Grant Deliverables and Reporting Requirements for UTC Grants

UTC Project Information	
Project Title	Analysis and Design of Pavement Surface Mixtures for Traffic Noise Reduction
University	University of South Florida
Principal Investigator	Qing Lu Manjriker Gunaratne
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Funding Source(s) and Amounts Provided (by each agency or organization)	USDOT: $80,000 University of South Florida: $40,000
Total Project Cost	$120,000
Agency ID or Contract Number	Sponsor Source: Federal Government CFDA #: 20.701 Agreement ID: 69A3551747119
Start and End Dates	■ Start date: 10/01/2019 ■ End date: 06/30/2021
Brief Description of Research Project	Road traffic noise pollutes the living environment and has adverse effects on public health, but it can be reduced at the source of one of its major components, the tire-pavement noise, by a porous pavement surface. This research project investigated the relationship between design parameters of porous asphalt mixtures placed at the pavement surface and the pavement acoustic performance. A mechanistic-empirical model was developed based on a microstructural model of the acoustic absorption of porous media and regression analysis of model parameters as functions of mixture design parameters, using a set of experimental data covering a range of porous asphalt mixture designs. This model may be used to predict the acoustic absorption of porous asphalt concrete, particularly at high frequencies. Regression models were developed to estimate the effect of mixture design, primarily aggregate gradation, on tire-pavement noise at low frequencies. The impact of porous mixture design on pavement friction, in terms of skid resistance and hydroplaning speed, was also evaluated. Based on the research outputs (i.e., the mechanistic-empirical model and the

	regression models), a procedure was recommended to include the consideration of acoustic performance in the design of porous asphalt mixtures for road pavement surfaces. It is recommended that within the ranges of aggregate gradation allowed by current design methods for open-graded friction course mixtures, gradation selection may go towards a smaller nominal maximum aggregate size or a lower percentage passing the 2.36-mm sieve for lower tire-pavement noise.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	Research outcomes have not been implemented because the work was just completed. The outcomes will be implemented through journal paper publication, presentations at conferences or workshops, and education of students and professionals at the PI's institute.
Impacts/Benefits of Implementation (actual, not anticipated)	Impacts of future dissemination of research outcomes are yet to be determined.
Web Links • Reports • Project website	http://ctech.cee.cornell.edu/final-project-reports/