CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY

Name(s)
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Project Number
J0227

Project Title
Do Sound Walls Work?

Abstract

Objectives/Goals
The purpose of the experiment is to learn if sound walls, at neighborhoods adjacent to freeways, increase or decrease the freeway noise.

Methods/Materials
A digital sound meter was used to calculate the noise level in decibels at neighborhood#s beside freeways. Various distances between 0 and 1000 feet were tested. At every distance, the min, max, and average were recorded. The test sites were located on a road that was perpendicular to the freeway. Three different test locations were used; one with two parallel sound walls, another with one sound wall, (tests were conducted on the same side as the wall) and the last with no sound walls.

Results
I discovered that with two parallel sound walls the noise levels after 250 feet increased. The noise level after 250 feet, with two sound walls, was greater then with no sound walls or one sound wall. Until around 500 feet from the freeway two sound walls had the greatest noise level.

Conclusions/Discussion
This increase in noise could have been caused by three different factors; reflection off the opposite wall, wind, and the inversion layer. The results showed that the experiment had a purpose. The results could help build better and more efficient sound walls. Ways to increase the efficiency of sound walls include curving the top of the sound walls inward toward the freeway, (Lessoning the reflections over the wall) and putting sound absorptive materials into the sound walls (The noise would be absorbed instead of reflected)

Summary Statement
Sound walls were tested to see if they affected noise levels in neighborhoods adjacent to the freeway and other neighborhoods further away.

Help Received
Dad drove me to the test sites. Mom and Dad helped correct my work.