



*Rochester Committee
for Scientific Information
Rochester, NY*

*RCSI Bulletin 163
Noise Legislation: Federal, State and Local*

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August 1973*

THE ROCHESTER COMMITTEE FOR SCIENTIFIC INFORMATION
P. O. Box 5236, River Campus Station
Rochester, New York 14627

Bulletin #163
Noise

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Summary

Noise is being recognized as a problem by various levels of government and laws dealing with it have either recently been enacted or are being considered. This includes the Federal Government, New York State, Monroe County and the City of Rochester. The main provisions of the Federal and State laws are discussed here along with the areas which remain open to local control.

I The United States Noise Control Act of 1972 (1)

Uncontrolled noise presents a growing danger to health and welfare. Therefore, it is now national policy to achieve an environment free from excessive noise. Federal agencies, mainly the Environmental Protection Agency (EPA), are directed to reduce noise. The EPA is authorized to conduct and finance research on the effects of noise, to coordinate the noise-related activities of other Federal agencies, and to disseminate noise information. The EPA is also directed to aid local governments in their development and enforcement efforts. The noise reduction programs of Federal agencies may be reviewed publicly by the EPA if they are deemed inadequate.

Information: The law requires the EPA to publish criteria for all identifiable effects of noise on the public by July, 1973. By October 1973 it must publish information on levels of environmental noise and, by April 1974, publish a report identifying major sources of noise and techniques for noise control.

Products in Commerce: The EPA is to set noise standards for any products in the categories of 1) construction equipment, 2) transportation equipment (including recreational vehicles), 3) any motor or engine, and 4) electrical or electronic equipment if these products are identified as major noise sources. Most household appliances would be included. The report to the Senate of the House-Senate conference states that the intent is for priority to be given to "such items as trucks, snowmobiles, compressors and construction equipment, rather than blenders, electric can openers and vacuum cleaners although standards could cover these items". This intent does not remove the household items from the scope of the law. States and their political subdivisions are prohibited from setting noise levels different from those promulgated by EPA.

Aircraft Noise: Prior legislation gave jurisdiction over flight and operational noise controls and aircraft noise emissions standards to the Federal Aviation Administration (FAA). This jurisdiction continues but the EPA is to study the adequacy of these controls and standards and submit recommendations to the FAA if needed. This existing legislation prevents both the State and local governments from setting noise standards for aircraft during operations. A recent decision by the U.S. Supreme Court also prevents the local government from imposing a curfew on an airport as a means of controlling the times when noise occurs.

Labeling: The EPA must cause any company to label properly any product, including imports, which emit noise capable of adversely affecting the public health or welfare. Documentation of direct effects of noise on health or welfare is presently meager, however (2). This provision may become more effective as the research on noise effects authorized under the Act begins to bear fruit.

Any product sold, even partially, on the basis of its effectiveness in reducing noise must be labeled as to its noise level. This would presumably apply to automobile advertisements. Many have recently used terms such as "quiet", but the amount of noise is vague (3).

All persons are prohibited from removing a noise reduction device or a label from a product.

Railroads and Motor Carrier Noise: The EPA, after consulting with the Department of Transportation, is required to promulgate regulations for surface carriers engaged in interstate commerce (trucks, buses, railroad trains). State and local governments are prohibited from establishing operational noise emission limits different from the applicable Federal standards.

II Proposed New York State Noise Regulations (4,5)

Construction Sites and Non-Residential Stationary Site Noises: The Department of Environmental Conservation (DEC) is developing a noise program. The first proposed regulation deals only with construction sites and non-residential stationary sites. Later regulations will consider noise from aircraft, motor vehicles and recreational vehicles but their application will be restricted by the Federal preemptions. The regulations will, of course, deal only with man-made sounds, not with thunder, waterfalls or wild animals.

Noise at Boundary: The proposed regulations do not specify noise emission limits for specific products or equipment since sound levels are additive and protection against a large number of sources would require setting a very low value for each single product source. Furthermore, the Federal government is setting noise levels for any construction or transportation products and for engines and motors so the State could do nothing but agree. Instead the State regulations specify acceptable levels for the sound crossing the site boundary. This prevents the State regulation from conflicting with the Federal law and being void. The State approach thus permits the owner to use distance to decrease noise levels rather than muffling devices, if he chooses.

Land-Use Noise Classes: Sounds will be classified as undesirable noise according to the land-use category on the receiver side of the boundary. There are four land-use categories, A, B, C, and R. For convenience we will discuss these in reverse order.

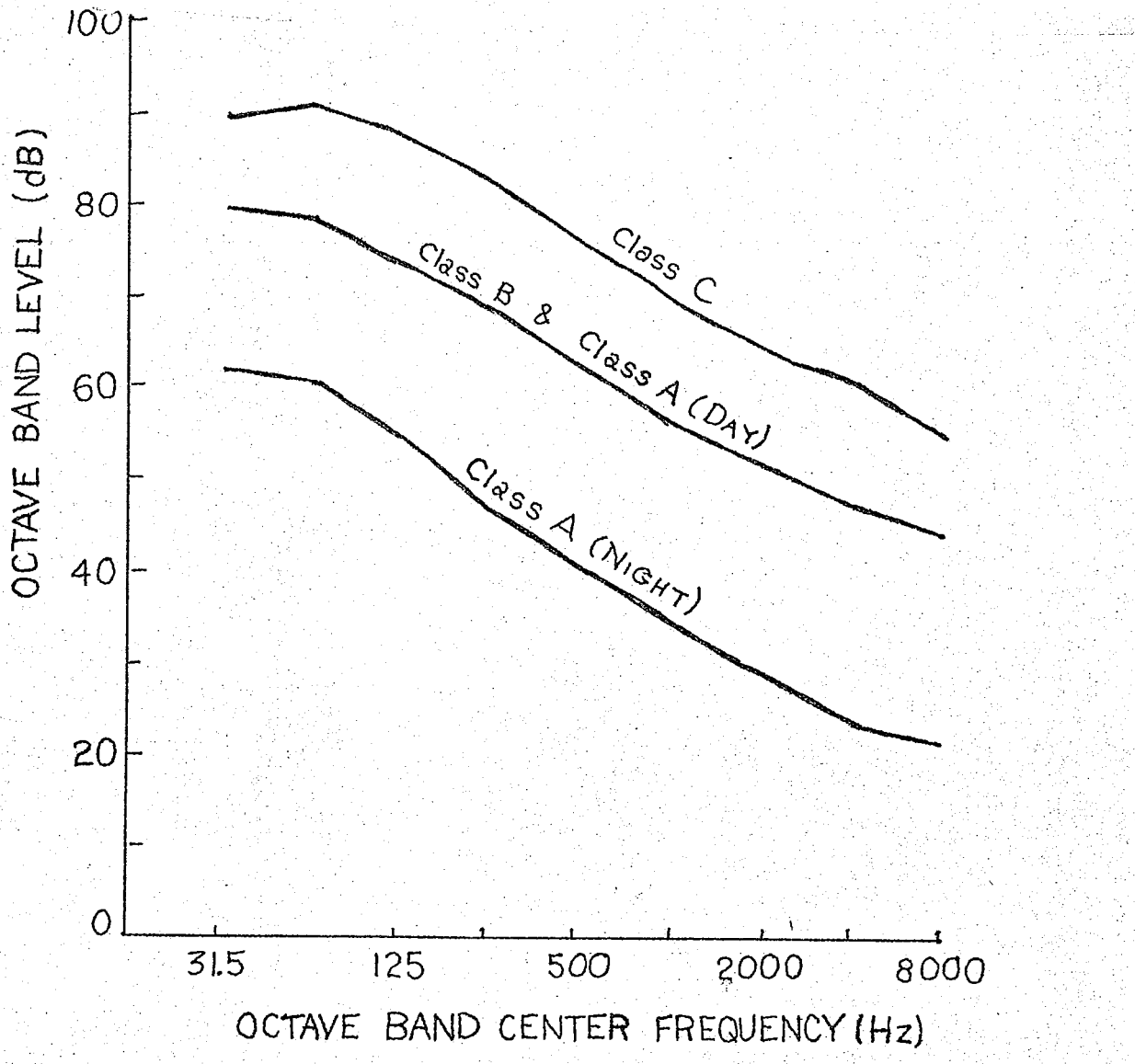
Class R is mainly private residential land, including year-round residences, seasonal residences, estates and mobile homes. The State regulations do not attempt to control noise which originates on residential land. Sounds generated by a homeowner's lawnmower or a backyard party are not restricted by the State regulations. While Class R is included in Class A of receiving zone as defined below, the R classification excludes it from consideration as a noise source.

Class C includes industrial land; manufacturing, mining, warehousing, and storage. The rules assume that some interference with speech is acceptable in such areas but that hearing damage is to be avoided. The level of noise allowed to enter Class C

* Newspapers reported on August 1, 1973 that the EPA has proposed regulations to reduce truck noise by setting muffler standards and by outlawing noisy tires. No decibel values were given. The regulations would take effect on October 1, 1974.

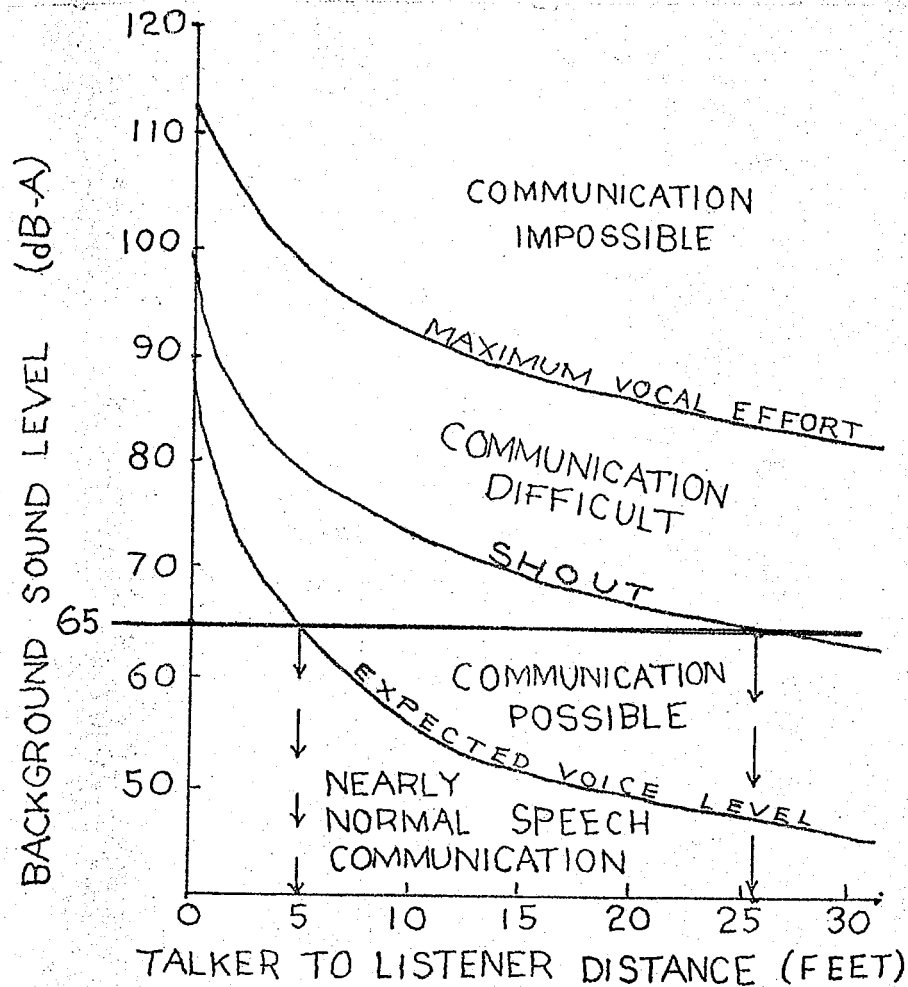
land is therefore set at 80 dBA. This is lower than the 90 dBA allowed under the Federal Walsh-Healy Act (6) which assumed a maximum of 8 hours exposure with some interruptions. The State rules include situations where the noise might continue all day without interruption. Sounds at higher frequencies are known to cause more damage to hearing than that at low frequencies (7) and to be more annoying (8). Consequently, limits are also defined for each octave of frequency, with higher frequencies assigned lower dB limits. These are shown in Figure 1, along with Class A and B discussed below.

Figure 1. Noise limits of the proposed State regulations as a function of frequency (5).



In Class B land people carry on activities which require normal conversations: restaurants, banks, offices. The relationship between background sound level in dBA and various degrees of difficulty experienced in communication is shown in Figure 2. The State will set a sound level limit into Class B land at 65 dBA, permitting normal conversation at distances of up to 5 feet and communication by shouting up to about 26 feet. A higher noise level would require workers to be closer to each other, than five feet in order to communicate by speaking in normal volume conversation, but this close distance is found to cause embarrassment; proximity is usually reserved for intimate association (10).

Figure 2. Quality of speech communication in relation to background sound level and distance between talker and listener (9).



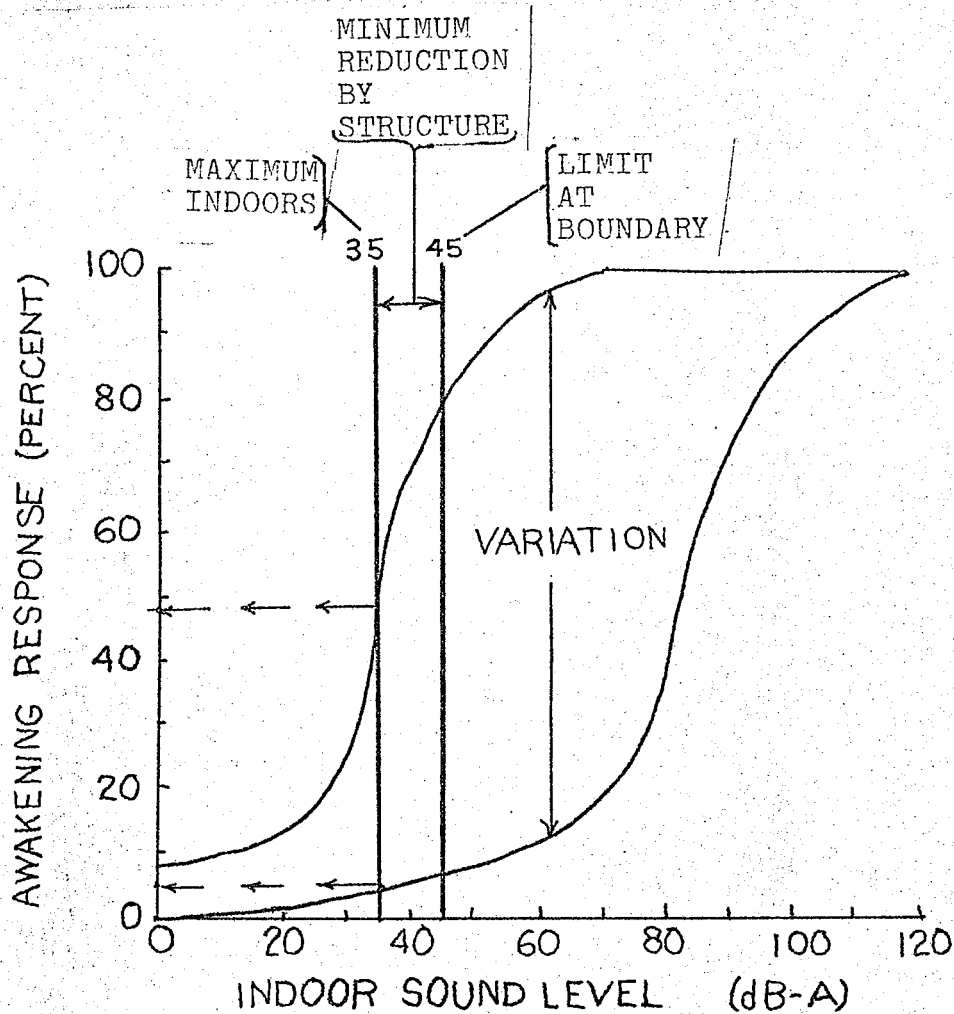
A lower noise level might be desirable but the regulation is directed at the maximum sound level permitted, at the boundary of the source. Noise will be decreased by distance at a rate of approximately 6 dBA for each doubling of the distance from the source (11). A pattern of noise limits in decibels for each octave of frequency is again specified. This is shown in Figure 1.

Class A generally includes land where people reside and normally sleep. This includes Class R (residences, estates, mobile homes), which was defined to exclude it from control as a source. As a receiver of noise, however, Class R type property is included along with other more commercial living accommodations such as hotels, motels, camps, resorts, etc. to form Class A. These latter categories would be regulated as noise sources as well as protected as noise receivers. They would be prohibited from making sounds which go across other property boundaries at excessive levels.

The permitted sound level into Class A land is set differently during the day (7 am to 11 pm) than at night (11 pm to 7 am). During the day normal conversation is the standard and the noise level permitted is at 65 dBA, just as in Class B. During the night the sleep is to be undisturbed so the level is at 45 dBA. The level must be met at the boundary of the property so it would be less in the sleeping chamber. If the windows are open the house structure reduces the sound intensity by about 10 dBA; if closed the sound is reduced by about 20 dBA (12). Distance also reduces the sound level so, even when the windows are open, the sound would be below 35 dBA in the

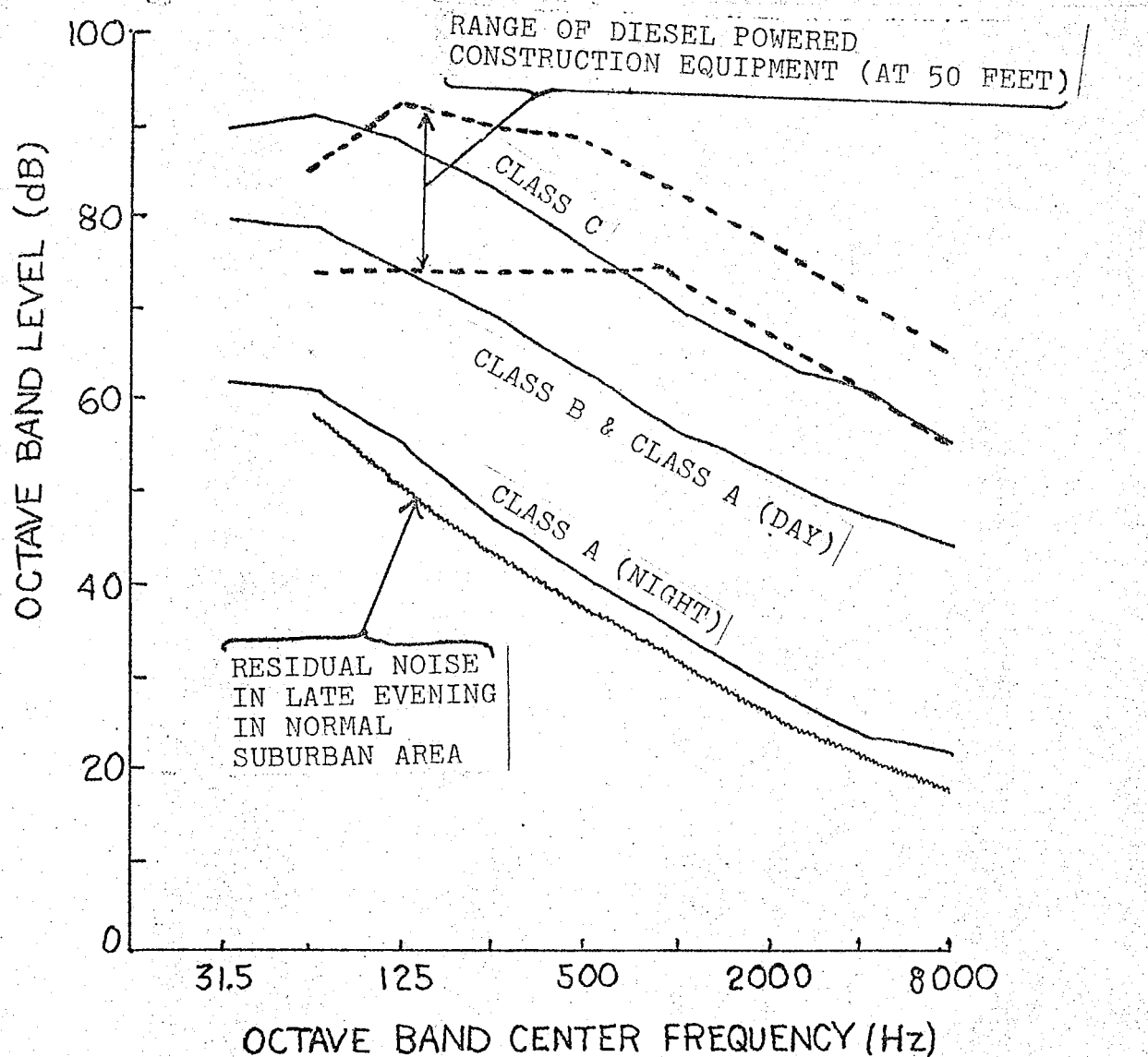
bedroom. Figure 3 (13) shows that 35 dBA noise would awaken between approximately 5 and 48 percent of sleeping persons, depending upon their depth of sleep, type of sound, and other variables (14). A schedule of decreasing sound level limits with increasing frequency is also required, as shown in Figure 1. The day level coincides with Class B limits but the Class A night limits are lower.

Figure 3. The percent of sleeping individuals awakened in response to a brief indoor sound of a given level (13).



Limits for each octave of frequency can be interpreted relative to a familiar situation by referring to Figure 4 (15), which includes a curve for residual noise in late evening in a normal suburban neighborhood. The range of noise levels at 50 feet for a variety of diesel powered construction equipment is also shown (15). Much of this equipment would need muffling, either by devices or by distance, even for a Class C area, and would need a great deal of muffling (almost 20 dB even for the quieter pieces of equipment at 1000 Hz and above) for Class B and Class A during the day. It would need more than 40 dB of muffling to meet the requirements of Class A at night. Since this is equivalent to reducing the sound intensity by the factor of 100 (16) it would be very difficult to achieve. Diesel powered equipment would be thus virtually banned from Class A land, where persons sleep, during the night. Permits will be available for cases where meeting the noise levels is judged unreasonable or in cases of emergency.

Figure 4. A comparison of Class A, B and C noise limits with residual noise in late evening in normal suburban neighborhood and with the normal range of diesel powered construction equipment at a distance of 50 feet (15).



III Other Noise Legislation

Monroe County and the City of Rochester are each preparing anti-noise legislation. Proposals are still being prepared and cannot usefully be discussed in any detail. Their areas of application are partially circumscribed by the laws discussed above, however. The Federal government has basically pre-empted all aspects which involve interstate commerce. This includes household appliances, hobby equipment and interstate transportation equipment (railroad, bus, aircraft, and trucking). The State of New York already regulates vehicles on public highways, some specific noise problems such as snowmobiles, and will be regulating both construction site noise and non-residential stationary noise sources, but not residential noise sources.

Our local governments may regulate the remaining areas. They can also include some of the sources already covered by the Federal or State governments provided they do not conflict with them. For example, local and State governments are forbidden to set conflicting noise limits on household appliances but they could put limits on appliances not covered by the Federal regulations. Time, duration, and place of use may also be regulated. Regulations would generally not be applied to homes, however. Neither Monroe County nor the City of Rochester are presently contemplating such regulations. They would not be permitted to regulate noise from interstate travel; trains, busses, and airplanes. State regulation of construction site noise levels, however, allows the local governments to specify working times. This approach is being considered by both Monroe County and the City of Rochester.

A large area which is not pre-empted includes residential noise and most adjustable noise sources. Radios, phonographs, TV, amplifiers, and other such sources are adjustable. The Federal law may limit them in their maximum sound intensity as part of the manufacturing process but local laws can still regulate adjustment and times and places of use. These non-stationary sources are also exempted from the proposed State regulations, therefore local governments can legislate control over them. Such regulation is limited only by unreasonable interference with the citizens' rights, which would be unconstitutional. The local legislatures bear the burden of balancing the citizen's right to peace and quiet against other citizens' rights to work, play and listen to radios.

References

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- (2) R. E. Lee, "Effects of Noise on Humans", RCSI Bulletin #155
- (3) C. R. Bragdon, Noise Pollution: The Unquiet Crisis, U. of Penna. Press, Phila. 1970, pp 205-215 lists excerpts from 78 ads appearing in national periodicals between the years 1968 and 1971 which mention quietness.
- (4) Proposed Regulations for the Prevention and Control of Environmental Noise Pollution, New York State Dept. of Environmental Conservation, Nov. 1972
- (5) Prevention and Control of Environmental Noise Pollution: Explanation of Regulations for Construction and Non-Residential Stationary Sources, New York State Department of Environmental Conservation, BNC-1, Nov. 1972
- (6) R. E. Lee, loc. cit.
- (7) C. R. Bragdon, loc. cit. p 77
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- (9) Effects of Noise on People, U.S. Environmental Protection Agency Report NTID 300.7, Dec. 31, 1971 p 50
- (10) Ibid. p 51
- (11) "Noise and Its Control", Encyclopedia Britannica, 1969, Vol 16, p 556
- (12) L.L. Beranek, Noise and Vibration Control, McGraw-Hill, 1971, p 579

- (13) EPA Report NTID 300.7 loc. cit. p 68 (modified)
- (14) Ibid. pp 66-77
- (15) N.Y.S. DEC Explanation of Proposed Regulations, loc. cit. pp 18, 21 and 22
- (16) R. E. Lee, "Noise: Definition and Typical Values", RCSI Bulletin #146