19

NOISE CONTROL IN ALBERTA

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ABSTRACT

The Provincial and Municipal Governments of Alberta have attempted a variety of measures for the abatment and control of environmental noise. The origins, contents and effectiveness of the measures are outlined and commented on. Several major studies have and are being conducted by both levels of government in their attempts to improve their ability to deal with these problems. This work is described in outline and the special difficulties related to the conduct of this work because of the lack of sufficient professionally trained man-power will be described. The difficulties of finding the appropriate solutions to particular problems especially in regard to urban planning, economic impact and the fostering of good public relations is discussed by reference to the role of the acoustician in a multi-discipline team. The problems which exist for Municipal and Provincial Governments because of the presently inadequate national regulations relating to some aspects of noise control is also discussed.

Alberta has two cities which are home to about half its population, consequently the problems of noise mainly relate to the cities of Edmonton and Calgary. Both of these cities, in separate and independent initiatives, formulated by-laws for noise control which were eventually passed in Calgary in 1968, and in Edmonton in 1970. The by-laws in their presently amended forms constitute the main legislation on noise abatement and control in the province, and are the first topic considered in this discussion.

Table 1 summarized the relative positions of Calgary and Edmonton regarding vehicle noise emission.

TABLE 1

CALGARY BY-LAW (Figures in Parenthesis are for the original bylaw)

VEHICLE CLASS	LAWFUL SPEED LIMIT (in miles per hour)	MAXIMUM NOISE INTENSITY (dbA)
Light Motor Vehicle (Passenger vehicle, light truck, power bicycle, motor scooter)	not more than 30	80
	More than 30 and not more than 45	85
	more than 45	88
	Edmonton 40 mph or less	83

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TABLE 1 (continued)

VEHICLE CLASS	LAWFUL SPEED LIMIT (in miles per hour)	MAXIMUM NOISE INTENSITY (dbA)
Motorcycle	not more than 30	(80) 85 (in daytime) 82 (in night)
	more than 30	(88) 90 (all times)
	Edmonton < 40	83
Motor Truck	not more than 30	87
	more than 30 and not more than 45	91
	more than 45	95
	Edmonton < 40	90
Tractor Trailer and Concrete Mixer	not more than 30	(88) 92
	more than 30 and not more than 45	94
	more than 45	98
	Edmonton < 40	92

Clearly there is some considerable discrepancy between the requirements of the two cities; one city enforces levels which are regarded as impractical by the other. It is to be noted that the Edmonton by-law specifies noise emissions at 40 miles an hour and less, above 40 miles an hour there is no restriction.

The two by-laws are quite divergent in their content and philosophy. The Calgary by-law introduces a series of particular prohibitions against a variety of noise sources. For example, 'unloading trucks at night', advertising, lawn mowers, powered snow clearing devices, model aircraft, dogs and air conditioning. Table II summarizes some of these conditions.

TABLE II

(1) No person shall operate a power or hand lawn mower in any area designated as a Residential District between the hours of
   (a) ten o'clock in the evening and eight o'clock of the next forenoon on weekdays or
   (b) ten o'clock in the evening and nine o'clock in the morning of the following day which is a Sunday or holiday.

(2) No person shall operate a model aircraft driven by an internal combustion engine of any description during the hours when the use of a lawn mower is prohibited by subsection (1) in any Residential District.

(3) No person shall operate a snow clearing device powered by an engine of any type during the hours when the use of a lawn mower is prohibited by subsection (1).

(4) In addition to but not is substitution for any penalty which a person may incur by a contravention of any provision of the Dog By-law a person who owns, keeps, houses, harbours or allows to stay on his premises a dog which by reason of barking or howling disturbs persons in the vicinity of his home is guilty of an offence under this By-law.

(5) No person shall operate an air conditioner, fan or similar device at more than the following levels measured at any location on the lot line;

July 1, 1973	60db A (Day or night)
July 1, 1974	55db A (Day)
	50db A (Night)
July 1, 1977	50db A (Day)
	45db A (Night)

There is an unusual statement on the measuring techniques to be used in Calgary. This requires the use of a B and K meter, Aweighted, on the fast response, so that it appears that the legal unit for the measurement of noise is a "B and K Aweighted decibel" (which is the result of an amendment of the by-law, causing the replacement of the ISO 123 standard).

Edmonton chooses to set noise standards for different zones in the city. These are given in the table below for the residential, commercial and industrial zones.

TABEL III

Noise Level in Residential Zones

10. No person shall cause or permit to be caused in a residential zone within the City during the day, a noise level in dbA recorded on a sound level meter operated as directed herein greater than 65 dbA unless the noise level:

(a) results from an emergency situation, or
(b) has been approved by a special permit issued by the City Commissioners, or
(c) is included in Part 4 hereof, or
(d) is of a temporary and intermittent nature to the extent hereinafter set forth, namely,

dbA	70	75	80	83
Time	2 hours	1 hour	30 minutes	15 minutes

Noise in Commerical or Industrial Zones

12. No person shall cause or permit to be caused in a commercial or industrial zone within the City, a noise level in dbA recorded on a sound level meter operated as directed herein greater than 75 dbA unless the noise level:

(a) results from an emergency situation, or
(b) has been approved by a special permit issued by the City Commissioners, or
(c) is included in Part 4 hereof, or
(d) is of a temporary and intermittent nature to the extent hereinafter set forth, namely,

dbA	80	85
Time	2 hours	1 hour or less

A general abatement provision is included in the by-law which prohibits 'unnecessary or unusual noise which disturbs the comfort or repose of other persons'.

Enforcement is not without its difficulties. In Calgary this task is mainly undertaken by the police who, apparently, have little enthusiasm for duty with a B and K sound level meter. There is a variety of reasons for the reaction of the police. They feel that the noise enforcement duty is less essential than some of their other tasks. For example, they feel that their efforts to stem the road traffic casualty rate is a more imperative duty. Some difficulty has been experienced in obtaining convictions under the by-law. The sound level meters are used less frequently than hitherto. The Police tend to stop a noisy vehicle and have it examined under the provisions of the Highway Traffic Act. The findings of this examination can lead to a prosecution.

Edmonton approaches the problem in a different manner. The police department uses a special noise enforcement team. Consequently, the majority of police officers are not concerned with enforcing the by-law. It seems that the opinion of the police is that difficulties arise because of the lack of a Provincial standard for motor vehicle emission. The police feel quite strongly that test stations should be established for the static testing of vehicle noise. The police have found difficulties in using noise level meters in compliance with the by-law. The by-law requires that no sound level reading shall be taken if the background is within 10 dB of the permitted noise level, or when the wind velocity is greater than 25 miles per hours.

It can hardly be said that either of the by-laws attempt to legislate a comprehensive noise control package. In practice, they serve to deal with the worst excesses only.

This situation is fairly well recognized in the Province and has lead to consideration of alternative approaches to the problem. A second attempt was made by the Provincial Department of the Environment, which funded two noise surveys. These called for a comprehensive study of the problem in both cities [1~2]. The results of these surveys were published about 18 months ago and reported in detail on the various problems of the cities. Reaction to these reports and other related pressures had led to attempts to avoid reproducing the conditions which occurred at some of the more unsatisfactory existing situations. These attempts have been made at several levels of Government. At one level, trucks have been re-routed in several parts of the Cities, so that the impact of their noise on residential areas has been reduced. Questions of re-routing are raised often as a result of public pressure. The published noise measurement data has been very influential in assisting objective decisions. At another level, new major highways have in many cases been designed so that the noise inflicted on local communities has been kept within reasonable limits. Now it is quite usual for a noise assessment study to be part of the planning process for the siting and layout of new highways and residential subdivisions. A recent example of such a study is that done for the small town of Leduc. This small community, which is just south of Edmonton, is close to a major airport and sandwiched between the Province's main north-south highesy and a railway line. Developers and the town council looked for opportunities for expansion. The Provincial Government called for a detailed study of the preliminary proposals. The study, Reference 3, pre-

sented the facts of the situation very graphically. A public inquiry followed the study and all the facts relating to the proposed development have been thoroughly discussed.

The noise problem in multiple dwellings have received some attention, particularly when there was a 15-20% vacancy rate. At that time, developers were anxious to make their property more attractive to renters. Unfortunately, more recently the vacancy rate has declined dramatically and although the problem remains it is not always treated with the same urgency nowadays. One of the major acoustical consultants in the Province still receives quite a few inquires related to this problem. Unfortunately building codes are not satisfactory and no effective government action appears to be forthcoming.

Airport noise is a well recognized problem. In Calgary development around the airport has been limited to commercial and light industrial buildings. As the Leduc study showed, Edmonton is trying to keep the approaches of its International Airport free of housing.[4] There has been discussion of the need for more frequent updating of the Department of Transport/NEF contours; but I do not know if an approach has been made to the Federal Department on this matter. Developers have approached consultants and asked for noise measurements in the approach lanes to the airport. Clearly there is pressure to develop housing in these areas.

The Provincial government has initiated a $300,000 study of transportation noise. This work is being conducted by a civil engineering firm, De Leuw, Cather, Bolt, Beranek, and Newman, and the University of Calgary Acoustics Group. The study has concerned itself mainly with the problems of urban highway noise. In particular, its scope is mainly limited to the design and assessment of barriers along major highways. The testing of the validity of the predictions of the design guide prepared for the U.S. Government by Bolt, Beranek and Newman is the major activity of the study.[5] Berms and walls will be built and their effectiveness measured both physically and by the response of the public to the changed conditions. The economic viability of this method of noise control will receive some consideration. The University of Calgary Group is concerned with (i) field measurements of traffic noise, (ii) studies of the public reaction to noise and (iii) the establishing of a scaling law facility.[6] This project is being reviewed by a board set up under the chairmanship of the ex-lieutenant governor of the Province, Dr. Grant MacEwan, and has among its membership Dr. E.A.G. Shaw for NRC and Mr. Walton of CMHC.

A difficulty with advancement of legislation arises from the fact that there are no professionaly trained or experienced acousticians in Provincial government employment, apart from those concerned with industrial hearing hazards. A similar situation exists in both the City governments. The three governments are aware of this problem, and have sought the advice of those who have expertise in the area. It is very probable that a public advisory subcommittee will be set up by the Provincial government and that this committee will be given the task of producing a comprehensive and detailed report for consideration.

Clearly, Provincial and Municipal government take the problem of noise seriously. Some of the goodwill and effort, however, has been wasted because of the lack of understanding of the technical problems which exist. There

appears to be a need for a close study of all the implications of the noise problem. This study should not only deal with engineering problems but should also discuss the legislative requirements which have to be satisfied for a noise abatement act to be effective. It seems to be clear that close cooperation between the three levels of government is essential if really substantial progress is to be made.

REFERENCES

1. Dunn, B.E. and Jones, H.W. "Summary Report of Calgary Noise Survey", Alberta Environment 1974.

2. Bolstad, E.H. "Summary Report of Edmonton Noise Survey", Alberta Environment 1972.

3. Western Res. Assoc. and Lombard North Group. "Environmental Impact Assessment of Residential Development in Leduc/International Airport Area" and Appendix 3 thereto.

4. (Alberta) Environmental Conservation Authority Report and Recommendations on 3 (above).

5. De Leuw Cather et al. "A State of the Art Literature Review" Alberta Transformation 1975.

6. Jones, H.W. and Vermeulen, P.J. "Modelling Applied to Environmental Acoustics" Ibid.