RESEARCH PAYS OFF

Florida Improves Noise Prediction

STAMINA 2.0, the computer program for predicting highway traffic noise, is used in project development to forecast the effect of traffic-generated noise on surrounding land uses and to assess mitigation measures such as noise barrier walls (Figure 1). The mainframe computer program, which was developed by the Federal Highway Administration (FHWA), is based on reference energy mean emission level (REMEL) data gathered in 1974 and limited to speed ranges from 48 to 97 kilometers per hour.

Problem

On the basis of field data gathered in 1985 for the Florida Department of Transportation (FDOT), it was obvious that the REMEL data of 1974 were no longer representative of the conditions in Florida. Field studies conducted by the California Department of Transportation yielded similar results for California vehicles. With the change in the national speed laws on designated roadways, the ability of the current STAMINA 2.0 program to model noise levels accurately under these conditions became the subject of a research project.

Solution

Through the Highway Planning and Research program of FHWA and FDOT, the University of Central Florida (UCF) was asked to update the REMELs on the basis of Florida traffic and to expand the speed range of these data. As a result of the study, completed in 1992, an improved data base was developed that allowed the upper limit of the program to be increased from 97 to 113 kilometers per hour. The lower limit was reduced from 48 to 32 kilometers per hour. After extensive testing, FHWA approved the new REMELs for use in all of FDOT's programs for predicting traffic noise.

Application

Field measurements immediately revealed the enhanced accuracy of the prediction program. The ability to predict higher and lower speeds also improved the versatility of the program and reduced user errors and time. UCF researchers suggested that a personal computer (PC)--based STAMINA program be produced as a spin-off of this effort. Using the data gathered by UCF and the source code for the FHWA mainframe version of STAMINA 2.0, Ken Graham, a computer engineer with FDOT, developed a PC version for use in Florida. The PC version has on-screen graphics capability and runs efficiently on nearly any IBM-compatible PC.

Benefits

The improved accuracy of the STAMINA 2.0 model allowed FDOT noise specialists to more accurately predict the levels of traffic noise on highway projects and the impact of the noise on surrounding land uses. This ability has led to more extensive noise barrier wall designs to protect the public interest, but it has also reduced the amount of corrective work, which could save millions of dollars a year.

In addition, the PC-based version has given FDOT district staff and consultants a program that they can run at their convenience. The consultants, then, are less dependent on access to the FDOT mainframe program. It has also cut their costs by eliminating the time-sharing option costs that FDOT charges to outside users. These savings can be passed on to FDOT in reduced contract costs. Finally, a substantial benefit is that all noise assessments conducted by and for FDOT will use the same base data, which has led to more consistent and uniform noise prediction results and has eliminated any concern about the validity of studies performed using non-FDOT data.

For further information, contact Win Lindeman, Environmental Administrator, Environmental Management Office, Florida Department of Transportation, 605 Suwannee Street, Mail Station 37, Tallahassee, Florida 32399-0450 (telephone 904-488-2914).

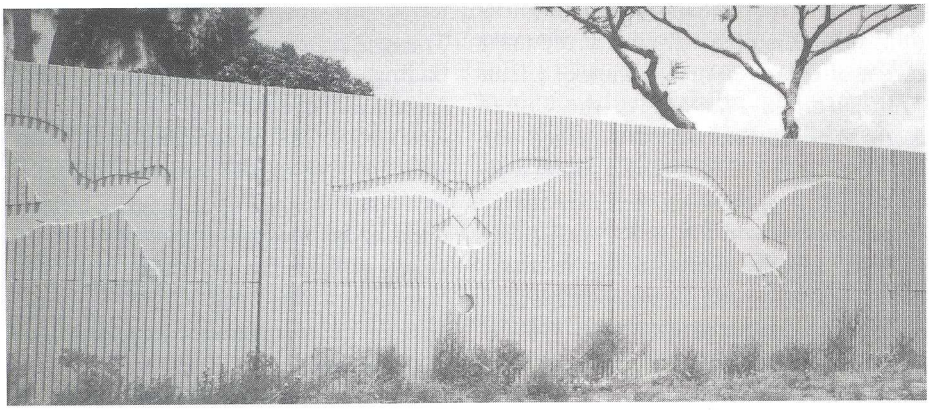

FIGURE 1 Barrier wall eases effects of noise along I-95 in Palm Beach County, Florida.

Suggestions for "Research Pays Off" topics are welcome. Contact Crawford F. Jencks, Transportation Research Board, 2101 Constitution Avenue, N.W., Washington, D.C. 20418 (telephone 202-334-2379).