



Fall 1970

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Recommended Citation

Clifford R. Bragdon, *The Community Noise Problem: Factors Affecting Its Management*, 10 Nat. Resources J. 687 (1970).

Available at: <https://digitalrepository.unm.edu/nrj/vol10/iss4/3>

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THE COMMUNITY NOISE PROBLEM: FACTORS AFFECTING ITS MANAGEMENT

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The noise associated with urban living is a growing environmental liability. Increasing numbers of the population are affected by this pollutant, making proper noise management vitally important. To provide a background for effective policy decisions, it is essential to identify those factors affecting community noise management. Those factors include auditory regression, human misunderstanding, adaptation, priority of concerns with respect to urban problems, institutional apathy (both public and private), and ignorance. The purpose of this article is to discuss each of these factors. No relative importance is implied by the order in which they are listed and discussed.

I AUDITORY REGRESSION

In the development and growth of man's sensory world he has relied upon certain modes of perceiving in order to comprehend. Today it seems as though visual perception is the predominant sense. However, this does not mean vision is an isolated sensory function, but rather that the eye dominates the perceptual process. Other senses (auditory, tactual, olfactory, and gustatory) are complementary, but subordinate. Consequently, the auditory sense being less than fully used has become less sensitive to the surrounding environment. Visualized cues, for example, often are more rapidly perceived than those purely of an auditory nature. Popular expressions in use today reflect the present state of visual dependence. Such sayings as, "One picture is worth a thousand words", "Seeing is believing", "I am from Missouri, show me", and "I can't hear you without my glasses", illustrate this visualized awareness.

This sense is fundamental in the formal process of learning. In many aspects of education, visual learning with audio reinforcement is the commonly accepted teaching method. Take reading, for instance. In antiquity and the middle ages, reading was oriented toward the ear.¹ The term "reading" meant reading aloud. This reading method created what Marshall McLuhan refers to as a synesthesia or interplay of the senses.² Manuscripts were written throughout the middle ages with minimal punctuation and other visual aids. Word

† Ph.D in city planning; University of Pennsylvania, Philadelphia.

1. F. Kenyon, *Books and Readers in Ancient Greece and Rome* 65 (1937).

2. M. McLuhan, *The Gutenberg Galaxy* 83 (1962).

separation was unknown. This characteristic style, even as late as the seventeenth century, was geared to the ear, not the eye.³ Today in reading we have moved further away from the auditory sense with emphasis on speed reading and the visual skill of scanning.

In general, learning became primarily visual with the advent of the scientific revolution. The more rationally based sense of visual observation lent itself to the scientific method. Consequently, touch, taste, smell, and hearing, described as affective senses because they are predominantly associated with the sources of emotional life, yielded to visual reasoning and scientific experimentation.⁴

Man's entire way of life, not just the processes of reading and learning, is affected by how the environment is perceived. History suggests that major shifts in the sensory structure of perception have occurred. The middle ages, for example, represented a time when man's auditory sense was keenly developed. In a world of little artificial light and nearly universal illiteracy, medieval man relied heavily upon his ears for information. Throughout this time the church bell was not rung for esthetic purposes. Its ringing ordered lives and gave them meaning. Bell tolling evoked a total range of emotional response, from happiness and joy during holy days and festive occasions, to fear when the town was being attacked, and to sadness after battle when the death toll could be heard. The message conveyed was so precise that the bell's final strokes "indicated the age, sex and social rank of the dead."⁵ Another important auditory vehicle giving meaning to the medieval townpeople was the crier or bellman. The town crier acted as a verbal newspaper, assisting those responsible for law and order in conveying their messages.

Because auditory communication was essential for community survival, oftentimes when noise interfered with this vital process, steps were taken to reduce the unwanted intrusion. By the thirteenth century many towns had enacted laws prohibiting blacksmiths from working in the early morning hours owing to the bothersome noise.⁶ In contrast with today, this meant the population could enjoy a relatively noise-free sleep lasting from sunset to sunrise. Among those towns having a thriving marketplace, paved streets were a major noise source. They became a particular nuisance when iron rimmed carts entered the market towns from nearby farming areas. Laws were introduced to prohibit the use of these carts in the marketplace. In Beverly, England, a fine was imposed on those persons driving iron

3. Z. Barbu, *Problems of Historical Psychology* 19-26 (1960).

4. *Id.*

5. J. Raven, *The Bells of England* 252 (1958).

6. *Medieval England* 252 (A. Poole ed. 1958).

wheeled carts wherever stone pavement existed.⁷ The less noisy and destructive wooden wheeled carts could operate more freely in most towns. (In contrast, currently there are only a few instances where ground transportation noises are legally controlled.) Although probably less intentional, the irregularly curved medieval street, by nature of its design, reduced community noise propagation more so than the later grid, or rectilinear street system.

With the passing of the so-called "dark ages" came the renaissance. A new ordering of perceptual skills had now evolved. Slowly vision replaced hearing as the principal means of perceiving. This historical trend has continued, more or less, up to the present time.

How does it affect our everyday lives today? It affects us in two ways: in the recognition and the resolution of problems. First, man's awareness of environmental problems is affected by the preoccupation with items that are visually recognized. To a great extent beautification, waste management, air pollution, and even water pollution are recognized as environmental maladies because they confront us visually. A darkened sky filled with particulate matter, a residential street cluttered with rusting abandoned vehicles, an unkept vacant lot filled with garbage and refuse, or a nearby murky looking stream containing solid wastes are not scenes that often go unnoticed. Although no action may be taken to correct these conditions, there is at least visual recognition. Noise unfortunately does not assault our eyes, and consequently there is usually a tendency to be more tolerant. People have been known to complain about noise because it confronts them as a visual problem. In a social-environmental survey conducted in the vicinity of the Philadelphia International Airport, respondents complained about aircraft noise in visual terms, saying that it soiled their wash and house.⁸ A more common cause of annoyance was that aircraft interfered with their television watching, even though often they could continue to hear the program.

Recognizing the environmental problem is one factor. Equally important is the solution. Often when there is a noise problem, a visual rather than an accoustical solution is used. Visual relief from a noise source can reduce the community complaint level. Utility companies know all about this phenomenon. When they erect fences or barriers around substations, noise complaints usually lessen even though there may be only a slight noise reduction. A similar response occurs around noisy roadways, where buffers of some type, primarily

7. G. Salusbury, *Street Life in Medieval England* 168 (1948).

8. C. Bragdon, *The Unquiet Crisis: Community Noise and the Public Interest* (unpublished Doctoral Dissertation submitted to the University of Pennsylvania, 1970).

fencing or landscaping, are erected. Here again, complaints seem to dissipate despite the lack of any significant sound reduction.⁹

The problem lies not only with the public, but also with the professions responsible for managing the environment. Consider the architect. Responsible for designing structures, he considers his task to be principally visual. This orientation is largely due to a visual emphasis in architectural training. Although changes are not in the offing, the architectural profession is beginning to be aware of the noise problems.

If only a fraction of the effort applied to the visual aspects of a building were to be expended on acoustical considerations, the world would be a quiet place to live in, and at least one of the major causes of tension could be drastically reduced.¹⁰

The problem of auditory regression is not universal. A segment of our population still uses sound for direction and consequently is very aware of noise as a pollutant. In some respects this group's predisposition to the sense of hearing is similar to medieval man's. The blind utilize their ears more fully, but this is by necessity. In their perceptual world the auditory sense is a vehicle to achieving personal well-being. For them the environment consists of various auditory patterns, some of which convey a feeling of warmth and security, while others convey coolness or impersonalness. For the rest of us the auditory sense has atrophied. The sighted population today seldom relies upon it even for its own protection and safety.

II

HUMAN MISUNDERSTANDING

Until the late sixties the prevailing attitude of urban society toward the environmental pollution problem was one of disregard, insensitivity and misunderstanding. Interest has grown for the need to control air, water and even land pollution. Comparatively speaking, however, noise has not yet gained the public's attention. The former Surgeon General speaking at the first Conference On Noise As A Public Health Hazard observed that attitudes toward noise were similar to those toward air pollution ten years earlier. "Back in 1958 people were saying, 'Air Pollution problem? I don't smell anything.' Today there are apologists for some of the noisier phenomena in our society saying, 'I don't hear anything.'"¹¹

There are numerous examples of these attitudes toward noise.

9. A. Cohen, *Location-Design Control of Transportation Noise*, J. Urban Planning and Development Division: ASCE 82 (1967).

10. *Id.* at 82.

11. W. Stewart, *Keynote Address*, Noise as a Public Health Hazard (1969).

A. Noise and Power

People tend to equate noise with power. Without this accompanying noise, consumers often believe there is a comparable loss in power. A major manufacturer during the early 1960's introduced two identically powered lawnmowers. One had been acoustically engineered so it operated more quietly than the other. There was a wide discrepancy in sales, with sales of the quiet one lagging decidedly, and it was later removed from the market. Why? According to the manufacturer, the buying public thought that it "lacked power", and did not operate as well as the louder "more powerful" model.¹²

Another manufacturer is testing to see if this consumer attitude still prevails. The Whirlpool Corporation presently is offering the public two similar window air conditioning units. Among other differences, one has been engineered to reduce the noise by designing a sound absorbing decorator panel. The other is a standard model. Performance characteristics (i.e., cooling capability, operational costs, etc.) are comparable, though the purchase price is slightly higher for the quieter unit.

Often exhaust systems of vehicles are altered in the belief that loudness gives the vehicle substantially greater power. The trucking industry is probably the most flagrant violator, since many carriers, or truckers themselves, remove mufflers and modify the exhaust system. The problem lies more with the user than with the manufacturer who generally suppresses vehicle exhaust noise adequately.¹³ The outcome is a much noisier operating truck having only a nominal increase in actual power. Whatever small gain there may be in engine power because of reduced back pressure (probably less than 2%) it is not proportionate to the increase in truck noise. The noise is a liability endangering the driver's hearing and performance, while also contributing to community din.

B. Noise and Efficiency

Not only is there the attitude that noise means greater power, but also that noise contributes to greater operational efficiency. The vacuum cleaner is a good example. When it is being used the noise the housewife hears reinforces her belief that it is "performing properly". Conversely, a quiet one is perceived as inept, and therefore is not capable of cleaning as well. Midway through 1967 the Hoover Company introduced a vacuum cleaner decidedly quieter than the

12. H. Manchester, *Rising Tide of Noise*, 53 Nat'l Civic Rev. 418-422 (1964).

13. D. Apps, *Cars, Trucks and Tractors as Noise Sources*, Noise as a Public Health Hazard 317-320 (1969).

models of previous years. Its national advertising program described the appliance as "whisper quiet", powered by a one horsepower motor. Housewives evidently were not convinced of the performance capability of the quieter model. They continued to purchase the noisier model, under the misconception that to clean properly a vacuum cleaner has to be noisy.¹⁴ The marketing people at the Remington Division of Sperry Rand Company encountered similar attitudes when they introduced a quiet electric typewriter.¹⁵ Noise control engineers had removed the "clacking" sound from the typewriter. However, secretaries complained that it was noticeably "slower" than the noisier, otherwise identical machine.

Consumer preference has been strong enough that, according to manufacturers of lawnmowers, vacuum cleaners and refrigerators, noise at one time engineered out had to be rebuilt in. Companies that make refrigerators claim housewives want to hear the steady rumble of the motor.¹⁶ This noise assures them it is running. Even some industries associate the sound level of equipment with efficiency. A "quiet" jackhammer has been on the market for several years but "salesmen for competing products have succeeded in persuading contractors they are less effective and underpowered."¹⁷ In truth all of these quieted products were as efficient as their noisier counterparts.

Quietness, as these examples indicate, is foreign to the consumer. This country has undergone a history of technological conditioning. The early products available to the public were minimally engineered, especially regarding noise suppression. To buy most consumer items, such as power tools, household appliances, recreational equipment, and automobiles meant buying noise. This was an accepted practice for there were no alternatives. Today a choice exists. The accustomed noise of most products can be removed, or at least reduced, through engineering means. (Usually reducing the noise increases the consumer's cost, but as a rule no more than 10%). A few companies have taken the initiative by demonstrating to the public what is possible. However, a consumer re-education process is also necessary. Consumers must assert their preference to buy "quiet", if indeed that is their preference, especially in relation to other goals and services desired.

14. G. Mapes, *A Vacuum's Woosh, A Car Door's Thunk Don't Just Happen*, Wall Street J. Sept. 10, 1968.

15. *Id.*

16. Advertisement, *Life*, Aug. 15, 1967.

17. H. Bredin, *City Noise: Designers Can Restore Quiet at a Price*, Product Engineering 35 (1968).

C. Noise and Social Recognition

Probably the most popular use of noise is to gain recognition. Unfortunately, many people attach a sense of status to noise. It is an attention-seeking device that at least temporarily gives recognition and identity to its user. The greatest users today are youth. Unmuffled cars or motorcycles signal their arrival and departure to and from the scene. Such cacophony gives them a feeling of being part of the "in" or "hip" crowd. It can also be interpreted as a protest against the "establishment's" highly organized, dull, quiet world. Loudness, often outright noise, is also linked to the music of the younger generation. The world of electronic amplification has found a home with this age group. Loud music is considered by youth to be an identifiable trademark. Unfortunately, they do not give equal consideration to the very real problem of hearing loss. Temporary, as well as permanent, hearing loss is being found by audiologists who have examined musicians that frequently play electronically amplified music.^{1,8}

III ADAPTATION

The modification of an organism's function in adjusting to environmental conditions has been a common occurrence throughout history. However, adaptation is a two-edged sword. It has often been a saving grace, but at the same time it may have created a certain false sense of well-being.

On the positive side, the human ability to adapt has allowed us to survive when, without this ability, the odds of survival were slim. For example, the early westward migrants adapted to changes in climate, diet, and even life style in order to meet the demands of settling new areas of the country. More currently, the urban population has adapted to a series of environmental irritants (air, water, refuse, and noise pollution) to endure city living. These poor conditions have often been subjectively suppressed by the population in order to function normally.

On the negative side, subjective responses are not always an accurate indication of the health effects of noise. Generally about one-fourth of the urban population never is annoyed by noise regardless of its intensity according to one acoustics consultant. A similar finding has been reported in studying human response patterns to aircraft noise. Even at the noisiest monitoring stations in a Philadelphia Com-

18. F. Dey, *Auditory Fatigue Predicted Permanent Hearing Defects from Rock-And-Roll Music*, The New England J. Medicine 467-470 (1970).

munity Noise Study, where aircraft noise would presumably disrupt the sleep state during the night, some residents commented that they had become "accustomed" to the noise.¹⁹

The obvious extension of this adaptation mechanism is the loss of ability to recognize the potential hazards of noise and consequently to react. Logically this could lead to more detrimental health effects than are now experienced. It is possible, particularly among the younger generation and those to follow, that they will automatically adapt to the prevailing environment. We can ill afford to let this happen with noise, if the present amount of hearing loss being discovered by audiologists among adolescents continues. As time passes and larger and larger portions of the world are infested with noise, there are fewer and fewer quiet places. Comparisons between noisy and non-noisy environments are becoming more difficult, particularly among developed nations.

Fortunately, cultural differences still prevail. The countries of Europe, and especially Germany, France, Britain, Sweden, and Switzerland, are less tolerant of noise. A natural resource delegation from the Department of Interior visited Germany and found the German people intensely concerned about protecting their environment.²⁰ Strongly supported by its citizens, Germany has taken major steps to abate noise. They have adopted the most stringent noise regulations in existence with considerable success. Obviously, there are degrees of environmental awareness and adaptation to environmental problems among various cultures. Consequently the chance of noise growing into a major environmental problem is less of a possibility in Europe than in the United States because of cultural conditioning.

IV

PRIORITY OF URBAN PROBLEMS

Noise represents just one of many problems besieging urban society. It has been overshadowed by burgeoning crime rates, racial disharmony, student unrest, civil strikes, and the southeast Asia conflict. These constitute major problems that are demanding attention for the allocation of federal resources. Education, social welfare, medical assistance, and housing are some of the needy areas receiving financial support. Expenditures for these purposes, combined with the more fixed ones (national defense, veterans benefits and services, income security, and debt retirement, account for 76% or \$150 bil-

19. Bragdon, *supra* note 8.

20. Department of Interior, Natural Resources Mission to Germany: A Special Report to the President (1966).

lion of a \$198 billion federal budget) restrict funds available for other purposes.²¹ Consequently there is little economic support at any governmental level for tackling existing environmental problems (see Table 1). In fiscal year 1970 the federal government has obligated only \$165 million for air pollution control. This is to be increased slightly in 1971 to \$195 million. The 1970 federal allocation for water pollution control is \$828 million, and this figure is to be nearly doubled for 1971. Federal support for noise abatement is much smaller, amounting to \$34 million in 1970. On a comparative basis noise control will receive one-fifth of what air pollution receives, and one-fourtieth of what water pollution receives in fiscal year 1971.

Table 1
U.S. FEDERAL BUDGET^a
(in billions)

<i>Fiscal Year</i> 1970	<i>Fiscal Year</i> 1971	<i>Budgetary Item</i>
\$197.885	\$200.771	Total Budget
149.766	150.241	National defense, Veterans benefits, Interest, Income Security
.828	1.636	Water Pollution Control
.165	.195	Air Pollution Control
.034	.040	Noise Pollution Control

^aFederal Budget for Fiscal Year 1971

(Preliminary data, August 6, 1970)

Executive Office of the President

Bureau of the Budget, Office of Management and Budget

The majority of noise control funds are being spent on aircraft, which represents just one of many community noise sources. In fiscal year 1970, \$31 of the \$34 million budget was devoted to subsonic and supersonic noise.²²

Another complication in obtaining adequate funds for controlling noise is the fact that there is no federal noise legislation comparable to the Clean Air Act or the Water Pollution Control Act expressly authorizing appropriations. Only by executive order did former President Johnson request Federal departments and agencies to begin participating in a unified effort to try to solve just one part of the problem, aircraft noise.²³ Even the continuation of this effort is not

21. Bureau of the Budget, *Federal Budget for Fiscal Year 1971* (preliminary data on air, water and noise pollution control programs: August 6, 1970).

22. Council On Environmental Quality, *Environmental Quality* (1970).

23. Office of the White House, Memorandum for Heads of Departments and Agencies, *Aircraft Noise and Compatible Land Use in the Vicinity of Airports*, Mar. 22, 1967.

particularly assured at present. Relative then to the total package of urban problems, noise has been given a rather low priority.

There are, however, indications that among the population, noise pollution is considered to have a higher priority than government has assigned it. In other words, a discrepancy exists between government activity and citizen concern. This observation is based upon several community opinion surveys where noise was compared to other community conditions. The London survey of 1961-1962 conducted in the vicinity of Heathrow Airport found that noise ranked high on the list of "The one thing people most wanted to change."²⁴ A more detailed, comparative analysis of social and physical environmental conditions in Philadelphia produced similar findings.²⁵

The Federal Aviation Agency (under Department of Transportation) exemplifies this conflict. The fault lies with Congress and the enabling legislation creating this regulatory agency in 1958. Under the provisions of this Act the FAA has several missions, including:

1. encouraging the use and development of the aircraft industry;
2. providing safety and welfare to the public.²⁶

The aircraft noise problem is a particularly good example of the conflict in social priorities. The development of air transport is presumed to be desirable in terms of its positive impact on economic growth and consequent provision of jobs. But little consideration has been given to the substantial side effects, i.e., externalities, which arise therefrom. Governments at all levels are not organized to give adequate consideration to these externalities.

Technological and economic development of the aircraft industry has occurred, but with substantial damages to the public, for aircraft noise has gone unchecked. Within the past ten years as the industry has rapidly expanded, there has also been a "steady decline in habitability of residential areas near the large airports, areas containing tens of thousands of families, their schools and hospitals."²⁷ As a result, strong public dissent has arisen in communities close to airport facilities. Community concern is more and more being brought to the attention of government officials. When General William F. McKee was FAA director he said, "Noise means irritated citizens whose growing protests are blocking needed airport expansion even

24. Committee on the Problem of Noise, *Noise: Final Report* (London: Her Majesty's Stationery Office, 1963).

25. Bragdon, *supra* note 8.

26. Federal Aviation Act of 1958, S. Rep. No. 1811, 85th Cong. 2nd Sess. (1958).

27. Address by Nicholas E. Golovin, 76th Meeting of the Acoustical Society of America, Cleveland, Ohio, Nov. 21, 1968.

when such money is available."²⁸ The former Assistant Secretary of Transportation, M. Cecil Mackey, went further, saying the citizen's insistence on less degradation of his environment "is the single most outstanding characteristic of society."²⁹ He warned that if this insistence cannot be answered with acceptable solutions to aircraft pollution, congestion, and noise "people will just say 'sorry, we don't want airplanes around any more'".³⁰ Community resistance to the construction of new jetports is mounting across the country, and noise is one of the primary reasons for this resistance.³¹ Currently there are about 50 of our 140 major airports involved with noise litigation having claims for damages approaching \$4 billion.³²

The FAA has not consistently supported the citizen's position. Key personnel in the FAA and in the Department of Transportation, reports the Conservation Foundation, "have indicated in the past that aviation noise is not one of their primary concerns."³³ Economic development of the aircraft industry has been emphasized by officials with the Department of Transportation. Former DOT Secretary Allan S. Boyd earlier commented, "Noise is a very unfortunate and disturbing thing, but we do learn there is room for more tolerance of noise in the field of aircraft."³⁴ This same position is shared by current departmental officials that include John Shaeffer, the present FAA administrator.³⁵ Even before there are adequate solutions to controlling subsonic aircraft noise, we are in the process of creating a more pervasive noise, the sonic boom. This nation is becoming more and more financially committed to its success, as America's entry in the SST race.

There are signs that because of this financial commitment the chances for objectively evaluating the SST program are steadily diminishing. Although Congressional opposition grows each year, appropriations for the SST continue to be approved, with \$623 million already spent.³⁶ Surely the government's economic commit-

28. E. Clark, *Noise Called Bar to New Airports*, N.Y. Times, October 5, 1967.

29. Address by Cecil Mackey, Fourth Annual Meeting of the Institute of Aeronautics and Astronauts, Anaheim, California, reported N.Y. Times, Oct. 25, 1967, at 13, col. 1.

30. *Id.*

31. R. Lindsey, *Irate Citizens Across the Nation Are Vigorously Resisting the Construction of Jetports*, N.Y. Times, Dec. 26, 1969, at 40, col. 1-8.

32. Council on Environmental Quality, *Environmental Quality*, First Annual Report (1970).

33. Conservation Foundation Newsletter, Aug. 30, 1968 at 4-5.

34. V. Block, *The Supersonic Transport and You*, Science Digest, July, 1966, at 60-67.

35. C. Lyndon, *Higher Airport Noise Level Foreseen*, N.Y. Times, Feb. 25, 1970.

36. R. Lindsey, *Inflation Is Adding to SST Cost, According to an Aide of Boeing*, N.Y. Times, Oct. 17, 1969.

ment for developing such a plane should not be an overriding reason for not considering equally the sonic boom implications. Economic necessity is the primary argument presented by the acting SST Director, William M. Magruder, even though serious environmental problems remain unsolved.³⁷ One government official close to the project has said, "We are all-out for economics now, and the hell with the boom."³⁸ As in the case of human annoyance associated with subsonic aircraft noise, Federal authorities are minimizing criticism of the SST. When General Maxwell was SST program director, he tried to give this newest technological "advancement" in aviation a clean bill of health.

We believe that people in time will come to accept the sonic boom as they have the rather unpleasant side effects which have accompanied other advances in transportation.³⁹

Subsequent studies indicate that this will not happen, particularly when booms occur in populated areas at night. Even the scientists most closely aligned to government sponsored research have expressed doubts that adaptation is possible. Dr. Karl Kryter, Director of Sensory Sciences at Stanford Research Institute, summarizing psychosocial research on the sonic boom, believe humans will not tolerate SST land flights.

Will the society of the United States pay the price of the annoyance and discomfort of being exposed to the booms from the SST? This is most, if not the only, necessary question, and the answer, if one is to believe the research data discussed above, appears to be definitely "no."⁴⁰

No one envisions any solution to sonic boom generation, not even the most adamant supporters of the SST. Until actual test flights are made by the SST prototype, the land area affected by each boom is not really known. Opinion within the scientific community varies. Reliable estimates suggest the boom carpet may range from 40 to 80 miles in width. A pledge has been made by the new Secretary of Transportation that this plane will never be allowed to fly over populated areas until the sonic boom is brought within "acceptable limits."⁴¹ Secretary Volpe has not yet publicly disclosed what these

37. C. Lyndon, *Project Chief Lobbies Hard to Sell SST*, N.Y. Times, July 20, 1970.

38. F. Zimmerman, *Supersonic Snow Job*, Wall Street Journal, Feb. 9, 1967.

39. V. Block, *supra* note 34, at 60-67.

40. K. Kryter, *Sonic Boom—Results of Laboratory and Field Studies*, Noise as a Public Health Hazard (1969).

41. N.Y. Times, Dec. 17, 1969, at 109, col. 6.

limits are, but the FAA has issued notice of a proposed rule prohibiting land overflights.⁴²

The Senate Appropriations Committee has given notice to the present administration that although it supports developing the SST project, the Committee "is not willing to buy aviation leadership at further cost to our environment."⁴³ In reviewing the federal transportation expenditure the Subcommittee on Economy in Government reported to the Joint Economic Committee that:

few significant public benefits appear likely to result from the supersonic transport development program. On the other hand, very significant social costs are associated with this program. More productive uses of Government resources are clearly available. No further Federal financial support of the supersonic transport development program is justified at this time.⁴⁴

There are further signs of congressional opposition. In May, the House narrowly defeated a motion halting any further SST appropriations. The roll call vote was 176 to 163.⁴⁵ It is expected that the Senate vote will be even closer, with not only the \$290 million requested appropriations in doubt, but the entire SST program.⁴⁶

The aviation industry began seeking both governmental and public support for the SST project back in the Kennedy administration. Before the Boeing Company was awarded the primary contract the other major SST competitor, Lockheed Aircraft Corporation, attempted to dispel any problems with supersonic flying. The theme of several national advertisements was "What will supersonic travel be like in the seventies?"⁴⁷ No mention was made about the sonic boom and the possible world-wide community annoyance problem, or its resolution. "Atmosphere, sounds and in-flight experience will be pretty much as they are now. No adjustments will have to be made—except in the manner of time."⁴⁸ In contrast to the Surgeon General's description of the aircraft as being "a coast-to-coast drop forge plant,"⁴⁹ Lockheed described it as "the world's fastest breadwinner" built to "serve the economic progress of our country and our people."⁵⁰ Whether there will be any meaningful flight re-

42. 35 Fed. Reg. 74 (1970).

43. N.Y. Times, *supra* note 41.

44. *Federal Transportation Expenditure*, H.R. Doc. 91st. Cong. (1970).

45. C. Lyndon, *Fund for the SST Is Voted In House by a Slim Margin*, N.Y. Times, May 28, 1970.

46. C. Lyndon, *Doubts on SST Rising in Senate*, N.Y. Times, Aug. 1970, at 26, col. 3.

47. Advertisement, Lockheed Aircraft Corporation, *Newsweek*, Oct. 24, 1966.

48. *Id.*

49. W. Stewart, *supra* note 11, at 10.

50. Advertisement, *supra*, note 47.

strictions over land areas is ultimately the responsibility of the FAA, which must compromise one of their two missions in rendering a decision. Even by eliminating overland supersonic flights the problem of subsonic noise remains, as well as the boom effect over water areas, and upper atmosphere effects.

V

INSTITUTIONAL APATHY: PUBLIC SECTOR

The prevailing institutional structure of society (political, educational, legal, corporate, etc.) has responded indifferently to the noise pollution challenge, a challenge directly affecting the quality of urban life. Both the private and public sectors of society are responsible for institutional inactivity.

The more than 80,000 federal, state and local governmental units in the United States have inadequately faced the noise problem because of the organizational, legislative and/or implementation constraints and limitations.⁵¹

A. Organization

Most governmental agencies are not organizationally capable of confronting problems of an interdisciplinary nature because these problems do not fit into the more traditional table of organization. Effective noise management requires either close interdepartmental cooperation, under the present set-up, or, alternatively, revised governmental organization. The latter choice means widening the scope of a city department or agency in order to look at a total urban problem rather than a segment of one. Many different disciplines are then grouped under one "roof" and the resulting interchange and "cross-fertilization" can potentially offer fresh insights. A change of this type occurred when, in 1967, New York City established a superagency to handle the massive environmental quality problems in a comprehensive manner.⁵² Noise pollution is one of the responsibilities of this management agency, to be handled through the Bureau of Noise Abatement; but to date the Bureau has done little.⁵³ This agency represents a significant shift from traditional organizational thinking. Similar changes have occurred in a few state governments.

As a rule, in most cities, antiquated governmental machinery prevails. Within local departments of public health, noise, if considered at all, is considered solely as an industrial worker problem rather

51. 34 Am. Soc'y of Planning Officials Newsletter 114 (1968).

52. D. Bird, *Environmental Superagency Asks City for Half Billion for Projects*, N.Y. Times, Oct. 30, 1968, at 53, col. 2.

53. D. Bird, *Sirens Scream for Quiet's Sake*, N.Y. Times, Dec. 19, 1969, at 57, col. 1.

than also as a community problem. Public health employees assigned to this area usually are industrial hygienists by training. Their training deals almost exclusively with the work environment; consequently, the community environment has seldom, if ever, been considered. Other organizational handicaps exist, too. Frequently the responsibility for noise control is a "paper function" of some department or agency. This is the case in Philadelphia, where the responsibility was shifted from the City Department of Public Health to the Police Department. When Public Health was in charge of community noise, several of its members generously contributed their time and energy to the Mayor's Committee for Noise Abatement. The subsequent transfer of this function to the Police Department led to the dissolution of the Committee. Equally important is the fact that community noise control is now given token attention by the already overburdened police. Usually the only "action" taken is when a complaint is received, which means acknowledging the alleged noise complaint and entering it into a log book. Community noise research is no longer undertaken, and the earlier noise abatement campaigns informing the public about this problem have been dropped. But, Philadelphia is not alone in pigeonholing noise control. There are other examples of governmental insensitivity or inaction, such as in St. Louis, Missouri, where the city also has a legally stated responsibility, but is doing nothing.⁵⁴

President Nixon recently proposed reorganizing the federal agencies responsible for controlling the environment.⁵⁵ Most pollution control activities are to be transferred to an independent Environmental Protection Agency. The consolidation would provide the means for a more concerted effort to improve the environment. However, at this time it is not definite where the noise abatement program will be located. Because of various departmental interests it may remain divided among several departments, rather than being more effectively consolidated.

B. Legislation

Contributing to organization ineptness is the failure of policy makers to initiate action leading to legislation. Local governing bodies generally have not legislated against noise pollution. When action is taken, city councils approve ordinances prohibiting the occurrence of community noise as a nuisance. There are probably over 500 ordinances in this category throughout the U.S. However,

54. St. Louis Globe Democrat, May 17, 1967.

55. J. Naughton, *Nixon Proposes 2 New Agencies on Environment*, N.Y. Times, July 10, 1970, at 1, col. 1.

their effectiveness is limited for a variety of reasons. A large number of ordinances define noise nuisances so narrowly that legislation is written to control only a small part of the problem (i.e., loud or noisy mufflers). Either by design or because they receive limited technical and legal advice, city councils frequently prepare ordinances having little legal value, often written so vaguely they cannot be defended. Rather than prescribing a maximum allowable decibel level for the noise source, a law may read, "No person shall operate any vehicle which causes unnecessary noise." Of course the legal question is what constitutes "unnecessary noise"? (Rarely is this defined quantitatively.) In other situations a maximum decibel level is indicated, but it may be so low that normal talking on the street is a violation,⁵⁶ or so high that all noise sources in cities would be legally immune. A final point is that some local governments have approved noise ordinances where they have no legal jurisdiction. According to a federal court opinion in the Hempstead, Long Island, case, no municipality has the legal authority to control the noise of aircraft overflights.⁵⁷ Although this decision is still being appealed, it appears as though the management of navigational airspace (which includes noise control) is a federal responsibility.

Besides nuisance-type legislation, some municipal governments have adopted or are in the process of adopting building codes with sections dealing with noise transmission. This is an aspect more neglected than community noise, for before 1968 no major city had ever passed a building code requiring acoustical materials that limit noise within a building. In November, 1968, New York became the first U.S. city to approve a building code with such a provision.⁵⁸ Outside of this country, particularly in Scandinavia and elsewhere in Europe, there are very sophisticated and stringent building codes that minimize the noise transmission problem. Many foreign regulations on noise date a long time back, to as early as 1938. Building regulations in England and Wales are very thorough and include defined grades of sound insulation for walls and floors between dwellings.⁵⁹ Both grades of sound insulation surpass those presently in use by the building industry in this country.

Municipal governments are not alone in having lagged in noise legislation. State governments have been equally negligent with

56. W. Bradley, *Living with Noise Laws and Regulations*, Industrial Hygiene Foundation: Transactions Bulletin #40, (1966).

57. *Am. Airlines, Inc., et al. v. Town of Hempstead, et al.*, 272 F. Supp. 226 (E.D.N.Y. 1967).

58. J. Fried, *Revised Building Code Approved by City Council*, N.Y. Times, Oct. 23, 1968, at 43, col. 1.

59. Comm. on the Problem of Noise, *supra* note 24.

respect to community noise. In fact, their major activity in relation to noise has been "workmen's" compensation laws which establish criteria for hearing loss. The states of California and New York are the most notable exceptions. In 1967 the California legislature adopted two Vehicle Code Sections, 23130 and 27160, which established maximum permissible noise limits for vehicles.⁶⁰ Other states, including Connecticut, New Jersey, and Pennsylvania, all have introduced bills into their respective legislatures to broaden government responsibility in community noise pollution, but none has been approved.

Like both local and state governments, the Federal government has largely ignored the problem of urban noise. Congress has approved just one public law dealing with this subject. The law authorizes the Federal Aviation Agency to prescribe and amend rules and regulations for the control of aircraft noise and the sonic boom.⁶¹ Although very important, this law is concerned with only one segment of the noise problem. Furthermore, the FAA has been responsible for managing navigable airspace since 1958, but it was ten years later that any agency was given legal authority to control the noise of aircraft. Up until 1968, then, there were no Federal limitations on noise generated by U.S. aircraft. The FAA promulgated the nation's first Federal regulation limiting the noise of new commercial and civil aircraft in late 1969.⁶² By amending Federal Aviation Regulations, the FAA prescribes noise standards for aircraft type certification. Depending upon aircraft weight, number of engines and point of measurement, the maximum allowable noise level ranges from 108EPNdB (Effective Perceived Noise Level in Decibels) to 93EPNdB. (EPNdB is defined as the value of PNdB adjusted for both the presence of discrete frequencies and the time history.) All new subsonic jet powered aircraft must meet these limits or they will not receive the government flight certificate necessary before entering service. Present aircraft, including the noisiest plane in general use (Boeing 707) are exempt from the law. Plans are underway to extend their working life by installing a new wing assembly and consequently allowing the high noise level to remain unabated for an extended time period. Furthermore the 747 will not be required to comply to the noise certification law until December, 1971. By then 90% of all these planes will already have been built.⁶³ There are no laws regulating rotary winged, VTOL, or STOL aircraft at this time.

60. Cal. Veh. Code §§ 23130, 27160 (West Supp. 1970).

61. 49 U.S.C. § 1431 (1968).

62. 14 C.F.R. § 36 (Supp. 1970).

63. C. Lyndon, *supra* note 35.

Other than aircraft noise regulation, no other legislation is pending that would enable Federal authorities to attack the community noise problem in a comprehensive manner, such as by establishing what former Congressman Kupferman proposed, an Office of Noise Control within the Office of the Surgeon General.⁶⁴

C. Implementation

Implementation is the remaining ingredient necessary for the adequate control of noise. For example, without proper manpower and equipment, the most well-intended law becomes ineffective. In 1968 England amended its motor vehicle code, establishing maximum permissible noise levels. To enforce this amended code requires that the police monitor vehicular movements along roadways using sound level meters. A violator can be fined as much as 50 pounds (approximately \$120) in his first offence, so the penalties are relatively steep. However, in the first three months of operation, no one was prosecuted. Less than 10% of the police forces responsible for enforcement possess the sound level meters. The chief constables, already overburdened with other duties, feel that this requires an inordinate amount of time for something which, as one has said, is "a load of rubbish" and "totally unenforceable."⁶⁵ Many constables are waiting and seeing; seeing how the police forces using the instruments fare, and what problems they may encounter. Today the law is still being enforced haphazardly.

A somewhat similar situation developed in New York State. There the state police are responsible for enforcing an anti-noise law which establishes maximum vehicular noise emissions for those traveling along the New York State Thruway.⁶⁶ The Thruway Noise Abatement Committee, organized in 1961, fought five years for its passage. Approved in July of 1965, the law was heralded by many. Speaking for proponents of the bill, one Senator stated, "We have, at last, a means of enforcing our anti-noise laws against the small minority of offenders who have persistently ruined the sleep of hundreds of Westchester residents."⁶⁷ In retrospect, the platitudes spoken at that moment appear to have been premature. Little enforcement has taken place. Among trucks alone the average hourly traffic volume on the Thruway is about 1,000 vehicles, or 8.7 million trucks annually. However, the number of summonses issued for noise viola-

64. H.R. 14602, 89th Cong., 2nd Sess. (1966).

65. L. Marks, *Police Chiefs Back-Pedal on Noise Meters*, London Observer, Sept. 22, 1968.

66. N.Y. Veh. and Traf. Law § 386 (McKinney 1970).

67. 112 Cong. Rec. S 9024-29 (daily ed. May 22, 1966).

tions in two years (1967-1968) has been just six.⁶⁸ One obstacle, as in England, is the number of sound level meters. There are just two for the entire length of the New York State Thruway. The police authorities have not been anxious to request any further equipment to be more thorough in enforcing this law because of other duties and manpower limitations. It is doubtful if the laws of England and New York have had any impact on noise levels, and trends in noise levels.

Not all motor vehicle noise ordinances are this poorly enforced. The Memphis Anti-Noise ordinance, adopted in 1938, is a well-known exception. In this Tennessee community the Police Department takes great pride in the way it has dealt with offensive vehicles. During 1966, the Police Department made 5,760 arrests for vehicles operated with excessively noisy mufflers and 360 arrests for other combined violations.⁶⁹ Excessive noise is defined as that which exceeds 90 dBA.

California is beginning to enforce the noise provision of its motor vehicle code on a state-wide level. The Department of Motor Vehicles has six sets of sound measuring equipment being used by six teams of trained enforcement officers. The results are very encouraging for the six month period ending September, 1969.⁷⁰

Problems in implementation are not limited solely to motor vehicle codes, and police should not bear the full brunt of the criticism. The fault lies in many other places too. City planning bodies are notoriously insensitive to the noise problem.

The major obstacle to effective planning of roads and communities, whether for the sake of minimizing noise nuisance, for easing traffic congestion or for any other public advantage seems to lie in the fact that the authority of planning bodies is permissive in nature.⁷¹

A decision by the New York City Planning Commission has paved the way for the construction of two high-rise apartment towers directly under the approach to LaGuardia Airport's all-weather instrument runway. These towers will house 816 persons who will be exposed to aircraft noise "equivalent to a diesel freight train traveling at 50 miles an hour passing at a distance of 100 feet every 45

68. S. Potter, *Opening Remarks—Community Noise Control*, Noise as a Public Health Hazard 309-311 (1969).

69. Letter from K. L. Rose, Administrative Services Division, Memphis Police Department, to Clifford R. Bragdon, Jan. 24, 1967.

70. Address by Ross Little, 78th Meeting of the Acoustical Society of America, San Diego, California, Nov. 4, 1969.

71. G. Thiessen, *Survey of the Traffic Noise Problem*, Paper presented at the 69th Meeting of the Acoustical Society of America, Washington, D.C., June 2, 1965.

seconds."⁷² This decision is, of course, contrary to the Federal government's desire to create more compatible land uses, principally non-residential uses around airports, in order to provide a buffer zone against intrusive noise. To assist in implementing this objective a Technical Advisory Committee to the City Planning Commission was started in 1963; however, this committee had not met in two years prior to the above decision.

Mayor Lindsay more recently asked the planning commission to consider the feasibility of heliport sites in Manhattan, in the midst of a sizeable population. There was formal opposition to the plan. For example, Dr. Bronk, President of Rockefeller University, had serious reservations, feeling the noise could well result in injury to the school's hospital patients and to the accuracy of its research.⁷³ Furthermore, the land in question originally was to have been used as a park and recreation area. Nine months later the city, with the commission's recommendation, granted Pan American World Airways the permission to operate the heliport at 61st Street. It was hailed by the mayor as "an important step toward relieving air-traffic congestion at the major airports by making the smaller fields more attractive, particularly for corporate aircraft."⁷⁴ The mayor and the planning commission made no comments about the impact of the noise resulting from this operation. Helicopter service is still being provided in this area of New York.

To suppress aircraft noise experienced by homeowners adjoining London's Heathrow Airport, the British government approved making grants to insulate these homes. Evidently this program has not proved effective. Of the 60,000 householders eligible after a year, only 2,589 have inquired about the noise insulation schemes.⁷⁵ In this same period less than half of these grants have been paid out. This illustrates another problem of implementation. Most people feel these grants available through the British Airport Authority are not adequate because the homeowner must pay for at least half the cost of the job; this usually amounts to over \$300. Many believe that since they, themselves, are not directly responsible for the noise, they should not have to pay to abate it. In order for the grants to be effective, it appears that a greater burden of the cost will have to be borne by the government, or, preferably, by the noise generators, the

72. W. Burrows, *City Backs Housing Despite Jet Fear*, N.Y. Times, Oct. 26, 1967, at 93, col. 2.

73. E. Hudson, *Helicopter Opposed by Rockefeller U.*, N.Y. Times, Jan. 18, 1968, at 78, col. 3.

74. N.Y. Times, Oct. 19, 1968, at 71, col. 1.

75. London Daily Telegraph, Dec. 10, 1966; *id.*, Mar. 10, 1968.

airlines, airport operators and airline manufacturers. This could be in the form of higher landing taxes to reflect the externalities produced.

VI INSTITUTIONAL APATHY: PRIVATE SECTOR

The institutions connected with our private enterprise system seem at least equally insensitive to the need for controlling noise as those within the public sector. By their own admission, spokesmen for industry say changes will come only with public insistence for improvements. The primary objective of private enterprise is maximizing profit. Any deterrent to that objective, including the use of additional research and development funds for noise suppression, industry contends, raises their unit costs, placing them at a competitive disadvantage. Although there are few examples, businesses have changed their tune when government, under pressure from its constituents and public interest groups has requested noise abated municipal equipment. For example, in ordering additional refuse trucks for its fleet, New York City wrote into the specifications that the trucks could not exceed a prescribed noise level when operating. Not all truck manufacturers shied away from this specification, even though the industry at that time had no truck in production capable of meeting these requirements. At considerable expense to themselves, General Motors provided a so-called "noise package" for this order, and became the successful bidder. Not only was the maximum passby noise level (measured at 50 feet) reduced from 88 to 77.5 dBA for the treated vehicle, but the additional cost per unit amounted to only \$102.⁷⁶ Compared to the total cost of a truck, \$13,000, the added expense was a nominal less than 1%.

The trend toward specifying noise abated products is a procedure occasionally used. Bethlehem Steel Corporation, when purchasing large-scale mining equipment, stipulates certain noise requirements. Their purchase orders specify a maximum operator noise level of 90 dBA. In most cases reducing the noise to the operator also means reducing the noise to the community. Although the exception, a few corporations feel they have a public responsibility to be a good neighbor and community noise control is part of the cost of doing business. A policy such as this can result in sizeable savings to a firm. At Esso the problem of noise is considered when a new refinery is being planned, rather than after it is in operation. This way there are fewer community complaints and lawsuits that require additional

76. Letter from Ralph K. Hillquiatt, Noise and Vibration Laboratory, General Motors Proving Ground, Milford, Michigan, to Clifford R. Bragdon, July 16, 1968.

personnel and expensive litigation. The corporate image remains positive because there are good community relations. Furthermore, the cost of incorporating acoustical controls into the original design and construction typically amounts to $\frac{1}{2}$ of 1% of the refinery's total cost.⁷⁷ If noise control measures are incorporated after the refinery is in use costs increase to about 10%, or one-tenth of the buildings original cost.

A. Aircraft

Unfortunately, the examples cited above are exceptions to current private enterprise practices. The airport noise problem is one of many areas where being a good neighbor appears to have been compromised, if not overlooked. This existing situation, as stated in the Congressional investigation of aircraft noise,

... can be characterized as one of conflict between two groups—those who benefit from air transportation services and people who (individually and collectively) live and work in communities near airports. The conflict exists because social and economic costs resulting from aircraft noise are imposed upon certain land users in the vicinity of airports who receive no direct benefits. It is important that this situation be rectified in an equitable manner consistent with the public welfare and the orderly development of air commerce.⁷⁸

Certain airline operator practices indicate that the public is being victimized. One practice is the "beat the box" scheme. This game is being played today by most commercial airline companies using the airports operated by the New York Port Authority.⁷⁹ The Authority established maximum allowable noise levels for aircraft departures at these installations. Jets taking off are not allowed to exceed 112 PNdB. To insure that this is observed, ten permanent noise monitoring stations (referred to as measuring boxes) are located at JFK, LaGuardia, and Newark Airports. Anytime a plane exceeds 103 PNdB it is recorded in the Noise Room operated by the Authority. However, the airlines have devised a way to "beat the box" so they do not violate the 112 PNdB ceiling. Pan American Airways offers a contractual service to other airlines. They have an "agent" located at the busiest and noisiest stations whose job is to inform pilots by radio when they are in the vicinity of the box. When the agent says "mark" to the pilot, for a period of about ten seconds the pilot

77. Interview with Frank W. Church, Esso Research and Engineering Company.

78. H.R. Rep. No. 36, 88th Cong., 2nd session (1963).

79. Report of Proceedings, National Aircraft Noise Symposium (Jamaica, New York, 1965).

reduces power and maintains his altitude during take-off. Then, again on command from the ground agent, the pilot resumes his normal noisy flight operation. Using this evasive procedure, the agent has done his job well, at the expense of the community. During September, 1967, approximately 1,686 aircraft noise violations were illegally avoided this way. Because of these efforts, only 690 official noise violations were recorded out of 98,443 flights that occurred in the first nine months of 1967.⁸⁰ This illegal procedure is still being used, and the FAA has chosen not to intervene.⁸¹

There are more subtle schemes used by the aircraft industry. The Airport Operators Council, Inc. (AOCI) offers a "solution" to the problem of introducing aircraft to a community never before experiencing jet service. (This advice may well be of interest to those persons living in the 800 communities projected to have newly constructed airports by the year 1980.⁸²) Their solution is basically a public relations approach. The AOCI draws an analogy between the elderly spinster who does not like to be driven fast in an automobile and the jet plane first introduced to a new airport community. In time, by starting out slowly, the community, like the spinster lady, will begin happily to tell friends how quickly the trip was made, and what a careful driver she had.

Some of this advice is included in the Airport Operators Aircraft Noise Kit, also prepared by the AOCI.⁸³ More detailed assistance is offered in how to cope with noise trouble that may arise from the community. Much of this is thoughtful advice, but part of the strategy is a direct attempt to manage people and manipulate the community in order to remove social opposition—opposition to aircraft noise that can affect the environmental health of a community.

Airline advertising has done its best to minimize negative aspects of operating aircraft, by focusing on the passenger, not the community. The amenity of quiet afforded the passenger is repeatedly used by Madison Avenue. Eastern Airlines proudly heralded their fleet as "whisper jet" quiet, and inscribe the two words on every airliner. McDonnell-Douglas describes the DC-9 as "quick and quiet" rapid transit, for they have placed "twin fanjets at the rear, to give you smoother, quieter flights."⁸⁴ According to British Overseas Airways Corporation (BOAC) beginning in 1964 "things quieted down

80. W. Burrows, *Hugh-Hush Agent Helps Airlines Beat Noise Ban*, N.Y. Times, Oct. 20, 1970.

81. C. Lyndon, *supra* note 35.

82. Philadelphia Inquirer, Nov. 10, 1969.

83. *AOCI Airport Operator's Aircraft Noise Kit*, Airport Operators Council, Inc. Aug., 1967.

84. Advertisement, Time, May 10, 1968.

over the Atlantic." This happened because the "engines were placed back by the tail instead of on the wings."⁸⁵ As a result of acoustical engineering improvements, the sound level inside the BOAC VC10 is portrayed as being "as quiet as an English meadow on a Sunday afternoon" and "as quiet as a lagoon."⁸⁶ Compared to all other present aircraft BOAC purports to have "the quietest cabin in the sky."⁸⁷

Nearly all aircraft advertising is passenger oriented and the inference is that what is good for the passenger is good for the community. But, what about the community? Rarely does it benefit at all. Usually acoustical improvements are limited to quieting cabin interiors. Present day aircraft simply do not offer the same whisper jet quiet to communities as they offer passengers. Unlike passenger comfort, "community comfort" is never mentioned. Although by 1975 "15 million people will be living near enough to airports to be subjected to intense aircraft noise."⁸⁸

However, with the introduction of a new generation of larger aircraft, advertisements now admit that the noise levels of current aircraft are offensive to airport community residents. "Neighbors of airports don't have to be told what's up. It's noise. But quieter engines are coming. And those engines will be quieter and virtually smoke-free."⁸⁹ In announcing their entry into the air bus race, Lockheed Aircraft Corporation for the first time offered "quiet power" to both passenger and community.

Three mighty Rolls Royce high-bypass turbofan engines will make the quietest "sh-h-h" in the sky. Takeoff and landing noise will be far below present jet levels, making this airliner a quieter, better neighbor for people on the ground as well as those in the air. In 1971, the low-noise Lockheed 1011 will start flying for many great airlines.⁹⁰

It remains to be seen whether or not the advertised results will be achieved, and at what costs.

B. Power Lawnmowers

Another area where industry often disassociates itself from any responsibility for community noise is in establishing performance standards for products. If and when standards are

85. Advertisement, *Time*, May 17, 1968.

86. Advertisement, *Newsweek*, Feb. 13, 1967.

87. Advertisement, *Newsweek*, Sept. 7, 1967.

88. *Environmental Quality*, *supra* note 22.

89. Advertisement, *New Yorker*, Sept. 13, 1969.

90. Advertisement, *New Yorker*, Oct. 25, 1969.

developed, industrial trade associations prepare the majority of them. In the absence of governmental control performance standards concerning noise emission are written by business for business. The primary function of any trade association is to maintain the most favorable climate for business. Therefore, the usual philosophy behind writing a standard is to make one that all members of the association can meet, and only secondly to make one which could be a benefit to the ultimate user. When a specific decibel level is included, the normal procedure is to "shoot high." If "outside pressures" do develop *later*, once a commodity is marketed, then there is a comfortable margin to reduce the noise it generates, without major expense to association members.

There is evidence that the lawnmower industry, represented by SAE (Society of Automotive Engineers) used this tactic in writing an industry-wide regulation establishing noise emission limits for their power mower equipment. By their own admission, the lawnmower group agreed they could meet a standard where the noise level from the mower could not exceed 59 dBA at a distance of 50 feet.⁹¹ Despite this fact the members approved a more lenient standard of 72 dBA at the same distance. It is apparent that these companies felt there was no need to place an additional financial burden on themselves to quiet their product when the public was essentially content. A quiet lawnmower could be built for about \$15 more than a conventional model.⁹² Mass media advertising here, too, portrays the image of quiet. One power mower manufacturer has a model called the "Peacemaker." The advertising copy reads: "it's designed to keep peace in the family and neighborhood, quiet as a church mouse."⁹³

Another manufacturer has chosen to emphasize rather than to hide the fact their product is noisy. Their advertisement states, "Turn the key on the handle of this Huffy, the motor roars, and you're ready to go."⁹⁴

C. Air Conditioners

Another source of community noise is air-conditioning. As a guide to communities contemplating legislation, the Air Conditioning and Refrigeration Institute has prepared a performance

91. Interview with Raymond Donley, physicist, noise control consultant.

92. H. Mecklin, *It's Time to Turn Down All That Noise*, Fortune, Oct. 1969.

93. Advertisement, House and Garden, Apr. 1968.

94. Advertisement, Life, Apr. 24, 1970.

standard for air conditioning noise. The Institute, supported by industry, recommends a 60 dBA noise limit, measured at the closest property line.⁹⁵ In a random examination of both central and room air conditioning units, it has been found that nearly one-third of the central type installations exceeded even this industrial determined standard.⁹⁶ Commenting on the heating, ventilating and air conditioning systems currently available to the public, a federal task force on the technical aspects of the noise problem observed:

[T]he current economic trend of many heating, ventilating and air conditioning manufacturers toward designing high-velocity pressure equipment, thin wall ducting and the use of false ceiling plenum spaces and open corridors as return ducts has resulted in the creation of some of the noisiest systems in existence . . .

Most major manufacturers claim there is no real demand for quieter products when their cost is made known to the prospective buyer. In other cases the consulting engineer may reject a higher priced unit that the owner might be willing to buy. There are indications that the cost problem arises because many manufacturers attempt to recover immediately a large share of development costs. This is an unreasonable burden on the initial purchaser.⁹⁷

There are ways of getting around this 60 dBA limit without ostensibly attenuating the noise. A well-known manufacturer has simply altered the frequency distribution of the air conditioner noise. This manufacturer has succeeded in meeting a recommended standard. But since there is no basic noise reduction, the user (which includes the community) has not benefitted at all.

Every major air conditioning manufacturer tells the customer its product operates quietly. Similar to aircraft advertisements, purchaser or user comfort is emphasized. The community, which continuously receives this din during the summer months, as a rule remains unmentioned. One manufacturer claims to offer a window unit model that "roars like a mouse,"⁹⁸ while another is portrayed as being "noiseless."

95. Draft of a Municipal Ordinance to Regulate Sound, Air-Conditioning and Refrigeration Institute, 1966.

96. W. Blazier, Jr. *Criteria for Control of Community Noise*, Sound and Vibration 14 (No. 2, 1968).

97. Committee on Environmental Quality of the Federal Council for Science and Technology, *Noise—Sound Without Value*, (Sept. 1968).

98. Advertisement, *Life*, June 7, 1968.

Frigidaire describes its Prestige Model (AEP-8MN) as "pin-drop quiet,"⁹⁹ the epitome of noise suppression. Similar claims have been made by General Electric, Westinghouse, Whirlpool and Lennox. While indoors, individuals may well be able to converse, relax and possibly, sleep; outdoors, the situation is different. Despite all these claims about noise-free operations, present day air conditioning systems, as indicated earlier, are not functioning quietly in the outdoor environment. Collectively these manufacturers do not meet their own self-imposed 60 dBA noise limit. Furthermore, community-noise ordinances like the one adopted by Coral Gables, Florida, are uncovering the fact that most residential air conditioners exceed the maximum allowable noise level.¹⁰⁰

D. Vehicles

The automobile industry advertises quiet more than any other industry. Ford Motor Company was the first American car manufacturer to use this theme on a national basis. These earliest advertisements compared the Ford to the Rolls-Royce, with Ford offering a quieter ride. They still make reference to this earlier comparison, "LTD by Ford is designed to ride quieter than the Ford LTD that was quieter than a Rolls-Royce."¹⁰¹ Beginning with the introduction of the 1969 automobiles, other manufacturers began mentioning noise control. However, the current model year has emphasized the amenity of quiet more than any previous year. On all of their 1970 cars the Chrysler Corporation offers a "Torsion-Quiet Ride", described as "A unique suspension system that insulates against road shock and engine noise."¹⁰² Ford Motor recommends that the consumer "Take a Quiet Break in the 1970 Ford. We don't just cover up the noise. We build in the quiet."¹⁰³ Two divisions of General Motors have also launched quiet car campaigns. The 1970 Chevrolet Monte Carlo is publicized as being "sailplane silent"¹⁰⁴ while the new Cadillac V-8 engine "smoothly and quietly delivers a responsiveness that's astonishing for a car of such magnificence."¹⁰⁵ In all of these cases, the primary emphasis is reducing noise within the car's interior. Community "quiet" receives no attention.

Aircraft, lawnmowers, air conditioners and vehicles represent a

99. *Id.*

100. Blazier, *supra* note 96.

101. Advertisement, *Life*, Nov. 1968.

102. Advertisement, *Newsweek*, Nov. 29, 1969.

103. Advertisement, *Time*, Oct. 10, 1969.

104. Advertisement, *Forbes*, Oct. 1, 1969.

105. Advertisement, *New Yorker*, Oct. 11, 1969.

few of the offensive community noises. Most manufacturers of these items realize the problem exists, and some are trying to do something about it. However, other firms have either avoided the problem altogether, or have treated it superficially. Major segments of the private enterprise system are directly responsible, for they have allocated more dollars to manufacturing and sales promotion than to reducing product noise.

Community noise has received some attention indirectly, through a recent amendment to the Walsh Healey Public Contracts Act.¹⁰⁶ This Act now establishes occupational noise thresholds which could make industry think more seriously about controlling noise in general. Also, nuisance legislation has affirmed the principle of product liability which asserts the manufacturer of a consumer item is liable for any hazards associated with the product sold to the consumer. One of the most publicly concerned spokesmen from industry has reminded negligent companies of their obligation to abate noise they, themselves, create.

The manufacturer is obligated to incorporate safety features into his product that will reduce the possibility of injury to the ultimate user. Legal precedents involving product liability affirm this principle. Excessive noise is a hazardous attribute of many products that manufacturers have not given the corrective attention it deserves.¹⁰⁷

Some states are making sure industry doesn't drag its feet in controlling product noise. California is considering legislation to amend their Health and Safety Code establishing noise standards for consumer articles sold within the state.¹⁰⁸

VII IGNORANCE

Although the picture is changing, a sizeable part of the population knows little about community noise as an environmental health problem. Therefore it is little wonder that until recently the public has never demanded efforts to quiet the environment. Even now the public at large is unfamiliar with the magnitude of the problem, the technological and institutional ways to bring about changes, and the cost of noise reduction.

For example, every day more people settle in housing near noise sources such as airports, freeways, and commuter lines, without

106. 41 C.F.R. § 50-204.10 (1970).

107. J. Botsford, *Control of Industrial Noise Through Engineering*, in *Noise as a Public Health Hazard* 133 (1969).

108. Cal. S.B. No. 1300 (1970).

recognizing the magnitude of the noise problem. In Rosedale, Long Island, close to the JFK International Airport, a plan for a multiple-family residential development was approved. The developer, who had previous success in the same area, told New York City officials that when he built "Country Estates" development of single-family houses, people knew of the proximity of the airport and were aware of a potential noise problem.¹⁰⁹ However, this proved to be no obstacle in selling the houses. These houses ranged in price from \$37,000 to \$48,000, "plus options", and incorporated no sound insulation materials.

A. Noise Abatement Organizations

In defense of the public, few avenues are open to learn much about either the potential hazards of noise or what can be done to reduce them. There is no longer a nationally based organization concerned with this pollutant. The National Noise Abatement Council (NNAC) was active for over 10 years, but was disbanded in 1961. Those companies sponsoring the Council withdrew their financial support because interest declined. NNAC presented awards to cities which had done the most significant abatement work.

After a six year hiatus, two noise abatement organizations began representing the public interest once again. The Citizen's League Against the Sonic Boom (CLASB) was established in 1967 under the direction of Dr. William Shurcliff, a Harvard University physicist. By the end of that year their membership had reached 2,200.¹¹⁰ Today, numbering well over 3,000 members, the league is carrying on a campaign opposing the development of the SST in conjunction with other conservation groups (e.g. Friends of the Earth). A newsletter available to CLASB members reports the status of the U.S., Anglo-French, and Russian SST projects. Their activities have included sponsoring national advertising, directing a congressional write-in campaign, as well as preparing a "SST and Sonic Boom Handbook," for members of Congress, governmental officials, and journalists. This same handbook has now been published in paperback by Ballantine Books.¹¹¹

Citizens For a Quieter City, Inc. was organized in 1966. This organization is concerned about urban noise in general, with its geographical focus being New York City. The Executive Director, Alex Baron, considers that "education and applied research are pre-

109. *Incompatible Land Use—Rosedale Long Island, N.Y.—J.F.K. Airport*, National Aircraft Noise Abatement Council 6-7 (1968).

110. W. Shurcliff, Newsletter #9, Citizen's League Against the Sonic Boom, Oct. 10, 1967.

111. W. Shurcliff, *SST and Sonic Boom Handbook* (1970).

requisites to intelligent action." Consequently the purpose of Citizens For a Quieter City is:

to create an awareness of the need for the control of city noise and of the means available for such control. We want to stimulate research not only on hardware and legislation, but on the effects of noise on man.^{1 1-2}

As a citizens' group the members have lobbied and supported efforts to: limit the use of heliports and STOL facilities in residential parts of Manhattan, reduce the din of refuse trucks by including noise performance specifications on city contracts, pass the N.Y.C. building code with its noise provisions, and acquaint the public with acoustically treated products available on the market, i.e., quieted air compressor, pavement breaker, and refuse cans. Under Baron's leadership the organization has also sponsored forums on noise pollution and the need for control. A recent undertaking has been a public advertisement project urging the public to recognize that "the citizenry has at least an implicit right to a reasonable amount of quiet—and present technology is capable of insuring that right." One full-page antinoise advertisement simply states "Noise pollution won't kill you. It can only drive you nuts or make you deaf." Although doing a commendable job of supporting the public's interest, this organization has limited financial resources, and it is designed to assist primarily the New York metropolitan area. Citizens For a Quieter City has been awarded a \$300,000 Ford Foundation grant to determine methods for reducing noise in a 60 block area of N.Y.C.^{1 13} Other than these organizations, there are few places where the citizen can learn about noise and how it can be controlled.

B. Public Information

Professionalization has further restricted the vital flow of scientifically based noise information to the public. Acoustical engineers, industrial hygienists, behaviorists, etc., appear to guard their interests in this pervasive problem by writing in a jargonistic, "professional" manner. The public only occasionally receives translations through the wire services or popular magazines. Usually they are watered down and incomplete. For eight years the Acoustical Society of America supported a very competent journal on the subject entitled *Noise Control*.^{1 14} Because of certain economic con-

112. A. Baron, *The Noise Receiver: The Citizen*, Sound and Vibration 8-11 (No. 2, 1968).

113. M. Gansberg, *Grants Will Aid Pollution Study*, N.Y. Times, July 6, 1970, at 27, col. 1.

114. Sound (Replaced Noise Control); also sponsored by the Acoustical Society of America. Lasted two years. The final issue appeared Nov./Dec. 1963.

siderations their sponsorship was terminated and the highly readable magazine was discontinued. Although the Acoustical Society assured readers of *Noise Control* that the *ASA Journal* would incorporate the subject of noise, community noise articles infrequently appear. When articles do appear, they usually are highly technical.

There still is a link, if only a small one, between the scientific community and interested citizens, namely, the publication *Sound and Vibration*. The magazine has a growing readership of over 12,000, and all aspects of noise are reported. However, since it has a controlled circulation, (the journal is received by "management, engineering, scientific, or technical personnel—in industry, government or education—having a responsible interest in the control, measurement, or generation of sound and vibration), most of the public is left out.¹¹⁵ Attempts by the public to become more educated on this subject continue to be thwarted. The lack of public awareness still remains because of lack of availability of adequate information.

CONCLUSION: NOISE MANAGEMENT

All noises do not result in the same damages. Nor are the cost functions for noise reduction the same for all sources. Hence, a rational noise management program should seek to achieve the greatest reduction in noise for the least cost. Such a program is not likely to involve equal treatment for all sources. Priorities assigned to controlling urban noises should be based upon how disturbing they are to community residents. But they are not. At present there is an emphasis on certain noise generating activities, independent of the resulting intensity and annoyance.

Those activities fixed to the land receive primary attention. Many community zoning ordinances contain performance sections which establish noise limits for commercial and industrial land uses. Hours of business activity are often limited to the daytime because of noise levels they produce. Activities of fixed businesses may be stringently controlled, but this is not the case with mobile businesses. Trucking and aviation businesses are frequently the most offensive noise makers, yet rarely are they included in community noise ordinances. For example, air freight flights leave Philadelphia International Airport at 3:00 a.m. and generate a sound pressure level of 100-110 dBA.¹¹⁶ If a manufacturing plant produced a similar noise it would not be tolerated by local residents. When cities do regulate mobile noise sources, different standards are often applied than are applied

115. Circulation Policy of Sound and Vibration found inside front cover of each issue.

116. C. Bragdon, *supra* note 8.

to fixed sources. The maximum allowable noise level for jet aircraft taking off from any of the three New York Metropolitan airports is 99 dBA.¹¹⁷ In contrast, under the provisions of the Chicago Zoning Ordinance, the maximum allowable noise level for an industrial area, zoned M-3 is 61 dBA. Both laws are designed to regulate industry, but industrial noise generated in the sky is allowed to be 38 dBA greater than industrial noise that occurs on the ground.

The ingredients necessary to make a dent in the community noise problem are illustrated in the foregoing discussion. Included are: organizational change at all three governmental levels; change in the perceptions and understanding of noise problems by both producers and consumers; and increased public information concerning all facets of the problem—noise generation, noise impacts, methods and costs of noise reduction.

117. Address by Albert Odell, Panel on Jet Aircraft Noise, Washington, D.C., Oct. 29, 1965.