

UTC Project Information	
Project Title	Street Noise Relationship to Vulnerable Road User Safety
University	Texas A&M Transportation Institute (Greg Griffin); Virginia Tech (Steve Hankey; Ralph Buehler)
Principal Investigator	Greg Griffin (note: Steve Hankey is lead on VT portion)
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Funding Source(s) and Amounts Provided (by each agency or organization)	Safe-D (Federal): \$60,211 Match (Non-Federal): \$
Total Project Cost	\$60,211
Agency ID or Contract Number	Grant No: 69A3551747115 Project: 02-027
Start and End Dates	6/1/2017-5/31/2018
Brief Description of Research Project	Street noise may be a valuable indicator for bicyclist safety, but no studies have evaluated the relationship to date. This study develops a method for evaluating street noise and documented crash rates for roadways in Austin, Texas, and Washington, D.C., in a manner that is replicable by researchers and practitioners. Researchers collect street-level noise in both cities over a range of locations, facility types, and times, and compare these against crash records, normalized by bicycle volumes, and other explanatory variables. Descriptive and inferential statistics of a pilot test suggest a role for street-level road noise impacts to vulnerable road user safety. If this full-scale examination in two cities show consistent results, street-level noise measurement—obtainable by non-experts—may offer time and cost savings relative to other street safety estimation methods for bicyclists. Street noise may be a valuable proxy for safety variables such as motorized vehicle speed, volumes, and proximity to bicyclists, which could result in improvements to facility design and crash modification factors to reduce bicycle crashes.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	Education and Workforce Development Plan There are two types of audiences for the education and workforce development plan. First, college level students. Second, transportation staff/experts at state departments of transportation. Develop two college-level lectures based on the study process and findings, tailored to planning for safety, considering the noise impacts to vulnerable road users.

Students will be encouraged to integrate work on this project with applicable coursework and master's report or thesis, and to co-author at least one Transportation Research Board paper submission. Depending on the results of this initial study, additional funding for students will be pursued from sources such as State Planning and Research programs in Virginia and Texas, and the Federal Highway Administration's Eisenhower Transportation Fellowship Program.

Researchers will also develop a presentation or webinar for both VDOT and TxDOT staff.

Technology Transfer Plan

This study evaluates noise data as a potential indicator for safety risk for bicyclists in on-street settings, providing insights to the relationship between noise and crash risk at a very high spatial resolution. Depending on the robustness of the results, this study could establish street noise as a valuable predictor of bicycle crashes, potentially leading to improvements in crash modification factors and facility design to reduce collisions. The method is designed to be implementable by researchers and practitioners.

We anticipate at a minimum two written publications. First, a final report for this project will be posted on the Safe-D website, the TTI online publication catalog, which will be publicized through TTI social media. Second, a peer-reviewed journal article in the Transportation Research Record and associated dissemination via the conference papers list (formerly CD).

The noise platform is developed as a crowdsourcing tool, so community members can collect noise data following our methods to identify hot spots for bicycle crashes based on exposure. This is a new, low-cost method to collect exposure data, and can combine it with other data for analysis. The method could also be applied to improve bicycle routing algorithms for web and smartphone-based platforms.

We will propose a webinar to reach a national audience, such as through the Institute of Transportation Engineers, or the Association of Pedestrian and Bicycle Professionals and we will present at the TRB annual meeting.

Professionals will have a new, low-cost method to collect exposure data, and can combine it with other data for more in-depth safety analysis and facility design. This project will likely lead to other funded studies, such as relating noise levels to bicyclist comfort

	models, and possibly a larger-scale project that could represent contexts across the nation.
Impacts/Benefits of Implementation (actual, not anticipated)	<ul style="list-style-type: none">• Identification of areas with high bicycle-motorist crash risk.• Identification of modifiable factors (e.g., facility design) that could result in reduced collisions.
Web Links <ul style="list-style-type: none">• Reports• Project website	http://www.vtti.vt.edu/utc/safe-d/index.php/projects/street-noise-relationship-to-vulnerable-road-user-safety/