



## Florida Department of Transportation Research

Simulation Visualization of Highway Noise Near Barriers

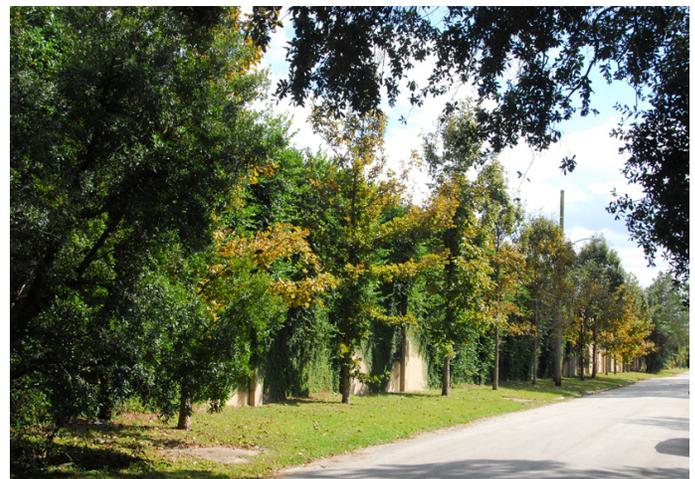
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Researchers at the University of Central Florida Noise Laboratory have developed a computer simulation program that allows roadway designers to visualize the shadow zone behind a planned highway noise abatement barrier. The shadow zone is area where the barrier effectively reduces the sound level. Transportation agencies commonly use a traffic noise model (TNM) program to predict sound levels along roadways. These predictions are incorporated into the design of noise abatement barriers. However, the TNM does not always provide enough data for an accurate estimate of a shadow zone.

An accurate estimation of the shadow zone is important. The choice of a barrier design is based on a cost-benefit analysis that considers how many receivers, or buildings that will receive the benefits of barrier, fall within the shadow zone. The designs that protect the most buildings are considered to be the most cost effective.

The shadow zone visualization program incorporates data developed by the researchers during their evaluation of 19 different barrier designs currently used in Florida. With the data, they created a program that can simulate the probable extent of a shadow zone, taking into consideration local topography and a condition known as “end effect,” which is the diffraction of sound waves around the end of a barrier.

The shadow zone visualization program is accompanied by a user guide that shows how the program can be used in combination with the TMN and CAD programs. The program will help planners more clearly demonstrate to agencies and to the public the benefits of different barrier designs. The selection of the most effective designs can provide cost savings to the state while providing quality-of-life benefits to the public.



*A noise abatement barrier on I-95 in Jacksonville: on the left as seen from the Interstate and on the right as seen from the protected residential neighborhood in the shadow zone.*

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