Center for Advanced Multimodal Mobility Solutions and Education

UTC Project Information – CAMMSE @ UNC Charlotte	
Project Title	Effects of Incorporating Connected Vehicle Technologies into No-Notice Emergency Evacuation during Winter Weather
University	Washington State University
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Funding Sources and Amount Provided (by each agency or organization)	The University of North Carolina at Charlotte: $59,999 Washington State University: $30,012
Total Project Cost	$90,011
Agency ID or Contract Number	
Start and End Dates	10/01/2018 – 09/30/2020
Brief Description of Research Project	In the northern states and other cold-climate regions, winter weather can disrupt reliability and mobility of the roadway system and further complicate the emergency evacuation operations. Data modeling and analytical tools are much needed to optimize passenger and freight movements under such scenarios, as the roadway network is exposed to the impacts of winter weather as well as the different levels of market penetration by connected/automated vehicles (CAVs). The effect of winter weather could be particularly problematic during earthquake evacuation. Recent years have seen increased introduction of CAV technologies on U.S. roads, which play a disruptive role in

	increasing the roadway capacity, altering the conventional composition and characteristics of traffic flow, and ushering in new models of traffic operations and mobility management. When implemented appropriately, CAV technologies may significantly improve traffic flow and reduce congestion and time delays in the roadway system, which is highly desirable for effective and efficient evacuation transportation. The mobility effects of such enabling technologies, however, remain underexplored and need to be investigated and quantified. It is the intent of this study to lay the foundational work for modeling the microscopic and macroscopic effects of incorporating connected vehicle (CV) technologies into no-notice emergency (e.g., earthquake) evacuation during winter weather typically seen in Pacific Northwest, with the first case study conducted on Washington highways. In Phase I, we will identify an appropriate WSDOT highway corridor and metropolitan area and collect the relevant data before simulating the non-evacuation and evacuation traffic under a few selected winter weather scenarios and under different levels of CV market penetration. The main methodology will then entail the development of an integrated scenario-simulation planning framework.
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-2019-UTC-Project-Information-16-Shi.pdf https://cammse.uncc.edu/sites/cammse.uncc.edu/files/media/CAMMSE-UNCC-2019-UTC-Project-Report-16-Shi-Final.pdf