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ENVIRONMENTAL NOISE RESEARCH AND GOVERNMENT FUNDING

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1.0 Introduction

The purpose of this article was to review the various Canadian funding mechanisms and sources available to the environmental noise researcher. At the same time, the extent of environmental noise research in Canada would be realized.

Once the information from the various government agencies had been gathered and reviewed, it became apparent that there are two types of funding mechanisms available: (1) general objective research, (2) specific objective research.

Generally speaking, each mechanism is geared towards a specific type of noise research, the results of which are not often applicable to the objectives or goals of the "other" mechanism. In other words, a strong co-ordinated effort does not exist between the two means of funding.

2.0 Funding Mechanisms

Whether the subject is environmental noise research or research of another discipline, there appears to be two broad approaches to government funding:

(a) Research applications or proposals are encouraged by the keepers of established funds. The choice of topic is at the discretion of the applicant. By means of committees and/or boards the projects

are reviewed and to the extent of the budget, contracts are awarded to those whose projects will best suit the general objectives of the funding agency. These general objectives are usually clearly defined to give the applicant the correct impression of purpose at the outset. Detailed information on this approach is given in section 3.

(b) Government departments, in their pursuit of regulations, standards and control of noise or any other pollutant, often encounter specific problems. As long as money can be made available through a department budget, the department is in a position to specify the problem, detail specific objectives, and award a contract to carry out the research work necessary to meet the specific objectives. Detailed information on this approach is given in section 4.

3.0 General Objective Research

The following agencies fall into the category of general objective research funders:

1. Industrial Research Assistance Program - National Research Council
2. Office of Grants and Scholarships - National Research Council
3. Associate Committee on Scientific Criteria for Environmental Quality - National Research Council
4. Department of Industry, Trade and Commerce - Incentives Research Program
5. Federal Atmospheric Environment Service
6. National Health Grant Program
7. Alberta Environmental Research Trust

3.1 Industrial Research Assistance Program - National Research Council

The Industrial Research Assistance Program (IRAP) is operated in co-ordination with the Defence Industrial Research program, administered by the Defense Research Board. Both programs have common eligibility requirements and similar objectives. However, the Defense Research Board encourages projects that will meet Canadian, NATO, or other Allied defence requirements.

The objective of the IRAP is: "to increase the calibre and scope of industrial research in Canada in situations where it leads to high business effectiveness with economic and/or social benefit to Canada.

This objective is pursued by providing financial support to approved research workers engaged in approved industrial research projects of high technical merit accompanied with prospects of a high return and good business plans for achieving success. Such projects should -

(a) Be aimed at innovating products or processes realistic to the company and of significant need or benefit to the economic and/or social life of Canada, and might particularly;

(b) Relate to research which in relation to the company's resources, is in unusually high risk, expensive, or longer range areas, but where the potential benefits nevertheless appear large, and/or

(c) Be designed to increase Canada's competitiveness in world trade in realistic situations by strengthening a necessary technological base in a company's present field or in an appropriate new field, and/or

(d) Encourage participation by government and university scientists in industrial activities, and/or

(e) Assist the attainment of the objectives of the Canadian Government's industrial strategy as may be formulated from time to time."¹

One project is currently being funded by IRAP in the area of environmental noise for an amount of \$49,200 during the 1974-75 fiscal year. This research is directed towards air conditioning equipment.

3.2 Office of Grants and Scholarships - National Research Council

This program was inaugurated in 1917. The purpose of the office of Grants and Scholarships is outlined as follows:

"The purpose of the National Research Council's program of awards to university staff is to support, in a comprehensive way, research carried out in Canadian universities, and to maintain a research capability and competence in science and engineering."²

Applications for grants are judged on the basis of the significance of the research and the scientific competence of the applicant. The choice of the project is left to the applicant. Thus, although, there is no specific program to support research in environmental noise, researchers who choose to work in this field have the opportunity of receiving funds for noise projects through the university grants program.

Of the monies allocated for the 1974-75 fiscal year, six grantees are undertaking work in or related to the field of environmental noise. Total worth of the six projects is \$99,300. The projects are listed in Table 1.

¹ Taken from Information for Applicants, IRAP, National Research Council.

² Taken from Awards to University Staff 1974 distributed by the National Research Council.

Table 1
NATIONAL RESEARCH COUNCIL GRANTS
RELATED TO ENVIRONMENTAL NOISE

| <u>Name</u> <u>Department</u> <u>University</u> | <u>Title of Research Project</u> |
|---|--|
| Glass, I.I. Institute for Aerospace Studies Toronto | Sonic boom, shock-wave phenomena, and compressible flows |
| Johnston, G.W. Institute for Aerospace Studies Toronto | Suppression of aerodynamic noise |
| Reif, Z.F. Mechanical Engineering Windsor | 1. Non-linear vibration of geared systems 2. Noise control of engine exhaust systems |
| Ribner, H.S. Institute for Aerospace Studies Toronto | Aerodynamics noise and subsonic aerodynamics |
| Siddon, T.E. Mechanical Engineering British Columbia | Research on flow noise and applied acoustics |
| Vermeulen, P.J. Mechanical Engineering Calgary | The study of acoustic-flame interactions in order to evolve high energy combustors with less adverse acoustic impact on the environment |

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3.3 Associate Committee on Scientific Criteria for Environmental Quality - National Research Council

The Associate Committee on Scientific Criteria for Environmental Quality was established by the National Research Council in 1970 in response to a Federal Government mandate to develop scientific guidelines for defining the quality of the environment.

The aim of the Associate Committee on Scientific Criteria for Environmental Quality is

"to produce a document detailing the scientific criteria for each environmentally harmful material. This would assist administrators in taking a rational approach to the forming of regulations for the preservation of environmental quality in Canada."³

In preparing these documents of scientific criteria, gaps in scientific knowledge become evident. Thus, the secondary aim of the Associate Committee is to arrange for research to fill these gaps.

The area of environmental noise is handled by the "Physical Energy Phenomena Subcommittee". Of eight contracts awarded for the 1973-74 fiscal year at a total cost of \$188,293.12, none were awarded in the area of environmental noise.

3.4 Potential General Objective Funding Agencies

Many government departments, both federal and provincial, have research programs operating on a grant or general objective basis. However, the agencies described below have either not recently or ever awarded any money in the area of environmental noise. The most popular reason would be due to limited funds. Then again, it is up to the researcher, in this case, to sell the importance of his topic.

3.4.1 The Federal Department of Industry, Trade and Commerce

This department has a number of industrial research and development programs. The objectives of the programs are to motivate research that will supply Canadian companies with improved industrial design of their products. Therefore, if the product is a noise source and the improvement is controlling noise from the source, the program is applicable.

Specifically the following programs exist:

³Taken from the January 1974 Status Report of the Associate Committee on Scientific Quality for Environmental Criteria.

(a) Industrial Design Assistance Program

Objectives: "To improve the competitive position of Canadian industry by achieving improvement in the quality of industrial design of its products."⁴

(b) Industrial Research and Development Incentives Act

Objectives: "To expand scientific research and development in Canada which, if successful, is likely to benefit Canada."⁴

(c) Program for the Advancement of Industrial Technology

Objectives: "To encourage industrial growth and efficiency by supporting the development of new or improved products and processes for commercial markets."⁴

In the recent past any industrial research related to environmental noise has stood in the shadow of some more important or demanding objective, which in turn makes it difficult to determine the actual amount of research carried out in the area of environmental noise.

3.4.2 The Science Subvention Program, Federal Atmospheric Environment Service

Subventions are aimed at problems of interest to the Department of the Environment which cannot be considered in detail because of current commitments. Under this program the potential research area in noise would be atmospheric acoustics. However, budget constraints have limited the program to funding only core projects such as atmospheric dispersion.

3.4.3 National Health Grant Program

This program is managed by the Department of National Health and Welfare. The purpose of the National Health Grant is

"to provide financial support for health research and related projects of national interest for which definite periods could be specified for their completion."⁵

Thus, research related to the human effects of noise exposure could be eligible for support under this program. To keep this approach in the right perspective, environmental health is only one of ten major topics considered for funding under this program.

⁴Taken from Incentive and Development Programs for Canadian Industry, 1973, distributed by Industry, Trade and Commerce.

⁵Taken from a supplement of The National Health Grant Manual, 1972, distributed by the Department of National Health and Welfare.

3.4.4 Alberta Environmental Research Trust

The general objectives of the trust are:

"to seek, hold, use, and administer funds for the purpose of provincial expansion of applied and fundamental research relative to environmental improvement."⁶

With this type of objective the potential for receiving funds exists for researchers of any environmental discipline. A variety of projects were funded by the Research Trust in 1973 to a total of \$246,188. Projects in the discipline of environmental noise were not among the projects funded.

4.0 Specific Objective Research

Government departments that carry out or are responsible for noise control and legislation programs constitute the majority of funding agencies in this category. Even though some of the contracts awarded may appear to be assessment studies, no attempt has been made in this paper to distinguish between assessment and pure research.

4.1 Environment Canada

Table 2 illustrates the type of projects contracted by Environment Canada. Noise research related to airports appears to absorb most of the contract money.

4.2 Ministry of Transport

All \$134,000 as indicated from Table 3, is contracted for the Vancouver Airport Study. However, this is not the only area of funding under the Ministry of Transport.

The Traffic and Safety Branch of the Ministry of Transport is responsible for policy on noise and gaseous emissions from motorized vehicles. A reported one quarter to one third of their budget is invested in longer term noise projects that are specific in nature. Currently underway is the first phase of a two phase project contracted with the University of Western Ontario concerning the "Rationale for Motor Vehicle Noise Standards". This phase will explore the basic health related effects of noise levels. Phase two will deal with monitoring traffic noise and correlating the characteristics of noise with annoyance response.

⁶Taken from The Alberta Environmental Research Trust Act, 1971.

Table 2

CONTRACTS AWARDED BY THE SCIENCE PROCUREMENT SECTOR,
DEPARTMENT OF SUPPLY AND SERVICES DURING THE PERIOD
APRIL 1973 TO AUGUST 1974 IN MEASUREMENT, ASSESSMENT,
AND CONTROL OF ENVIRONMENTAL NOISE (AND ITS EFFECTS)

ON BEHALF OF DEPARTMENT OF ENVIRONMENT:

| <u>Contractor</u> | <u>Summary</u> | |
|--|--|----------------|
| Robert Rackl, Hull, Quebec | Consultant and advisory services on noise and noise control problems associated with air transportation. | \$12,000 |
| F.F. Slaney & Co. Ltd., Toronto, Ontario | Investigation and preparation of a compendium of the decisions and processes leading to the location of the Toronto II Airport at the Pickering Site, with particular reference to the environmental consideration. | \$16,609 |
| Adolf Andres, Aylmer, Quebec | Consulting and advisory services on environmental noise control matters including the conduct of technical studies related to the development of standards, regulations and guidelines and the co-ordination of federal and provincial activities directed to environmental noise abatement and control. | \$ 6,200 |
| Barron and Strachan, Vancouver, B.C. | Study of airport and aircraft noise at Vancouver International Airport, identifying its contribution to community annoyance, recommending methods for noise measurement and developing suitable criteria for acceptable noise levels. | \$16,600 |
| | Total | <hr/> \$51,409 |

Table 3

CONTRACTS AWARDED BY THE SCIENCE PROCUREMENT SECTOR,
DEPARTMENT OF SUPPLY AND SERVICES DURING THE PERIOD
APRIL 1973 TO AUGUST 1974 IN MEASUREMENT, ASSESSMENT,
AND CONTROL OF ENVIRONMENTAL NOISE (AND ITS EFFECTS)

ON BEHALF OF MINISTRY OF TRANSPORT:

| <u>Contractor</u> | <u>Summary</u> | |
|--|---|-----------|
| Acoustical Engineering Ltd., Vancouver, B.C. | Noise measurement survey of Vancouver International Airport | \$53,122 |
| Acoustical Engineering Ltd., Vancouver, B.C. | Noise measurement of selected aircraft flyover noise events at Vancouver International Airport | \$ 4,380 |
| Acoustical Engineering Ltd., Vancouver, B.C. | Noise measurement and determination of the effective perceived noise level for up to 800 aircraft noise events at Vancouver International Airport | \$ 1,530 |
| Aviation Planning Services Limited, Montreal, Quebec | Environment noise impact and air-space assessment for operational development alternatives at Vancouver International Airport | \$75,000 |
| | Total | \$134,032 |

4.3 The Ontario Department of the Environment

Of the ten Canadian Provinces at this point in time, it would be safe to say that Ontario has made the most progress towards noise control and legislation. The in-house staff provides much of the expertise and therefore eliminates much of the need for contract research. However, community noise assessment projects have been carried out in addition to a contract awarded concerning the assessment of vehicle exhaust noise for passenger cars.

4.4 Other Provincial Governments

In Alberta one of the functions of the Research Secretariat is to identify environmental research needs and to promote research from which usable guidelines can be developed for future environmental management. To this end, some specific objective research is funded in noise, and tight budget constraints do exist. Nevertheless, two projects funded by the Pollution Control Division have been carried

out in Alberta to date. They are specific to noise assessment in Edmonton and Calgary.

The Alberta Department of Highways and Transport, in becoming cognizant of road and highway noise, is in the process of awarding a contract that will explore the attenuation of various noise buffering techniques.

The Government of Manitoba has in the past fiscal year completed a community noise study as well as a contract for methods of computer analysis of noise monitoring data. The total amount of the noise study and computer analysis contract was \$15,000.

Environmental noise research funding in other provincial governments has not materialized, even though many provinces are considering legislation for control of various noise source levels.

5.0 Summary

Having cited a review of environmental noise research funded by governments in Canada, it becomes apparent that only a limited amount of research is being carried out in this discipline.

Some research funds appear to remain untapped in the area of environmental noise. This probably exists due to limited budgets and established priorities.

Government funding has been classified into two types of funding mechanisms: (1) General Objective Funding, (2) Specific Objective Funding. Considering first the general objective funding agencies, all seven research projects mentioned in this category are related to research of the noise source, and noise source control. This type of research is the result of our appetite for technological and scientific knowledge.

On the other hand, if we consider the solicited contracts (specific objective funding), the majority of research projects mentioned in this category consider the noise receiver or the effects of noise. This type of research is the result of current government policies on regulations and standards.

Because much of the research in general is done in support of science and technology, specifications for planning and control are, in many cases, related to best available technology. Research in environmental noise has not managed to escape this trend. Is best available technology sufficient to eliminate hazardous effects? A multidisciplinary approach to environmental noise research is one way of co-ordinating efforts and answering this question.

6.0 Acknowledgements

The authors wish to thank the various government agencies mentioned for their contribution of literature and comments to the content of this paper. In particular, our appreciation is extended to Environment Canada and The National Research Council.

Addendum

Recent information received from England can be summarized as follows:

Expenditure on Noise Research⁷
England

74/75 (£'000)

| | |
|--|-----|
| Transportation and Road Reserach Laboratory (TRRL): Noise from Construction Sites | 30 |
| TRRL: Traffic Noise | 67 |
| Building Research Establishment: External Noise | 119 |

In addition the expenditure in 1973 - 1974 on aircraft noise research in Britain is expected to be 1.7 million⁸. These figures may be loosely compared with the \$350,000 total via the Canadian Governments.

⁷Taken from correspondence with The Department of the Environment, London, England. (estimated figures only) October 1974.

⁸Taken from correspondence with the Department of Industry, Teddington, Middlesex, England. October, 1974.

INTER-NOISE 75

1975 INTERNATIONAL CONFERENCE ON NOISE CONTROL ENGINEERING

Sendai, Japan

27-29 August 1975

The 1975 International Conference on Noise Control Engineering (INTER-NOISE 75) will be organized by the Acoustical Society of Japan (ASJ) in cooperation with the Institute of Noise Control Engineering (INCE/USA) and it will be held at the Sendai Shimin-Kaikan (Public Hall), Sendai, Japan from 27-29 August 1975. Juichi Igarashi, President of ASJ, has appointed Tadamoto Nimura as General Chairman for the conference. The technical program will highlight transportation noise control engineering, national and international programs for the control of environmental noise, recent developments in noise control engineering, and vibration control engineering. The program will include:

- surface transportation noise
- aircraft noise
- industrial noise control
- machinery noise control
- noise control engineering in buildings
- community noise and its assessment
- vibration pollution control
- standards and legislation for noise and vibration
- methodology and instrumentation for noise and vibration measurements
- an exhibition of materials and equipment for noise control

The working language of the conference will be English. An exhibition of equipment and materials for noise control engineering will be arranged in the conference hall.

Japan Air Lines has been appointed official carrier for the conference.

CALL FOR PAPERS

Papers will be invited from recognized specialists in noise control engineering. Contributed papers will also be welcome. An abstract of not more than 500 words must be submitted before 15 January 1975. For additional information concerning the preparation of abstracts or other details on INTER-NOISE 75 please return the coupon below.

1975 INTERNATIONAL CONFERENCE ON NOISE CONTROL ENGINEERING

- I intend to submit an abstract: please send more information
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