

CFADAGA2004/405

Concepts for estimating the total annoyance in residential settings containing two noise sources

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Administrators in industrialized countries are often faced with the task of estimating the effect of two or more noise sources on the "total annoyance" of residents. Since laboratory experiments do not seem adequate, well controlled field studies are rare, and both lab and field studies show conflicting results, the administrative task has to be done from the desk, using certain assumptions and a theoretical concept. In the past, several models have been proposed, e.g., energy summation, annoyance summation, energy difference, and dominant source. The main concepts discussed today make at least three assumptions: (1) The relation between integrated noise levels of a single source and integrated annoyance judgments of this source is different for different noise sources. (2) The annoyance judgment related to a specific source is independent from the annoyance judgment related to a second source. (3) The noise level of a specific source can be converted to the noise level of a reference source, using annoyance equivalents. These and other assumptions are discussed in the present paper.

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