRB standing committee ABC40 and/or SAFE-D website. • Present the research results in the forms of white papers and computer animation of AV/CV-pavement rut-vehicle hydroplaning to AV/CV industry, State DOTs, State Asphalt Pavement Associations, automotive OEMs, automotive technology developers, and any other related agencies.
Impacts/Benefits of Implementation (actual, not anticipated)	• People taking training course will be educated on the impact of AV/CV on pavement performance (rut depth) and travel safety issue (potential hydroplaning). • State DOTs can design better materials to resist premature rutting problem related to AV/CV so that the potential hydroplaning will be reduced on the road. • AV/CV industry and automotive technology developers can design better controls in terms of lateral travel pattern within a traffic lane so that less rut depth is generated and then less safety concerns.
Web Links • Reports • Project website	http://www.vtti.vt.edu/utc/safe-d/index.php/pavement-perspective-on-av-safety-through-optimizing-lateral-positioning-pattern/