Center for Advanced Multimodal Mobility Solutions and Education

UTC Project Information – CAMMSE @ UNC Charlotte	
Project Title	Determination of Freeway Acceleration Lane Length for Smooth and Safe Truck Merging
University	Texas Southern University
Principal Investigator	Yi Qi, Mehdi Azimi and Qun Zhao
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Funding Sources and Amount Provided (by each agency or organization)	The University of North Carolina at Charlotte: $58,562 Texas Southern University: $31,736
Total Project Cost	$90,298
Agency ID or Contract Number	
Start and End Dates	10/01/2017 – 09/30/2019
Brief Description of Research Project	In U.S., over 70% of the freight tonnage is moved by large trucks. Roadway design must accommodate large trucks to ensure the efficiency of freight transportation. The purpose of this research is to develop an analytical model to estimate the length of freeway acceleration lane to ensure large trucks can merge into freeway smoothly and safely. To achieve this goal, this research will first summarize current design guidelines on freeway acceleration lane length, with focus on those considering large trucks. Then, an analytical model will be developed for estimating the length of freeway acceleration lanes at freeway on-ramps according to the merging distances required by the large trucks. This model will

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	consider both the acceleration and gap searching needs of merging trucks. Field studies at selected on-ramp locations will be conducted to collect data for developing and validating the model. After that, a model for estimating the required freeway acceleration length for large trucks will be provided, and the adequate acceleration lengths under different traffic conditions will be recommended according to the modeling results. The results of this research will help complement the current federal and state design guidelines on freeway acceleration lane length by considering the unique characteristics of large trucks.
Describe Implementation of Research Outcomes (or why not implemented) *Place Any Photos Here*	
Impacts/Benefits of Implementation (actual, not anticipated)	
Web Links • *Reports* • *Project website*	https://cammse.uncc.edu/sites/cammse.uncc.edu/files/media/CAMMSE-UNCC-2018-UTC-Project-Information-13-Qi.pdf https://cammse.uncc.edu/sites/cammse.uncc.edu/files/media/CAMMSE-UNCC-2018-UTC-Project-Report-13-Qi-Final.pdf