



UTC Project Information – Center for Transportation, Environment, and Community Health	
<i>Project Title</i>	Analysis of the impact of pavement surface mixture on traffic noise and related public health
<i>University</i>	University of South Florida
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<i>Funding Sources and Amount Provided (by each agency or organization)</i>	USDOT: \$105,570 USF: \$53,263
<i>Total Project Cost</i>	\$158,833
<i>Agency ID or Contract Number</i>	Sponsor Source: Federal Government CFDA #: 20.701 Agreement ID: 69A3551747119
<i>Start and End Dates</i>	10/01/2020– 06/30/2022
<i>Brief Description of Research Project</i>	Road traffic noise is a harmful environmental pollutant that affects public health. Reducing the tire-pavement noise by appropriate design of a sustainable pavement may reduce the road traffic noise. This study developed and applied a procedure to predict the road traffic noise and resulting health impact from the design parameters of a commonly used pavement surface mixture type, open-graded asphalt concrete (OGAC), and evaluated the impact of including a renewable material (seashell) in OGAC on its mechanical and acoustic performance. A series of empirical models were combined to correlate the mixture design parameters to the perceived road traffic noise and health indicators. Case study results showed that reducing the nominal maximum aggregate size (NMAS) from 19.0 mm to a smaller value had a noticeable impact on the perceived noise from car traffic and the resulting public health. For a given NMAS, variations in the OGAC design parameters did not cause significant change in the perceived noise. The laboratory evaluation of the incorporation of seashell in OGAC showed that coarse aggregates may be replaced with seashell up to a certain percentage without causing statistically significant changes in most mixture properties. The inclusion of seashell, however, reduced the permeability, acoustic absorption, and macrotexture of OGAC, which suggested that seashell in OGAC may increase the tire-pavement noise at high frequencies but reduce the tire-pavement noise at low frequencies.

<p><i>Describe Implementation of Research Outcomes (or why not implemented)</i></p> <p><i>Place Any Photos Here</i></p>	<p>Research outcomes have not been fully implemented because the work was just completed. Part of the outcomes, however, has been implemented through one journal paper publication. Other outcomes will be implemented through further publication in journals, presentations at conferences or workshops, and education of students and professionals at the PI's institution.</p>
<p><i>Impacts/Benefits of Implementation (actual, not anticipated)</i></p>	<p>Impacts of future dissemination of research outcomes are yet to be determined.</p>
<p><i>Web Links</i></p> <ul style="list-style-type: none"> • <i>Reports</i> • <i>Project website</i> 	<p>http://ctech.cee.cornell.edu/final-project-reports</p>