

Municipal Environmental Management Systems

Benchmarking Survey Results



Executive Summary

This report presents the results of an Environmental Management System (EMS) benchmarking survey undertaken to identify the experiences of municipal entities, including the costs and benefits of implementing an ISO 14001 based EMS within Canada and the United States (US). An EMS is a management framework that is used to implement an environmental policy in any type of organization. The most widely recognized EMS standard worldwide is ISO 14001, an international framework for environmental management, measurement, evaluation and auditing. Findings of the survey were used to assist the City of Toronto-Ontario in further developing its EMS. This report discusses best available information on the costs and benefits of implementing a municipal Environmental Management System, taking into account the experiences of other Canadian and American municipalities.

The benchmarking survey was distributed to 30 cities across Canada and the US known to be engaged in EMS. Responses were received from 20 cities and further information was collected through phone interviews with additional Canadian cities. The cities surveyed have most often implemented an EMS at the facility or operational level as opposed to city-wide, although two cities surveyed have committed to a city-wide EMS implementation strategy. The two most common areas for EMS implementation are water/wastewater and solid waste operations, as these municipal operations are generally considered to be of higher environmental significance. The average length of time that the respondents have been working on EMS is 3.6 years with a few cities reporting that they have been working on EMS for over six years.

The top two reasons why cities decided to implement an EMS were improved performance/ operations and due diligence/legal compliance. Other common reasons given were environmental policy/responsibility, to increase employee environmental awareness and reduction of risk/liability.

It was found that the tracking of the costs of EMS implementation is not consistent between cities and some cities were unable to report on costs. Reported costs of implementation ranged from \$80,000 to \$280,000 (all cost figures given in Canadian dollars) from municipalities with a population size from 72,000 to 1.3 million, to implement an EMS in single operations and single business units. Although there are economies of scale for EMS implementation, the study found that the larger the municipality, the larger and more complex the business units, thus higher overall cost for implementation.

Several respondents stated they had no data or it was too early to calculate the cost savings of their EMS. Others reported savings as a result of improved efficiencies of operations such as reductions of solid waste disposal costs and energy, fuel and water consumption. The cost savings reported as a result of EMS implementation ranged from "no measurable cost savings" to \$2.8 million (converted to Canadian dollars) annually as reported by San Diego-California, primarily as a result of reducing idle times of heavy equipment and renegotiating the equipment lease terms.

Cost savings cannot be guaranteed as a result of EMS implementation, but are commonly achieved. This is because EMS implementation involves examining business processes and associated resource consumption with the objective to minimize environmental impacts and costs. Business decisions on whether to implement an EMS should not be based solely on costs of EMS implementation versus measurable cost savings. Many of the reported benefits are difficult to quantify in dollar terms, and fall under the category of "doing the right thing" in support of community values. The recent public consultation "Listening to Toronto" sessions lead by the Mayor found that Torontonians do put a high value on maintaining the natural environment.



The main benefits realized as a result of a functioning EMS were improved performance/ operations and improved employee environmental awareness. Due diligence/legal compliance, saved money/resources and enhanced public image were other common benefits reported by the survey respondents. Five respondents indicated that the EMS was likely to have a positive influence on access to insurance and/or the cost to borrow money (bond rating).

In addition to the benchmarking survey, information was collected through contact with EMS professionals in various cities providing a bigger picture of the status of EMS in Canada and the United States. On this basis it was concluded that there are approximately 26 municipal entities known to be active with an EMS, either registered, in progress towards registration or in the planning phase in Canada and approximately 100 in the US.



Acknowledgements

The authors David T. MacLeod and Kyle Leetham wish to express their thanks to various City of Toronto staff whose assistance was helpful in the compilation of this report including Nancy Ruscica, Shelley Grice and Uwe Mader. Representatives from the following cities provided a wealth of knowledge on their organization's EMS implementation including cost and benefits.

- Dave Day and Carolyn Bowen, City of Calgary-Alberta
- Alan Davidson, York Region-Ontario
- Kim A. Kidd Kitagawa, Regional Municipality of Waterloo-Ontario

The following staff from private firms also provided helpful assistance in identifying cities active with EMS in Canada:

- Laura Banks (Hamilton-Ontario), American Water Services Canada Corporation;
- Nathan Crawford (Toronto-Ontario), Greenware Environmental Systems Incorporated;
- Gary Grant (Kitchener-Ontario), XCG Consultants;
- Bob Leung (Mississauga-Ontario), BRI Consultants;
- John Mitchell (Calgary-Alberta), Jag Bilkhu (Calgary-Alberta) and Michael Charles (Halifax-Nova Scotia), Jacques Whitford Environment Limited; and
- Phil Webber, Municipal EMS Services (Vancouver-British Columbia);

Jim Horne of the US Environmental Protection Agency's "Public Entity Environmental Resource" (PEER) Center and Faith Leavit of the "Global Environmental Technology Fund" (GETF) provided useful information on the state of municipal EMS in the US as well as contact people working in American cities active with EMS.

Peter Machno, Environmental Management System Director, National Biosolids Partnership provided information on the extent American municipal entities are implementing EMS for biosolids.



Table of Contents

Executive Summary.....	1
Acknowledgments	3
1.0 Background.....	5
1.1 What is an EMS?	5
1.2 Objective of the Benchmarking Survey.....	5
2.0 Methodology.....	6
2.1 Background Research to Prepare Survey	6
3.0 Results of Survey	7
3.1 Areas Covered by EMS	7
3.2 Years Working on EMS.....	7
3.3 Reasons for Implementing an EMS	8
3.4 Costs of EMS	8
3.5 Software Usage.....	8
3.6 Cost Savings	8
3.7 Benefits of EMS Implementation	9
3.8 EMS's Affect on Insurance and Lending Rates	10
3.9 EMS Experience in Canadian Cities.....	10
3.10 EMS Municipal Networking.....	11
4.0 Conclusions.....	12
Appendices	14
Appendix A Survey of Environmental Management Systems for Cities	15
Appendix B Areas Covered by EMS (Chart)	17
Appendix C Length of Time Working on EMS (Chart)	18
Appendix D Reasons for Implementing EMS (Chart)	19
Appendix E Main Benefits of EMS (Chart)	20
Appendix F Canadian Municipalities Active with EMS (Map)	21

*Prepared by:
David MacLeod & Kyle Leetham*

*City of Toronto
Environmental Services, Technical Services,
Works and Emergency Services*

September 2, 2004



1.0 Background

1.1 What is an EMS?

An Environmental Management System (EMS) is a management framework used to implement environmental policies in business, industry, institutions and governments. It is a systematic approach to incorporating the environment into every business decision. An EMS establishes a set of management processes and procedures that helps an organization to analyze, control and reduce the environmental impact of its activities, products and services and operate with greater efficiency and control. An EMS also provides an auditable system for tracking, managing and improving environmental performance. As such, an EMS should be integrated within an organization's existing management structure, in much the same way as a financial management system.

The most widely recognized EMS standard worldwide is ISO 14001, an international framework for environmental management, measurement, evaluation and auditing. ISO 14001 is a voluntary standard, published in 1996 by ISO (International Organization for Standardization), ratified by over 50 member countries world-wide. The standard contains 17 elements addressing topics such as environmental policy, roles and responsibilities, operational controls, emergency preparedness and auditing. Once the EMS is in place, the organization may hire an independent accredited firm known as a "registrar" to conduct a registration audit of the EMS. If the audit is passed, the organization receives ISO 14001 registration and is assured that it meets the international standard. Periodic audits are required to maintain registration. Self-declaration of conformance to ISO 14001 is an option, although in Canada this practice is not common.

Over 53,000 organizations of all kinds have registered to ISO 14001 globally, and many more use the 14001 framework but do not take the final step of obtaining independent registration. A common practice amongst many organizations is to have an informal EMS that follows some, but not all of the elements of ISO 14001. ISO 14001 has mostly been applied to businesses, but it has also been applied to cities.

1.2 Objective of the Benchmarking Survey

City of Toronto staff conducted a benchmarking survey to collect and analyze information on the cost and benefits of EMS implementation by other municipal entities in Canada and the US. The findings of the survey will serve to inform the City of Toronto and other cities considering EMS implementation about common approaches and best practices used by leading cities.

1.3 Breakdown of Organizations Surveyed

A Three-page survey (Appendix A Survey of Environmental Management Systems for Cities) was e-mailed to 30 key contacts: 19 in Canadian cities and 11 in American cities. A total of 20 survey responses were received from 11 Canadian cities and 9 American Cities.

All cities responding are smaller in population than Toronto-Ontario, ranging in size from 72,000 To 1.3 million. Toronto-Ontario has a population of 2.5 million.



2.0 Methodology

2.1 Background Research to Prepare Survey

One municipal EMS benchmarking study was found, "Benchmarking Report: Environmental Management Systems", prepared for the City of Seattle, Office of Sustainability and Environment by CH2M HILL in 2001. The nature of the benchmarking study was different from the City of Toronto study in that it focussed less on the costs and benefits of an EMS, and more on the drivers and factors affecting the success of an EMS. Key findings for the CH2M HILL study are summarized as follows:

1. The primary driver for implementation was compliance. Sustainability as a driver was less common.
2. Corporate - based EMSs generally took a broader approach to implementation, rather than utilizing pilot or test projects. These EMSs were generally largely influenced by broader environmental condition issues, such as air quality, than the business unit-based EMSs.
3. Business unit or department - based EMSs generally took a more incremental approach to implementation, often focussing first on specific facilities. Direct impacts from operations were the primary driver for prioritizing issues within these EMSs.
4. Implementation created a shared vision and responsibility for environmental issues.
5. Implementation factors necessary for success include:
 - Senior management commitment
 - Adequate implementation resources provided
 - EMS champion
 - Phased implementation
 - Visible process
6. Resistance to change was often overcome by training and communication.

City of Toronto staff contacted numerous EMS consultants and an EMS software company active in Canada and US to assist in the identification of which cities in North America have been most active in the field of EMS. These cities were then targeted as survey participants. Additional survey participants were identified through contact with the US Environmental Protection Agency's Public Entity Environmental Management System Resource Center (PEER). This US federally supported group has existed since 1997, and has assisted approximately 30 municipal entities in implementing an ISO 14001-style EMS.



3.0 Results of Survey

The survey's key results are summarised below from 20 municipal respondents. A summary of key survey responses are detailed in the tables found in the appendixes.

3.1 Areas Covered by EMS

Cities have most often implemented an EMS at the facility or business unit level. The two most common areas for EMS implementation are water/wastewater and solid waste operations, as they are traditionally considered to be of higher environmental significance. Of the 20 cities surveyed, 13 were active with an EMS for wastewater, nine were active with an EMS for water supply, and eight were active with both water and wastewater. Nine were active with an EMS for solid waste. Other reported areas of EMS implementation from the survey are fleet management, general maintenance, fire services, golf courses, public works, recreation, risk management, roads and transit. (See Appendix B Areas Covered by EMS (Chart)).

Experience has shown that the first business unit within a city to achieve EMS implementation can provide a useful template example for other business units working towards EMS implementation. The cities of Calgary-Alberta, and Scottsdale-Arizona are the first to achieve city-wide implementation of an EMS. In Calgary-Alberta, 11 business units achieved individual ISO 14001 registrations. The remaining Policy and Administrative business units, have achieved corporate registration. The corporate registration includes all 20 office-based business units as well as the management of the aspects common to all business units in the City of Calgary-Alberta. Seattle-Washington has implemented an EMS in several business units (e.g. water/wastewater, solid waste), and the City of Hamilton-Ontario is in the process of implementing an EMS in seven business units within the Public Works Department.

3.2 Years Working on EMS

The average number of years the survey respondents have been working on EMS is 3.6 years. Some leading cities including Calgary-Alberta, Charleston-South Carolina, Scottsdale-Arizona and Seattle-Washington have been working on their EMS for six years or more. (See Appendix C Length of Time Working on EMS (Chart)).

3.3 Reasons for Implementing an EMS

Many varied responses were given by the survey participants as the reasons why the municipal organization pursued an EMS. Approximately 50% of the respondents cited the top two reasons for implementing were improved performance/operations and due diligence/legal compliance. Other common reasons given were environmental policy/responsibility, increased employee environmental awareness and to reduce risk/liability. (See Appendix D Reasons for Implementing EMS (Chart)).



3.4 Costs of EMS

14 of the 20 responding cities in the study were able to provide EMS implementation cost figures however, these costs were not consistently calculated, as there is no standard for such cost accounting. Variability of costs reported by various cities are at least in part due to differing size and complexity of business units, as well as the scope of the EMS. Reported costs to implement an EMS in single operations and single business units on the low end are \$35,000 (Winnipeg-Manitoba) and \$40,000 (Quebec City-Quebec), both for wastewater facilities. However these low-end costs do not include all staff time, which is the largest component of cost.

More realistic low to moderate costs for EMS are reported to be around \$80,000 (Kamloops-British Columbia) to \$120,000 (Jefferson County-Alabama). The highest cost for EMS implementation at a single operations and single business units was \$280,000 (San Diego-California). Best available Canadian breakdowns of costs for EMS implementation are discussed below.

York Region-Ontario registered two operations within their wastewater business unit to the ISO 14001 standard: the York-Durham Sewage System and five Wastewater Treatment Plants, at a cost of approximately \$241,000. This includes \$73,000 for consulting fees, legal compliance audit, registration costs and staff costs of \$168,000 (excluding benefits) for 3.5 person years of work. Maintenance of the EMS requires two thirds of a person per year estimated at \$30,000/year and registration costs of \$5,000/year. The two wastewater operations employ a total of 25 staff.

The Region of Waterloo-Ontario implemented ISO 14001 within its solid waste business unit, including operations such as collection, composting, recycling and landfill, at a cost of approximately \$210,000 over an 18-month period. The unit employs 60 staff and 40 contractors. The total cost includes \$50,000 for consulting fees, legal compliance audit, gap analysis, group program, software, auditor training, and registration and surveillance audits. Staff time spent drafting procedures, producing and organizing new documents and records, and attending training and meetings was valued at \$160,000 (excluding benefits). In an average year, staff costs to maintain the EMS are approximately \$40,000/year (excluding benefits).

3.5 Software Usage

Approximately half of the 20 cities surveyed have purchased or developed specialized software to facilitate the implementation and maintenance of the EMS. Several respondents are using commercially available ISO 14001 EMS software that can assist with implementation and maintenance.

3.6 Cost Savings

Several respondents stated they had no data or their EMS was too new to be able to identify cost savings, although a few cities were able to identify savings. Two US cities reported substantial savings. San Diego-California has achieved annual savings of \$2.8 million, primarily as a result of reducing idle times of leased heavy mobile equipment and renegotiating the equipment lease terms. Some savings were also achieved due to reduction in use of water and disposal costs of contaminated water. Scottsdale-Arizona has reported savings of more than \$640,000 as a result of implementing an EMS, primarily due to energy savings.

The best Canadian example of cost savings as a result of implementing an EMS is the Regional Municipality of York-Ontario, which has reported savings of \$80,000 per year in its Wastewater Operations due to the elimination of a treatment chemical. Most of the other cities' reported savings are a result of improved efficiencies of operations resulting in reductions of solid waste disposal costs and energy, fuel and water consumption.



Cost savings cannot be guaranteed as a result of EMS implementation, but are commonly achieved. EMS implementation involves an examination of business processes and associated resource consumption with the objective to minimize environmental impacts and costs. Most of the reported benefits are difficult to quantify in dollar terms, and readily fall under the category of reducing risks, "doing the right thing", environmental stewardship and sustainability. The apparent conclusion is that business decisions on whether to implement an EMS should not be based solely on implementation costs versus measurable cost savings, but must also consider the non-monetary benefits of the EMS in the short and long term.

3.7 Benefits of EMS Implementation

The respondents universally were able to indicate benefits associated with the implementation of an EMS. 70% of the survey participants found the top benefit to be improved environmental performance/operations with 60% also stating that increased employee/environmental awareness as an important benefit. Other common benefits to several cities were due diligence/legal compliance, saved money/resources and enhanced public image. (See Appendix E Main Benefits of EMS (Chart)). Further explanations of the benefits of EMS implementation are found below.

(1) Improved Performance / Operations

An EMS is based on the quality management system framework "plan, do, check and act", which embodies the concept of continual improvement. In general, ISO 14001 helps achieve environmental performance improvement by setting objectives, targets to address priorities; assigning responsibilities; checking on progress; and taking corrective action where necessary.

Municipalities surveyed improved their environmental performance in specific operations or business units, most notably through resource and material conservation and increased operational and management controls.

(2) Increased Employee Environmental Awareness

ISO 14001 requires general EMS awareness training and job-specific training for employees whose jobs can have a significant environmental impact. Due to this training they become aware of their responsibilities for emergency, operational and environmental procedures leading to improved performance/operations of the organization.

(3) Due Diligence / Legal Compliance / Reduce Risk & Liability

Many municipalities stated that one of the most significant reasons why they implemented an EMS was to improve the ways in which they identify and communicate the many complex regulatory requirements that apply to their operations. An EMS requires an organization to have a system in place to identify, manage and measure its regulatory compliance on a periodic basis. Failure to comply with relevant legislation can result in significant fines, court costs, lawsuits, disruption of staff and negative publicity, with potential impacts in the millions of dollars. Several municipalities across Canada have been charged/fined or had lawsuits filed against them as the result of environmental incidents associated with their operations. One municipality in Western Canada, found guilty of a chemical spill, negotiated a sentence that included implementing an EMS. Another municipality in Ontario decided to implement ISO 14001 as a result of a significant fine imposed by a sewage spill.

ISO 14001 is increasingly being viewed by the courts as the benchmark for due diligence. This trend is likely to continue given the increased uptake of EMS principles in Canadian municipalities. If environmental prosecution was to occur and relevant elements of an EMS are in place, then a defence of due diligence may be available to a municipality that has taken reasonable steps to avoid non-compliance and negative environmental incidents.



(4) Cost Savings / Cost Avoidance

An EMS can often uncover cost savings by reviewing environmental impacts and identifying potential reductions in energy, fuel and water consumption and waste disposal costs. For example, York Region-Ontario was able to eliminate the use of a wastewater treatment chemical for annual savings of \$80,000 (as noted previously in section 3.6).

An EMS can also result in cost avoidance. With stronger compliance and emergency prevention and preparedness plans, negative environmental incidents such as chemical spills, can be minimized or avoided, and costs such as fines, court costs and disruption of staff productivity associated with non-compliance can be avoided.

(5) Enhanced Public Image

Registration of an EMS to the ISO 14001 international standard involves an audit by an independent firm qualified by the Standards Council of Canada. This adds credibility and improved public image to the EMS as viewed by stakeholders of the municipality with a registered EMS. Municipalities that do not register their EMS may not receive the tangible benefit of communicating to their stakeholders about their EMS.

Although not ranked as top of mind benefits stated by survey respondents, discussions with staff from various cities have stated many other benefits of an EMS approach, which are consistent with the experience of private sector companies that have implemented an EMS. Examples of these benefits include:

- a) Improved documentation of operating procedures and environmental records, reducing risks of costly errors;
- b) Assistance in succession planning and managing staff turnover through better documentation; and
- c) Enhanced sense of pride and motivation for workers.

3.8 EMS's Affect on Insurance and Lending Rates

Several respondents have stated that their EMS has contributed positively to securing or maintaining favourable insurance and lending rates (bond rating) including the Port of Houston-Texas, Scottsdale-Arizona, Jefferson County-Alabama and King County-Seattle. One municipality, Jefferson County-Alabama population 662,000 reported that it achieved an improvement in the cost of borrowing money by 1/16 to 1/8th of a point on their bond rating. The EMS was one of several contributing reasons for improvement of creditworthiness. This represents savings of millions of dollars.

3.9 EMS Experience in Canadian Cities

In addition to the benchmarking survey, information was collected through contact with EMS professionals in various cities providing a bigger picture of the status of EMS in Canada. On this basis it was concluded that there are approximately 26 municipal entities involved with EMS in Canada. A map of Canadian cities active with EMS was produced. Please see Appendix F Canadian Municipalities Active with EMS (Map). Nine Canadian municipalities have registered at least one business unit or facility to ISO 14001, primarily in Water/Wastewater, and one municipality (City of Calgary-Alberta) has registered the entire city. Nine more cities are in progress towards completing an EMS, although not necessarily with the intention of obtaining ISO 14001 registration. Eight municipalities are in the planning phase but have not yet identified a specific business unit or facility for implementation.



Information collected in addition to the benchmarking survey also identified that approximately 100 municipalities in the United States are active with an EMS. The scope of the study did not examine EMS activity elsewhere in the world, but European and Japanese cities are known to be relatively more active with EMS than those in North American cities.

3.10 EMS Municipal Networking

As a result of undertaking the Municipal EMS Benchmarking Survey, City of Toronto staff were able to establish an informal network of colleagues working on EMS, all of whom expressed interest in sharing information in the future. It is anticipated that it may be possible to reduce municipal EMS implementation costs by sharing EMS documentation and info on environmental studies and programs, thereby reducing duplication of effort.



4.0 Conclusions

The EMS Benchmarking Survey report documents the costs, benefits and experiences of implementing an ISO 14001-based EMS within 20 Canadian and the US cities. The findings of the survey will serve to inform the City of Toronto and other cities considering EMS implementation about common approaches and best practices used by leading cities.

The survey found that cities often implemented an EMS at the facility or business unit level as opposed to city-wide. The two most common areas for an ISO 14001 EMS are water/wastewater and solid waste operations. Calgary-Alberta, and Scottsdale-Arizona are the only two cities surveyed that have achieved a city-wide implementation of an EMS. The average length of time that the respondents have been working on EMS is 3.6 years, with a few cities reporting that they have been working on EMS for over six years.

The survey found that the top two reasons why cities decided to implement an EMS were improved performance/operations and due diligence/legal compliance. Other common reasons given were environmental policy/responsibility, increased employee environmental awareness and to reduce risk/liability.

It was found that the tracking of the costs of EMS implementation is not consistent between cities and some cities were unable to report on costs. Reported costs of implementation ranged from \$80,000 to \$280,000 from municipalities ranging in population size from 72,000 to 1.3 million, to implement an EMS in single operations or single business units. It is expected that the costs for a municipality the size of Toronto would be at least in the upper range, as all survey respondents were from smaller cities.

Several respondents stated they had no data or it was too early to calculate the cost savings of their EMS, while others reported savings as a result improved efficiencies of operations resulting in reductions of solid waste disposal costs and energy, fuel and water consumption. The cost savings reported as a result of EMS implementation ranged from "no measurable cost savings" to \$2.8 million annually. EMS implementation involves an examination of business processes and associated resource consumption with the objective to minimize environmental impacts and costs. Cities considering EMS implementation should understand that cost savings can not be guaranteed as a result of EMS implementation. Business decisions on whether to implement an EMS should not be based on costs versus measurable cost savings. Most of the reported benefits are difficult to quantify in dollar terms, and readily fall under the category of "doing the right thing" and practically support the concept of environmental stewardship sustainability.

Cities reported the main benefits found after EMS implementation were improved performance/operations and improved employee environmental awareness. Due diligence/legal compliance, saved money/resources and enhanced public image were other common benefits realized by the survey respondents. Several respondents indicated that the EMS was likely to have a positive contributing influence on access to insurance and/or lending costs (bond rating).

Although not ranked as top of mind benefits stated by survey respondents, discussions with staff from various cities have stated benefits of an EMS approach, which are consistent with the experience of private sector companies that have implemented an EMS. These benefits include:

- 1) Improved documentation of operating procedures and environmental records
- 2) Assistance in succession planning and handling staff turnover through better documentation
- 3) Motivation to achieve and sustain environmental improvements



As a result of undertaking the Municipal EMS Benchmarking Survey, City of Toronto staff were able to establish an informal network of colleagues working on EMS, all of whom expressed interest in sharing information in the future. It is anticipated that it may be possible to significantly reduce EMS implementation costs at the City of Toronto by sharing EMS documentation and information on environmental programs with other cities. This benchmarking survey report is intended to benefit other cities considering EMS implementation.

For further information contact:
David T. MacLeod, M.A., B.Sc., CEA, EMS(LA)
Senior Environmental Specialist
Telephone: 416-392-4340
Email: dmacleo2@toronto.ca



Appendices

Appendix A Survey of Environmental Management Systems for Cities

Appendix B Areas Covered by EMS (Chart)

Appendix C Length of Time Working on EMS (Chart)

Appendix D Reasons for Implementing EMS (Chart)

Appendix E Main Benefits of EMS (Chart)

Appendix F Canadian Municipalities Active with EMS (Map)



Appendix A

Survey of Environmental Management Systems for Cities

Background:

The City of Toronto is considering the implementation of an environmental management system (EMS) perhaps using ISO 14001 as the guiding framework. An EMS is generally defined as a systematic framework for managing environmental issues to ensure that an environmental policy is being met. We are conducting a benchmarking survey of other cities to help us develop recommendations on moving forward with an EMS. If you don't have an answer to a question, that's OK!

We plan to make a summary of the survey results available to all respondents which we believe will be information of interest to you. If you wish your city to remain anonymous please let us know.

Please mark an "X" beside the appropriate answer and/or provide further information in the space provided.

Questions:

1) What is the name and population of your city / town?

Name of city / town:

Population:

2) Does your city have any of the following systems in place (use an X if in place):

a) Environmental management system (e.g. ISO 14001):

b) Quality management system (e.g. ISO 9000 or TQM):

c) Health and safety management system (e.g. OHSAS 18001):

d) Other:

e) None (if no EMS skip to question 12):

3) What areas of city operations does the EMS cover?

Areas covered by EMS:

Number of employees covered:

Don't know:

4) How long has your city been working on its EMS?

Years working on EMS:

Don't know:

5) What was the main reason for implementing the EMS?

Main reason for EMS:

Other key reasons for EMS:

6) Do you have ball park estimates on the cost of the EMS?

Budget to implement:

Person days to implement:

Person days to maintain per year:

Don't know:



7) Does your city use specialized software to maintain the EMS?

EMS Software used:

No special software used:

8) What cost savings have there been as a result of the EMS?

Cost savings:

9) What are the main benefits of the EMS?

Benefits:

10) Have insurance or lending rates been decreased due to the EMS?

Yes:

No:

Don't know:

If yes, please specify details:

11) Can you provide us with any documents/reports which justify the creation of the EMS?

Yes:

No:

If yes, please forward to the address indicated below

Question if no EMS is in place:

12) Is there any consideration being given to implementing an EMS?

Yes:

If yes, why?:

No:

If no, why not?

Don't know:

Would you have time to speak with us in more detail?

Yes:

No:

Would you like to receive a summary of the survey results?

Yes:

No:

If yes, please indicate best e-mail address to use:

Would you be interested in maintaining some informal networking contact in the future on the subject of EMS for cities?

Yes:

No:



Appendix B

Benchmarking Survey Respondents - Areas Covered by EMS

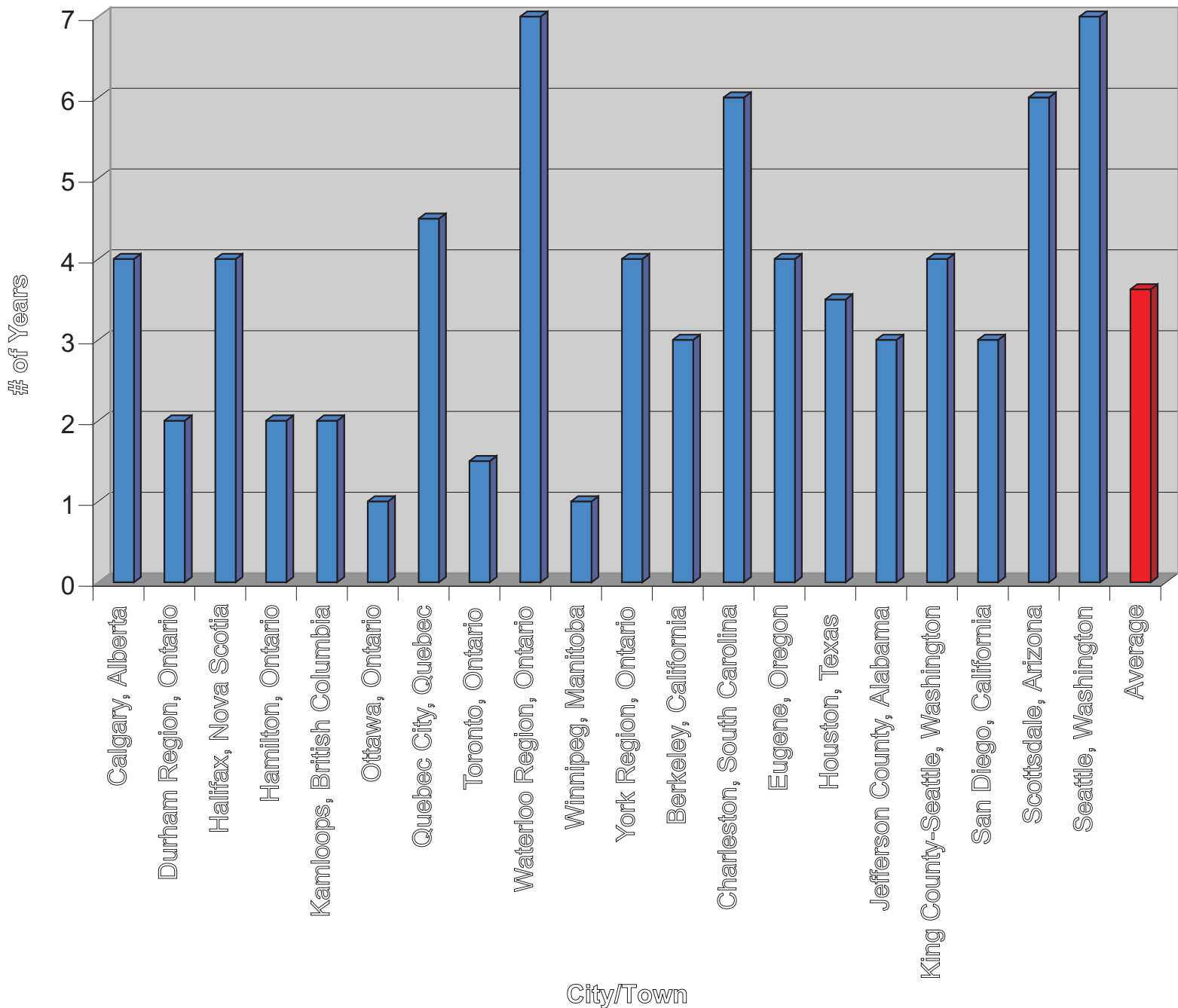
City/Town	Citywide	Corporate	Facilities	Fire	Fleet	Golf Courses	Parks & Recreation	Planning	Port Authority	Roads	Solid Waste	Transit	Water/Wastewater
Canadian Municipalities													
<i>Calgary, Alberta - Pop. 930,000</i>	✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
<i>Durham Region, Ontario - Pop. 575,000</i>													✓
<i>Halifax, Nova Scotia - Pop. 300,000</i>													✓
Hamilton, Ontario - Pop. 490,270		✓	✓		✓			✓			✓	✓	✓
Kamloops, British Columbia - Pop. 72,000											✓		✓
Ottawa, Ontario - Pop. 700,000											✓		✓
<i>Quebec City, Quebec - Pop. 515,000</i>													✓
Toronto, Ontario - Pop. 2,500,000											✓		
<i>Waterloo Region, Ontario - Pop. 470,000</i>											✓		
Winnipeg, Manitoba - Pop. 750,000													✓
<i>York Region, Ontario - Pop. 800,000</i>													✓
US Municipalities													
Berkeley, California - Pop. 102,000											✓		
<i>Charleston, South Carolina - Pop. 400,000</i>													✓
<i>Eugene, Oregon - Pop. 144,000</i>													✓
Houston, Texas - Pop. N/A					✓				✓				
Jefferson, Alabama - Pop. 662,000		✓	✓		✓								
King County, Washington - Pop. 1,100,000											✓		
San Diego, California - Pop. 1,300,000											✓		✓
<i>Scottsdale, Arizona - Pop. 220,000</i>	✓										✓		
Seattle, Washington - 565,000		✓					✓		✓	✓	✓		✓
Total: 20	2	3	3	1	4	1	2	2	1	2	11	2	13

Note: 1. The check mark indicates that the EMS is either in place or in progress.
 2. A municipality listed in bold and italics is known to have registered to the ISO 14001 standard.





Average 3.6 years



Length of Time Working on EMS

Appendix C

Appendix D

Reasons for Implementing EMS

City/Town	Competitiveness	Continuous Improvement	Due Diligence/Legal Compliance	Enhanced Public Image	Environmental Leader	Environmental Policy/Responsibility	Financial Incentive	Improved Performance/Operations	Improved Documentation	Improved Communication	Increased Employee Env. Awareness	Reduce Risk/Liability	Save Money/ Resources
Canadian Municipalities													
Calgary, Alberta	✓		✓	✓	✓							✓	
Durham Region, Ontario		✓						✓	✓				
Halifax, Nova Scotia			✓										
Hamilton, Ontario			✓										
Kamloops, British Columbia					✓				✓	✓			
Ottawa, Ontario								✓				✓	
Quebec City, Quebec					✓			✓					
Toronto, Ontario			✓					✓	✓		✓		
Waterloo, Ontario	✓	✓	✓		✓			✓		✓		✓	
Winnipeg, Manitoba												✓	
York Region, Ontario		✓	✓					✓					
US Municipalities													
Berkeley, California						✓							
Charleston, South Carolina	✓							✓				✓	
Eugene, Oregon	✓							✓					
Houston, Texas						✓							
Jefferson, Alabama			✓	✓		✓	✓			✓			✓
King County, Washington			✓				✓			✓			✓
San Diego, California					✓	✓							
Scottsdale, Arizona			✓										
Seattle, Washington							✓			✓			
Total: 20	4	3	9	1	1	5	4	10	3	2	5	5	2



Appendix E

Main Benefits of EMS

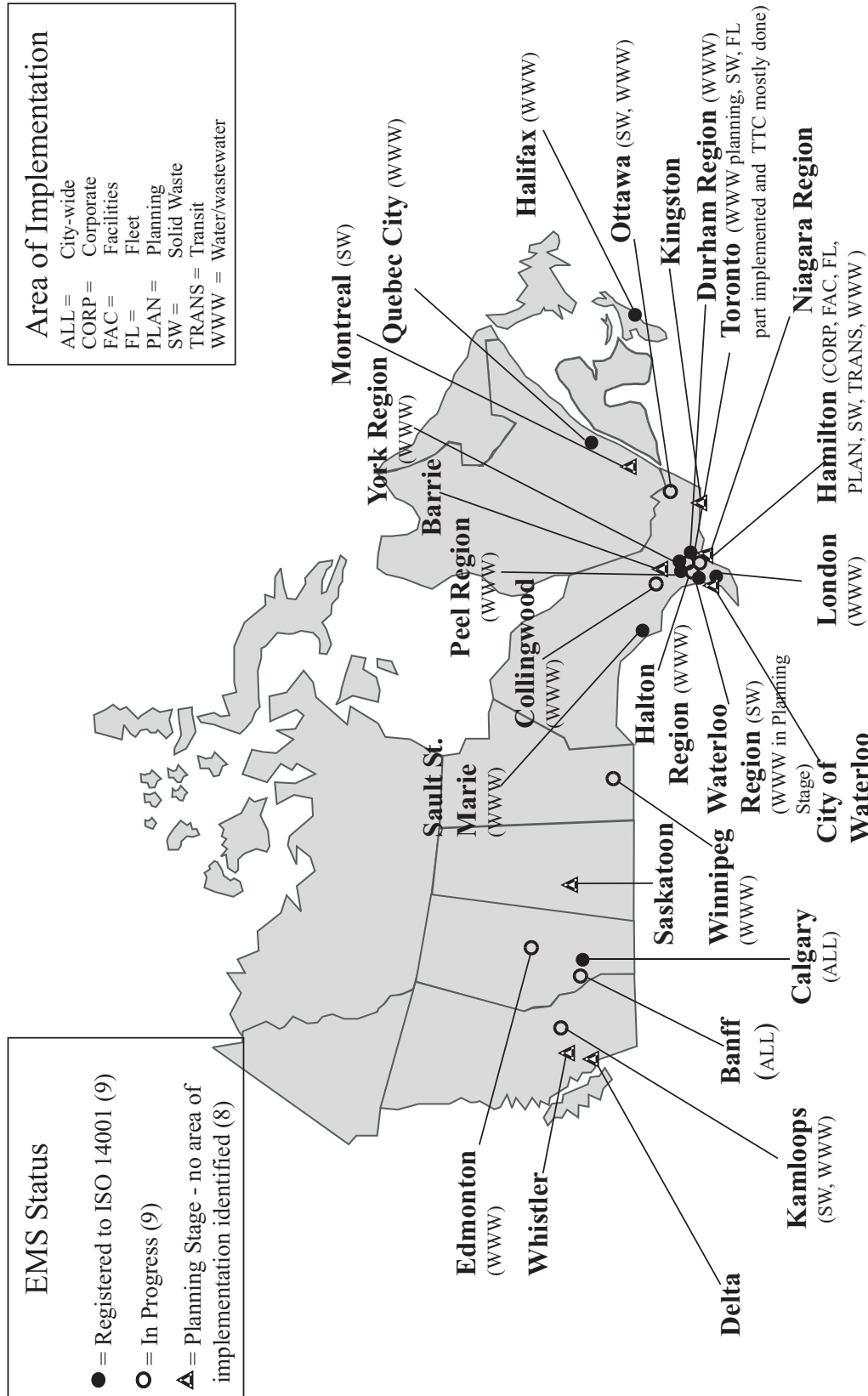
City/Town	Due Diligence/ Legal Compliance	Enhanced Public Image	Improved Emergency Response	Improved Performance/Operations	Improved Documentation	Improved Communication	Increased Employee Env. Awareness	Reduction in Environmental Impacts	Reduced Risk/Liability	Saved Money/ Resources
Canadian Municipalities										
Calgary, Alberta	✓	✓		✓		✓		✓	✓	✓
Durham Region, Ontario			✓	✓						
Halifax, Nova Scotia						✓				
Hamilton, Ontario	✓	✓		✓		✓	✓			
Kamloops, British Columbia	✓	✓	✓			✓				
Ottawa, Ontario		✓						✓		
Quebec City, Quebec			✓			✓	✓			
Toronto, Ontario *										
Waterloo, Ontario	✓	✓	✓	✓	✓	✓				
Winnipeg, Manitoba							✓	✓		
York Region, Ontario			✓	✓		✓	✓			
US Municipalities										
Berkeley, California	✓			✓						
Charleston, South Carolina		✓	✓			✓				✓
Eugene, Oregon			✓	✓		✓				
Houston, Texas						✓				
Jefferson, Alabama			✓		✓	✓				✓
King County, Washington			✓			✓				✓
San Diego, California			✓				✓			✓
Scottsdale, Arizona	✓	✓	✓							✓
Seattle, Washington			✓			✓				
Total: 20	6	6	2	14	4	4	12	5	3	6

* Benefits not available as EMS pilot is not fully implemented



Appendix F

Canadian Municipalities Active with EMS



Notes: 1. In 2005, a provincial law will require a basic management system approach for all municipal water supply utilities.
 2. Approximately 100 municipalities in U.S.A. are active with EMS.

