WORLD SOUNDSCAPE PROJECT

A SURVEY OF COMMUNITY NOISE BY-LAWS IN CANADA (1972)

Sonic Research Studio
Communication Studies
Simon Fraser University
Burnaby 2, B.C., Canada

Research Team

R. Murray Schafer, Director
Peter Huse, Assistant Director
Kathleen Swink, Co-ordinator of this subproject
Howard Broomfield
Lorraine Cushing
Bruce Davis
Colin Miles

J.J. Becker, Legal Advisor

This survey has been published by Labatt Breweries of Canada as part of their continuing policy actively to support the protection of the environment.

Copies of this document are available at $.50 (to cover postage and handling).

WORLD SOUNDSCAPE PROJECT

It is a fact that the human organism is becoming more and more separated from its natural environment as each new convenience, tool and technological system enters the human community. This changing relationship between man and his surroundings is to be seen, heard, felt and tasted; it is inescapable.

The World Soundscape Project is studying man's relationship to his acoustic environment. Our immediate concern is the Canadian soundscape - past, present and future. Later we shall extend our studies to include the sound of the world environment, so that trends can be noted, differences compared and salient features documented.

Acoustics as a design study has been limited to closed environments: concert halls, sound-proof rooms and the like. It is time that acoustic design be applied to the environment as a whole. To this end, the public must be stimulated to listen to and make critical judgments about the sounds to which it is exposed, or which it directly or indirectly produces. Too often people ignore (or think they ignore) unpleasant and boring sounds. This serves only to increase the problem of the proliferation of such sounds. Noise pollution is the direct result.

The World Soundscape Project takes a positive attitude to the situation: we regard the sounds of the environment as a great macrocultural composition, of which man and nature are the composer/performers. To disguise an acoustic ambience with background music or masking noise, to block it out with ear muffs, cocoon-like sound-proof rooms or automobiles is not, in our view, a satisfactory solution to the problem of noise nor is it a creative approach to acoustic design. People must be stimulated to take a more active part in their acoustic environment, and not passively accept the "well-engineered" sound effects that are presently being introduced to the ears of an ever-increasing number of people.

The project combines the musician's aesthetic with many functional activities, which include aspects of architecture, psychology, acoustical engineering, urban geography, communications and many other disciplines. Much of our work has not yet been attempted on any systematic scale, and our efforts for the forseeable future will be to lay the groundwork for what is in effect a new field of studies which might be called Acoustic Design, or even Acoustic Ecology. Our aim is to provide coherent facts by which decisions can be made not only to

control, but also to compose the acoustic environments of the future.

The World Soundscape Project is preparing a series of documents dealing with its various research activities. The documents to date are the following:-

1) The Book of Noise - a primer on noise pollution for the citizen; also suitable for schools. Price 25¢.

2) Okeanos - a 90-minute quadraphonic tape composition in which a "geneology of images" of the sea attempts to bring a sense of ocean to the listener. On rental from the composers.

3) The Music of the Environment - an article originally written for the Unesco Journal of World History, on man's changing relationship to the sounds of the world environment. Price: 50¢.

4) A Survey of Community Noise By-Laws in Canada - a compendium of noise legislation in all major Canadian cities, with commentaries, analysis and a guide to the citizen on legal action. Price: 50¢

(All prices for printed documents are to cover postage and handling costs only).

Future documents will be published concerning the present research subjects, which include:

An Archive of Lost and Disappearing Sounds - sounds of the past collected on tape and annotated in detail on cards.

A Glossary of Sounds in Literature - a collection of informative and evocative references to sounds in literature.

A Dictionary of Acoustic Ecology - explanations of terms from the various disciplines as they relate to soundscape studies.

Sound Association Tests - experiments to discover social differences in unconscious or associative responses to various environmental sounds.

Soundscape Analyses: Events and Entertainments - the documentation of the interesting acoustic aspects of social activities.

Soundscape Analyses: Community Soundmarks - recording and studying those sounds having unique or outstanding social or historical significance in the community.

A SURVEY OF COMMUNITY NOISE BY-LAWS IN CANADA 1972

PART I

Introduction

This is the first comprehensive survey of community noise by-laws in Canada, and it has been undertaken by research workers of the World Soundscape Project with financial assistance from the Donner Canadian Foundation and UNESCO.

The survey consists of noise by-laws from Canadian communities with a population in excess of 25,000, together with commentaries from mayors, city solicitors, by-law enforcement officers and others involved with the enforcement of the legislation. We would like to thank everyone who was kind enough to answer our persistent questions. Despite repeated efforts, a few communities continued to remain silent. We hope that is the way it is with them.

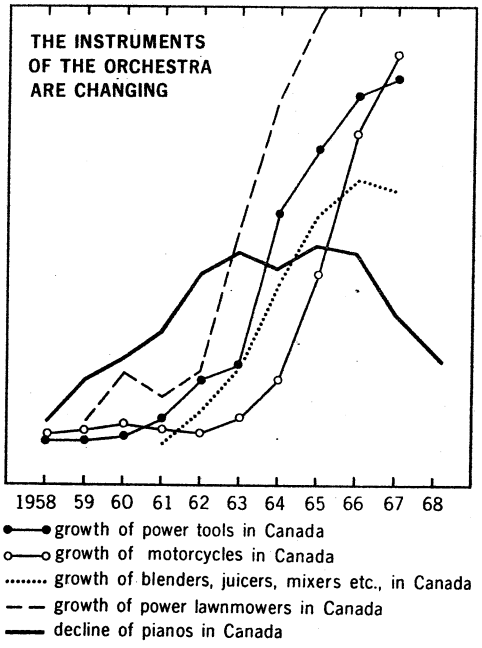
The primary intention of our survey is to enable legislators to compare notes. We also hope and expect many citizens, interested in the problem of noise, will find this report useful.

It has often been stated that the noise level of modern cities is rising at the rate of one decibel per year. While this is impossible to prove at the present time, an extensive acoustical engineering survey prepared for the Greater Vancouver Regional District in 1971 does show the community noise climate to have risen by some 6-11 dBA, when compared with studies in comparable American cities in 1954.[1]

---

1 Man can hear sounds with a sound pressure varying from between 0.0002 dynes per square cm. and 1,000 dynes per square cm. The ratio between these two figures is so vast (one to five million) that it can best be expressed logarithmically using decibels. The corresponding decibel scale runs from 0 dB at the threshold of hearing to about 120-140 dB at the threshold of pain. It is important to realize at all times that decibels form a logarithmic and not an arithmetic scale, so that a rise of 10 dB represents a tenfold increase in sound intensity, a 20-dB rise a hundredfold increase, and a 30-dB rise a thousandfold increase. The "A" in the abbreviation dBA refers to the "A" weighting network in the sound level meter, which discriminates against low-frequency sound and has a response curve which most closely approximates that of the human ear. Since the dBA scale is regarded as "statistically indistinguishable from the best psychologically-derived measure in its reliability as a prediction of human responses to traffic noise," it continues to be the simplest, most effective scale of noise measurement and has been adopted in noise-abatement legislation around the world.

The noise problem in the modern world has been caused by the unchecked spread of technology. Machines have become both more numerous and louder. The graph below shows how some common community sounds are multiplying in Canada.



Many of the machines we use have been permitted to become louder in recent years, due to inadequate governmental regulations. Since 1960, car engines have become noisier, as David Apps of General Motors acknowledges: "The trend toward larger displacement engines and high compression ratios makes for increased engine noise, induction, and exhaust noise...."[2] Yet noisier cars are paralleled by excessively loud domestic equipment. Electric blenders have been measured at 90 dBA and vacuum cleaners at 84 dBA.

---

2 David Apps, quoted by R. Murray Schafer, The Book of Noise, World Soundscape Project, Vancouver, 1970, p.15.

The snowmobile is a striking example of the careless introduction of technology into our daily lives. Only in 1970, after millions of Canadians were being exposed to this new form of noise, was the National Research Council in Ottawa able to conduct research demonstrating that existing machines "present a definite hazard to hearing."[3] Their report shows that machines on the market frequently exceeded 110 dBA at the driver's ear. The intrusion of snowmobiles has now made deafness and ear disease the largest public health problem in the Canadian Arctic, according to Dr. J.D. Baxter, head of McGill University's Otolaryngological Department. In his 1972 address to the Canadian Otolaryngological Society he pointed out that of 156 adult Eskimos examined in one area, 97 showed a significant hearing loss.

Briefly, what are the effects of excessive noise? In general it is agreed that a continuous noise above 85 to 90 decibels may cause a hearing loss. However, some researchers have found that exposure to levels as low as 70 dBA for sixteen hours daily may be sufficient to cause a hearing loss.[4] This is substantially lower than average curb-side traffic noise.

For many years it has been known that noise in industry can cause deafness. But "recent population studies have suggested that hearing loss formerly thought to be a hazard of aviators and boilermakers, occurs...after lifetime exposure to noise at a community level."[5] For example it has been established by audiometric examination that men operating power lawnmowers averaging 97 dBA suffer a temporary hearing loss after 45 minutes exposure.[6] Dr. David Lipscomb at the

---

3 Snowmobile Noise, Its Sources and Control, APS-477, National Research Council, Ottawa, 1970.

4 Alexander Cohen et al., "Sociocusis -- Hearing Loss from Non-Occupational Noise Exposure," Sound and Vibration, 4:11, November, 1970, cited in Clifford R. Bragdon, Noise Pollution: The Unquiet Crisis, University of Pennsylvania Press, Philadelphia, 1971, pp. 74-76.

5 J.D. Dougherty and O. Welsh, "Community Noise and Hearing Loss," New England Journal of Medicine, 127:14, October 6, 1966, p. 759, cited in Bragdon, Noise Pollution, p. 73.

6 William A. Shearer, "Acoustical Threshold Shift from Power Lawnmower Noise," Sound and Vibration, 2:10, October, 1968, cited in Bragdon, Noise Pollution, pp. 29-30.

University of Tennessee found in tests of 3,000 public school children that there was a marked decrease in high-frequency hearing as the student progressed from the sixth to the twelfth grade, a period during which the students had been exposed to the noise of rock bands, motorcycles, and other "recreational" noises. Dr. Lipscomb and others found that the hearing ability of college freshmen who had attended rock concerts had often deteriorated to that of 65 year olds.[7]

Because sound is vibration it affects other parts of the body as well. Intense noise can cause headache, nausea, sexual impotence, reduced vision and efficiency, impaired cardiovascular, gastro-intestinal and respiratory function.[8] Intense noise also constitutes a danger to property. A jet plane's sonic boom over Kelowna, B.C., on August 6, 1969, caused $250,000 in damage and a sonic boom over Ottawa's Uplands Airport Terminal in 1959 caused $500,000 in damage.[9]

Noise can also cause psychological damage, a matter harder to document, but one which is now gaining researchers' attention. Dr. George Thiessen of the National Research Council in Ottawa has demonstrated that noise may interfere with sleep though the sleeper may not be consciously aware he has been disturbed. Russian researchers have found that "the level of thirty-five decibels can be considered as the threshold for optimum sleeping conditions...." and that "when noise is at a level of fifty decibels...there are fairly short intervals of deep sleep...followed, on waking, by a sense of fatigue accompanied by palpitations."[10]

---

7 See: Time Magazine, August 9, 1968.

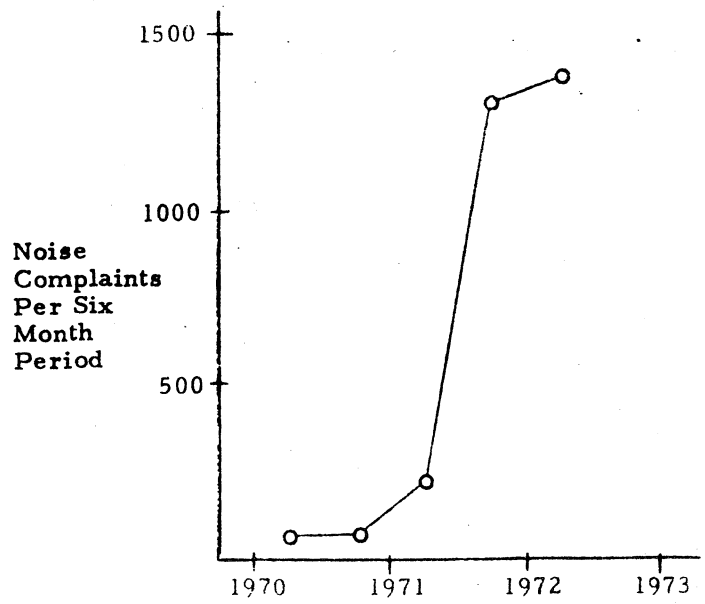
8 Bragdon, Noise Pollution, pp. 70-71.

9 William A. Shurcliff, SST and Sonic Boom Handbook, Ballentine, New York, 1970, pp. 29, 31.

10 "Séminaire interrégional sur l'habitat dans ses rapports avec la santé public," World Health Organization, PA/185.65. See summary in WHO Chronicle, October, 1966, cited in Bragdon, Noise Pollution, p.81.

Researchers are also attempting to discover whether there is any relationship between noise and mental illness. For instance, an intensive study of neighbourhoods adjoining London's Heathrow Airport by the Committee on the Problem of Noise, revealed an incidence of mental illness three times as great as in quieter districts.[11]

Noise has thus become a serious world pollution problem, and during the past couple of years it has begun to be discussed widely in the media and press. More and more people have begun to understand the dangers and are speaking out about it. Although most Canadian communities have not kept reliable records on public reaction to noise, the city government of Chicago has provided us with some interesting statistics which show a dramatic recent increase in the number of noise complaints.



INCREASE IN NOISE COMPLAINTS IN THE CITY OF CHICAGO

---

11 Noise: Final Report of the Wilson Committee, London, 1963, Appendix XI.

Returning to the situation in Canada, we may now enquire as to which are the largest sources of noise complaints. In 1969 a social survey of 651 residents in the City of Vancouver was undertaken and the following were the principal types of noise mentioned.[12]

Trucks	were considered annoying by	549	persons
Motorcycles	"	"	"	"	497	"
Cars	"	"	"	"	482	"
Helicopters	"	"	"	"	407	"
Sirens	"	"	"	"	357	"
Power Saws	"	"	"	"	303	"
Power Lawnmowers	"	"	"	"	298	"
Construction	"	"	"	"	298	"
Jet Aircraft	"	"	"	"	271	"

In the course of the present survey we were in contact with many civic officials across Canada. We asked them to identify the major source or sources of noise complaints in their community. Here is a tabulation of their replies.

Motor Vehicles (including faulty mufflers and tire squeals)	considered a major source by	28	correspondents
Construction	"	"	"	"	16	"
Barking Dogs	"	"	"	"	14	"
Motorcycles	"	"	"	"	13	"
Industrial	"	"	"	"	11	"
Aircraft	"	"	"	"	8	"

---

12 R. Murray Schafer, "A Social Survey on Noise," Simon Fraser University, 1969.

CONCERNING PAGE 7, PARAGRAPH 3:

The present Minister, The Honourable Jean Marchand, supports his predecessor's statement in a recent letter to Mr. Schafer received after this survey went to press. He suggests that the "final version" of the Concorde will compare "favourably" with the current and "somewhat noisy" Boeing 707-320C, giving manufacturers' forecast levels as his only source of information. We await independent testing and verification of these rather hopeful claims.

Snowmobiles	considered	a	major	source	by	8	correspondents
Trucks	"	"	"	"	"	7	"
Air Conditioners	"	"	"	"	"	5	"
Power Lawnmowers	"	"	"	"	"	4	"
Trains	"	"	"	"	"	3	"
Rock & Roll music	"	"	"	"	"	2	"
Car Washes	"	"	"	"	"	2	"
Snow Removal	"	"	"	"	"	2	"

There are three levels of government in Canada, and each has its responsibilities in any program of noise abatement.

The responsibilities of the Federal Government include aircraft noise, the setting of standards for all manufactured goods for the country, and industrial noise - a matter which they share with the provincial governments.

The Federal Government has done practically nothing in these areas. There are no regulations governing noise at Canadian airports aside from the use of preferential runways whenever possible and "partial" curfews at a few airports. Only two Canadian airports have installed noise monitoring equipment, but there are no regulations regarding permissible limits and no penalties for offenders. Regarding the future flight of supersonic aircraft over Canada, the Minister of Transport, The Honourable Don Jamieson, assured the House of Commons on May 24, 1972: "Our policy remains what it has been, that flight at supersonic speed is not permitted over Canada." In a letter to R. Murray Schafer, however, he later said, "...it is not our intention to deny to these aircraft access to those of our international airports to which they are otherwise authorized to operate through existing international civil aviation agreements." He maintains that they "would be flown, while in Canadian airspace, at subsonic speeds. When operated in this manner they differ very little, in an environmental sense, from other jet aircraft." Since recent reports of the Concorde show it to be about 10 EPNdB louder than all other commercial aircraft during take-off and landing, the latter part of The Honourable Minister's statement is false.[13]

---

13 While Anglo-French authorities have released no facts concerning the noise problems of the Concorde, the above information comes from independent surveys reported in the London Daily Telegraph in June, 1972. EPNdB is a scale for judging the annoyance of aircraft noise in terms of sound intensity and frequency of occurrence. Ten EPNdB would be approximately ten decibels.

The Federal Government has also failed to set reasonable limits on noisy imported or manufactured goods. We have already mentioned the example of the snowmobile. While the National Research Council study referred to earlier recommended limiting snowmobile noise to 85 dBA at 15 feet, the Federal Government responded by limiting the noise level of new machines to 82 dBA at 50 feet (i.e., approximately 92 dBA at 15 feet).

The provincial governments have done somewhat more in their areas of authority: industrial and highway noise abatement. Some provinces (though not all) have recently adopted the standards of the American Walsh-Healey Act for aural hygiene in industry and are attempting to enforce them. The various provincial highway traffic acts contain references to excessive vehicle noise from faulty mufflers, squealing brakes and horns, and these have been more or less effectively enforced.

It is at the municipal level that most anti-noise legislation in Canada has been passed. Throughout Canada the provincial governments authorize municipalities to create by-laws in specific areas by means of the provincial municipal acts. There is, however, a widespread feeling in the municipalities that the terms of the various municipal acts do not provide them with enough powers to design and enforce effective legislation. Rimouski, Québec, for instance, reports that their by-law "is very difficult to enforce since there is no provincial legislation authorizing cities in the Province of Québec to legislate in the matter...." (Hérbert Dubé, City Clerk); and Mayor Marcel Robidas of Longueuil reports "until such legislation comes from the Federal Government, our police department is doing its best...."

There is an enormous difference, however, in how far certain municipalities have decided to act or not to act under the general provisions of the municipal acts. To take Ontario, for example, the Municipal Act includes several references to noise. The reference offering the widest umbrella for general legislation is section 354, paragraph 18, which reads:

> By-laws may be passed by the councils of local municipalities for prohibiting...the ringing of bells, the blowing of horns, shouting and unusual noises, or noises likely to disturb the inhabitants.

This has permitted many municipalities to enact intelligent legislation. The City of Ottawa, for example, has passed good comprehensive by-laws for a number of noises, with permissible limits established in decibels. (We will discuss the problems with the Ottawa by-laws in a moment.) The Borough of York, Ontario, simply quoted the section from the

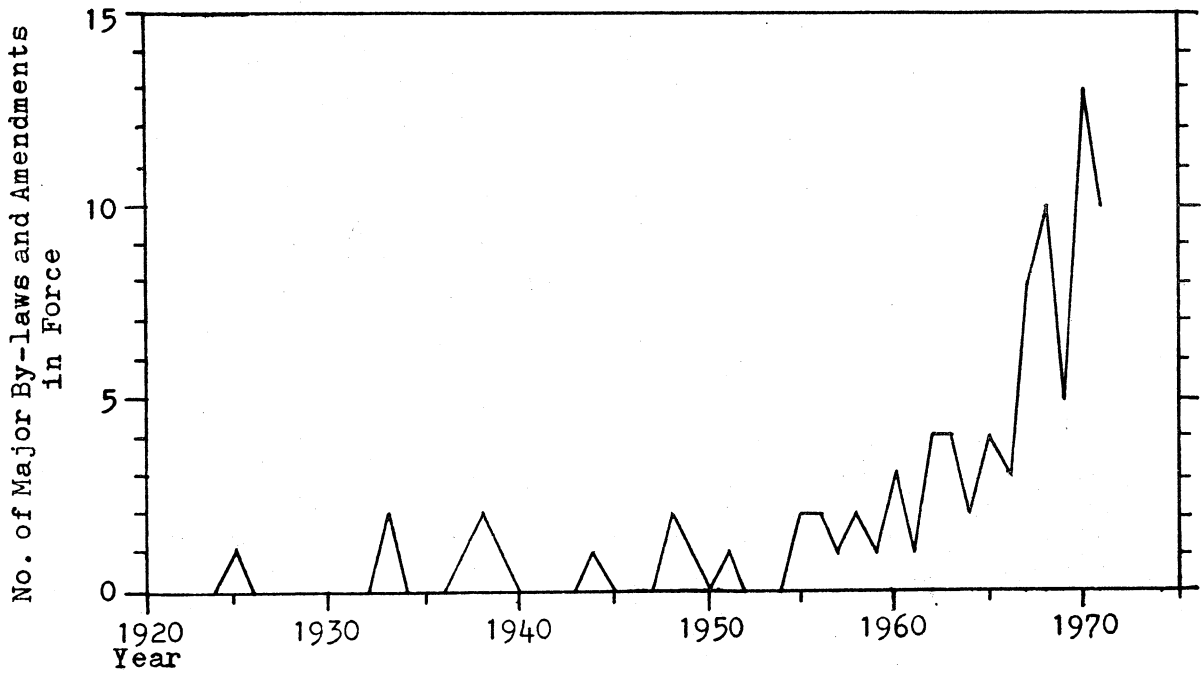
Municipal Act verbatim in its own by-law and has secured "40 - 50 convictions each year since 1970." In total contrast, the City of Windsor, Ontario, has no by-law because, in the opinion of its administration, "there is no legislative authority from the Province for a Municipality in this Province to pass such a by-law that would hold up in a court of Law." Statements like the following are also unwarranted: "Our by-law regarding noise is completely inadequate as are most on this subject due to lack of definitions and the lack of Provincial standards on the subject." (Mayor D.P. Meston, Waterloo, Ontario). This is not to say that the municipal acts cannot be improved and the provinces should see to it that they are, but many municipalities are not taking advantage of clear opportunities that already exist.

Our survey indicates that procrastination is still the most popular strategy. While 4 municipalities are currently in the process of enacting their first anti-noise legislation and 7 are reviewing their current by-laws, 12 are awaiting reports of studies, 16 are awaiting provincial legislation and 48 have no plans for the future.

Nevertheless, there is still more activity in noise legislation today than there used to be. The following graph illustrates the dates of passing of community noise legislation now in force in Canada.

PASSING DATES OF MAJOR NOISE LEGISLATION NOW IN FORCE ACROSS CANADA

(Communities over 25,000 population)



(7 By-laws Passing Date Unspecified)

What kind of legislation do Canadian communities have? Our survey shows that of a total of 87 communities

45 have noise by-laws,

10 have special motor vehicle noise legislation,

6 have other special noise by-laws (air conditioners, etc.) in addition to a general by-law,

8 have special noise by-laws (air conditioners, etc.),

9 have a nuisance by-law but no noise by-law,

8 have special references to noise incorporated into a nuisance by-law,

and,

13 have no noise by-law at all.

One of the cities with no noise by-law arrived at this position in an interesting way.

> The City of Guelph had an anti-noise by-law for several years which was seldom called into play until about four years ago. The complaints mainly were about dogs barking and this was usually corrected by a visit from a policeman, and industrial noise which was usually corrected or reduced by a telephone call to the management. About four years ago, complaints started to roll in about everything under the sun, bands playing, trucks, motorcycles, sports events, etc.. While we attempted to resolve as many of the complaints as possible by personal contact we were unable to do so in a number of instances and on the advice of our City Solicitor, the Council repealed the by-law. (W.G. Hall, City Clerk, Guelph, Ontario)

If only all problems could be solved so easily!

As can be seen, community noise legislation in Canada is exceedingly varied. Nuisance laws which prohibit "loud," "unusual" or "disturbing" sound in the neighbourhood are, of course, difficult to enforce. The quaint eloquence of some of the by-laws and the anachronistic subjects they deal with is striking.

> No hawker, huckster, pedlar, petty chapman, newsvendor or other person shall by his intermittent or reiterated cries disturb the peace, order, quiet or comfort of the public.

This is a paragraph from West Vancouver's by-law which was passed in 1967.

In the article "Noise and the Law," which follows, J. J. Becker explains how noise can be dealt with under common law and Statute Law. As he states, a costly and time-consuming civil action (under common law) can "easily develop into a war of witnesses...." But by-laws (a form of Statute Law) in which sound is dealt with as a nuisance are also difficult to enforce, due to their subjective nature, and municipalities are diffident about prosecuting, as explained by I. T. Lester, Deputy Municipal Clerk of West Vancouver:

> ...our Abatement and Control of Noise By-law is enforced upon complaint. However, this requires that the individual who is offended by the noise swear out the information against the violator. Our solicitor advises that this is necessary as it is the individual who is offended and not the municipality.

There is a tendency today to create statutory legislation in which quantitative limits are established in decibels for specific offensive noises. Under such legislation the collection of evidence and preparation of the Information is undertaken by the municipal enforcement officers. This is necessary because testing with complicated equipment is required to determine whether an infraction has occurred. The citizen may still lay a complaint, but beyond that the matter is generally out of his hands -- probably to his great relief.

At present (1972) there are 11 municipalities with at least one piece of legislation containing decibel limits: Burnaby, B. C.; Calgary and Edmonton, Alberta; Regina, Saskatchewan; Winnipeg, Manitoba; Toronto, Ottawa and Etobicoke, Ontario; Hull, Dollard-des-Ormeaux and Québec City, Québec.

Though only a few other municipalities are contemplating the immediate introduction of such legislation, many feel that it is the only sensible way to approach the problem. This is evident in commentaries received from Coquitlam, Delta, Nanaimo, Penticton, Port Alberni, and Prince George, B. C.; Burlington, Cornwall, North Bay, Scarborough, and Thunder Bay, Ontario; and Montréal, Québec.

Quantitative noise legislation has been passed by Canadian municipalities dealing with air conditioners, power lawnmowers, model airplanes, chainsaws, snowmobiles and industrial sound-spill, but the main target of most of the legislation has been traffic noise. We have gathered together all this legislation in tabular form in the Appendix. As may be seen there, the limits adopted show considerable variety. Regarding vehicle noise, a report of the National Research Council recommended the following limits:[14]

	in 30 mph zones	in higher speed zones
Passenger vehicles & small trucks	80	88
Motorcycles	85 (82 at night)	90
Trucks over 3 tons	87	92
Tractor trailers	87	95
Skidoos, etc.	85	90

(All measurements to be made at 15 feet in dBA)

This was an attempt to balance the ideal with the practical and may be recommended to all municipalities for consideration. Surely for effective co-operative enforcement, the levels adopted by all municipalities should be identical.

The lack of uniformity which characterizes the scene in Canada at the moment may be seen from the following comparative table for automobiles.

---

14 A Brief Study of a Rational Approach to Legislative Control of Noise, APS-467, National Research Council, Ottawa, 1968, p.34.

Community	Limit in dBA	Distance
Burnaby to June 1, 1978	80 (30 mph zone) 85 (faster zone)	20 ft.
Burnaby after June 1, 1978	70 (30 mph zone) 80 (faster zone)	20 ft.
Calgary	80 (30 mph zone) 85 (30-45 mph zone) 88 (over 45 mph zone)	15 ft. 15 ft. 15 ft.
Edmonton	83	15 ft.
Hull	83	15 ft.
Ottawa	83	15 ft.
Québec City	83 (dB)	25 ft.
Toronto	94 (dBC)	15 ft.

As standard types of vehicles are used in all parts of the country the Federal Government could do a great service by fixing the levels for all new or imported vehicles at reasonably low limits; but the best they have managed is to indicate that "possibly" beginning in 1973 new vehicles sold in Canada should respect the following limits:

Automobiles	84
Trucks	85 - 92 (depending on weight)
Buses	85 - 92 (depending on weight)
Motorcycles	82 - 86 (depending on engine displacement)

(All measurements to be made at 50 feet in dBA)

We draw the reader's attention to the fact that these measurements are to be made at 50 feet, not at 15 feet as is the case with the NRC guide or most existing legislation.

The other critical problem concerning quantitative noise legislation is to get it upheld by the courts. This is not always easy to do. The problem here revolves around the validity of evidence gathered on a sound level meter. It will be recalled that the same argument once existed concerning radar speed traps. It is ironical

that two cities, Ottawa and Calgary, with similar traffic-noise legislation, should have completely different records. In 1969, Ottawa became the first city in Canada to pass a quantitative traffic-noise by-law. Noise pollution experts hailed this as a giant step forward. Ottawa, however, has not yet obtained a single conviction under this by-law. City Solicitor Donald V. Hambling writes:

> ...the use of the noise meter has been very limited indeed in the City of Ottawa, and this is due in part to the personal opinion of the Chief of Police that insofar as traffic is concerned, the meter is next to useless in that the noise emanating from a particular vehicle cannot be isolated from the general noise created by the surrounding traffic. The Chief is of the opinion that the noise meter would only be effective in residential areas where traffic is not so congested and where the offending vehicle could be pinpointed or marked and isolated by the use of the noise meter. I do not know of a single case involving a prosecution by the police of a person operating a vehicle in excess of the noise limit prescribed in By-law 163-69.

The Chief of Police is perfectly right in asserting that it is almost impossible to measure a single sound source in the midst of many, and it is not very intelligent to try to do so. Rather, cities could make use of a "tagging" system whereby a suspected vehicle is issued a citation informing the owner that he must present the vehicle at an inspection station for testing. It is a simple matter for police to "tag" a vehicle suspected of being excessively noisy and to test the sound level at an inspection station. In 1971 Calgary secured a conviction in court on the basis of motor vehicle noise measurements. With this as the precedent, 258 vehicle tags for excessive noise were issued during the first six months of 1972. The Québec City by-law includes a diagram of a grid which can be chalked on the pavement of a convenient testing area (the parking lot of the police station would be adequate), so that the noise level of a vehicle idling, accelerating and decelerating could be measured.

Among American cities, Memphis is notable for its approach to traffic noise. All vehicles are required to pass a noise level test as part of a compulsory semi-annual inspection. "In 1966, the Memphis Police Department made 5,760 arrests for the operation of vehicles with excessively noisy mufflers and 360 arrests for other related violations." [15] In some German cities the permissible noise level for a motor vehicle is stamped on the driver's license. There is

---

15 Bragdon, Noise Pollution, p.21.

no reason why imaginative and effective methods cannot be developed by Canadian administrations.

Another common excuse for not having quantitative noise legislation is that the necessary equipment is expensive and difficult to operate. A properly calibrated noise level meter will cost a few hundred dollars, and a moderately intelligent person can be trained to use it properly in a few hours.

Again, the provincial governments could be expected to assist smaller municipalities by obtaining sound level readings and providing witnesses for the Crown in court. This is an arrangement which has been tried out by the Ontario Ministry of the Environment and the communities of Richmond Hill and Oshawa, to their apparent mutual satisfaction.

We have seen how important construction noise is in terms of complaints received. Nevertheless, some by-laws such as that of Etobicoke, Ontario, specifically exempt construction and excavation noise. Paragraph 9 (2) of the Calgary by-law states:

> The provisions of this section do not apply to any work carried on by the City or by a contractor carrying out the instructions of the City.

Much of the din of pavement-breakers, air compressors and pile drivers in the centres of our cities is created by the municipal departments themselves. These departments could set an example by adopting quieter procedures and by purchasing quieter equipment. The first step of a noise-conscious Mayor and Council should be to ensure that they do so. The English firm of Taylor-Woodrow has developed a "silent" pile driver. Ingersoll-Rand's "whisperized" SPIRO-FLOW (DL 9005) air compressor is about a fifth as loud as its competitors and the "Hydroville" air compressor and pavement-breaking unit manufactured by Montabert and Company in France is a tenth as loud.[16] There should be no exemptions for construction work of any kind in any model by-law.

There are other mechanical noises which require quantitative measurement such as power lawnmowers, air conditioners, chainsaws and model airplanes. The manufacturers of power lawnmowers themselves have agreed that their products ought not to exceed 72 dBA

---

16 "Stop that Noise--French Offer Quiet Concrete-Breaker," France Actuelle, February 1, 1970, p.5.

at 50 feet. This is the sound level of the loudest power lawnmower in production when operated at moderate power, and is therefore a reasonable limit to be enforced immediately in our communities.

Air conditioners, whose sales have doubled in the last decade, are an increasing source of complaint. The National Research Council recommended maximum levels of 55 dBA (48 at night), measured at the property line.[17] Only the City of Ottawa has adopted these limits: other communities with this sort of legislation have exceeded the NRC limits. By comparison, the City of Coral Gables, Florida, has passed an ordinance restricting the noise of air conditioners to 36 dBA measured inside, or 41 dBA measured outside the neighbouring residence.

Chain saws are becoming a progressively larger source of complaint. Canadian municipalities could place restrictions on the hours of use of such equipment, or require that permits be obtained when saws are to be operated in the vicinity of inhabited buildings. In Sweden, chain saws must be fitted with silencers by law. A further source of irritation, model airplanes, could be restricted to authorized areas in the community where their noise would be less disturbing. The NRC recommendation for model airplanes, incidentally, is 70 dBA at 15 feet.[18]

In all these areas municipalities should expect intelligent action from the Federal Government in limiting the noise produced by such equipment at the source, but to date nothing has come forward.

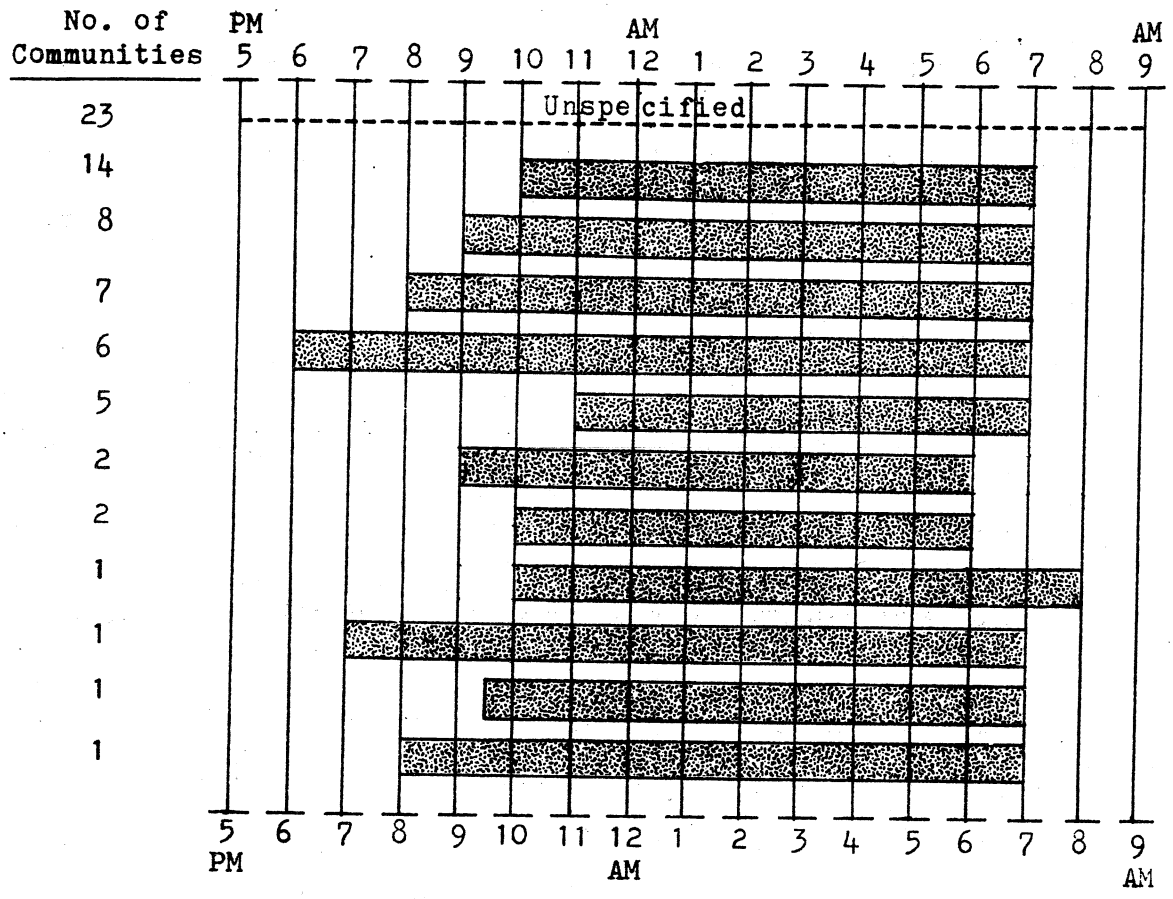
Most noise legislation divides the 24 hour period into day and night periods; but there is considerable difference across Canada concerning the durations of these periods.

---

17 NRC, Legislative Control of Noise, p.19.

18 Ibid.

QUIET PERIODS SPECIFIED IN NOISE LEGISLATION ACROSS CANADA
(Communities over 25,000 population)



A related question is zoning. It is obvious that in larger communities the same regulations cannot be applied to residential, commercial and industrial areas, though little attempt has been made in North America to produce some operable levels for different zones. The Commission of Noise Abatement of the Swiss government, however, suggests the following zones:[19]

---

19 Organization for Economic Co-operation and Development, Urban Traffic Noise: Strategy for an Improved Environment, Report of the Consultative Group on Transportation Research, Paris, 1971, p.154.

	Background Noise Level		Frequent Peaks		Infrequent Peaks	
	Night	Day	Night	Day	Night	Day
Hospital, Convalescent	35	45	45	50	55	55
Quiet, Residential	45	55	55	65	65	70
Mixed	45	60	55	70	65	75
Commercial	50	60	60	70	65	75
Industrial	55	65	60	75	70	80
Main Arterial Road	60	70	70	80	80	90

(In decibels on the "A" scale)

Finally, turning to the matter of penalties, it does seem that as noise is an environmental offence, some of the penalties associated with current noise by-laws in Canada are unrealistically low.

Maximum Monetary Penalty			Maximum Prison Penalty		
$500	6	communities	180 days	6	communities
$300	26	"	90 "	3	"
$200	2	"	60 "	12	"
$100	17	"	30 "	9	"
$ 50	5	"	21 "	1	"
$ 40	3	"	20 "	1	"
$ 20	1	"			
$ 10	1	"			
Unspecified	13				

Probably a minimum and a maximum penalty should be established in order to cope with problems as diverse as industrial noise and barking dogs.

If a community wished to improve its noise abatement program, where should it start? A valuable preliminary to any legislation would be a social survey in the community to determine the unique or variable problems to be solved. Where this is impractical, accurate statistics of complaints received should be kept by police and at municipal offices. This is a simple thing to do and from such statistics patterns will soon begin to emerge.

Engineering surveys can also be undertaken, though these are hard to conduct and tend to be very expensive. The most detailed survey in Canada to date would appear to be that prepared for the Pollution Committee of the Greater Vancouver Regional District in 1970 by the engineering firm of Barron and Strachan. Some 10,000 readings were taken on a sound level meter over a grid of points covering the Greater Vancouver Regional District, an area of approximately 559 square miles and comprising fourteen municipalities. The survey shows that traffic noise is the most significant at all times, and relates findings to those of other researches abroad.[20] It seems that such surveys need not be duplicated too frequently, though other large Canadian cities are planning surveys of their own. More important would be to repeat the same surveys periodically to monitor variations. The original Greater Vancouver Report contained a model by-law and since a number of B.C. Communities are apparently contemplating its adoption, we have included the levels recommended in this report in the Appendix.

Of all the by-laws included in our survey we find that of Burnaby, B.C., to be the most exemplary. This by-law is the only one planned in phases, with limits, initially liberal, but progressively stricter. In this respect the Burnaby by-law follows the precedent of some of the best new anti-noise legislation in the United States (Chicago; California and New York states). If we already have a noise pollution problem, it will not be solved by merely adopting a holding policy against it, as appears to be the case with other recent legislation in Canada. The validity of the Burnaby by-law remains to be established in court (1972), and as with every new piece of legislation, it may have to undergo adjustment before it can be successfully prosecuted. The courageousness of this community in planning such a strong and intelligent by-law is commended, and we hope that other communities will study it carefully.

Before any new by-law is adopted there should be a warning

---

20 For a summary see A.J. Price, "Community Noise Survey of Greater Vancouver," Journal of the Acoustical Society of America, 52:201, 1972, pp.488 - 492.

period during which the proposed new regulations are explained to the public. If the public understands the changes and the reasons for them, enforcement of the legislation will be a much easier task. Radio, television and newspapers can be used in this respect. In the United States the City of Chicago published 50,000 pamphlets to explain its new noise ordinance and the publicity campaign also included the distribution of 100,000 "Ssshhicago!" lapel buttons.

A great deal remains to be done if noise pollution is to be sucessfully eliminated in Canada. The Federal Government must begin to assume its responsibilities, for it is impossible to have uniform standards across the country until it begins to move. The provincial governments should revise the municipal acts to permit municipalities to develop stronger anti-noise legislation. They can also help by conducting engineering surveys and by offering technical assistance to smaller communities. But the communities themselves should not hesitate to seize the opportunities that already exist. There are indications that they are beginning to apply pressure to other levels of government by taking the initiative themselves. Perhaps, if they are successful, the community soundscape of the future might touch that ideal mentioned by Shakespeare in <u>The Tempest</u>, and be full of

> Sounds and sweet airs, that give delight and hurt not.

A Brief Bibliography

In addition to the reports of the NRC which are available to civic bodies, the following would be useful sources.

For a general introduction:

Bragdon, Clifford R. Noise Pollution: The Unquiet Crisis. Philadelphia: University of Pennsylvania Press, 1971.

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

For a more technical approach:

Burns William. Noise and Man. London: William Clowes and Sons Ltd., 1968.

Bell, Alan. Noise: An Occupational Hazard and Public Nuisance. Geneva: World Health Organization, 1966.

Peterson, Arnold, and Ervin E. Gross, Jr. Handbook of Noise Measurement. West Concord, Mass.: General Radio Corporation, 1967.

For special problems:

Organization for Economic Co-operation and Development. Urban Traffic Noise: A Strategy for an Improved Environment, Report of the Consultative Group on Transportation Research, Paris: OECD, 1971.

Shurcliff, William A. SST and Sonic Boom Handbook. New York: Ballantine, 1970.

Listening to the soundscape:

Picard, Max. The World of Silence. Chicago: Henry Regnery Company, 1954.

Schafer, R. Murray. The Book of Noise. Vancouver: World Soundscape Project, 1970.