U.S. Department of Transportation
Federal Highway Administration

Priority, Market-Ready Technologies and Innovations

FHWA Traffic Noise Model®, Version 2.1

Problem: Traffic noise creates headaches for communities and motorists

Highway traffic noise has been a Federal, State, and local problem since before the first noise barrier was built in 1963. Emanating from vehicle engines, exhaust systems, and tires interacting with pavement, traffic noise affects the quality of life for nearby residents and businesses by drowning out conversations, disrupting sleep, and discouraging outdoor activities. Over the years, community and motorist concerns have fueled the push to improve noise measurement and modeling tools that help transportation agencies address the highway traffic noise problem.

Putting It in Perspective

- Between 1997 and 2001, nationwide costs for noise barriers averaged more than $124 million a year.
- As of 2001, 44 State departments of transportation (DOT) and the Commonwealth of Puerto Rico had constructed more than 2,947 linear kilometers (1,831 linear miles) of noise barriers at a cost of more than $2.5 billion (in 2001 dollars).

Solution: Traffic Noise Model predicts traffic noise impacts around highways

The Federal Highway Administration (FHWA) has developed the FHWA Traffic Noise Model (FHWA TNM), a state-of-the-art computer program for predicting noise levels in the vicinity of highways. It uses advances in acoustics and computer technology to improve the accuracy and ease of modeling highway traffic noise, including the design of efficient, cost-effective highway noise barriers.

How does the FHWA TNM differ from earlier noise-prediction software?

The FHWA TNM calculates traffic noise levels using new acoustical algorithms and newly measured emission levels for five standard vehicle types: cars, medium trucks, heavy trucks, buses, and motorcycles. Its flexible database includes more than 6,000 individual vehicle pass-by events, measured at 40 sites across the country.

The FHWA TNM models sound levels for locations with and without noise barriers. The FHWA TNM allows for analyses of noise from constant-flow and interrupted-flow traffic, and determines the effects on noise levels of different pavement types, graded roadways, rows of buildings, dense vegetation, and parallel noise barriers.

What are the potential cost savings?

The FHWA TNM provides a 1-decibel increase in accuracy over FHWA's previous prediction model. Nationwide, noise barriers average 3.6 meters (12 feet) high. A 1-decibel improvement in traffic noise prediction accuracy could reduce the barrier height needed to control noise by 0.6 meters (2 feet), generating a 16 percent savings in noise barrier program costs, so savings could total more than $19 million a year.

Benefits

- Improves accuracy of predicting traffic noise levels.
- Helps design more efficient noise barriers.
- Reduces program costs for noise barriers.

Additional Resources

The FHWA TNM is being distributed by the McTrans Center at the University of Florida at a cost of $695. The FHWA TNM package includes the executable code, the User's Guide, the Technical Manual, and a CD-ROM Trainer. The FHWA TNM may be ordered from McTrans at 352–392–0378, extension 242, Monday–Friday. The fax number is 352–392–3224.

For more information, contact:

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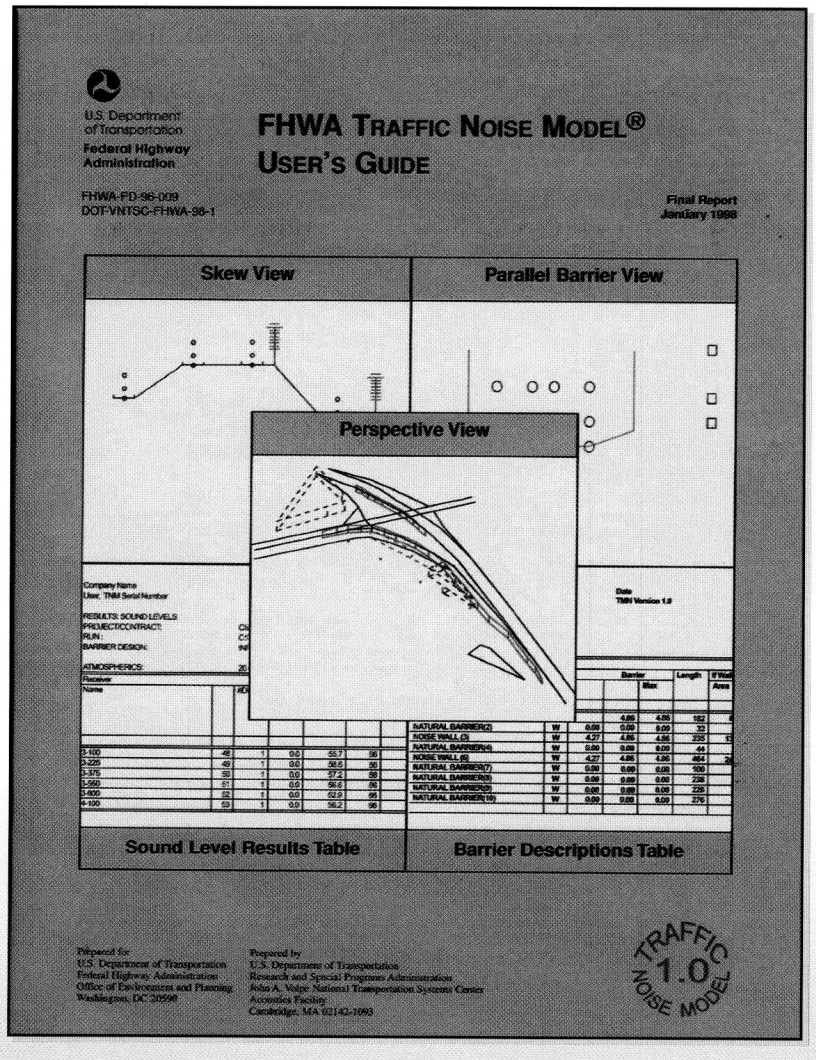

FHWA TNM User's Guide

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