

ENVIRONMENTAL POLICY REVIEW

OF

15 CANADIAN MUNICIPALITIES

Volume 1
Summary Report

ICURR Intergovernmental Committee on Urban
and Regional Research
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FOREWORD

On behalf of the Intergovernmental Committee on Urban and Regional Research (ICURR), we are pleased to present this survey of environmental policies and programs in 15 municipalities across Canada.

Drawing from past research at ICURR on sustainable urban development, as well as from her own experience in the field of environmental planning — experience which led to several publications — Paule Ouellet analyzed the components of Canadian municipal plans and related policy statements in terms of: air quality, water quality and conservation, solid waste management, land use planning, intensification, energy and transportation patterns.

This analysis was complemented by a survey of municipal officials to obtain more detailed information on the problems and successes of implementing and monitoring environmental policies by Canadian local governments. The resulting report provides, we believe, a comprehensive overview of the many and varied policy initiatives on the environment being undertaken by municipalities throughout Canada.

ICURR, along with its sponsors, the provincial ministries of Municipal Affairs and the Canada Mortgage and Housing Corporation, identifies the issue of sustainable urban development as one of the major challenges facing urban research and municipal policy making. For this reason municipal environmental issues remain a key component of ICURR's strategic plan, and this report happily supplements our first research effort in the area: *Sustainable Urban Development in Canada: From Concept to Practice* by Virginia Maclaren.

ICURR wishes to thank the State of the Environment Reporting of Environment Canada for its assistance in the publication of Volume 1. We also wish to thank the Office of the Scientific Advisor (also at environment Canada) for its support in the preparation of Volume 2.

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BIOGRAPHICAL NOTES

Paule Ouellet has a Bachelor's degree in biological sciences from l'Université de Sherbrooke, a teaching certificate from l'Université du Québec à Hull and a Masters Degree in Environmental Planning from the School of Urban and Regional Planning at the University of Waterloo. Her thesis was entitled *An Assessment of the Effectiveness of Environmentally Sensitive Policy Areas in the Regional Municipality of Waterloo: 1978-1991*, and has been published by the Waterloo Heritage Resources Centre of the University of Waterloo. Paule worked for ICURR's Research Program from September 1991 to May 1993, and now works for the State of the Environment Reporting Office at Environment Canada in Ottawa.



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EXECUTIVE SUMMARY

The objectives of this study were twofold: to determine how 15 Canadian municipalities integrated environmental concerns into their municipal plans, programs, and other policies, and to obtain some insight into the problems and successes of environmental program implementation and monitoring at the municipal level.

The study methodology includes a textual analysis of municipal plans and other documents, such as task force reports and waste management plans. The document analysis was complemented by a questionnaire and telephone interviews with senior municipal officials involved with the implementation of environmental programs. Various departments were contacted, such as planning departments, parks and recreation, engineering, and special offices of the environment. The study investigates the municipal plans of at least one municipality per province and territory in Canada.

The analytical framework used to review the municipal plans was defined by a literature search and through discussion with researchers involved in the field. The plans were reviewed with regard to policies, strategies and programs including the following subject areas: air quality, water quality and conservation, solid waste management, hazardous waste management, land use planning, energy and transportation patterns, and environmental assessment at the municipal level.

Chapter 2 provides a summary of environmental policies and programs that have been developed: information on how many cities have developed environmental policies and programs in each subject area; if there is monitoring and what kind; and problems with program implementation. Chapter three presents the conclusions of the report and suggestions to improve environmental management at the municipal level, as well as future research directions.

Appendix 1 presents an exhaustive description of the environmental policies and programs developed by each of the 15 municipalities studied. Other appendices include the questionnaire used for the interviews with municipal officials and environmental statements found at the beginning of the municipal plans reviewed for this study.

Increasing awareness of environmental problems at the municipal level is reflected in the growing presence of environmental policies and programs. Tables A, B and C summarize environmental policies and programs in 15 Canadian municipal plans in several areas. It is clear from this summary that the natural environment is no longer equated with environmental hazards and the minimizing of pollution, as it was in the 1970s. Municipalities have now integrated environmental policies and programs in their municipal plans, including the protection of the natural environment, new patterns of growth to prevent urban sprawl

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and to improve the quality of life, and new practices to preserve public health.[†] Obviously, the environment is not a "fad" and has become an important component of municipal planning and policy making. Environmentally sensitive areas have been designated in most municipalities in order to protect the last remnants of natural areas in the urban environment. State of the environment reports are being developed in Regina, Ottawa, Toronto and Montréal. The creation of task forces allows for the exchange of ideas between various stakeholders: municipalities, non-governmental groups, provinces, academics and the general public. Concrete measures, such as the tree-cutting bylaw in Vancouver, should improve the protection of the urban forest.

However, the translation of environmental policies into program implementation is not as advanced. In many cases, the municipality needs provincial authority or legislation to implement the programs, such as the CFC bylaw in Toronto, and the tree-cutting bylaw and ozone depleting regulations in Vancouver.

In other cases, even if the policy is well developed — such as the designation of environmentally sensitive areas — their inventory and protection will require financial and human resources that are not available at the present time. The same remarks apply to monitoring of environmental programs. It is done for sectors such as air quality, water quality and solid waste management, but not for the protection of the natural environment, such as designated areas. Hazardous waste is another sector where municipalities do not have the resources to monitor. Environmental assessment is still largely a provincial and federal responsibility.

Municipal plans have the potential to address environmental problems, but they also have their limitations. If municipalities are to develop programs to implement all their environmental policies, they will need to address what they have identified as the major problems: a clearer mandate from the province, with the necessary powers, more financial and human resources and more expertise in environmental problems.

[†] For a description of main policy statements at the beginning of the 15 plans studied, see Appendix No. 3.

TABLE A MUNICIPAL ENVIRONMENTAL POLICIES AND PROGRAMS ON AIR, WATER QUALITY AND WASTE MANAGEMENT

SUBJECT AREA	AIR QUALITY						WATER QUALITY AND CONSERVATION		SOLID WASTE MANAGEMENT	HAZARDOUS WASTE MANAGEMENT
	Ozone Depleting Chemicals	CO ₂ and other greenhouse gases	NO ₂	SO ₂	Alternatives to car use	Water Quality	Water Conservation			
Vancouver	X	X	X	X	X	X	X	X	X	X
Edmonton	Task Force 1993	NO	NO	NO	X	X	X	X	NO	NO
Regina	X	X	NO	NO	X	X	X	X	X	X
Winnipeg	X	X	NO	NO	X	X	X	X	X	X
Sudbury	NO	NO	NO	X	NO	X	NO	X	X	X
Toronto	X	X	X	X	X	X	X	X	Provincial responsibility	Provincial responsibility
Ottawa	X	X	X	X	X	X	Regional responsibility	X	X	X
Montreal	X	X	NO	NO	NO	X	X	X	X	X
Sherbrooke	X	X	X	X	NO	X	X	X	X	X
Fredericton	NO	NO	NO	NO	NO	X	X	X	Provincial	Provincial
Cavendish Planning Area	NO	NO	NO	NO	NO	X	X	X	Provincial	Provincial
Dartmouth	NO	NO	NO	NO	NO	X	X	X	X	X
St. John's	NO	NO	NO	NO	NO	X	NO	X	Federal and Provincial	Federal and Provincial
Whitehorse	NO	NO	NO	NO	NO	X	X	X	Territorial	Territorial
Yellowknife	NO	NO	NO	NO	X	X	NO	X	NO	NO

Legend: X: Municipal environmental policy or program present
 NO: Municipal environmental policy or program absent

TABLE B MUNICIPAL ENVIRONMENTAL LAND USE POLICIES AND PROGRAMS

SUBJECT AREA	AGRICULTURAL LANDS	BIODIVERSITY	ECOSYSTEM APPROACH	NATURALIZATION	URBAN FOREST	OPEN SPACES	NATURAL AREAS (ESAs)	GREENWAY SYSTEMS	LAND REHABILITATION
Vancouver	X	NO	NO	X	X	X	X	X	X
Edmonton	X	NO	NO	X	X	X	X	X	X
Regina	NO	NO	NO	X	X	X	X	X	X
Winnipeg	NO	NO	NO	X	X	X	X	X	NO
Sudbury	X	NO	NO	X	X	X	Policies	NO	X
Toronto	X	Policy statement	NO	X	X	X	X	X	X
Ottawa	X	X	X	X	X	X	X	X	X
Montréal	X	Policy statement	NO	X	X	X	X	X	X
Sherbrooke	NO	NO	NO	X	X	X	X	X	X
Fredericton	N/A	NO	NO	X	X	X	X	X	NO
Cavendish Planning Area	X	X	NO	X	X	X	X	X	NO
Dartmouth	N/A	NO	NO	X	X	X	X	X	NO
St. John's	NO	NO	NO	NO	X	X	NO	NO	NO
Whitehorse	X	NO	NO	X	NO	X	NO	X	X
Yellowknife	N/A	NO	NO	X	NO	X	X	X	NO

Legend: X: Municipal environmental policy or program present
 NO: Municipal environmental policy or program absent

TABLE C MUNICIPAL ENERGY AND TRANSPORTATION POLICIES AND PROGRAMS AND ENVIRONMENTAL ASSESSMENT

SUBJECT AREA	INTENSIFICATION	PUBLIC TRANSPORT	REDUCE CAR USE	CYCLING	RESIDENTIAL ENERGY USE	COMMERCIAL/ INDUSTRIAL USE	ENVIRONMENTAL ASSESSMENT	CUMULATIVE IMPACTS
Vancouver	X	X	X	X	X	X	NO	NO
Edmonton	To be developed	X	X	X	X	X	NO	NO
Regina	X	X	X	X	X	X	For industries (small projects)	NO
Winnipeg	X	X	X	X	X	X	NO	NO
Stubury	Statement only	X	X	X	X	X	NO	NO
Toronto	X	X	X	X	X	X	X	NO
Ottawa	X	X	X	X	X	X	X	NO
Montreal	X	X	X	X	X	X	To be developed	NO
Sherbrooke	X	X	X	X	X	NO	NO	NO
Fredericton	X	X	X	X	N/A	N/A	NO	NO
Camendish Planning Area	X	N/A	X	X	N/A	N/A	NO	NO
Dartmouth	X	X	X	X	X	X	NO	NO
St. John's	X	X	X	X	X	X	For Environmentally Valuable Areas/Land Use Impact Assessment	NO
Whitchorse	X	X	X	X	X	X	NO	NO
Yellowknife	NO	X	X	X	X	X	NO	NO

Legend: X: Municipal environmental policy or program present
 NO: Municipal environmental policy or program absent

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Half the world's population will live in urban areas by the turn of the century. The way these urban areas are developed will largely determine our success or failure in overcoming environmental challenges and achieving sustainable development.¹ As the magnitude of the problem of environmental degradation becomes clearer, strong pressures on all levels of government are bringing them to develop policies to integrate the natural environment into the planning process. Despite the higher profile given to federal and provincial governments, municipal governments will have a growing role to play in addressing environmental problems.

By definition, municipal plans are key components in the identification of development objectives, as well as their implementation. Plans represent a synthesis of policies on housing, transportation, land use and many other areas in which environmental concerns can be integrated. Municipal plans belong among a set of tools that can foster the implementation of sustainable urban development programs at the local level.

The involvement of municipalities in sustainable development was well documented in Dr. Virginia Maclaren's 1992 report *Sustainable Urban Development in Canada: From Concept to Practice*.² In that study, the author held detailed interviews in 22 Canadian municipalities and provided the Intergovernmental Committee on Urban and Regional Research (ICURR) with an extensive compendium of ongoing local sustainable development activities. This study is a follow-up to Dr. Maclaren's work. This study will demonstrate how 15 Canadian municipalities have incorporated the concept of sustainable development into their municipal plans and other policies, focusing on the ecological component of sustainability.[†]

Until recently, environmental effects have rarely been considered at the front-end of the decision-making process — whether that be in formulating policies and plans, or at the project level, such as roads and subdivisions — or in the environmental assessment process. Incorporating environmental concerns into municipal plans is a step towards a more comprehensive and environmentally sensitive approach to decision making.

[†] For the purposes of this research, the term "municipal plan" is equivalent to "official plan" and "development plan".

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1.2 RESEARCH OBJECTIVES

This study has four objectives:

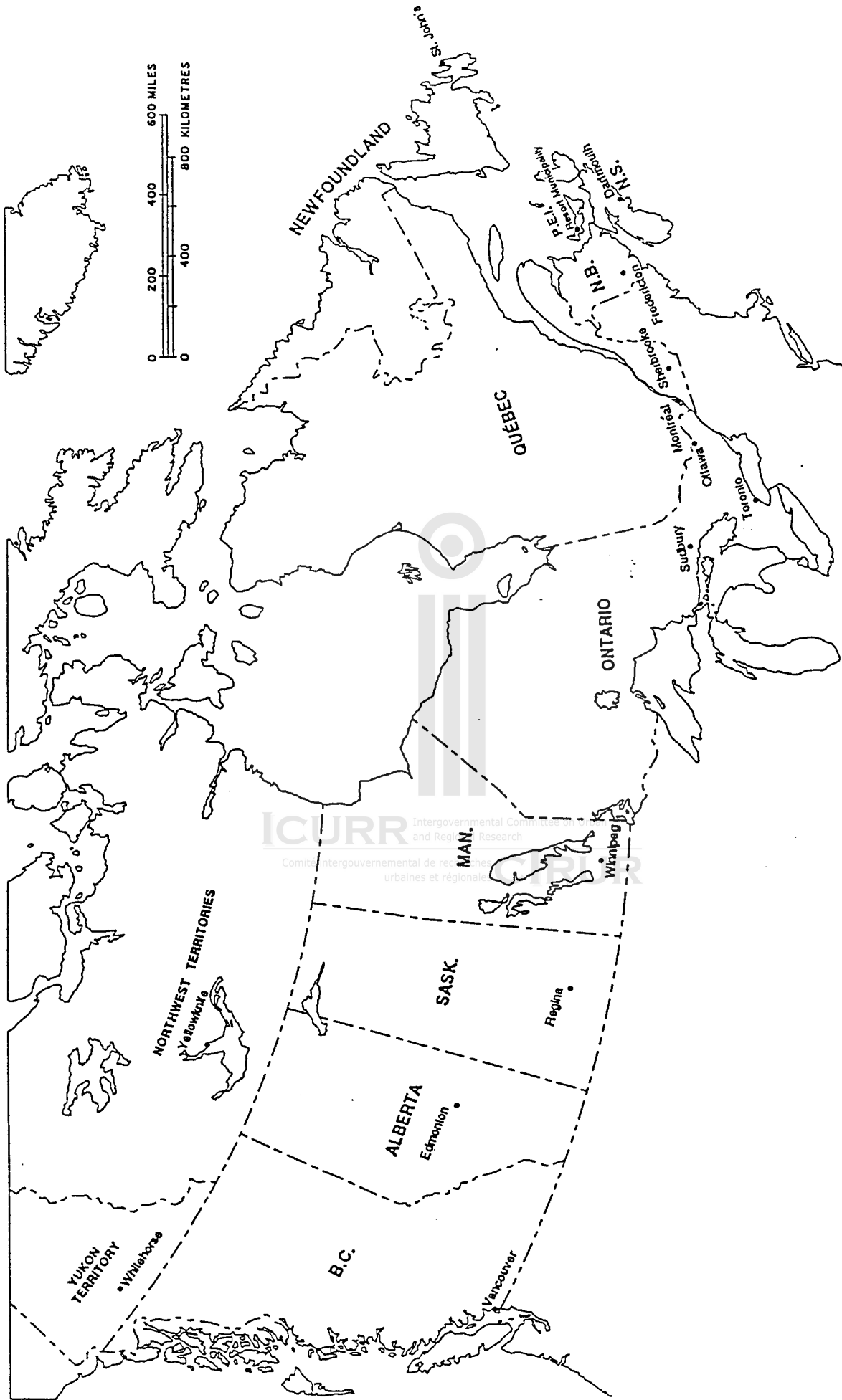
1. to analyze the content of the municipal plans of 15 Canadian municipalities in order to determine their environmental strategies, policies and programs;
2. to gather information based on interviews with municipal officials, on budgeting, monitoring and implementing these environmental plans and programs;
3. to determine what the main obstacles are to the implementation of these environmental programs;
4. to develop a better understanding of the roles and responsibilities of the municipalities in implementing environmental programs.

1.3 SCOPE OF THE STUDY

This study investigates the municipal plans of at least one municipality per province and territory (Fig. 1).

Although the social and economic aspects of sustainable development are integrally related to the environmental components, they are beyond the scope of this report. This study focuses on the integration of environmental policies and programs into the municipal plans of selected Canadian cities. The following issues are addressed: air quality, water quality, solid waste management, hazardous waste management, land use and energy and transportation.

FIG. 1 STUDY AREA



Source: Department of Cartography, University of Toronto

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1.4 METHODOLOGY

1.4.1 Criteria for Selecting Municipalities

ICURR's Research Committee felt that at least one municipality from each Canadian province and territory should be included in this research project. Therefore, the 15 municipalities chosen for the purposes of this study cover all Canadian provinces and territories. Maclaren's report was used to select some municipalities. A preliminary phone survey was undertaken with municipal officials and researchers to determine which municipalities had recently reviewed or were in the process of reviewing their municipal plans. It was felt that plans recently reviewed would more likely incorporate environmental concerns. Copies of draft or approved municipal plans were obtained from municipal officials. Table 1.1 provides a list of adopted municipal plans and Table 1.2, a possible list of the draft plans. The sample includes major urban centres, medium-sized municipalities and one small resort municipality (Table 1.3).

1.4.2 Definition of the Municipal Plan

This study attempts to determine if municipal plans contain statements of goals, environmental policies and programs by using an analytical environmental framework.

Although there are variations in the content of municipal plans in the different provinces and territories, a general definition of municipal plans and the role they play are presented in the following paragraphs.

In one phrase, the community plan is a long-range, comprehensive, general policy guide for future physical development. The community plan (master plan, general plan, municipal plan, official plan) is the fundamental component of community planning; the component that provides the *raison d'être* for detailed plans and regulations.

The community plan defines the substantive focus in the physical environment, structures a planning viewpoint, and ultimately provides a policy instrument. The existence of agreed-upon policies for the physical development of the community enables councillors to judge development problems and proposals in the light of ideas about the kind of community they and their citizens want rather than on grounds of expediency.⁴

TABLE 1.1 ADOPTED PLANS

PROVINCE	MUNICIPALITY	YEAR
PRINCE EDWARD ISLAND	Cavendish Planning Area	1989
QUEBEC	Sherbrooke	1990
ONTARIO	Sudbury (Regional Municipality)	1987
SASKATCHEWAN	Regina	1991
ALBERTA	Edmonton	1990
BRITISH COLUMBIA	Vancouver †	1990
NORTH WEST TERRITORIES	Yellowknife	1988
YUKON	Whitehorse	1987

† Vancouver has no municipal plan, but a series of Area Plans such as the South Lands Area Plan. In the absence of a municipal plan, I have used other documents such as the recommendations of the *Clouds of Change* task force (City of Vancouver) and *Towards a Liveable City* (Greater Vancouver Regional District).

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TABLE 1.2 DRAFT MUNICIPAL PLANS

PROVINCE	CITY	YEAR
NOVA SCOTIA	Dartmouth Municipal Planning Strategy	1990
NEW BRUNSWICK	Capital City Municipal Plan Draft for Fredericton	1991
NEWFOUNDLAND	City of St. John's Draft of the Revised Municipal Plan	1992
ONTARIO	City of Toronto CityPlan	1991
	City of Ottawa Official Plan: A Vision for Ottawa	1991
QUEBEC	Montréal	1992
MANITOBA	Plan Winnipeg Toward 2010	1992

TABLE 1.3 POPULATIONS OF SAMPLE MUNICIPALITIES

MUNICIPALITY	POPULATION	LAND AREA IN SQUARE KILOMETRES
MONTREAL	1,017,666	177.24
TORONTO	635,395	97.15
VANCOUVER	471,844	113.09
EDMONTON	616,741	670.08
WINNIPEG	616,790	571.60
OTTAWA	313,987	110.15
REGINA	179,178	111.39
ST. JOHN	95,770	101.62
SUDBURY	92,884	262.73
SHERBROOKE	76,429	56.96
DARTMOUTH	67,798	58.57
FREDERICTON	46,466	129.58
WHITEHORSE	17,925	413.48
YELLOWKNIFE	15,179	102.38
CAVENDISH AREA (Stanley Bridge, Hope River, Bayview, Cavendish, North Rustico)	256	38.04

Source: Census Divisions and Census Subdivisions Population and Dwelling Counts, Statistics Canada, 1991.

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1.4.3 Analytical Framework

A framework using environmental subject areas was used to analyze the content of the 15 municipal plans. The analytical framework was defined by a literature search and by contacting researchers involved in the field. Two sources were especially useful: first, a 1990 study done by Gariépy et al. for Montréal's Central District Plan and secondly, a study done for Environment Canada by the Urban Information Project in 1992.^{5, 6}

In their research, Gariépy et al. mention three conditions that must be fulfilled if sustainable urban development is to be achieved. They are: meeting the needs of present and future generations; equity, social justice and cultural diversity, and ecological integrity. The ecological integrity component refers to what has been defined by the World Conservation Strategy⁷ as three strategies to conserve the Earth's vitality and diversity. They are: the maintenance of essential life support systems, the enhancement of biotic diversity, and sustainable resource use.

Minimal requirements to meet the goal of ecological sustainability have been presented by Gariépy et al.. Their goal was to define more clearly the requirements of sustainable urban development in terms of environmental management in an urban context, the Montréal Central District. They developed an analytical framework with environmental categories and subject areas that can be used to analyse the ecological integrity component in municipal plans. The principal categories used were: air, water, climate, soil, energy, waste, and biogeochemical cycles. They acknowledge that this matrix is not sufficient in itself to ensure sustainable development, but it can be used as a tool to analyze plans. Each plan is evaluated in terms of the presence or absence of objectives and performance criteria.

At a first level of analysis, Gariépy et al. looked for the presence (or absence) of objectives related to the ecological integrity aspect of sustainable development. Three possibilities can be considered (Table 1.4):

- 1) The objectives are present. The plan clearly addresses one or many objectives related to the subject area.
- 2) The plan indirectly addresses an objective related to the subject area. For example, by promoting public transportation, the plan addresses the energy objective.
- 3) The plan does not directly or indirectly address any objectives related to subject areas.

TABLE 1.4 ANALYTICAL FRAMEWORK MODEL

SUBJECT AREA	OBJECTIVES			POLICY & PROGRAM NOTES
	present	implicit	absent	
CO ₂ and other greenhouse gases (e.g., methane)				
SO ₂				
NO ₂				
Use of alternative fuels				

LEGEND:

- Present:** The plan clearly addresses one or many objectives related to this subject area.
Implicit: The plan addresses indirectly an objective related to this subject area.
Absent: The plan does not address directly or indirectly any objectives related to this subject area.

In the Environment Canada study other criteria were developed. Subject areas chosen for monitoring include demography, air quality, water, solid and hazardous waste, land use, energy, and human health as well as a category for miscellaneous subjects. Indicators were selected for each subject area based upon a review of existing municipal, provincial and federal State of the Environment Reports:

Air Quality Indicators: concentrations of sulphur dioxide, nitrogen dioxide, ozone, carbon monoxide, total suspended particles, and lead.

Water Quality Indicators: upgrading municipal wastewater treatment, water consumption, drinking and recreational water quality.

Land Use Indicators: land use change, amount of green space.

Waste Management Indicators: waste composition, per capita generation, upgrading waste treatment system, method of waste disposal.

Energy and Transportation Indicators: per capita consumption, mode of transport to work, bicycle paths per sq. km.

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This list does not represent a definitive set of indicators of urban environmental quality and resource consumption. However, it does serve as a foundation for selective information collection. The subject areas (e.g., air quality) and indicators (e.g., concentrations of ozone) can help to evaluate the importance given to sustainable urban development in a plan.

Some of the subject areas included in Gariépy and the Environment Canada report have been used to guide the present analysis. They include: air quality, water quality, solid waste management, hazardous waste management, land use (including natural areas), energy and transportation. Consideration of environmental assessment as well as cumulative impacts have been added to the analysis because of their importance in anticipating development impacts.[†] Most municipalities have not developed precise indicators to measure most of the subject areas mentioned above; for example, the amount of urban green space. For this reason, the term "subject area" is preferred to "indicators" for the purposes of this report. The analytical framework, including the different environmental subject areas used in this research, is presented in Tables 1.5 to 1.11.

1.4.4 Questionnaire

A questionnaire was used to complement the analysis arising from the municipal plan documents. The reader will find a copy of the questionnaire in Appendix 2. The appendix also includes a description of the methodology used in administering the questionnaire.

1.5 OVERVIEW

Chapter 2 is a synopsis of the policies and programs of the 15 municipalities studied; it provides information on how many cities have developed environmental policies and programs in these fields and how many that did have policies also had provisions for their implementation. Successes and problems are discussed in cases where the programs have been in place long enough to be evaluated. Monitoring activities undertaken by the municipalities are presented where they exist.^{**} The information comes from the textual analysis of the plans and from interviews with municipal officials on initiatives not mentioned in the plans.

In Chapter 3, successes and weaknesses in implementing environmental policies are summarised, including problems related to environmental program implementation, financing environmental programs, delegation of provincial authority to municipalities and lack of

[†] Cumulative impacts result when "insignificant" impacts from many human activities combine synergistically or additively through time and space to create "significant" effects. The concept of cumulative effects is best explained by the example of the gradual loss of wetlands through infilling or lowering water tables (Collnett, 1991).

^{**} The reader should be reminded that data collection stopped in June 1992. The status of programs surveyed in this report may have changed since that time.

legislative authority. Chapter 3 also presents the conclusions of the research and suggests future research directions.

A detailed description of environmental policies and programs for each municipality can be found in Volume II, Appendix 1. Other appendices presented in Volume II are: environmental policy statements in municipal documents, and a copy of the questionnaire. Endnotes are presented at the end of each chapter or appendix.



ANALYTICAL FRAMEWORK

TABLE 1.5 AIR QUALITY

SUBJECT AREA	OBJECTIVES			POLICY & PROGRAM NOTES
	present	implicit	absent	
CO ₂ and Other Greenhouse Gases (e.g., Methane)				
SO ₂				
NO ₂				
Use of alternative fuels				

TABLE 1.6 WATER QUALITY

SUBJECT AREA	OBJECTIVES			POLICY & PROGRAM NOTES
	present	implicit	absent	
Water Conservation				
General Water Quality				
Drinking Water Quality				
Wastewater Treatment Upgrading				
Protection of Groundwater Supplies				

TABLE 1.7 SOLID WASTE MANAGEMENT

SUBJECT AREA	OBJECTIVES			POLICY & PROGRAM NOTES
	present	implicit	absent	
Waste Reduction				
Recycling				
Alternatives to Disposal				

TABLE 1.8 HAZARDOUS WASTE MANAGEMENT

SUBJECT AREA	OBJECTIVES			POLICY & PROGRAM NOTES
	present	implicit	absent	
Waste Reduction				
Recycling				
Alternatives to Disposal				

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TABLE 1.9 LAND USE

SUBJECT AREA	OBJECTIVES			POLICY & PROGRAM NOTES
	present	absent	implicit	
Protection of Agricultural Land				
Biodiversity				
Ecosystem Approach				
Naturalization				
Urban Forest				
Natural Areas (including Environmentally Sensitive Areas)				
Greenway System/Open Spaces				
Land Rehabilitation Programs				

TABLE 1.10 ENERGY AND TRANSPORTATION

SUBJECT AREA	OBJECTIVES			POLICY & PROGRAM NOTES
	present	implicit	absent	
Intensification				
Public Transit				
Reduce Car Use				
Use of Alternate Fuels				
Cycling				
Residential Energy Use				
Commercial/Industrial Use				

TABLE 1.11 ENVIRONMENTAL ASSESSMENT

SUBJECT AREA	OBJECTIVES			POLICY & PROGRAM NOTES
	present	implicit	absent	
Environmental Impact Assessment				
Cumulative Impacts				

ENDNOTES FOR CHAPTER 1

1. *The Toronto Declaration on World Cities and Their Environment* (Conference on World Cities and Their Environment, August 1991, Toronto), pp. 25-28.
2. Virginia Maclaren, *Sustainable Urban Development: From Concept to Practice* (Toronto: ICURR Press, 1992).
3. A municipal plan is a document adopted by a City's elected Council and approved by the provincial government.
4. T.J. Kent, Jr., *The Urban and General Plan* (San Francisco: Chandler, 1964), p. 99.
5. Gariépy et al., *Développement viable et évaluation environnementale en milieu urbain: essai d'application au cas montréalais* (Montréal: Université de Montréal, 1990), p. 54. A condensed version of this article can be found in: G. Domon, M. Gariépy, et P. Jacobs, "Développement viable en milieu urbain: vers une stratégie de gestion des interventions," *Plan Canada*, (Janvier 1992): pp. 8-17.
6. C. Van Bers and Richard Post, *State of the Urban Environment Urban Information Project* (State of the Environment Reporting, (Environment Canada, Ottawa), unpublished, 1992).
7. United Nations Environmental Programme, *Caring for the Earth, A Strategy for Sustainable Living* (Gland, Switzerland: World Conservation Union, United Nations Environment Programme, World Wildlife Fund for Nature, 1991), p.9.

CHAPTER 2

SYNOPSIS OF FINDINGS

This chapter gives a summary of environmental policies and programs that have been developed by municipalities in the fields of: air quality, water quality, solid waste management, hazardous waste management, land use planning (including the protection of the natural environment), intensification and transportation, energy conservation and environmental impact assessment.

The information provided in this chapter comes from two main sources:

1. textual analysis of municipal plans and other documents, e.g., task force reports, waste management plans;
2. a questionnaire sent to municipal officials soliciting information on environmental policies and programs as well as their implementation and monitoring.

This chapter addresses the following questions:

- How many cities have developed environmental policies and programs in each subject area?
- How many of those who do have policies also have programs to implement them, whether part of the municipal plan or external to it?
- According to municipal officials, what are some of the program successes? What are the most frequent problems encountered with the implementation of environmental policies and programs?
- Is there monitoring of these programs and if so, what form does monitoring take? If not, what is being proposed?
- Are there any regionally significant variations in the development and implementation of environmental programs?
- Which cities have the most comprehensive environmental programmes?

Tables 2.1 - 2.7 indicate the number of municipalities, among the 15 studied, that have developed environmental policies or programs in a particular subject area.

2.1 AIR QUALITY POLICIES AND PROGRAMS

Virtually all emission standards are set by the provinces. The major exception is standards for automobile emissions from new vehicles, which are established by the federal Minister of Transportation under the Motor Vehicle Safety Act. The Canadian Clean Air Act, passed in 1971, gives the federal government authority to set non-binding guidelines. Binding air quality standards and the regulations to enforce them are issued by the provinces but do not

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cover automobile emissions. However, the federal statute does authorize the federal government to establish national emission standards for pollutants that "pose a significant danger to the health of persons," but this provision has only been used four times in 20 years.

2.1.1 Ozone Depletion and Global Warming: Description, Numbers and Implementation

Five municipalities have purchasing policies in their municipal plan related to ozone depleting chemicals.² Of these five, most are being implemented. One municipality has programs not included in the municipal plan. This includes the Vancouver Task Force on Atmospheric Change, some of whose recommendations have been implemented.

Two municipalities have policies in their municipal plan to reduce greenhouse gases. Vancouver is attempting do this through cooperation with federal and provincial governments, as well as international agencies. Programs are being developed and put into action. Five municipalities have programs external to the municipal plan to reduce greenhouse gases. Because they are new, it is difficult to obtain information on their implementation.

TABLE 2.1 AIR QUALITY POLICIES AND PROGRAMS

SUBJECT AREA	POLICIES AND PROGRAMS IN PLAN	OTHER PROGRAMS	IMPLEMENTATION	MONITORING
Air/Ozone	5	1	1	proposed
Air/CO ₂	2	5	2	1
Air/SO ₂ , NO ₂	3	2	1	1
Alternative Fuels	0	8	8	8

Vancouver has adopted the most comprehensive municipal approach to global climate change in Canada. In 1990, Vancouver City Council created the Task Force on Atmospheric Change to study the complex issues surrounding atmospheric change, to gather public input on the question, and to recommend specific actions that the City and its citizens can take in this area.

The Vancouver Task Force has been successful in raising public awareness of the urgency of addressing air quality and atmospheric change. In total, 11 of the major actions proposed by the Task Force have been completed, insofar as staff have reported back to Council,

which has adopted recommendations. The major items under this category include:

- regulation of ozone-depleting chemicals;
- methane gas collection at Burns Bog;
- regional SO₂ reductions;
- encouraging work at home.

The City of Victoria has recently launched a Healthy Atmosphere 2000 initiative, modelled largely on the Vancouver report.

Montréal has also developed a Strategy for Reducing Emissions and the Use of CFCs and Halons.⁴ The main objective is to reduce emissions and non-essential uses of CFCs and halons in the city primarily through the use of incentive measures and by encouraging partnerships whenever possible.

The City of Montréal strategy :

- urges the federal government to commit Canada to an initial reduction in CO₂ emissions of 20 percent by the year 2005;
- encourages the phasing out of all emissions of CFCs and ozone depleting chemicals by 1995 and the pursuit of international agreements to reduce emissions of carbon dioxide and other greenhouse gases.

Winnipeg, Ottawa, Montréal and Sherbrooke have developed purchasing policies prohibiting the purchase of products containing ozone depleting chemicals. In Edmonton, a task force will make recommendations on ozone depleting chemicals in 1993 and a purchasing policy is also being developed to limit the use of these substances. Regina will address the problem of ozone depleting chemicals in a future annual report. Regina also wants to reduce CO₂ emissions by 20 percent by 1998. Sudbury, Yellowknife, Whitehorse, St. John's, Fredericton, Dartmouth and the Cavendish Area have not developed policies or programs for ozone depleting chemicals.

Toronto was the first city in Canada to adopt a CFC bylaw to ban the manufacture, sale, distribution, and use of disposable items that discharge CFCs and halons into the atmosphere. Sherbrooke is considering adopting a bylaw similar to the one in Toronto.

2.1.2 Ozone Depletion and Global Warming: Evaluation

In retrospect, *Clouds of Change*, the report of the Vancouver Task Force, has not met all of the expectations of its authors, Council, staff or the general public. One reason is that the time lines originally established for some of the recommendations may have been too ambitious. The lack of funding may have delayed or resulted in changes to the original recommendations. Finally, there is still a lot of education needed, particularly in changing

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attitudes towards single-occupancy use of vehicles.

The *Clouds of Change Status Report*⁵ explains that City staff and Council experienced a fair amount of frustration in attempting to address recommendations requiring action from senior levels of governments. For example, the much-heralded CO₂ tax to fund transit improvement (which would see a three cent tax levied on each litre of gasoline), approved by Council on June 18 1991, has yet to be approved by the provincial government. There appears little chance it will be approved.

Many provincial policies to improve air quality require a change in provincial legislation. Although a discussion paper on the CFC regulation was circulated with the promise of provincial action, the City of Vancouver has yet to see any concrete action taken on this matter by the provincial government. Meanwhile, the damage from ozone depleting chemicals continues. Summer visitors to Vancouver's beaches will soon be advised of the dangers of overexposure to the sun due in part to the erosion of the protective ozone layer.

There have been problems associated with the implementation of the CFC bylaw in Toronto because the City needs more power from the Province to enforce it. Another problem is that there is little incentive for the service industry to pump out old refrigerant before discarding old refrigerators. The procedure is labour intensive as it takes several people to disassemble the refrigerators. The problem will remain unless the senior levels of government introduce standards prohibiting the use of ozone depleting chemicals in refrigerators.

2.1.3 Reduction of Other Air Pollutants (SO₂, NO₂): Description, Numbers and Implementation

Three municipalities have relevant policies in their plans. Of these, only one municipality has begun implementation. Two municipalities have other programs and of these, one has begun implementation.

Toronto has set specific targets for SO₂ emission reduction for the year 2006. Sherbrooke intends to work with adjacent municipalities with industries that have an impact on air quality. In the Atlantic provinces air quality does not yet pose a major problem.

The presence of trees has a beneficial impact on air quality and climate. Trees act as air filters and air coolers in urban areas. Regina, Sudbury, Montréal and Fredericton have tree planting programs. In Regina, the Forestry Department is in the process of planting one million trees to green the city and to improve air quality.

Eight municipalities have tried using alternative fuels in their city fleets.

2.1.4 Reduction of Other Air Pollutants: Evaluation

Sudbury has been very successful in reducing air pollution produced by the operation of the two major mining companies. In Whitehorse, the Wood Smoke Control Bylaw has been implemented very successfully. In other cities, policies and programs are too new to be evaluated.

Winnipeg has tried alternative fuels for car use. The use of propane did not work well because of the very cold winters. A pilot study for the use of propane in police vehicles was also done. New buses using ethanol were purchased to cut down on emissions and new blends of diesel have been tried.

2.1.5 Air Quality: Monitoring

Many monitoring mechanisms have been proposed by the City of Vancouver:

- that Council direct the Special Office for the Environment to coordinate an annual report in which all departments report to Council on progress during the year on atmospheric change;
- appoint an independent panel of experts and community representatives to review publicly the annual report and provide commentary to Council;
- instruct the Engineering Department to continue to monitor global warming trends and potential adaptive measures and report periodically to Council on current scientific consensus and possible adaptation to strategies for those consequences on atmospheric change.

Vancouver City Council has requested that the Greater Vancouver Regional District use its influence to immediately reduce levels of SO₂ emissions from regional cement works and petroleum processing refineries. In Sudbury, targets set for SO₂ reduction by the Ontario Ministry of the Environment have been met thanks to the cooperation between the City, INCO and the Ministry of the Environment.

In Winnipeg, the Health and Safety Division tests indoor air quality for radon for all buildings with air-conditioners. In Toronto, monitoring is done for cost, use and implementation. In Ottawa, monitoring of the municipal plan policies is a city wide program and is done for each strategy on an annual basis. Indicators will be developed for better monitoring. In Montréal, monitoring is done for recovery of CFCs from refrigerators.

2.2 WATER QUALITY AND CONSERVATION POLICIES AND PROGRAMS

As in the case of air pollution, the principal mechanism for water pollution control used by the provinces consists of permits for specific facilities.⁶ Water quality standards are established by the federal and provincial governments; permits to operate a water utility are issued by provincial governments. Only 37 percent of the Canadian population is served by

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facilities that have secondary treatment for wastewater. Quebec has lagged behind other provinces in this area. However, facilities currently under construction in Quebec should significantly improve the sewage treatment record.⁷

TABLE 2.2 WATER QUALITY AND CONSERVATION POLICIES AND PROGRAMS

Subject Area	Policies and Programs in Plan	Other Policies and Programs	Implementation	Monitoring
Water Conservation	7	5	9	7
Water Quality (Drinking)	7	0	5	4
General Water Quality	3	2	4	3
Groundwater	3	1	1	2
Wastewater Treatment Upgrading	9	3	1	1

2.2.1 Water Conservation: Description, Numbers and Implementation

Water conservation is an issue for many cities. For example, the summer drought of 1992 forced the City of Vancouver to enforce very strict measures (e.g., on the watering of lawns) in order to save water. During an average Ontario summer, more water is used outside the home than inside.⁸

Seven municipalities have policies in their plans to improve water conservation. Five municipalities have other programs. Nine municipalities have started implementation. Seven municipalities have started to monitor these water conservation programs.

Toronto has set specific targets for the reduction of water consumption by 10 percent of the 1991 per capita levels by the year 2001. Public education programs on water conservation are carried out by Vancouver, Regina and Toronto. Regina promotes the use of drought plant varieties to reduce the need for watering. Water meters have been proposed and used in many cities including Toronto (for new buildings), Whitehorse, Fredericton, the Cavendish

Planning Area and Sherbrooke. Water conservation is not yet an issue for Yellowknife, because of the abundance of lakes and its small population.

2.2.2 Water Quality: Description, Numbers and Implementation

Seven municipalities have policies and programs for drinking water quality and five have implemented them. Four municipalities do some monitoring.

Three municipalities have policies for preventing snow dumping in rivers and to protect major tributaries. Some actions have been undertaken, but they are still in progress, so it is difficult to give numbers for implementation. Programs not included in the municipal plans include the Don Valley Task Force and the Dartmouth Lake Advisory Committee, both of which are being implemented. Three municipalities monitor their water quality programs.

Three municipalities have policies in their plan to protect their groundwater resources. In cases where groundwater is not used as a source of drinking water, this measure does not apply, i.e., Vancouver, Edmonton, Toronto, Montréal, Sherbrooke, Dartmouth, and Yellowknife.

The protection of major bodies of water has been addressed by the following cities: Fredericton, St. John's, Whitehorse, Toronto, Sudbury, Dartmouth, Sherbrooke and Montréal. Here are a number of the proposed strategies:

- in Winnipeg, Clean Environment Commission hearings run by the Province will set river water quality objectives;
- in Regina, public education programs have been developed to inform the public of the value and sensitivity of the Regina Aquifers;
- in Sudbury and Toronto, policies restrict development that would degrade water quality and require developers to be responsible for erosion control measures during construction;
- in Toronto, Ottawa and Fredericton ensure that modern storm water management techniques are employed in the design of all developments to control both quality and quantity of urban runoff;
- Montréal, Sherbrooke and Fredericton use alternative modes of snow disposal to avoid direct discharge into bodies of water;
- in St. John's, an Environmental Advisory Committee has been appointed by Council to review all applications adjacent to waterways and wetlands;
- in Whitehorse, a buffer zone will be established along the Yukon River and other important water bodies in order to prevent intensive development that may injuriously affect them;
- Toronto Council's objective is to reduce chemical, bacterial and sediment loadings that contaminate water bodies and to establish a program to monitor and control City activities to that effect;

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- in Sherbrooke, para-municipal agencies play a vital role in protecting the two main rivers;
- the Lake Advisory Committee, with its many volunteers, has been successful in advising Dartmouth City Council on appropriate actions to protect the city's watershed.

2.2.3 Water Quality and Conservation: Evaluation

In Montréal and Fredericton, snow management programs help to ensure that snow removal dump sites are not placed near rivers or other natural areas. In Toronto, water conservation programs have been successful due to their promotional and educational components. In the Cavendish Area, water meters have been instrumental in reducing the amount of water used by businesses and industries. Water conservation educational programs are difficult to evaluate because they are new. It is also too early to evaluate the successes and problems of many water conservation and wastewater treatment upgrading initiatives.

One of the key reasons why the Dartmouth Lake Advisory Committee has been successful is the fact that the committee has not taken an anti-development stance. On the other hand, the Municipality of Dartmouth has not dedicated enough resources to adequately inspect lake protection agreements.

2.3 SOLID WASTE MANAGEMENT POLICIES AND PROGRAMS

Canadian municipalities are among the heaviest generators of solid waste in the world, measured on a per capita basis. Many municipalities address this problem by giving priority to the 3R's — reduction, reuse, and recycling. While some municipalities have set weekly limits on garbage disposal, most initiatives revolve around recycling. Municipal solid waste generally includes residential and light industrial, commercial, and institutional solid waste that is collected by the municipality or municipal contractor. In most provinces, the provincial government regulates the disposal of municipal solid waste.

2.3.1 Description, Numbers and Implementation

Six municipalities have solid waste management policies and programs in their municipal plans that are being implemented. Seven municipalities have other programs that are being implemented.

Some municipalities are reviewing their approaches to waste management including Winnipeg, Yellowknife, Regina, Montréal, Fredericton, the Cavendish Area and St. John's. Many municipalities have developed waste reduction programs.

Some municipalities have set waste reduction targets: Vancouver: 50 percent reduction by the year 2000; Toronto: 50 percent by the year 2001; Montréal: 82 percent reduction by the year 2010; Sherbrooke: a 40 percent reduction target.

Toronto has proposed a packaging bylaw. The City has requested the passage of special legislation to allow it to adopt bylaws prohibiting or regulating the distribution, use and disposal of any material used for the purpose of packaging products for retail sale. The bylaw would apply to material that is not compatible with existing reuse and recycling initiatives or that cannot be returned to the distribution point for reuse or recycling.

Vancouver will continue to urge the federal and provincial governments to introduce stringent standards regulating non-degradable, non-returnable, and non-recyclable food and beverage packaging. Sherbrooke has proposed a "sorting" centre for waste.

In the Cavendish Area, the growth in tourism and business has prompted an examination of the needs for garbage collection and disposal. Some municipalities are just starting to develop waste management programs. Dartmouth has initiated a pilot project involving the curb-side collection of newsprint from residential neighbourhoods. The City has proposed a program expansion to include other waste products such glass, certain forms of plastic, ferrous and non-ferrous metals, rubber, building materials, oil, food waste, yard waste, clothes, and white goods such as washers, dryers and refrigerators.

In Whitehorse, the landfill site is undergoing several changes such as assigning specific locations for different waste materials and to receive compost. Sudbury is exploring waste reuse, recycling and recovery options in order to extend the life of Sudbury's sanitary landfill.

The Blue Box Program has been implemented in all municipalities surveyed except Winnipeg, Whitehorse, Yellowknife and the Cavendish Planning Area.

TABLE 2.3 SOLID WASTE MANAGEMENT POLICIES AND PROGRAMS

SUBJECT AREA	POLICIES AND PROGRAMS IN THE PLAN	OTHER PROGRAMS	IMPLEMENTATION	MONITORING
Solid Waste Management	6	7	7	7

2.3.2 Evaluation

Many recycling programs have proven successful including the Blue Box Program, backyard composting, fall leaf collection, Christmas tree recycling, education campaigns on the 3Rs and the use of tipping fees at disposal facilities.

A good information campaign coupled with a public-private partnership has been a key factor in the success of a leaf composting program in Sherbrooke. The City also promoted the use of biodegradable paper bags manufactured by Cascade and sold by Provigo at a cost less than plastic bags.

In 1992, Edmonton applied a budget of \$25 million to waste management. Waste reduction initiatives have helped the City to reduce waste by 130,000 tonnes per year.

In Vancouver, to achieve a 50 percent waste reduction goal by the year 2000, the basic weekly collection limit has been reduced from five garbage cans to three for single family dwellings and from seven to five for duplexes. The reduction in limit, together with a fine for garbage containers in excess of the limit, provides another incentive for residents to reduce solid waste. To accommodate residents who generate more waste, each single family and duplex residence receives six free tags annually. To date, only 18,500 tags have been sold (average of one tag for every five houses), which indicates that Vancouver households are generally able to live with the reduced limits.

Non-profit groups played an important role in the establishment of recycling centres for aluminum, glass and paper in Yellowknife. A recycling depot, established by the Ecology North Group, exists in the city's industrial zone. In Whitehorse, two non-profit groups received grants from the City and the federal government.

Two problems municipalities commonly have with the Blue Box Program are program start-up costs and box contamination. The Blue Box Program gives the City of Edmonton 30,000 tonnes of garbage per year to recycle and costs \$200 per tonne to collect. The City will attempt to increase the efficiency of the program by lowering collection costs. In geographically isolated municipalities, the cost to ship recyclable materials is very high. Many residents continue to place unacceptable items in their Blue Boxes such as egg and

milk cartons, cereal boxes and magazines. In Vancouver, these materials are part of the larger category of "mixed paper products" that are currently not accepted. Toronto just started to accept glossy magazines. There is considerable pressure from the community in Vancouver to increase the number of materials collected in the Blue Box Program but the lack of available markets for materials such as mixed paper and corrugated cardboard creates a barrier to its expansion. In Ottawa, the cost of paper recycling has outweighed the benefits in some cases.

2.3.3 Monitoring

In Vancouver, the quantity of leaves collected, recycled and composted is measured, and costs associated with the program are monitored. In Edmonton, Regina, Toronto and Ottawa, monitoring is done for cost, use, implementation and public support. In Edmonton, intense and continuous projects management exists in all programs. In Regina, a study on waste management and a new landfill was done by a private firm in 1989 for the provincial Environmental Impact Assessment process. In Toronto, there are reports on material weightsgoint to landfill. In Ottawa, all the programs are very well monitored by the Engineering Department. In Montréal, some monitoring is done for some of the selective sorting. It will eventually be done for all the programs. In Sherbrooke, leaf composting is monitored. In Fredericton, the Region monitors the amount of garbage collected. In Whitehorse, cost and landfill use are monitored. In Winnipeg, cost, use, implementation and public support will be monitored. In most cases, monitoring is paid for by ratepayers.

2.4 HAZARDOUS WASTE POLICIES AND PROGRAMS

The management of hazardous waste is seen as the responsibility of provincial governments. However, municipalities want to be more involved because of the importance of the problem. With the exception of annual collections of hazardous waste, there are few programs at the municipal level. Cities must cooperate with other levels of governments and the private sector in addressing the dangers posed by hazardous waste generated by the industrial and commercial sectors.

TABLE 2.4 HAZARDOUS WASTE POLICIES AND PROGRAMS

SUBJECT AREA	POLICIES AND PROGRAMS IN THE PLAN	OTHER PROGRAMS	IMPLEMENTATION	MONITORING
Hazardous Waste Management	5	1	6	0

2.4.1 Description, Numbers and Implementation

Five municipalities have municipal policies in their municipal plan, such as purchasing policies. One municipality has other programs. The most common measure has been the annual collection of hazardous waste (8 municipalities) and it has been successful in most cases. However, municipalities claim that the associated costs are very high.

Vancouver provides some educational support to its residents to complement the Province's efforts in the disposal of hazardous waste. Edmonton has a waste treatment plant for hazardous waste located in Northern Alberta (Swan Hills). The plant is mainly regulated by the Province. Winnipeg intends to build a hazardous waste management facility outside of the city. Sudbury encourages manufacturing processes that will discourage the production of hazardous waste that the community would not be prepared to treat or store.

The Toronto Environmental Protection Office is preparing a proposal on a polychlorinated biphenyls (PCB) management strategy. The City encourages all significant generators of hazardous waste in Toronto to complete hazardous waste audits and to prepare a waste reduction plan by the year 2001. This would ensure that environmentally acceptable methods for the handling, storage and disposal of hazardous products are put in place in all new developments within the city that will generate, transport or store such waste.

Montréal will participate with other municipalities in a regional system that will include the mobile collection of hazardous waste combined with a sorting and recovery centre. Montréal and Sherbrooke will complete inventories for current and potential sites.

2.4.2 Evaluation

Partnerships have been a key factor in the success of annual hazardous waste collections in Sherbrooke. A partnership has been successful between the Université de Sherbrooke and a consulting firm with expertise in the field of hazardous waste transportation and elimination. The annual collections are well attended in all municipalities but are very costly and are limited in their contribution to preventing the manufacturing, handling, storing, and other problems associated with hazardous waste.

A problem associated with geographic isolation is the lack of stringent regulations on the kinds of materials (e.g., hazardous waste) that enter the landfill site. This applies to Yellowknife and Whitehorse.

2.4.3 Monitoring

In general, municipalities are not directly responsible for the management or monitoring of hazardous waste. The City Council of Dartmouth has proposed a policy to ensure that the population is protected from any possible impacts resulting from the location of a hazardous waste or special waste facility in the city. The policy creates a Hazardous Waste Zone, describes the types of waste and permitted uses in the zone, the location of the zone and other requirements necessary to implement the policy. Studies will be carried out to determine the most appropriate location of the Hazardous Waste Zone and the public is to be consulted on all proposals.

2.5 LAND USE POLICIES AND PROGRAMS

The role municipalities can play in the protection of natural areas is significant, because they can protect the last remnants of nature in urban environments. This section looks at the integration of natural and agricultural area protection into municipal land use policies and programs. Have municipalities started to adopt an ecosystem approach to planning? Are there defined policies for the protection of biodiversity in municipal plans? Do parks and recreation departments implement measures to reduce the use of pesticides and develop alternatives? Are there programs to naturalize or rehabilitate some areas? What does the Environmentally Sensitive Areas designation really mean at this time for the protection of natural areas at the municipal level? How do municipalities protect their trees?

TABLE 2.5.a LAND USE POLICIES AND PROGRAMS

STUDY AREA	POLICIES AND PROGRAMS IN PLAN	OTHER PROGRAMS	IMPLEMENTATION
Agricultural Areas	6	3	6
Biodiversity	2	2	too early to say
Ecosystem Approach	1	1	too early to say
Naturalization: Pesticide Reduction	0	4	4
Naturalization: Native Species	0	6	6

Note: It is difficult to evaluate the extent of implementation of most of these programs as they are new. Monitoring is just starting in many cases so no figures are given.

2.5.1 Agricultural Areas: Description and Numbers

Because it threatens the sustainability of agriculture in key agricultural regions, urban encroachment is a serious concern. In 1986, about two-thirds of Canada's population lived in 70 "urban-centred regions" with populations of over 25,000 persons. Between 1966 and 1986, urbanization claimed over 300,000 ha. of rural land in these regions, 58 percent of which was prime agricultural land.

Six municipalities have environmental policies and programs in their municipal plans and three have other programs. Most municipalities have implemented mechanisms to protect agricultural land from urban encroachment.

Vancouver has zoning in place to protect its last few remnants of agricultural land. Lands located at the periphery of urban settlement in Sudbury, or lands that are not slated for development are designated as Rural Districts. In Rural Districts, permitted uses include agriculture, forestry and conservation. Ottawa has designated the Central Experimental Farm as an agricultural area. The City intends to support the federal commitment in the long-term conservation of these lands for agricultural and urban forest uses, including research, educational and leisure activities, and as a vital component of the Greenway System.

The Cavendish Area Municipality is working with the Prince Edward National Park to protect agricultural lands. However, the tourism industry is exerting pressure on farmers to sell their farms. The Municipality is trying to promote the co-existence of agricultural development and the tourism industry. Sound farming practices are encouraged such as

limiting chemical spraying or the type of chemical applied, the use of more appropriate ways to spread manure, and choosing more appropriate times to move heavy machinery. In St. John's, the agriculture designation applies to those lands that are considered to have potential for agriculture. Designated areas have been identified in accordance with the Department of Forestry and Agriculture's Agricultural Development Area Guidelines.

In Winnipeg and Sherbrooke there are no provisions for subdivision development to protect agricultural land. In Yellowknife, Whitehorse, Fredericton, and Dartmouth there are no specific programs for the protection of agricultural lands.

2.5.3 Protection of Biodiversity: Description and Numbers

Biodiversity is defined by the International Union for the Conservation of Nature (IUCN) as encompassing all species of plants, animals (large and small, vertebrate and invertebrate), fungi and microorganisms (such as the decomposers in the soil) and the ecosystems of which they form a part. The ecological processes of change include succession, species migration, water and nutrient cycles. The planet's biodiversity is rapidly decreasing under human impacts and faces even more serious future threats unless present trends are reversed. It is widely, though not universally, accepted that we should try to preserve biodiversity.⁰

Most of the planners and other municipal officials who participated in this study linked the protection of biodiversity to the protection of natural areas including open spaces, environmentally sensitive areas and wetlands. Respondents from Vancouver, Edmonton, Regina, Winnipeg, Sherbrooke, Whitehorse and Yellowknife all espoused this view. However, these municipalities do not have specific statements, policies or programs for the protection of biodiversity. Ottawa, Montréal and Sudbury have explicit policy statements on the protection of biodiversity.

In Toronto, environmental indicators will be developed within the framework of the *State of the City Report* prepared by the Healthy City Office. Vancouver is also preparing a state of the environment report. Montréal is preparing an ecological management plan for the regional parks of the Montréal Urban Community in co-operation with the Recreation and Community Development Services Department and the Research Institute on Plant Biology. A study on environmental indicators for one district of Montréal has been carried out in the framework of the project *Vivre Montréal en Santé*.

Winnipeg has protected its unique tall grass prairie habitat and is in the process of designating and introducing regulations to evaluate development that are proposed for natural areas. Regina wants to facilitate the preservation and enhancement of key natural areas to prevent development that interferes with continuing function of important wildlife habitats of the City.

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2.5.4 Protection of Biodiversity: Evaluation

Although some municipalities have started to take better stock of the natural environment (for example in undertaking state of the environment reports), the protection of biodiversity is still in its infancy at the local level. In many municipalities, the protection of habitats is just beginning through the designation of environmentally sensitive areas or has yet to be initiated.

2.5.5 Ecosystem Approach: Description, Numbers and Evaluation

The ecosystem approach to planning is based on natural instead of jurisdictional boundaries. There are only allusions to the ecosystem approach to planning in any of the municipal plans studied. In general, the concept and implementation of an ecosystem approach to planning is relatively new and it will take some time to see its integration into municipal planning. Ottawa is working with the Regional Municipality of Ottawa-Carleton to develop an ecosystem approach to planning when reviewing the Regional Official Plan.

2.5.6 Park Naturalization: Description, Numbers and Implementation

Naturalization can be realized through the planting of native rather than exotic species, the implementation of integrated pest management (IPM) and the reduction or elimination of the use of pesticides on private or public spaces. It can also mean allowing areas to grow without human intervention.

Four municipalities have programs outside their plans to reduce or eliminate pesticide use, especially on public spaces. These are being implemented. Six municipalities have other programs to encourage the planting of native instead of exotic species in public areas. These programs have been implemented.

Some cities have initiated one or more of these approaches. Seven municipalities: Vancouver, Winnipeg, Ottawa, Yellowknife, Montréal, Sherbrooke and Dartmouth have designated areas for natural regeneration. Vancouver has started to adopt integrated pest management. Sherbrooke has adopted a bylaw prohibiting the use of pesticides on public parks and green spaces in the city. Ottawa no longer uses pesticides on public spaces. Regina, Winnipeg and Montréal have started to reduce the use of pesticides and fertilizers. In many cases, it is as much a cost-saving as it is an environmental measure. The City of Regina encourages the planting of native species as an alternative to fine turf. In Yellowknife, the Ecology North Group has created a garden of native plant species. Vancouver, Montréal, Dartmouth and the Cavendish Area use native species in some public parks. Some areas have been left to naturally regenerate. Sherbrooke has a bylaw banning the use of pesticides in all public parks and green spaces; on private property, it has not been done yet.

2.5.7 Park Naturalization: Evaluation

Most naturalization initiatives are new or marginal, but a shift from the traditional care of public spaces is definitely occurring. A bylaw prohibiting the use of pesticides in public spaces in Sherbrooke has been successfully implemented.

TABLE 2.5.b LAND USE POLICIES AND PROGRAMS

SUBJECT AREA	POLICIES AND PROGRAMS IN PLAN	OTHER PROGRAMS	IMPLEMENTATION
Urban Forest	4	4	7
ESAs	12	2	5
Greenway System	9	3	7
Open Spaces	15	15	at different stages
Natural Regeneration Area	7	7	7
Land Rehabilitation	5	5	5

Note: It is difficult to evaluate the extent of implementation of most of these programs as they are new. Monitoring is just starting in many cases so no figures are given.

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2.5.8 Urban Forest: Description and Numbers

By planting trees, municipalities want to promote nature within the City, reduce carbon dioxide, provide visual buffers to unattractive sites, and promote natural habitat continuity and linkages for wildlife.

Four municipalities have specific policies in their plans for the protection of the urban forest. Four municipalities have other programs.

Over the past few years, many municipalities have become concerned with the loss of trees and the depletion of the urban forest. Vancouver's 1991 tree replacement bylaw requires the replanting of trees destroyed by development. The City can prohibit or regulate the cutting and removal of trees, regulate activities that may damage trees, and require the replacement of trees that have been cut or damaged in contravention of a bylaw.

Ottawa, together with the Regional Municipality of Ottawa-Carleton, requires that for every tree removed from a road right-of-way, a replacement tree must be provided in the same location if possible. Ottawa has asked the Province to pass the relevant enabling legislation. Toronto encourages the preservation of existing trees on public and private property in the city and intends to request legislative authority from the Province to prohibit the cutting of trees on private lands.

2.5.9 Urban Forest: Evaluation and Monitoring

In Vancouver, the tree replacement bylaw helps to protect trees on private property. However, follow-up enforcement of the bylaw is a problem due to a lack of staff. The preservation of mature trees on private property is a difficult undertaking because of the lack of jurisdiction.

Winnipeg, Regina and Fredericton have been successful in saving their elms from Dutch Elm disease. The Regional Municipality of Sudbury continues to plant a variety of vegetation through the Region's Land Reclamation Program and the City's Parks Department. More than 1,500,000 trees have been planted since the program's inception.

Winnipeg, Regina, Toronto, Ottawa, Montréal, Sherbrooke, Fredericton and the Cavendish Area have inventories of public and private trees and have implemented tree planting programs.

2.5.10 Natural Areas, Environmentally Sensitive Areas: Description, Numbers and Implementation

Environmentally sensitive areas (ESAs) can be aquifers, flood plains, river valleys and ravine systems, hillsides, steep slopes, coastal areas or woodlands.²

Twelve municipalities have policies to designate environmentally sensitive areas in their plan, and two have policies outside the municipal plan. Only five municipalities have developed programs to implement the policies.

If an ESA designation exists, there is usually an associated citizen's environmental advisory committee, which brings together expertise and provides advice to municipal officials. The committee ensures that any development in or near an ESA will be subject to an environmental impact assessment and that a subsequent conservation plan will control any negative impacts of the development.

Regina's plan states that no subdivision or development shall be permitted that interferes with designated wildlife habitats. The Municipalities of Winnipeg and Dartmouth have proposed designating ESAs. Sudbury Regional Council recognizes some areas as environmentally threatened. Sherbrooke has not designated ESAs, but some wetlands are zoned such that they cannot be developed.

Whitehorse does not have an ESA designation, although a marine park has been proposed to protect wetlands. Yellowknife has recently designated environmental reserves. They are designed to preserve lands with unique physical or ecological characteristics. The Cavendish Area has provisions to protect wetlands from development, draining and filling.

Toronto has developed policies for ESAs and the Ravine System. In areas adjacent to designated natural areas, Council shall encourage only the development compatible with the environmental qualities of the area. Montréal's plan seeks to protect the unique natural heritage: the Mountain, the St. Lawrence and Des Prairies Rivers and the Islands, and public and private woods.

2.5.11 Natural Areas, Environmentally Sensitive Areas: Evaluation

In most cases, the ESA designation is new and whether it will provide effective protection in contentious situations is difficult to evaluate. In Ottawa, it will take many years to make the necessary amendments to implement the ESA designation. The Dartmouth Lakes Advisory Board, composed of community volunteers, has been successful in making Council more aware of the importance of lake and wetland protection.

2.5.12 Natural Areas, Environmentally Sensitive Areas: Monitoring

Designating an area as environmentally sensitive does not ensure its protection. In most municipalities, a lack of staff and budget limitations create problems in the management of natural areas. The protection of urban woodlots that do not have any special status is particularly difficult.

2.5.13 Greenway Systems: Description, Numbers and Evaluation

The establishment of greenway systems promotes linkages between natural areas and enhances habitat for wildlife. Wildlife research in cultural landscapes has emphasized the importance of connectivity between isolated natural areas. Hedgerows perform a critical function as habitat for certain species, while linkages facilitate the movement of animals and the dispersal of seeds.

The extension and the protection of greenway systems is being pursued by many municipalities. Nine municipalities have policies for greenway systems in their plans and seven have developed and implemented programs. Three municipalities have other programs.

Vancouver, Edmonton, Winnipeg, Regina, Toronto, Ottawa, Montréal, Yellowknife, and Fredericton are all in the process of developing a greenway system. Ottawa has a well defined greenway system comprising ESAs, waterway corridors, linkages, agricultural areas, major open spaces. Limited development is permitted within selected areas of its greenway system. To pursue the extension and the enhancement of its greenway system, Ottawa will use a variety of methods including land acquisition, land exchange, long-term leases, easement agreements, conditions on development approvals, land trusts and land stewardship programs. The Cavendish Area promotes hedgerows to protect soil and wildlife. Dartmouth is proposing to acquire large parcels of land in order to link natural areas.

2.5.14 Greenway Systems: Evaluation

Greenway systems are accepted as a part of most municipal plans and are being successfully developed.

2.5.15 Open Spaces: Description and Numbers

All fifteen municipalities have policies and programs to improve their open spaces. Regina has one of the highest per capita ratios of parks and open spaces in Canada. Its Open Space Management Strategy will streamline the number by decreasing the quantity and increasing the quality of these areas.⁴ The Housing and Urban Development Department of the City of Montréal has developed a Master Plan for Local Open Spaces, which seeks to achieve a better balance between the amount of open space and the number of people in a given area.

Dartmouth will initiate an integrated plan for open spaces.⁵ Vancouver has a park acquisition project to increase the amount of land used for parks in the city. Sherbrooke wants to increase the area available for parks in neighbourhoods where they are lacking. Fredericton is actively pursuing the development of a linear open space system to provide pedestrian linkages throughout the city. St. John's, Whitehorse and Yellowknife also have open space networks.

2.5.16 Open Spaces: Evaluation

Most municipalities have implemented a series of measures to increase the amount or quality of their open space.

2.5.17 Land Rehabilitation: Description, Numbers and Implementation

Many municipalities are working to rehabilitate former industrial sites. Vancouver is reclaiming land formerly used by industry, including some of the Expo '86 site. Montréal is creating an urban park on the site of Expo '67. Vancouver, Montréal and Sherbrooke are working to rehabilitate river shorelines. Toronto is participating in the restoration of the Don River to its natural form, function, and habitat.

Five municipalities have policies in their plans to rehabilitate lands and five have other programs, all of which have been implemented.

2.5.18 Land Rehabilitation: Evaluation

The Regional Municipality of Sudbury won a United Nations Local Government Award for its massive Land Reclamation Program. Other rehabilitation initiatives are too new to evaluate their success.

Urban centres such as Vancouver, Toronto and Montréal, where the pressures on natural areas are high, have developed more policies and programs than municipalities such as

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Whitehorse and Yellowknife, where natural areas are still abundant. Designated natural areas are not completely protected from the threat of urban development in any of the municipalities studied.

2.6 ENERGY AND TRANSPORTATION POLICIES AND PROGRAMS

2.6.1 Intensification: Description and Numbers

The environmental and economic rationale for intensification is fairly clear. Intensification:

- reduces urban sprawl and commuting, thereby reducing energy consumption, pollution and car use;
- relieves pressures on adjacent natural areas and agricultural lands;
- concentrates new growth in adequately serviced and properly planned areas.

Thirteen municipalities have policies and programs on intensification in their municipal plans. Of these, only three have begun to implement the programs. Four municipalities have other programs.

The goal of intensification is clearly expressed in all municipal plans except Yellowknife and Edmonton's. In Yellowknife, it will be proposed in the 1993 plan. In Edmonton, a task force will make recommendations on this approach and include it in the next plan. Sudbury's plan has statements favoring intensification, but has no concrete measures associated with them. In Fredericton, a provincial commission was to present a position paper on urban sprawl in the fall of 1992.

TABLE 2.6 ENERGY AND TRANSPORTATION POLICIES AND PROGRAMS

SUBJECT AREA	POLICIES AND PROGRAMS IN THE PLAN	OTHER PROGRAMS	IMPLEMENTATION
Intensification	13	4	3
Reduce Car Use (Parking Policies)	8	0	6
Encourage Public Transit	7	6	5
Cycling	6	not surveyed	3
Residential Energy Conservation	7	6	6
Commercial/Industrial Energy Conservation	2	4	3

Here are a number of the policies and programs proposed by municipalities to achieve intensification:

- the integration of places of employment and residence in mixed-use neighbourhoods in Vancouver, Toronto, Sudbury, Montréal and Dartmouth and St. John's;
- promoting infill and redevelopment in Vancouver, Toronto and Sudbury;
- encouraging the renovation of old buildings instead of building new ones in Toronto and Montréal;
- giving strong recognition to the role of additional housing in the central area as a means of reducing long-distance commuting in Toronto;
- encouraging residential intensification through the creation of lodging houses and conversion of non-residential structures to residential uses in Toronto;
- development of intermunicipal agreements as well as a regional policy to fill the gaps in the urban fabric of Sherbrooke;
- Dartmouth has used a development boundary since 1966 as a primary tool for controlling where new development will occur;
- control of strip development along highways and the promotion of development on smaller lots in the Cavendish Area.
- in Whitehorse, a more concentrated community development pattern in order to make the provision of essential community services more economical and efficient.

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2.6.2 Intensification: Implementation

Vancouver has implemented intensification programs, such as converting industrial land to residential development. In Ontario, Toronto and Ottawa have proposed many policies and programs which have yet to be implemented. Sudbury has statements but no concrete programs. In Quebec, Montréal and Sherbrooke are proposing policies and programs, but these have yet to be implemented. In Winnipeg, intensification is not a pressing issue because of slow growth. The Atlantic Provinces have addressed this issue in their plans, but in most cases it is still at the policy stage. Yellowknife is considering the adoption of intensification policies and programs but these have yet to be integrated into the municipal plan.

2.6.3 Intensification Programs: Evaluation

Vancouver's intensification initiatives have been successful. In Dartmouth, the development boundary has proven to be a successful device in restricting development to areas that can be easily serviced by existing trunk sewer systems, roads, schools and so on. The Atlantic Provinces have addressed this issue in their plans, but in most cases, it is still at the policy stage. Yellowknife is considering the adoption of intensification policies and programs, but these have yet to be integrated into the municipal plan.

2.6.4 Reduce Car Use, Encourage Public Transit and Cycling: Description, Numbers and Implementation

In promoting the goal of intensification, municipalities also want to encourage a reduction in car use. The improvement of the public transit system and the development of alternative modes of transportation such as cycling and walking will be necessary to bring about this lifestyle change.

Eight municipalities have policies and programs in their municipal plan to reduce car use and encourage public transit use. Six municipalities have begun implementing these policies.

Six municipalities have policies in their plan to promote bicycle use. Three municipalities have started to implement them.

The majority of municipalities have developed policies and programs to improve their public transit systems:

- Toronto wants to increase the capacity, enhance the attractiveness and improve the operational efficiency of surface transit (streetcar, trolley and diesel buses) routes serving the central area.

- In Montréal, priority for public transit investments will be given to areas where employment is concentrated. This will require increased frequency, system reliability and user comfort; extension of the subway line, and: the modernization of the commuter train line between Deux-Montagnes and the downtown business core.
- Reserved bus lanes are being created in Vancouver, Toronto, Ottawa, and Montréal.
- Awareness programs have been developed to increase public transit use in Yellowknife, Whitehorse, Winnipeg, Vancouver, Toronto, Montréal, Sherbrooke and Dartmouth.
- Fredericton is ensuring that new developments are designed in a way that facilitates transit movement and use. The City is also considering improvements to the transit system including bus shelters and benches at high volume stops.
- St. John's is improving the effectiveness of routes serving major traffic generators such as employment centres, educational institutions, shopping areas and recreation centres.
- Dartmouth is promoting the establishment of an inter-city bus terminal within the city as well as an integrated fare system for transit and ferries.

In Sudbury, public transit is run by private companies. In Yellowknife, a transit system was recently established by private operators through federal-territorial grants and City subsidies.

Other recommendations developed by municipalities to reduce car use include:

- In Toronto: adopt appropriate measures to control the number of autos used for commuting into and out of the central area; give particular attention to influencing the supply of central area parking to achieve this end; increase City Parking Authority fees to the market rate in the central area; and increase parking meter fees.
- In Montréal: locate parking-and-ride lots ahead of traffic congestion points (such as bridges) since once past these points, many motorists are tempted to continue by car to their final destination instead of using public transit.
- In Vancouver: establish parking prices that favour high-occupancy vehicles over single-occupancy vehicles and encourage people to work at home by providing opportunities for telecommuting rather than commuting.

Programs developed to promote alternative modes of transportation include:

- Bicycle networks are or soon will be implemented in Vancouver, Edmonton, Regina, Yellowknife, Toronto, Ottawa and Montréal. Bicycle networks are proposed in Sudbury, Sherbrooke, Fredericton, Dartmouth, St. John's, and Whitehorse. Bicycle networks can include the development of a network of on-street and off-street bikes lanes and paths; securing bicycle parking facilities at

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subway stations to encourage combined bicycle/transit trips; requiring new major developments to provide secure bicycle parking, and where appropriate, shower/change facilities for bike commuters.

- Pedestrian networks are proposed or already exist in: Vancouver, Winnipeg, Regina, Whitehorse, Yellowknife, Toronto, Montréal, Sherbrooke, Fredericton, St. John's.
- In the Cavendish Planning Area, a transportation study funded through the Federal-Provincial Subsidiary Agreement on Planning and by Environment Canada has been completed. It examined an integrated transportation system for the movement of vehicles, bicycles and pedestrians in and around the planning area.

2.6.5 Reduce Car Use, Encourage Public Transit and Cycling: Evaluation

Most initiatives to reduce car use and to promote alternative modes of transportation are too new to be evaluated. In Yellowknife, public transit has been improved and ridership is up, particularly during the winter. A trail system throughout Yellowknife has helped to reduce car use during the summer.

Reducing car use has been more difficult to achieve in municipalities such as Whitehorse, Edmonton, Regina and St. John's. Edmonton claims that it creates conflict with economic objectives; e.g., downtown business people fear losing business if people cannot use their cars. Larger urban centres such as Vancouver, Toronto, Montréal offer more possibilities for public transit but there is still a need to raise awareness of the connection between car use and problems such as climate change, traffic congestion, and destruction of natural areas for road construction.

2.6.6 Reduce Car Use, Encourage Public Transit and Cycling: Monitoring

Monitoring of public transit is done for cost and ridership in some municipalities. Two of the municipalities monitor initiatives related to cycling.

2.6.7 Residential, Commercial and Industrial Energy Conservation: Description, Numbers and Implementation

Seven municipalities have policies and programs in their plan to improve the efficiency of residential energy use, and implementation is under way in six of them. Six have other programs. Two municipalities have policies in their plan for increasing the efficiency of commercial and industrial energy use. Four have other commercial and industrial energy conservation programs.

Energy conservation policies and programs are designed mainly to increase energy efficiency in City-owned buildings. In Edmonton, the City has embarked upon an energy management

program. Toronto did an energy audit and retrofitted City-owned buildings to reduce consumption; energy efficiency standards and audits have been completed for all new buildings. The City of Winnipeg has an energy management plan to reduce energy use, improve energy efficiency, and lower operating costs. Yellowknife undertook an energy audit for City buildings in order to reduce energy consumption.

Toronto City Council, with its Special Advisory Committee on the Environment and its Healthy City Office, has created an Energy Efficiency Office. Dartmouth has proposed the creation of an Energy Advisory Board that will compile an energy use and cost data base and implement a plan to monitor the City's energy use.

Vancouver has set energy conservation standards in all new and existing residential and commercial buildings. In all new construction, the City discourages practices and the use of materials that produce atmospheric pollutants.

In Edmonton, a Rebate Program has been developed for promoting energy efficiency in residences.

Maximizing solar energy in residential developments is a goal in Regina, Toronto, Ottawa, Montréal and Dartmouth. Regina for example, has provisions to relax zoning, enabling the reorientation of houses on the lot to maximize solar heat gains. The City of Dartmouth encourages energy-efficient residential development and subdivisions that maximize the use of solar energy. Dartmouth intends to develop legislation to prevent development that would create unfavourable shadowing of adjacent buildings.

The City of Regina promotes two-storey, semi-detached and townhouse units having less outside surface area, and therefore less heat loss than a bungalow of the same floor area. In Toronto, Energy Efficiency and Conservation Plans are to be submitted with all development applications. Ottawa considers energy conservation as an important factor while reviewing subdivision, rezoning, site plan and other development applications. The City encourages the use of vegetation that will reduce the energy consumption of buildings. Sudbury encourages building and landscape design that conserves energy.

Dartmouth encourages and supports the energy efficient design and construction of all buildings, according to the standards contained in the National Building Code and its applicable statements, including "Measures for Energy Conservation in New Buildings."

St. John's promotes energy conservation in buildings through building control regulations and site planning.

In Fredericton and the Cavendish Area, municipal plans do not include energy policies. Energy conservation is seen as a provincial responsibility in these cities. The same applies to Whitehorse and Yellowknife, where most energy efficiency initiatives are undertaken by Territorial organizations.

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Sudbury wants to train building inspectors in efficient energy management techniques in order to provide homeowners with information on upgrading the thermal efficiency of their homes. Montréal hired an Industrial Commissioner to help enterprises reduce their energy costs as a means of reducing their production costs. Sherbrooke developed a promotional energy saving program in cooperation with Hydro Québec involving the distribution of free low-energy light bulbs. Programs to encourage energy efficiency awareness among municipal employees exist in Winnipeg, Ottawa, Toronto and Montréal.

Edmonton uses methane gas extracted from landfill as a source of electricity. Montréal has suggested using the steam produced by incineration as an energy source. Dartmouth is investigating opportunities to implement alternative sources of energy such as solid waste incineration, district heating and co-generation.

Vancouver, Winnipeg, Toronto, Ottawa, Montréal and Whitehorse have energy efficient street light programs, including the replacement of incandescent mercury street lights by high pressure sodium ones. High pressure sodium lighting gives more light with less energy consumption.

2.6.8 Energy Conservation: Evaluation

In most cases, energy efficiency programs are too new to evaluate their success.

2.7 ENVIRONMENTAL IMPACT ASSESSMENT

2.7.1 Environmental Impact Assessment: Description and Numbers

Four municipalities have provisions in their municipal plans for environmental impact assessment for environmentally sensitive areas or for small development projects. Implementation is just starting.

Environmental assessment is a nascent area of municipal activity. Environmental impact assessments are done under federal legislation in Yellowknife and Whitehorse, while provincial legislation is most often used for assessments done in the other 13 municipalities studied.

However, some municipal plans make provisions for environmental assessment of development projects, mainly for the protection of environmentally sensitive areas. They have different names to differentiate the municipal from the provincial processes: St. John's Environmental Analysis Report; Winnipeg's Environmental Impact Review; Ottawa's Municipal Environmental Evaluation Reports for Environmentally Sensitive Areas; and Toronto's Environmental Impact Statements or Environmental Impact Assessments, which are required for any development in or abutting natural areas. In Edmonton, the intention

is to establish guidelines and use them to prepare an Environmental Impact Statement for newly developing areas.

2.7.2 Environmental Impact Assessment: Evaluation

It is too early to evaluate these environmental assessment mechanisms.

TABLE 2.7 ENVIRONMENTAL IMPACT ASSESSMENT

SUBJECT AREA	POLICIES AND PROGRAMS IN THE PLAN	OTHER PROGRAMS	IMPLEMENTATION	MONITORING
Environmental Assessment	4	0	N/A	N/A

2.7.3 Cumulative Impact Assessment

There are no policies on cumulative impacts in any of the municipal plans studied.

ENDNOTES FOR CHAPTER 2

1. G. Hoberg, "Comparing Canadian Performance in Environmental Policy" in *Canadian Environmental Policy: Ecosystems, Politics and Process*, R. Boardman, ed. (Toronto: Oxford University Press, 1992), p. 251.
2. The Montreal Protocol of 1987 and subsequent amendments have set timetables for phasing out the production of the major ozone-depleting substances. Eighty-six countries, including Canada and all major producers of ozone-depleting substances had ratified the Montreal Protocol as of September 1992.
3. City of Vancouver Task Force on Atmospheric Change, *Clouds of Change: Final Report of the City of Vancouver Task Force on Atmospheric Change, Volumes I and II* (Vancouver: City of Vancouver, 1990).
4. Ville de Montréal, *Énoncé d'orientation: Stratégie montréalaise de réduction des émissions et de l'utilisation des CFCs et Halons*, (Montréal: Ville de Montréal, 1991), p. 52.
5. City of Vancouver, *Clouds of Change*, p. 5.
6. *Ibid.*, p. 255.
7. *Ibid.*, p. 256.
8. Fred Wilson, "The Greening of Canada," *Civic Public Works* (October, 1992): pp. 10-12.
9. Government of Canada, *The State of Canada's Environment* (Ottawa: Supply and Services Canada, 1991), p. 9-6
10. Don E. McAllister, "Why save biodiversity? Rationales and Ethics," *Canadian Biodiversity*, 1-1 (Winter 1991): pp. 8-13.
11. The term "integrated pest management" (IPM) has become synonymous with the concept of environmentally sound pest control procedures for sustained agricultural production. IPM combines chemical, biological, cultural, and genetic methods to maximize effective and economical pest control, while minimizing harmful effects on non-targets organisms and the environment. It requires intensive monitoring of pest population to ensure optimum results. [From: *The State of Canada's Environment*, p. 9-25.]
12. Environmentally Sensitive Areas may have the following characteristics:
 - habitat of rare, threatened, unusual or endangered plant and/or animal species and communities;

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- rare, high quality or unusual landform or geomorphological processes;
- the ecological function of the area contributes significantly to the healthy maintenance of a natural ecosystem beyond its boundaries by serving as a migratory stopover or concentration point, or serves as a linkage corridor of suitable habitat between natural biological communities, or serves as a water storage or recharge area;
- an unusual high diversity of otherwise commonly encountered biological communities and associated plants and animals.

[From: City of Toronto *Cityplan '91* (Toronto: City of Toronto, 1991), p. 67.]

13. R.T.T. Forman and M. Godron, *Landscape Ecology* (New York: John Wiley & Sons, 1986); G. Merriam, "The Ecology of Heterogeneous Systems", in *Landscape Ecology and Management, a Symposium of the Canadian Society for Landscape Ecology and Management* (Montréal: Polyscience Publications, 1987), pp. 43-50.
14. City of Regina, *Development Plan* (Regina: City of Regina, 1991), p. 76.
15. The term "open spaces" is frequently associated with both passive and active outdoor recreation areas. Lately, open space has come to have a broader significance being used as land reserves to introduce relief from uninterrupted development.

CHAPTER 3

SUMMARY AND CONCLUSIONS

3.1 STRENGTHS AND WEAKNESSES OF MUNICIPAL PLANS

Vancouver, Edmonton, Regina, Toronto, Ottawa have developed policies and programs in most areas and have started to implement programs and monitor the results. The threat of global warming and ozone depletion has triggered the development of new policies in many major urban centres with others intending to follow suit.

Vancouver has adopted the most comprehensive municipal approach to global climate change in Canada. The City is addressing the problems of urban sprawl, disappearance of the urban forest and energy consumption. Edmonton's plan clearly addresses the protection of environmentally sensitive areas as well as the creation by City Council of an Environmental Task Force to ensure that the City is acting as a good corporate environmental citizen. The task force addresses the following issues: energy efficiency and transportation, intensification, public transit and CO₂ reduction over time. The overriding philosophy of Regina's plan is the concept of sustainable development. The City has developed environmental programs in most fields. The City of Winnipeg has developed environmental policies and programs in most areas. The City is re-examining its current practices with an environmental stewardship approach, but it is too new to evaluate the impacts of these policies and programs.

Sudbury has achieved significant reductions in industrial pollutants from mining companies and the massive land reclamation program has revegetated great portions of the city. In Toronto, CityPlan acknowledges that the state of the natural environment, air, water, and soil are directly affected by virtually every land use and transportation decision made. The plan recommends ecologically-sound policies to promote and protect the natural environment, to minimize pollution and energy consumption, and to encourage responsible stewardship of land resources. Targets have been set for CO₂, SO₂, and NO₂ emission reduction. The City has developed environmental programs in most areas. A State of the Environment Report has been undertaken.

Ottawa wants to adopt an ecosystem approach to planning. The City's Official Plan mission statement embraces sustainable development. Environmental programs cover most subject areas. The City has designated environmentally sensitive areas and City Council requires a Municipal Environmental Report as the basis for assessing development proposals within the greenway system.

Montréal will adopt the first master plan in its history. The four fundamental principles are: consolidation of the City Centre, enhancing public transportation, protection of natural features, and control of environmental problems. Many environmental initiatives have been

developed outside of the municipal plan, such as the Waste Management Strategy. In Montréal, as in Regina, the approach is to spread responsibilities among several departments rather than to concentrate all available resources in a single environment department.

Sherbrooke has adopted two strategies: first, the City will review regulations and clearly define the role of the municipality with respect to environmental matters. The second strategy consists in developing a coherent approach among all environmental programs. The priorities identified in the plan include: rehabilitating river shorelines, developing an integrated waste management strategy, protecting the urban forest, and reducing pesticide use.

In the Atlantic Provinces, Fredericton has the most comprehensive environmental programs, while the Cavendish Planning Area is a unique case of a community planning to protect the natural environment from the pressure tourism exerts. St. John's is addressing the protection of environmentally sensitive policy areas and has policies and programs to protect major bodies of water.

Dartmouth's Municipal Planning Strategy presents many good policies and programs, but most are still at the planning stage.

One of Whitehorse's municipal plan objectives is to protect and enhance the outstanding and fragile northern environment of the city. The City has started to implement some environmental programs in the fields of water quality and conservation, natural area protection and energy and transportation. Yellowknife has created a new Environmental Reserve Designation to preserve some of its unique natural areas, but the designation has not yet been tested. The City has water quality and conservation policies, and programs; public transportation has improved over the last few years.

Some of the weaker areas in most municipalities include:

- The term biodiversity is rarely found in municipal plans, and its importance has not yet been recognized at the local level as it has at national and international levels. The protection of biodiversity is generally addressed through the protection of natural areas. Most municipalities have not prepared natural areas inventories, although a few are beginning to do so.
- Although environmentally sensitive areas have been designated in many municipalities, it is too early to say if the policy will hold up in contentious situations.
- The Blue Box Program is successful, but very expensive. Recycling and especially collection costs are the problems most often cited. Other common problems with the Blue Box Program are contamination (i.e. non-recyclable material put in Blue Boxes) and collection exceeding the treatment capacity.
- Monitoring program implementation is not done in many cases, as there are no funds to hire staff for this purpose. Monitoring some programs — such as waste

management, air and water quality — is easier because measurable targets can be set. Establishing clearer environmental indicators could improve monitoring in the future.

3.1 PROBLEMS COMMON TO PROGRAM IMPLEMENTATION

Table 3.1 lists common problems encountered by municipalities in implementing environmental programs.

TABLE 3.1 PROBLEMS COMMON TO ENVIRONMENTAL PROGRAM IMPLEMENTATION

Problem Identified	Number of Municipalities
A) Lack of authority at municipal level to implement environmental policies and programs	11
B) Lack of funds to meet new requirements as a result of federal and provincial legislative changes	11
C) Lack of training for staff on environmental problems	6
D) Lack of human resources	6
E) Lack of coordinated approach among different departments	2
F) Lack of thorough understanding of environmental problems	2
G) Lack of political will locally and provincially	4
H) Lack of financial resources	11

A) Lack of authority at municipal level

Municipalities do not yet have the legislative authority to do many of the things that they are being asked to do. Vancouver pointed out that change in provincial legislation will be required to improve air quality standards. Changes in provincial and federal legislation will also be needed to introduce stringent standards on packaging. Other examples where municipal environmental initiatives are being hampered because of a lack of legislative authority are:

- Toronto needs legislative authority from the Province to enforce the CFC bylaw.
- The City of Toronto has applied for enabling legislation to allow it to pass bylaws regulating distribution, use and disposal of any material used for the purpose of packaging products for retail sale where such material is not compatible with other recyclable initiatives.
- Vancouver will continue to urge the federal and provincial governments to introduce stringent standards regulating non-degradable, nonreturnable, and non-recyclable food and beverage packaging.
- Legislative authority is also required by Vancouver to control tree cutting on private property.
- In Winnipeg, there is a lack of defined authority at the municipal level for the management of rivers and other environmental features.

On the one hand, municipalities are requesting more power from the provinces to better control environmental degradation, and on the other hand, the municipal governments are leery of inheriting more environmental responsibilities from the senior levels of government without appropriate financial compensation. This is a challenge that municipalities are starting to address. In Fredericton, for example, provincial environmental legislation has given the City more authority to control pollution. For example, the Clean Water Act allows the City to control land uses that have the potential to contaminate groundwater.

B) Lack of funds to meet new requirements

Thirteen municipalities felt that, in the near future, the provincial government would delegate more environmental responsibilities to municipalities. Most did not expect provincial funding to follow the increased responsibility.

While devolving provincial responsibilities is a common theme, whether municipalities are prepared or not is another issue. In British Columbia, the federal and provincial governments are enacting environmental legislation that requires significant expenditures by municipalities for compliance. However, municipalities such as Vancouver are not being provided with additional funding from senior governments to meet these requirements. Whitehorse gave the example of the Wood Smoke Programme, where the City became entirely responsible for what had been a provincial responsibility. No budget was allocated with the responsibility.

In some municipalities, the Province plays an important role with regard to environmental policies and programs. In Winnipeg, St. John's and Fredericton, it appears that devolution of environmental responsibilities will not be as important as in other municipalities.

C) Lack of training for staff in environmental problems

Education of the public and staff is seen as extremely important by many municipal officials.

D) Lack of resources, especially for implementation and monitoring

At the moment, many environmental programs are not monitored. Even if municipalities plan to monitor some of their programs, such as the protection of trees on private properties in Vancouver, there are few resources to accomplish this task. The same is true for the protection of environmentally sensitive areas and environmental assessment.

E) Lack of a coordinated approach

Environmental management tends to be fragmented across the various subject areas. In Edmonton the creation of a special Office of the Environment is helping, but there is still a lack of money and staff. Montréal also has had difficulty implementing a multi-sectorial approach. Regina prefers not to create a special office of the environment but rather gives all staff training on the environment. The concept of ecosystem planning is starting to emerge as a method of coordinating planning across subject areas. For instance, Toronto has developed a Strategy for the Protection and Management of Natural Heritage in the Greater Toronto Area.² The Strategy identifies basic design principles, a land use planning and management framework and a practical approach to identifying natural heritage systems based on existing or readily obtainable data.

F) Lack of thorough understanding of many environmental problems

Many environmental problems are not well understood, e.g., soil contamination and cumulative effects.

G) Lack of political will locally and provincially

In many cases the main barrier to progress on environmental issues is a lack of political will. For example, in Yellowknife, the main issue is not the lack of mandate or resources, but the absence of political will to develop and enforce environmental policies.

H) Lack of financial resources

Eleven municipalities mentioned that a lack of funds was a major impediment to implementation. In all cases, municipalities use regular operating and capital budgets to finance their environmental initiatives.

Many environmental programs fall under traditional services such as solid waste, water, and sewage and are paid for by taxpayers. In Yellowknife, for example, a new garbage dump will be partly funded through monthly utility bills. Engineering and Public Works Departments are responsible for water supply and treatment, recycling and composting.

External sources of revenue have been very important for the implementation of environmental programs, but it is often temporary and does not become a regular part of the budget. For example, in St. John's, a waste management study received money from the City and the Province. Small budgets are allocated to special projects, such as the Healthy Cities program in Montréal, or environmental audits in Regina. The Regional Municipality of Sudbury has been so successful in its land reclamation project that there is now a small budget from outside the municipality, i.e. the federal and provincial governments. Yellowknife obtained money from the territorial and federal governments for projects like bus services and trail systems.

Edmonton and Whitehorse have asked for support from federal and provincial agencies, but cannot count only on these sources of funding for environmental programmes. These municipalities mentioned that they have to be innovative and find other funding sources, such as organizations like Ducks Unlimited, to help protect natural areas.

3.3 CONCLUSIONS

1. The analysis reveals that municipalities are integrating environmental policies and programs into their municipal plans, but in most cases it is too early to evaluate the success of implementation.
2. Because of the major differences in the environmental and economic contexts among municipalities, there are no general solutions to environmental problems. Each municipality has to develop its own strategies.
3. Municipal plans offer tools to implement environmental programs, but they have limitations. The major obstacles to implementation by order of priority are:
 - a lack of legislative authority for municipalities and the need for more support from the province in specific cases, such as changes in legislation;
 - lack of funds;
 - lack of human resources;
 - lack of training for staff in environmental problems;
 - lack of a thorough understanding of many environmental problems;
 - lack of a coordinated approach among different departments to solve environmental problems;
 - lack of political will.
4. The lack of specific budgets is a major problem for environmental program implementation. Water quality and conservation programs, and waste management have generally been more successfully implemented because of existing dedicated budgets.
5. The municipal role in environmental planning is not clearly established by the provinces in most cases. A clear and defined mandate would certainly help municipalities in the development of environmental policies and programs. The Sewell Commission (Planning and Development Reform in Ontario) suggests that the principles of environmental planning should be built into the *Planning Act*. The Commission has proposed many ways to integrate natural environment considerations into the planning process: establishing clear environmental policies; setting out environmental matters that must be addressed in municipal plans; identifying, evaluating, and mapping environmental resources; allowing municipalities greater control over site alterations; and monitoring progress.
6. Municipalities have also found many creative solutions without any senior government funding. Local non-governmental groups and volunteers are playing important roles in taking action, such as recycling groups in Yellowknife and Whitehorse. Other programs include the protection of rivers in Toronto and Sherbrooke. During the past 20 years, Canada's environmental groups have made their way into the policy community that shapes government decisions on the environment. They have put a

host of new issues on the municipal, provincial and federal agendas. This has resulted in an heightened awareness and need for effective environmental management and added to the number of environment departments and regulatory authorities.⁴

7. Co-operation from all levels of governments — local, provincial, federal, and non-governmental organizations — is necessary if effective solutions are to be found and implemented. An example of successful co-operation is found in Sudbury, where SO₂ emissions from mining companies have been controlled as a result of the combined efforts of the federal, provincial and municipal governments. In another example, co-operation between the business community, the University and the Municipality of Sherbrooke has been a contributing factor to the successful implementation of this area's waste management programs.

3.2 FUTURE RESEARCH DIRECTIONS

1. The implementation and the monitoring of programs reviewed in this report should be studied in a few years to determine if progress is being made. There is already monitoring for subject areas that can be easily measured with indicators: i.e., air and water quality, solid waste management, public transit use, cycling and walking paths, and energy conservation programs. Some municipalities are in the process of establishing monitoring mechanisms for hazardous waste elimination, disposal and transportation. Little or no monitoring exists for the protection of environmentally sensitive areas and the protection of mature trees on private property. The compliance of developers to established environmental standards will have to be monitored to be effective.
2. There is a need to develop indicators to monitor municipal environmental quality. Indicators would improve our capacity to monitor key environmental changes/trends and inform the public of the state of the environment. Some of these indicators, such as stratospheric ozone levels or migratory game bird populations, measure the status of an environmental component. Others, such as emissions of sulphur dioxide and oxides of nitrogen, document the contribution of particular human activities to environmental stress. Some municipalities have begun to develop indicators: Toronto, Ottawa and Montréal. The State of the Environment Report, undertaken by the Environmental Protection Office in Toronto, reviews a number of environmental indicators and identifies possible actions for improvement. Since 1989, Environment Canada, through the National Environmental Indicators Project has been leading a federal effort to develop a national set of indicators.⁵
3. Although educational programs were not part of the questionnaire, they were mentioned in many instances as crucial to influencing individual behaviour. This applies to pesticide use, recycling, disposal of hazardous waste, alternatives to car use, protection of natural areas, and energy conservation. Education of government

officials was also mentioned as an important factor in the development of environmental policies and programs. Future research could examine the importance and impact of education in the successful implementation of environmental programs.

4. Many municipalities are not waiting for other levels of government to address their environmental problems, but are working with the resources of the local community. The District of Matsqui, British Columbia, has organized a community-wide approach to the environment, thereby winning recognition from the United Nations International Council for Local Environmental Initiatives Honours Program.⁶ Matsqui's environmental program began with a state of the environment study in February 1990, to provide the community with enough information to develop environmental policies. The policies and strategies of the *State of the Environment Report* have been incorporated into the municipality's Community Plan. An interesting study could be done with small municipalities that are adopting this kind of community-ownership approach to the environment.



ENDNOTES FOR CHAPTER 3

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4. J Wilson, "Green Lobbies, Pressure Groups and Environmental Policy," *Canadian Environmental Policy: Ecosystems, Politics, and Process* R. Boardman, ed. (Toronto: Oxford University Press), pp. 123-124.
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