

Grant Deliverables and Reporting Requirements for UTC Grants

UTC Project Information	
Project Title	Analysis of the impact of pavement surface mixture on traffic noise and related public health
University	University of South Florida
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Funding Source(s) and Amounts Provided (by each agency or organization)	USDOT: \$102,325 USF: \$52,785
Total Project Cost	\$155,110
Agency ID or Contract Number	Sponsor Source: Federal Government CFDA #: 20.701 Agreement ID: 69A3551747119
Start and End Dates	Start date: 10/01/2020 End date: 09/30/2021
Brief Description of Research Project	<p>Noise is a harmful environmental pollutant and has negative impacts on public health such as annoyance, sleep disturbance, and learning impairment. Road traffic noise is one of major sources of environmental noise, particularly in areas with high population density near or along highways or streets.</p> <p>Road traffic noise mainly arise from three sources: engine and exhaust noises, aerodynamic noise, and tire/pavement noise. The tire/pavement noise becomes significant when vehicle speed exceeds certain values. Reducing the tire/pavement noise, therefore, may have significant bearing on health promotion for the public. In recent years, there has been a body of research in the pavement community that investigated the impact of pavement type and surface conditions on tire/pavement noise. There are also recommendations on the design of pavement surface mixtures to improve the acoustic performance of pavements. For example, it is generally agreed upon that for asphalt pavements, placing a thin layer of porous asphalt mixture at the surface may result in so-called “quiet pavement”. Based on</p>

	<p>his previous research work, the PI has recommended design modifications to porous asphalt mixtures for better acoustic performance. The existing research, however, mainly focused on noise measurement near the tire/pavement interface or sound absorption performance of pavement materials. The impact of pavement surface design on the road-traffic noise perceived by the public at various distances away from the road, however, has rarely been investigated. Moreover, the effectiveness of surface mixture design modifications proposed in the literature has not been evaluated from the perspective of public health such as annoyance and sleep disturbance. In the long run, when more road agencies decide to include noise abatement as one of the performance measures in the selection and design pavement surface mixtures, these limitations need to be overcome.</p> <p>The main objective of this proposal is to analyze the impact of pavement surface mixture design on the road-traffic noise perceived by the public living nearby and their health condition, and to make recommendations on pavement surface mixture design and selection with noise-related public health taken into consideration. The specific tasks include:</p> <ol style="list-style-type: none"> (1) Perform a literature review on pavement surface mixture designs for noise reduction, road noise propagation models and tools, and relationship between road traffic noise and public health. (2) Develop a procedure to analyze the relationship between pavement surface features and traffic noise perceived by the public and their health outcome. (3) Perform a case study for a selected area/region with relevant data collected from the literature and/or measured from the field. (4) Provide recommendations for selection of pavement surface mixtures in various contexts (e.g., traffic volume and speed, terrain, and population density) for mitigating noise impact on public health.
<p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p>	
<p>Impacts/Benefits of Implementation (actual, not anticipated)</p>	

Web Links

- Reports
- Project Website

<http://ctech.cce.cornell.edu/final-project-reports/>