The need for a unified community noise policy

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Today, there exists in the United States an assortment of federal, state and local laws and regulations which attempts to define and manage community noise. However, there are sometimes serious conflicts among these mandates. These conflicts may be simply differences in the sound level limits that each regulation imposes on a given source or other substantive differences. Further, various agencies often use different metrics to characterize the offending source noise. There can also be cases where multiple sources individually comply with applicable noise limits, but in combination place an unacceptable noise level burden on the community. These conflicts arise because many governing noise policies are source (emission) oriented, limiting levels at a neighboring property line. In general, community noise policy in the U.S. has had limited success in controlling specific noise sources, while failing to contain the geographic spread and associated rise in overall noise levels. Another approach is to manage the total noise environment of the receiving person. Using a noise exposure effects (immission) methodology to assess community impact may provide the tools needed to harmonize currently conflicting noise policies. It is time for a serious debate on the policy direction needed to improve our acoustical environment.

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1. THE PRESENT STATE OF COMMUNITY NOISE POLICY

It is taken as a given that excessive exposure to noise is detrimental to one's welfare and quality of life. How then to control noise exposure in the community, where people live, shop and work? In the terminology of environmental law, community means residential and commercial land uses. These land uses may include homes, schools, offices, retail stores and public parks, among others. Of course, industrial land uses may be sources of environmental noise in the community, but apart from worker health and safety, there seems to be less public concern about noise inside the industrial environment. The need to develop a consensus on how to deal with excessive noise in communities has long been recognized, at least as early as the 1940's.[1-9] However, at present there is no unified policy on noise control in the U.S. In this regard, the U.S. lags far behind the European Union.[10]

The response to the need to control environmental noise in U. S. communities has involved a wide assortment of environmental regulations, including federal, state and local law, regulations and zoning performance standards, often based on property rights, and common law. These legal mechanisms were developed by a variety of governmental interests, and are almost exclusively directed at controlling specific noise source emissions.[11] There is no governing body in the U.S. to define and coordinate community noise goals, legislation, standards, education or research.

As a result, many of the existing noise laws and regulations now conflict with each other in terms of the acoustical metrics used, the criteria applied to those metrics, the assessment methods, and the means of enforcement.[12,13] For example, the Federal Aviation Administration (FAA) has determined that an annual day-night average sound level, DNL, of 65 dB(A) is the level at which action must be taken to protect residents from aircraft noise near an airport.[14] However, the Federal Energy Regulatory Commission (FERC) has adopted the Environmental Protection Agency's (EPA) recommended outdoor limit of DNL = 55 dB(A) for the enforcement of plant modifications to natural gas pipeline compressor stations to protect nearby residents.[15] Still different, the Federal Highway Administration (FHWA) has defined a Noise Action Level (NAC) of $L_{eq(1h)}$ = 67 dB(A), measured during the peak traffic hour, as the criterion for action to protect residents near a federally funded highway project.[16] Clearly, these federal noise criteria are in conflict. For communities impacted by a combination of those sources, the issues would have to be resolved in court, a technically and legally arduous, and inefficient process. The next community to be so impacted would have to start over from the beginning. This raises the question of equal protection under the law for all residents, certainly a thorny issue.

Matters become worse when examining the regulations of state and local jurisdictions. Here, variety is the rule. Some states (e.g., Illinois and Connecticut) have carefully crafted environmental noise regulations,[17,18] while others (e.g., Michigan) ignore the issue completely, delegating the matter to local governments.[19]

Many of the state regulations use metrics different from the federal regulations described above. Rather than place limits on average sound level (L_{eq}), these regulations place limits on maximum A-weighted sound level as measured using the time weighting function of a sound level meter (i.e., L_{AS}). Often, different limits are mandated for noise levels during daytime and nighttime hours. Commonly used limits include 55 dB(A) during the day and 45 dB(A) at night for residential receivers. Further, there can be a discrepancy between the state and local regulations in the same community on the exact definitions of daytime and nighttime hours, as well as the level limits. Some regulations place limits on maximum measured unweighted octave band levels. Others place additional limits on sound levels with tonal content, using a variety of definitions. Some

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regulations are source specific, placing different noise limits on different types of emitters. There is also the question of absolute versus relative limits. For example, the Massachusetts regulation applies a limit of 10 dB(A), over which an emitter may not increase the ambient background noise level (L_{90}).[20]

Several municipal codes have been recently enacted which place limits on octave band noise levels, but use the old octave band definitions,[21-23] which were rendered obsolete in 1960![24] The 0 to 75 Hz band is particularly problematic. Perhaps worse, other localities have simple nuisance ordinances which are subjective only, without any objective measurement requirements. The hodge-podge of existing noise regulations can make compliance difficult, even for emitters with "good will." For uncooperative emitters, enforcement is a serious challenge. Due to the lack of a consistent, coherent and coordinated national policy, community noise issues are most often dealt with on a case by case basis, with uneven results.

2. A UNIFIED COMMUNITY NOISE POLICY

Clearly, the time has come to remedy this situation. A unified community noise policy is needed in the U.S.A. This would promote consistency among federal agencies, and encourage the harmonization of state and local regulations, to allow for equal protection under the law for all U.S. citizens. The goal of such a policy should be to provide for the safe and quiet enjoyment of one's home, while balancing this right with the need for economic development in the community.

Perhaps this new, unified policy should focus on the total noise exposure (immission) of the community; that is, the environmental impacts of all noise, rather than on individual "point-source" emitters. In this scenario, community noise limits would be based on the number in the population exposed to each range of noise level, weighted by a function which describes the human response to increasing levels of noise.[25] Another recent approach to environmental protection is known as Community Based Environmental Protection (CBEP). This approach focuses on a geographic area (place-based), encourages collaboration among many stakeholders, and applies adaptive management techniques.[26] It is clear that developing a unified community noise policy is a major task. To be successful, it should be developed by an institution of national stature, with the collaboration of the public, government, industry and engineering interests. The policy could then have a national constituency and, when implemented, can result in a quieter environment for us all. The time to begin is now.

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