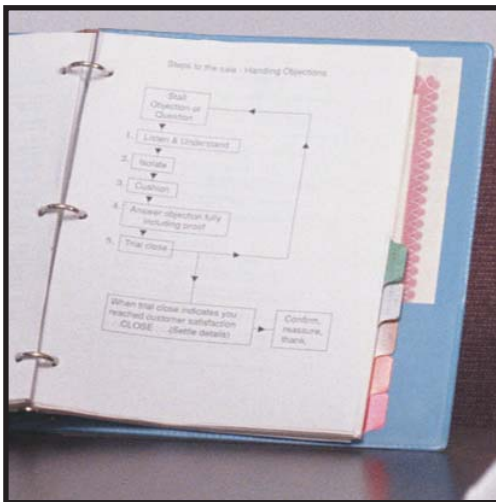
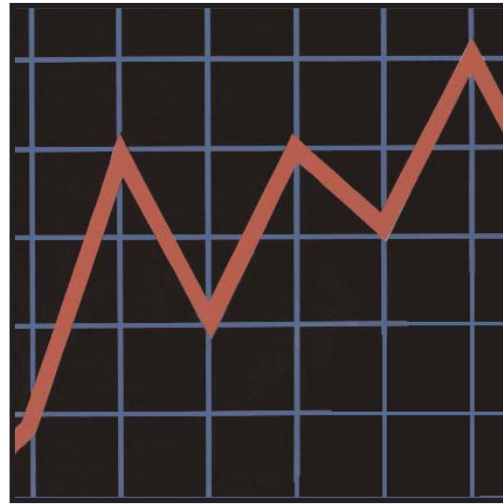


An Environmental Management System Troubleshooters' Guide for Local Governments



October 2002

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HOW TO USE THIS GUIDE

This Environmental Management System (EMS) Troubleshooters' Guide for Local Governments has been compiled from experiences and lessons learned through various EMS Initiatives for Government Entities. The practical data and case study material has been extracted from over 23 municipal, state, and local organizations which implemented EMSs as participants in these initiatives. The methodology employed in this guide reflects that utilized by GETF, and follows a "train-the-trainer" guidance approach. The document is structured to systematically lead a facility, by addressing the needs and issues that a facility might encounter, throughout the four phases of EMS implementation. The document has been designed to be "user-friendly" with each individual phase packaged as an individual workbook, complete with phase-specific documentation examples, case study materials, and troubleshooting guidance. We recommend utilizing one phase of the manual at a time, due to the breadth of information, detailed tasks, and systematic implementation structure. As each phase is completed, the individual "workbooks" should be maintained in a centralized location, such as a three-ring binder, for future reference by your organization.

This guide is not intended to be a "stand alone" EMS implementation manual, and we urge your organization to utilize each of the additional information sources highlighted throughout this document. For the user's benefit, we have included contact information for all of the contributors to this guide, links to valuable web resources, and references to additional implementation guidance documentation. In addition, this guide contains actual phase by phase sample documentation sourced from various contributors that have successfully implemented EMSs within their respective organizations. It is our hope that this guide will assist your organization and wish you the best in pursuing your own EMS implementation initiative.

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INTRODUCTION

Local governments are responsible for the management of their established institutions, centers, counties or cities, for the health and safety of their constituents, and for the protection of the environment in which they live. In addition, they face strong pressure to meet regulations from federal, state and local agencies. As a result, many local governments are turning to Environmental Management Systems (EMSs) as an efficient way to meet regulations, move beyond compliance and improve environmental performance.

Much of what you will read here is based on the experiences of the participants from the two EMS Initiatives for Government Entities funded by the U.S. EPA. This handbook is designed for local government officials who have an interest in developing and implementing an EMS within the framework of their organization. This is intended to steer local government officials through the EMS process and compliment various guidance documents already available. The authors have paid close attention to providing detailed information and case study examples/actual documentation examples pertinent to local governments and their unique issues. Please note that the handbook follows the ISO 14001 standard which is a voluntary international standard in the ISO 14000 series on environmental management.

Since 1997, the EPA, through a cooperative agreement with the Global Environment & Technology Foundation, has funded two EMS Initiatives for Government Entities to test the applicability and benefits of an EMS to local government operations. Through these pilot projects, 23 local government participants have received training and technical assistance to develop and implement an EMS within their organizations. Data and information collected through these projects suggests that an EMS is entirely applicable to operations managed by local governments. Participants found the EMS to be a useful tool for managing environmental issues, promoting compliance and pollution prevention approaches, increasing environmental awareness and stewardship, and improving operational efficiency and control.

HOW THIS GUIDE IS ORGANIZED

The handbook is organized to mirror the approach successfully used by the 23 public entities that participated in U.S. EPA's EMS initiatives - *U.S. EPA EMS Initiative for Local Governments* (June 1997 - July 1999) and *U.S. EPA EMS Initiative for Government Entities*. (February 2000 - March 2002). It reflects the most current benefits, lessons learned, and keys to success experienced by the project participants in these two initiatives in addition to those of other local governments that have implemented EMSs; on their own. The suggested EMS implementation approach follows four-phases based on the well-known management approach of "Plan-Do-Check-Act."

Following the sections titled **Background** and **Why Do Local Governments Implement EMS?**, this guide is divided into four sections labeled **Phases**. Each Phase represents one of the four EMS implementation stages. The individual analyses of each phase will include:

- ♦ Troubleshooting
- ♦ Mentor Tips/Quotes
- ♦ Questions to Address and Contemplate



Phase I - GETTING READY:

Activities in Phase I lay the foundation for the entire EMS implementation effort. Key issues, such as your decision for implementing an EMS in your organization and the benefits you expect to accrue need to be addressed. The organization's management requires briefing on the EMS and it is critical that their buy-in and support of the project is secured. Lead roles for key personnel will need to be designated as well.



Phase II - PLAN:

Phase II first explains how to assess and inventory the environmental impact of your organization. Once you have completed an impact assessment, you are guided to choose your "hotspots" or areas of most concern. Identifying your organization's regulatory requirements and keeping this information current is also important. In addition, you will establish an environmental policy which directs the EMS activities of your organization. Finally you will establish goals (e.g. objectives and targets) to improve upon your "hotspots" and fulfill the commitments of the environmental policy.



Phase III - DO:

During this phase of activities the organization develops programs to achieve its objectives and targets established in Phase II. In addition, it is important to develop documentation control procedures, develop documented work instructions or procedures, and train employees to ensure proper management of your environmental "hotspots." Managing records and the importance of communicating internally and externally will also be addressed. And although controls are put in place with the best intentions, you should be prepared for responding to an accident or emergency situation.



Phase IV - CHECK & ACT:

With your EMS foundation in place, plans to meet the objectives and targets and manage your significant aspects you will need to verify that progress is being made and responsibilities are being fulfilled. In Phase IV, your organization will assess whether it is meeting your regulatory requirements, meeting its objectives and targets, and confirm whether or not the EMS is in place and functioning properly. Management plays a critical role here by providing an overall evaluation the EMS status.

For each phase above, case study information included in this handbook will demonstrate how various municipalities and public entities have fulfilled their EMS requirements. A **troubleshooters guide** will assist readers with problems and questions that may arise throughout the implementation process.

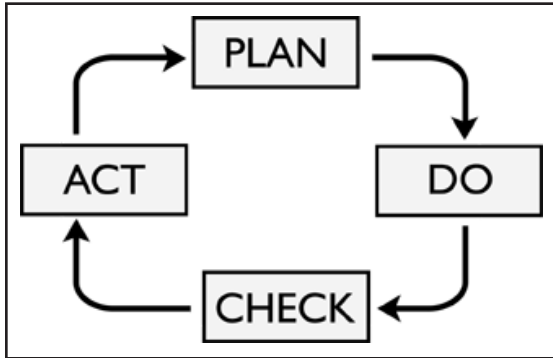
Appendices in the back of this handbook provide valuable reference material and resources for local governments which includes sample documentation for Phase II, III and IV.

BACKGROUND

What is an EMS?

An environmental management system, or EMS, is a set of problem identification and problem-solving tools that can be implemented by the employees in local government organizations in many different ways, depending on their activities and needs. An EMS successfully integrates environmental considerations into everyday business operations. Environmental stewardship becomes part of the daily responsibility for employees across the entire organization, not just in the environmental department.

Since its introduction in 1996, the most commonly used framework for an EMS is ISO 14001, which was developed by the International Organization for Standardization.



Based on the organization's core values and mission, employees analyze, control, and reduce the environmental impact of their activities, products and services and operate with greater efficiency and control. Local governments can evaluate the processes and procedures they use to manage environmental issues and incorporate strong operational controls and environmental roles and responsibilities into existing job descriptions and work instructions. They set objectives and targets for managing their environmental issues. They monitor, measure and evaluate their progress in environmental performance both in areas that are regulated and areas that are not (e.g. demand-side issues such as water or electricity use).

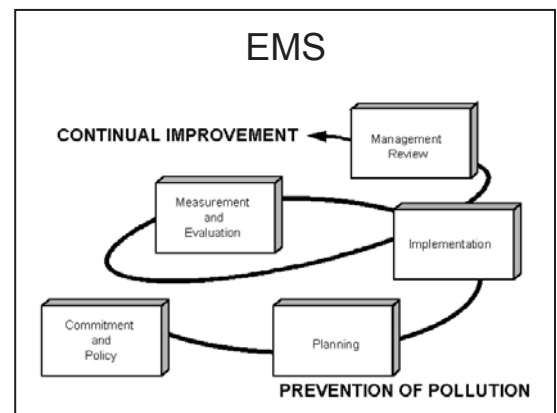
An EMS is not a substitute for regulatory requirements nor does it offer regulatory relief from the law. An EMS can improve an organization's compliance, pollution prevention and overall environmental performance and hopefully build greater confidence with local stakeholders. EMSs are proactive programs that identify and address the root causes of potential compliance problem areas and use pollution prevention approaches. Senior management plays an active role in the EMS by monitoring and measuring their organization's progress toward its environmental goals, and continually looking for ways to improve environmental management.

Federal and State Support for EMS

The US Environmental Protection Agency's (EPA) support for the voluntary adoption of EMSs has been evident since the mid-1990s. This support has taken the form of various EMS initiatives funded by EPA such as the National Biosolids Partnership, the EMS Pilot Project for Local Governments (August 1997 - July 1999), and the EMS Initiative for Government Entities (April 2000 - March 2002). EPA has also released various policy documents outlining its support for EMSs and the steps it will take to promote its adoption.

In May 2002, EPA released an EMS position statement signed by administrator Christine Todd Whitman that states:

"EPA will encourage wide spread use of EMSs across a range of organizations and settings, with particular emphasis on adoption of EMSs to achieve improved environmental performance and compliance, pollution prevention through source reduction, and continual improvement. We will support EMSs that are appropriate to the needs and characteristics of specific sectors and facilities."



"EPA will encourage organizations that use EMSs to obtain stakeholder input on matters relevant to the development and implementation of an EMS, and demonstrate accountability for the performance outcome of their EMSs through measurable objectives and targets. Additionally, we will encourage organizations to share information on the performance of their EMSs with the public and government agencies, and facilitate this practice where practicable."

The full EMS Position Statement can be found at www.epa.gov and www.peercenter.net

In 2000, EPA created The National Environmental Performance Track, which is designed to motivate and reward top environmental performance. A component of the Performance Track program requires that participating organizations have an EMS in place. Those that meet the programs criteria receive the following benefits: EPA recognition, low priority for routine inspections, and future regulatory incentives. State environmental agencies have instituted similar programs. For example, the Virginia Environmental Excellence Program (VEEP), Oregon's Green Permit Program, and New Mexico's Green Zia Program. All three programs require that participating organizations have an EMS in place.

The White House Council on Environmental Quality (CEQ) has also been very supportive of EMSs. In April 2002, CEQ Chairman James L. Connaughton and the Office of Budget and Management (OMB) Director Mitchell Daniels sent a memorandum to the heads of all federal agencies emphasizing the importance of developing EMSs. This is a continued effort to encourage federal facilities to adopt EMSs as required by Executive Order 13148, *Greening the Government through Leadership in Environmental Management*.

WHAT'S INVOLVED IN EMS IMPLEMENTATION?

- ♦ **IMPACT** - Understanding how your operations and activities impact the environment.
- ♦ **RISKS** - Evaluating the extent of risks posed by environmental issues.
- ♦ **COMMITMENT** - Defining an environmental policy that guides the organization's approach and commitment to environmental management.
- ♦ **PROCEDURES** - Establishing and maintaining specific procedures to ensure that work activities minimize or eliminate a negative impact to the environment.
- ♦ **RESPONSIBILITIES** - Communicating responsibilities and work instructions throughout the organization and training employees to effectively carry out their obligations.
- ♦ **PERFORMANCE** - Monitoring and measuring performance against established standards and indicators.
- ♦ **COMMUNICATION** - Communicating with people inside and outside the organization about the organization's progress.
- ♦ **CONTINUAL IMPROVEMENT** - Continue to revise and improve the system based on the monitoring results.

WHY DO LOCAL GOVERNMENTS IMPLEMENT AN EMS?

Many factors motivate municipal organizations to adopt an EMS.

Cities/counties as leaders and innovators: They would like to play a strong role in leading and mentoring their communities in environmental stewardship initiatives.

"I think Jefferson County had a rare opportunity to lead by example in implementing an EMS, becoming the first county in the nation to be registered to the ISO 14001 Standard. Frankly, the reputation of many southern municipalities is less than wonderful when it comes to environmental issues. Jefferson County, Alabama got a chance to demonstrate not only its active concern about these matters, but to pioneer the way for other local public sector organizations."

- Len Gedgoudas, Director of Fleet Management, Jefferson County, Alabama

Compliance assurance: Concerns for potential environmental problems, incidents and enforcement actions.

"The EMS has provided us a consistent method for finding the root causes of our noncompliances. We are no longer applying reactive quick fixes for violations, but are seeking to eliminate the causes of these violations and prevent future occurrences. Training, communication, monitoring and measuring, and regular management review are the EMS tools we use everyday that make this possible."

Management confidence: Management wants assurance that their organization is adequately handling its environmental responsibilities and identifying opportunities for improvement.

The City of San Diego identified several factors that led to their decision to design and implement an EMS. The city hoped to improve employees' participation in environmental performance as well as improving the city's overall environmental performance. In addition, the adoption of an EMS is consistent with the city's environmental principles and potentially provided San Diego with a competitive advantage on issues such as privatization. The availability of government assistance programs to aid in EMS development made the adoption of an EMS attractive for the City of San Diego. An EMS was also viewed as a valuable public relations tool.



City of San Diego



For more information, please contact
Mark ZuHone at 858-573-1247 or
MZuHone@sandiego.gov

"As a manager my skills have improved as a result of an increased understanding of the organization and its environmental issues. My knowledge about operations has been broadened and I have an increased understanding of technical and personnel issues."

- Timothy Hall, Superintendent - Massachusetts Correction Institute, Norfolk, MA

Organizational factors: Better efficiency, worker health and safety concerns, employee morale, and reduced costs.

"The decentralized structure of the Division compliance system had always presented challenges to keeping up to date on changes in regulations. There was no central area to track, find and update the permits and regulations. Many permits and regulations were not assigned as a responsibility to a specific member of the division, but were assigned based on who was available to do the work when the renewal came up. According to our research several employees held different information about similar permits without uniform communication and planning. Review of the existing compliance program revealed significant opportunity for improvement resulting in a new streamlined process that has saved significant man-hours."

- Pam Badger, King County Solid Waste Division - Seattle, WA

Public image concerns: Improving relationships with neighbors, the surrounding community, and counteracting negative press.

"Local governments often have difficulty maintaining a positive public image. The media often capitalizes on the negative instead of the positive. The ISO 14001 environmental management system is the tool we decided to use to show our Berkeley citizens and businesses that we voluntarily do the right thing - walk the walk - and not only pass legislation mandating that they do the same. The EMS provides ongoing opportunities to improve our public image as a government agency and helps provide a positive image for the whole organization."

- Wanda Redic-Bland, City of Berkeley Solid Waste Management Division

Privatization issues: Remaining competitive with private industry or privatized operations.

"The adoption of an EMS is consistent with the city's overall environmental principles and provides San Diego with a competitive advantage on issues such as privatization."

-City of San Diego Refuse Disposal Division



**Tri County Metropolitan
Transportation District**

Tri-Met identified several critical factors that led to the decision to design and adopt an EMS within their 8 maintenance facilities. Tri-Met observed that the adoption of an EMS presented the potential to lead to regulatory benefits and enhanced relationships with regulators from the U.S. Environmental Protection Agency's (EPA) Performance Track and the Oregon Department of Environmental Quality's (DEQ) Green Permits. After considering green building initiatives, LEED certification and Energy Star Buildings the EMS structure was seen as an opportunity to transition easily into these programs. Tri-Met also identified several internal drivers that offered similar benefits for the environment:

- ♦ Improved employee participation in the facility's environmental performance;
- ♦ Improved overall environmental performance;
- ♦ Improved facility compliance with environmental regulations; and an opportunity to use employee creativity to move beyond regulations.
- ♦ Increased support from environmental professionals including U.S. EPA, U.S. Department of Energy, and/or Department of Environmental Quality.
- ♦ Executive order from Governor mandating sustainable state offices by 2025.

For additional information, please contact Kevin Considine, Tri-County Metropolitan Transportation District Portland, OR at 503-962-2471 or considin@trimet.org

BENEFITS OF AN EMS

Local governments continue to realize numerous economic and environmental benefits from implementing an EMS in their organizations. In fact, EMS implementation within a diverse group of local government organizations has shown consistent short-term and long-term returns on investment that substantially outweigh the costs of implementation. Along with improved environmental performance many find that they can also reduce operating costs, improve public image, and diminish liability and risk within multiple workplaces.

The obvious first step in EMS Implementation is to achieve "buy-in" within your organization, especially in regards to top management. We acknowledge that this can be a formidable task; however, as is apparent from the following practical examples of environmental and economic benefits, momentum is building among local and state governments to develop and implement EMS. We encourage you to reference the benefits accrued by these organizations in building a solid business case within your own organization, and showcasing EMS implementation as a proven return on investment. In addition, we have added contact information for each of the organizations represented throughout the various case study materials, and would urge you to utilize these experienced individuals as mentors and leverage in promoting your own EMS initiative.

The following lists several broad benefits of EMSs with accounts from EMS implementers.

1. Resource Savings (Natural, Monetary)

"In terms of water use reduction, we eliminated 100% potable water use from our greens, dirt and trash operations which equates to 31 million gallons of potable water saved. For fuel use and emissions, we saved 90,000 gallons of diesel and 9 tons of CO2."

- City of San Diego Refuse Disposal Division

"We saved \$706,000 in heavy equipment rates by shutting off equipment during breaks and lunch periods. An additional \$80,000 was saved in diesel costs thanks to these shutdowns."

- City of San Diego Refuse Disposal Division

"We moved forward with a recycling program for lab waste that has diverted 18,000 lbs of waste from the landfill in a three-month period."

- Massachusetts Department of Environmental Protection- Wall Experiment Station Laboratory

"Systematically analyzing compliance issues revealed an opportunity to save money. Fifteen departments were responsible for obtaining their own air quality permits - 23 all together. The implementation team consolidated these permits into 8, saving the city \$16,000 per year in permit fees."

- City of Scottsdale, AZ

2. Financial/Insurance Reductions

"Many people hear 'environmental management' and immediately think two things: bureaucracy and expense. But the EMS effort for us yielded dozens of real world, long-term cost savings in areas like reduced power and water use. Perhaps even more significant is the possible impact on our bond ratings. Rating agencies recognized that, in taking time to examine how we did our-day-to-day business, Jefferson County had created a workplace that was less likely to generate injuries or serious environmental accidents. Less risk means greater opportunity for return on an investment. We're told the potential impact of our EMS, taken with other factors, is a 1/16th to 1/8th of a point improvement, which could mean millions of dollars of taxpayer money saved each time we borrow money for capital projects. Now, that's the kind of documented savings that makes elected leaders and the public both very happy."

- Jefferson County, Alabama

3. Improved Relationships with Regulators

"Our discharges are heavily regulated. The regulating agencies are responsible for well over 3000 wastewater treatment plants across the Commonwealth of Kentucky. I'm convinced that when the regulators see all the effort that we've invested into our EMS, they see us as doing our best to achieve the same goals they have for Kentucky's streams and rivers, and are less likely to clobber us when we have an occasional accident."

- Louisville/Jefferson County Metropolitan Sewer District, Louisville, KY

4. Operational Consistency

"Before the EMS, there were policies, work instructions and standard operating procedures scattered throughout our facilities. Some were written, some were unwritten but there was no consistency - no one place to find the answers to all those environmental questions. This inconsistency caused employees to do things differently from one facility to the next as they signed onto positions. Now that managers, supervisors and frontline staff know their EMS responsibilities, we are recognizing the benefits of these consistent best management practices in our operations."

- Tri-County Metropolitan Transportation District, Portland, OR

5. Labor-Management Improvement

"The first aim of the City to embrace EMS in the operations of its various departments was to bring the City into conformance with environmental regulations. Detroit being the epicenter of the Big Three Automobile companies and with these companies being the cheerleaders of EMS in their operations, Detroit cannot lag behind in its efforts to be in the forefront as a leader and innovator of EMS implementations for City governments."

Detroit was fully aware that to usher in EMS principles, it had to get its employee's involvement and whole hearted participation. Thus, the City's EMS Initiative began with a meeting of the EMS Core Team and the employees of the fenceline departments. The meeting was an opportunity to highlight the "pros" of the project and provide definite clarifications to the "concerns or fears" of the employees. We believe in our first conviction "employee buy in" was an integral aspect of the success of the EMS project in a unionized work force is a valid one."

- Environmental Affairs, City of Detroit

6. Environmental Efficiencies

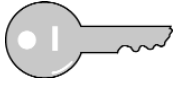
"Tri-Met's EMS set an objective and target related to resource conservation which included our diesel, electricity, natural gas, and water usage. The [target] goal was 10% savings for one year and each facility was responsible for finding creative ways to achieve these savings. After changing procedures, communicating the goals and monitoring results, the total operational savings for one year resulted in monetary savings of approximately \$63,631."

- Tri-County Metropolitan Transportation District, Portland, OR



KEYS TO SUCCESS

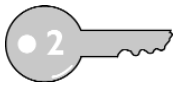
Local governments describe four keys to success, as follows:



TOP MANAGEMENT COMMITMENT AND SUPPORT IS ESSENTIAL TO THE SUCCESS OF THE EMS PROCESS.

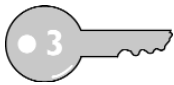
Employees are always eager to determine who is leading the charge for a new initiative. If management is visibly involved, there is a clear indication that the initiative has a high priority and deserves employee attention. In a local government entity, it is particularly useful for facility managers and political leaders to be united in their support and involvement in the EMS.

Top managers must be sufficiently prepared to understand and take on their leadership roles. Many take their EMS training along with the Core Team. Topics that should be addressed in EMS training include an understanding of the EMS principles and requirements; top management roles and responsibilities; the implementation schedule; human and financial resource requirements; and, the change in management issues that will be involved in EMS implementation. The Core Team can help management stay involved by communicating regularly and frequently about the progress of the EMS and the organizational benefits accrued during development and implementation. Above all, managers will convince employees that the EMS is a priority more by their deeds than their words.



ORGANIZATIONS WHO BUILD ON EXISTING ORGANIZATIONAL PROCESSES AND PROCEDURES ARE MORE SUCCESSFUL THAN THOSE WHO START FROM SCRATCH.

Most every organization has a system for managing environmental issues - some more successful than others. Most already have in place about 85% of the elements required by the EMS. Rather than re-creating what already exists, efforts should be concentrated on reevaluating the usefulness of existing processes, making revisions as appropriate, eliminating redundancy, and improving communication and access to the information throughout the organization. An EMS is a dynamic system that relies on continual improvement of management processes and matures over years of implementation - therefore the goal is to build on what exists and improve over time.

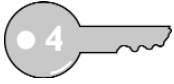


THE CORE TEAM IS PIVOTAL TO THE SUCCESS OF THE EMS PROGRAM.

Team members should be selected for their organizational knowledge, their excellent interpersonal, organizational, and communication skills; and, their strong project management ability. All of the departments of the fenceline should be represented on the Core Team. The team leader, called the EMS Management Representative, or EMR, is delegated the necessary authority to implement the EMS, and in fact the entire team must be empowered with authority as well as responsibility.

The Core Team functions in an advisory capacity, developing the project plan, enlisting buy-in from employees, collecting EMS information and disseminating it across the organization, and providing guidance and leadership as the requirements are being addressed by employees throughout the fenceline. Core Teams need in-depth EMS training to ensure that they have a clear understanding of the intent of the EMS and how each of the elements can be integrated with the current programs.

The size of the Core Team will vary depending on several factors, including size of the defined fenceline, nature of the specific process within the fenceline, existing management infrastructure, and the efficiency with which the EMS is implemented. From information gathered through two EMS Initiatives for Government Entities, Core Teams generally range in size from 2-12 people, with an average size of 7 team members. The size of your Core Team will depend heavily on your organizational structure, specific personnel skills and expertise, and your organization's available resources.



**EMPLOYEE AWARENESS, UNDERSTANDING AND INVOLVEMENT IN THE EMS
EXTENDS ACROSS THE ENTIRE ORGANIZATION AND IS RECOGNIZED AS AN
ORGANIZATIONAL PRIORITY.**

Involving employees in the EMS from the very beginning of the process builds understanding, involvement and commitment for the EMS and helps to institutionalize the EMS into the organizational culture. Employees are the ones who know their operations best and will be carrying out the programs, measuring the progress, and ultimately achieving the goals. One of the central precepts of the EMS approach is that environmental stewardship is the responsibility of every employee in the organization. Employees come to realize and take pride in the active role they play in the organization's efforts to protect the environment. EMS awareness takes time to filter throughout the organization and for employees to become comfortable with new ideas and responsibilities. Employees who are involved in the EMS process and the development of procedures and work instructions in their respective departments are more willing to accept organizational changes inherent in the EMS implementation. Managers who expect EMS involvement across the entire organization and who acknowledge employee contributions have good success in achieving this culture change. Regular communication about benefits and successes of the EMS is also important to building motivation and commitment. Employees will take their cue from management, whose job it is to develop enthusiasm and commitment for environmental protection.

SUGGESTED IMPLEMENTATION TIMEFRAME

It is recommended that a local government implement an EMS over a two-year timeframe through four separate phases. This amount of time should allow an organization to devote significant energy to each of the four phases necessary to fully develop and execute an EMS. Participants of the two US EPA EMS Initiatives for Government Entities agree that two years is sufficient time to implement an EMS. Following is a list of activities that fall within each phase.



Phase I: GETTING READY - Developing Project Infrastructure (4 months)

- ♦ Selecting a project scope ("fenceline").
- ♦ Establishing an EMS program infrastructure: allocate resources, appoint an Environmental Management Representative (project manager) and select a Core Team to lead the EMS effort.
- ♦ Conducting an analysis (referred to as a "gap analysis") to determine what EMS processes and procedures the organization may already have in place and what may need to be created.
- ♦ Defining and documenting the implementation team's roles, responsibilities and authorities.
- ♦ Confirming top management understanding and commitment.
- ♦ Planning an EMS "kickoff" for familiarizing employees across the organization with the EMS concept and getting employee buy-in.



Phase II: PLAN - Significant Aspects and Objectives and Targets (6 months)

- ♦ Determining a procedure for understanding and communicating legal and other requirements.
- ♦ Conducting a thorough inventory of the environmental aspects (both regulated and non-regulated) of their operations, activities, and services.
- ♦ Developing criteria for determining the "significance" of their environmental aspects and identifying them based on these criteria.
- ♦ Setting realistic objectives and targets in conjunction with significant aspects and environmental policy commitments.
- ♦ Drafting and communicating an environmental policy.



Phase III: DO - Managing the Environmental Hotspots (8 months)

- ♦ Developing environmental management programs (EMP) to accomplish the established objectives and targets.
- ♦ Identifying operational controls and developing documented procedures to manage identified significant environmental aspects.
- ♦ Establishing procedure(s) to ensure that documentation is controlled (i.e. current).
- ♦ Managing records.
- ♦ Identifying roles and responsibilities pertaining to the management of significant environmental aspects and EMS specific related activities.
- ♦ Training all personnel.
- ♦ Establishing internal and external lines of communication.
- ♦ Preparing for emergencies and unexpected accidents.



Phase IV: CHECK & ACT - Monitoring and Measuring and Management Review (6 months)

- ♦ Monitoring and measuring progress toward achieving objectives and targets.
- ♦ Determining the organization's compliance status.
- ♦ Ensuring that instruments used for monitoring and measuring are calibrated.
- ♦ Conducting internal EMS audits.
- ♦ Developing and implementing procedures for handling EMS nonconformance.
- ♦ Initiating a management review cycle.

ORGANIZATIONAL RESOURCE COMMITMENT: WHAT WILL IT COST ME?

The following section provides average resource commitments for implementation of an EMS over a two-year period. The data was collected from twenty-three individual organizations that participated in the two US EPA EMS implementation initiatives for local government entities. The participants were asked to select a department, division, or operation to which they would apply their EMS, called their "fenceline". The number of employees included within each individual fenceline ranged from 15 to approximately 1,500 individuals. The organizations started with smaller fencelines, which allows for the opportunity to capture lessons learned, keys to success and good practices that could be applied as the scope of the EMS is expanded to additional operations within their organization. Each of the participants submitted quarterly reports detailing information on the following:

1. *Time Committed: personnel involved by title and their respective hours*
 - a. Top Management
 - b. Environmental Management Representative(s)
 - c. Core Implementation Team
 - d. Specific Expertise Personnel: Legal, Human Resources, Maintenance, Interns, and Consultants
2. *Costs:*
 - a. Total Labor (internal): determined by the hourly rate of all employees involved in developing and implementing the EMS
 - b. Consultant Fees
 - c. Travel
 - d. In-kind Contributions from Outside Organizations
 - e. Materials: promotional materials, software, etc...

The bulk of the financial resources that participants invested involved direct labor costs. On average, each of the 23 participants committed 3,074 direct labor hours totaling \$95,275 in internal costs over the two-year period.

	Hours Committed (two-year period)	Cost (two-year period)
First Initiative	2,133 hours	\$67,901
Second Initiative	4,331 hours	\$126,223
AVERAGE TOTAL	3,232 hours	\$97,062
Range		
Low Values	716 hours	\$27,000
High Values	6,267 hours	\$195,565

The majority of the direct labor hours committed by an individual organization are the responsibility of the Environmental Management Representative(s) (EMR) and the Core Team. The EMR is the person or persons who lead the EMS implementation within an organization. The Core Team functions in an advisory capacity, providing vital leadership in planning the EMS project, delegating tasks, establishing deadlines, collecting and evaluating work products, and providing training, guidance and assistance where needed.

The following table presents the breakdown of hours committed in relation to position responsibility. The averages were calculated from the second initiative participants and are based on an overall average commitment of 4,331 direct labor hours.

	Average # of Individuals per Organization	Average Hours Committed per Individual (two-year period)
EMR(s)	2	987 hours
Core Team	7	223 hours

In addition to the EMR(s) and the Core Team, city government personnel, community activists, administrative support staff, legal departments, and environmental managers contributed time to the EMS development.

CONSULTANTS

Nine of the twenty-three participants utilized the services of consultants to address specific needs in their EMS implementation. The services provided by each consultant were similar for all nine participants; however, each of the participants utilized these services at varying points and degrees throughout the EMS implementation process. Consultant services included: training (awareness and internal EMS audit); documentation review; support with developing policies; procedures; and, work instructions, as well as technical assistance. The average cost for the consultant services, over the two-year period, was \$26,519.

	Cost (two-year period)
First Initiative	\$41,400
Second Initiative	\$14,614
AVERAGE TOTAL*	\$29,834
Range	
Low	\$3,200
High	\$143,000

* It should be noted that one participant chose to rely heavily on consultants to develop their EMS, utilizing consultant services for 1,100 hours at a total cost of \$143,000. Therefore, without including this participant, the average amount spent for consultant services among the remaining participants was \$11,959 over the two-year period.

The use of outside consultants depends upon the capacity of each individual organization; however, it is not, in most cases, necessary to rely on consultants to develop an effective EMS.

The division of data by other means, such as similar process characteristics (i.e. wastewater treatment facilities), proved fruitless due to the fundamental differences among individual EMSs and the limited number of participants within the initiatives.

RETURN ON INVESTMENT

While the decision to develop and implement an EMS entails a commitment of time and monetary resources, EMS implementation within a diverse group of local government organizations has shown consistent short-term and long-term returns on investment that often substantially outweigh the costs of implementation. In addition to economic savings, public organizations have also realized a wide-range of other significant benefits, including improved relationships with regulators and external stakeholders, sound risk management practices which can often help avoid costly mistakes, increased use of pollution prevention, enhanced operational efficiency and control, and better public perception and image.

The following organizations represent prime examples of this positive return on investment from EMS implementation:

Tri-County Metropolitan Transportation District

The Tri-County Metropolitan Transportation District, Oregon's largest public transit agency, designated the organization's 5 maintenance facilities as their EMS fenceline. Over the two-year project period, Tri-Met committed \$89,241 in direct labor costs. However, in just over one year into the EMS implementation, Tri-Met was able to identify \$300,000 in operating savings, \$66,000 of which was directly attributable to meeting their defined EMS energy conservation objectives and targets. The organization was also pleased to achieve better-defined roles and responsibilities resulting from the EMS implementation process, which has allowed employees the freedom and empowerment to design systems to fit their practical needs rather than being based solely on regulatory compliance.

City of San Diego

The City of San Diego defined the Refuse Disposal Division as their EMS "fenceline." This division is responsible for the city's only active municipal landfill, as well as the maintenance of six closed landfills. The Division committed \$213,908 in direct labor costs over the two year EMS implementation period. With an annual operating budget of almost \$18.7 million, the Division expects an on-going annual cost savings of approximately \$868,000 from the successful implementation of the EMS. The majority of the savings have been achieved through more efficient use of heavy equipment, fuel, and water. These achievements have resulted mainly from increased employee awareness, empowerment, and enthusiasm which has continued to prompt many employee-initiated operational changes. The Division is also the first public refuse disposal division in the U.S. to achieve ISO 14001 certification.

New Hampshire Department of Transportation

The New Hampshire Department of Transportation selected its Bureau of Traffic as an EMS Pilot Facility, in the hope that lessons learned could be employed for the entire organization. The Bureau falls under the Operations Division and represents an ideal microcosm of the DOT. Over the two-year EMS implementation period, the Bureau dedicated \$96,817 in direct labor costs. The Bureau has experienced a variety of benefits directly related to EMS implementation. For example, the Bureau has created more efficient training programs through combining existing programs and refining the operational requirements and documentation controls. The restructuring of these programs is expected to save the equivalent of 127 employee workdays per year.

In addition, the Bureau has implemented several programs as a result of the EMS implementation process, including a sign material recycling process calculated to save \$22,992 and an on-site waste paint treatment program calculated to save \$40,324 over the first five years. The Bureau, after this initial five year period, expects to save approximately \$20,000 per year through the combination of these two programs. Following the successful EMS implementation, the New Hampshire Department of Transportation plans to pursue ISO 14001 certification in 2003.