

CASE STUDY 7

New Hampshire Department of Transportation (NHDOT) Environmental Management System for Traffic Bureau

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EMS STATUS	Implemented (at least in part).
FOCUS	Pavement marking and sign fabrication operations conducted by the Bureau of Traffic.
DOT's BASIS FOR SELECTION OF FOCUS	The NHDOT EMS was developed at the Bureau of Traffic as part of a consent decree. The consent addressed the management of hazardous wastes generated in pavement marking/traffic line painting activities. The EMS lessons learned are being used in other NHDOT units to support continuous improvement efforts.
RELEVANCE TO THE EMS PROCESS ROADMAP	NHDOT EMS development and implementation efforts reflect virtually all steps presented in the AASHTO EMS Process Roadmap.
ACCOMPLISHMENTS AND BENEFITS	<ul style="list-style-type: none">• Evaluated 32 operational activities within the Bureau of Traffic to identify significant aspects of their operations. The resulting "Process Flow Diagrams" have supported development of EMS, job hazard analyses, and NPDES Phase II site evaluations.• The Bureau uses water based pavement marking paints, and cleans its equipment with water. EMS planning, opportunities identification, benefit characterization, and implementation processes supported investment in equipment that separates that removes paint waste from the washwater, and allows the remaining water volume to be lawfully discharged into the municipal sewer system. The removed solids are recycled into plastic products. This has resulted in savings of over \$25,000 annually in material disposal fees.• Sheeting materials are hydrostripped from worn aluminum traffic signs by a contractor, and the aluminum sign blanks are returned to the Bureau for reuse. This has resulted in lower resource use, and lower cost to deploy signing, since the reused blanks are 40% less costly than new material. The goal is to steadily increase the use of recycled material as experience is gained with this process (the Bureau is nearing its reutilization target of 95%).• EMS deployment has been combined where possible with health and safety program deployment to minimize the impact on productivity and increase the linkage between the two functions. As a result of these efforts, several important elements of department activities (environment, health, and safety) to be addressed in one operational document.• EMS procedures, processes, and tools have been used to address National Pollutant Discharge Elimination System (NPDES) Phase II compliance at maintenance sites within the Division of Operations to begin the further deployment of the system in the department.
IMPLEMENTATION NEEDS	<ul style="list-style-type: none">• Obtained external consulting assistance (approximately \$20,000) to initiate and complete the EMS development. The assistance was obtained through a grant program with the US EPA.

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IMPLEMENTATION NEEDS (cont'd)

- Bureau of Traffic direct line employees invested many hours as part of an “implementation team” that documented current work practices at the shop floor level. With the templates developed by this team it is expected that subsequent EMS implement efforts will require significantly less time.
- Sufficient new staff resources are required to maintain written procedures, support program development, support the internal audit function, and maintain records needed to perform performance measurement and corrective action tasks.

KEYS TO SUCCESS

- Top management “buy-in” to the purpose of EMS and the continuous improvement approach to management.
- Sufficient initial training to understand the ISO 14000 standard and principles of continuous improvement management systems.
- Appreciation of the cultural changes required to move from a hierarchical “top down” management system to a team driven system using continuous improvement principles.
- Minimize the impact of EMS implementation to productivity when possible.
- Development of internal performance auditing capability to “find-and-fix” issues that arise within the system, as opposed to traditional compliance audits which assign blame for non-compliance.
- Starting the EMS effort in a manageable area to gain experience and to show gains quickly.
- Involve staff at all levels in the process of identifying environmental aspects and developing the EMS.

BACKGROUND, ADDITIONAL INFO

The initial EMS development efforts were limited to the Bureau of Traffic. NHDOT is beginning to expand the use of EMS to address National Pollutant Discharge Elimination System (NPDES) Phase II compliance at maintenance sites within the Division of Operations.

We have found that information technology is very important to the development and deployment of the system. The software provides a means to collect documentation of policies and procedures that already exists and organize it for use in the EMS. We recommend that each agency examine commercially available software for ISO 14001 to understand how each of the core requirements of the system must be documented, and to see if the tool will assist in their efforts.

The greatest strength of an implementation team is their detailed understanding of how a task is actually performed on a daily basis. We document their work using step by step diagrams. We are using the diagrams as visual aids in training and in the workplace to emphasize the steps required to perform tasks safely and in an environmentally conscious manner.

A key to continuous process improvement is performance measurement. We are documenting all EMS work instructions in the format used by our Maintenance Activity Tracking System (MATS) to assure that we have the data to analyze.

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CONTACT(S)

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EXAMPLE TOOLS, PROCEDURES

- Exhibit 1, the NHDOT Environmental Policy, demonstrates the commitment of top management to the EMS.
- Exhibit 2 provides an excerpt of the Procedure for Determining Environmental Aspects and Significant Aspects which was used to evaluate operations, identify impacts, and prioritize EMS actions.
- Exhibit 3 provides an example of an objectives/target statement that includes responsibility assignments, resource needs, schedule, and approach.

NHDOT developed its EMS through the combined efforts of staff, and the second two year project of the US EPA to sponsor the EMS Pilot Project for Local Governments. The products of this effort are available online at the PEER Center, see <http://www.peercenter.net>. We will provide updated materials to the PEER Center as they are adopted.

CASE STUDY 7 Exhibit 1

Environmental Policy

Statement:



In the performance of its portion of the Department's mission, the Bureau of Traffic is committed to the prevention of pollution. The Bureau will strive to manage its activities to meet or exceed compliance with applicable laws, regulations and environmental performance standards. The Bureau commits itself to continual improvement through regular review of its activities, and the implementation of programs that will, where possible, reduce or eliminate the negative impacts of those activities upon the environment.

Comments:

(a) The purpose of this policy is to establish at the Division of Operations, Bureau of Traffic, an Environmental Management System designed in conformity with the ANSI/ISO Standard 14001-1996, entitled, "Environmental Management Systems Specification with Guidance for Use".

(b) This policy applies to the statewide operations of all employees of the Bureau of Traffic, both as they perform their direct service duties, and in the management of contracted services.

(c) These words shall have the following meaning in this policy:

"Environment" means the air, water, and soil of the State of New Hampshire that is or could be impacted by the activities of employees of the Bureau of Traffic as they perform their direct service tasks or manage the activities of contracted services.

"Environmental Aspect", or "aspect" means any element of the Bureau of Traffic's activities, products, or services that can interact with the environment.

"Environmental objective", or "objective" means a specific and measurable operational goal that the Bureau of Traffic commits to achieve as a result of its implementation of this environmental policy.

"Environmental Management System" means that portion of the overall management structure of the Bureau continually devoted to planning, determining responsibilities, implementing practices, allocating resources, and reviewing attainment of the environmental objectives set in accordance with this policy.

"Impact" means any change to the environment, whether adverse or beneficial, wholly or partially resulting from the Bureau's operational activities or management of contracted services.

"Pollution Prevention" means the use of processes, materials, or products that avoid, reduce, or control adverse impact to the environment, and also result in improved efficiency and reduced costs.

d) The Commissioners shall determine, acquire and allocate the resources required to implement this policy. To support this effort, they shall name a person to serve as the Environmental Management System Manager. This person is responsible to:

1. Assist in the development and implementation of environmental management system procedures.
2. Assist staff of the Bureau of Traffic in the identification of environmentally significant aspects of operations, and identification of the impacts such activities have or could have upon the environment,
3. Facilitate the efforts of the Bureau to determine, set and measure objectives, targets, and management plans arising out of the implementation of this policy.
4. Develop and distribute materials to make all employees, contractors of the Bureau, other persons or agencies directly impacted by department activities, and the general public aware of this policy; and
5. To perform such other duties as may arise from time to time in furtherance of this policy, including preparation of such reports as the commissioners may request to document efforts in the prevention of pollution and continual improvement of the environmental performance of the Bureau.

(e) With the assistance of the Environmental Management System Manager, the Bureau Administrator shall develop a set of written system procedures that:

1. Identify the legal and other compliance requirements imposed by applicable laws, regulations, or agreements made by the Bureau;
2. Identify those aspects of Bureau activities that have or could have a significant impact upon the environment;
3. Specify a means to identify, set, implement, and measure achievement of specific environmental objectives and targets for the Bureau;
4. Specify a means to document and maintain a record of activities undertaken in furtherance of this policy;
5. Specify the means to make all Bureau employees, other persons affected by the environmental aspects of the bureau, and the general public aware of this policy; and
6. Specify accountabilities for compliance with this policy and written system procedures applicable to the Bureau of Traffic.

(f) As a condition of employment, all employees of the Bureau are required to participate actively in environmental management system programs, and follow policies, procedures, instructions, and/or rules adopted to comply with applicable laws, regulations, or environmental performance standards imposed by governmental agencies charged with the enforcement of those laws.

Cooperation between management and employees is necessary to meet this work standard. Following completion of training, all employees of the Bureau of Traffic are responsible to be aware of the existence of this policy, and its principles of pollution prevention. This level of awareness may be tested at any point in time. Disciplinary action, up to and including dismissal, will be taken in cases where it is determined that disregard for environmental responsibilities has occurred. Disciplinary action will be taken in accordance with the New Hampshire Division of Personnel Administrative Rules, Chapter

Carol A. Murray
Commissioner

Adopted: September 21, 2001 Revised:

CASE STUDY 7
Exhibit 2

Procedure for Determining Environmental Aspects and Significant Aspects

Number: EMS-CH500- System - 54 - 02	
Title: EMS Procedure for Determining Environmental Aspects and Significant Aspects	
Date of Adoption:	12/12/01
Date of Revision:	
Prepared By:	EMS Program Manager
Reviewed By:	Implementation Team
Approved By:	Lyle W. Knowlton Director of Operations

Document Control:
_____ The secured hard copy signed, dated, and stamped "Official Document" shall be the controlled document and shall be maintained by Hearings Examiner.
_____ This document and the on-line version are copies of the secured hard copy controlled document.
_____ Duplicate copies may be made and distributed, however, users must assure themselves the copied document is the current controlled copy.
_____ Earlier versions of this document are obsolete and should be removed from points of use.

Distribution:
_____ NHDOT intranet; bulletin boards _____
_____ Administrators: _____
_____ Supervisors: _____
_____ Employees: _____
_____ Other: _____

Amendments:
Summary:

1.0 Purpose

The Bureau of Traffic will establish and maintain an Environmental Management System, in accordance with ISO 14001. Pursuant to ISO 14001 § 4.3.1, the Bureau has established and adopted the following procedure.

This procedure is to establish a method to analyze and identify environmental aspects of the Bureau of Traffic's activities, products, and services over which it can control or influence. It also

describes the process for determining aspects that have a significant impact upon the environment.

2.0 Scope and Applicability

This procedure applies to the Bureau of Traffic and its statewide operations.

3.0 Reference

This document utilizes references from the following sources:

Environmental Policy
EMS Legal and Other Requirements System Procedure
ISO 14001 § 4.3.1
Significance Matrix
Significance Matrix Definitions
EMS Document Control System Procedure

4.0 Policy

The Bureau of Traffic shall annually review and analyze its statewide operations to identify aspects of operations that have a significant impact upon the environment.

5.0 Definitions

- a. Implementation Team: means a team comprising of the supervisors within the Bureau of Traffic.
- b. Environmental Aspect: means any element of the Bureau's activities, products or services that can affect the environment.
- c. Environmental Impact: means any change in the environment, whether adverse or beneficial, wholly or partially, resulting from the Bureau's activities, products or services.
- d. Significant Aspect: means an environmental aspect that has or can have a significant environmental impact.
- e. Significance Matrix: means the matrix developed by management.

6.0 General Provisions

6.1 Operational Procedure

The Bureau of Traffic Implementation Team shall consider the following in determining whether an aspect of activities, products, or services constitutes a significant impact upon the environment:

- a. Any activity of the Bureau, which is expressly regulated by Federal or State laws, rules, or regulations.
- b. The use of an unregulated product that exceeds 100 gallons per year, or exceeds \$10,000 in annual cost.
- c. Any operation that discharges to surface water any material in excess of 25 gallons, that is not immediately contained and removed within 24 hours, and that has an adverse impact on surface or groundwater, or
- d. Any stream of solid waste that exceeds 2000 pounds a year.

The Implementation Team shall:

- a. At least annually, review and update process flow diagrams illustrating each operation of the Bureau that generates a significant impact on the environment as defined in above.
- b. Review applicable legal and other requirements, as they apply to identifying significant aspects.

- c. Analyze all aspects of the Bureau's operations using the process flow diagrams, and other tools devised by management, such as the Significance Matrix, to assist them in identifying potential environmental aspects and impacts.
- d. After reaching a consensus as to the environmental aspects and impacts of their operations, and applying the significance aspect criteria, identify significant aspects of their operations.
- e. Develop a list of significant aspects. The list shall be reviewed at least annually to ensure that they are current and accurately reflect their operations.

6.2 Required Employee Training

Implementation Team training shall be arranged by the Bureau Administrator from the Department's Environmental Management System Program Manager.

7.0 Specific Responsibilities

7.1 Bureau Administrator

The Bureau Administrator shall be responsible to:

- a. Review the Significant Aspects identified and developed by the Implementation Team.
- b. Notify the Implementation Team when new activities, products, or services will be integrated into existing traffic operations to enable a review of the aspects of such changes.
- c. Communicate to management, employees, and other interested parties via e-mail, bulletin boards and/or memoranda when new Significant Aspects have been determined for Traffic's activities, products, or services.
- d. That review of Environmental Management System compliance is a regular aspect of supervision of personnel and a factor considered in annual performance appraisals at the Bureau.

7.2 Implementation Team

Under the supervision of the Bureau Administrator, the Implementation Team determines environmental aspects and significant aspects.

7.3 Supervisors

Supervisors are responsible to:

- a. Develop and maintain an accurate process flow diagram for the activities, products, or services that falls within his/her sphere of operations.
- b. Know the substances used in their operations, and their environmental aspects.
- c. Know their tools and equipment, and know where environmental problems could arise from their use or misuse.

7.4 Employee

Each employee is responsible to be aware of the legal and other requirements applicable to the performance of work tasks, products, or processes assigned to them, and to perform the work in accordance with the practices and procedures approved by the Bureau. Each employee is responsible to request assistance, supervision, and/or training in the use of a product, or the performance of a task that is new, unfamiliar, or modified in order to prevent personal injury or an adverse impact to the environment.

7.5 Environmental Management System Program Manager

The EMS Program Manager is responsible to provide support and assistance to the Bureau of Traffic in the implementation of this procedure, and to audit controlled documents and records of the Bureau at intervals determined by the Commissioners.

8.0 Audit and Review

8.1 Items Subject to Audit and Review

At least annually, the Bureau Administrator shall review this procedure to ensure the purposes for which it was created are being met in an efficient manner.

8.2 Record Keeping; Format; Destruction

- a. This procedure shall be maintained in the records of the Bureau of Traffic and each relevant unit supervisor.
- b. This document is a controlled document. The on-line version and secured hard copies are the controlled documents.
- c. The Hearings Examiner shall maintain the secured hard copy, stamped "Official Document" and dated.
- d. Changes and updates to this procedure, and filing and destruction requirements shall be noted on all revisions to the original copy, and all paper copies distributed to the Bureau of Traffic.

8.3 Responsibility for Audit and Review

The Environmental Management System Program Manager and the Bureau Administrator shall review compliance with this procedure at such intervals as they deem appropriate, but no less than annually. A written report discussing compliance with this procedure shall be provided to the Commissioners as directed, but no less often than annually.

9.0 Personnel Actions

9.1 Discipline

As a condition of employment, all employees of the State of New Hampshire Department of Transportation are required to participate actively in environmental management system programs and follows established policies, procedures, instructions and/or rules. Cooperation between management and employees is necessary to meet this work standard. Disciplinary action, up to and including dismissal, will be taken in cases where it is determined that disregard for environmental responsibilities has occurred. Disciplinary action will be taken in accordance with the New Hampshire Division of Personnel Administrative Rules, Chapter 1000.

10.0 Other

Reserved.

CASE STUDY 7 Exhibit 3

Objective:

Reduce the amount of solid waste generation during Sign Section activities at the Bureau of Traffic. To accomplish this objective, the Sign Section will increase the use of recycled material. The increased use of recycled material will in turn reduce the amount of resources used to build new signs and will thus have a positive effect on resource consumption. The hydro stripper – water jet process is the approved method for the re-furbishing used signs.

Target:

Reduce the use of new sign material in the fabrication process by 15% for fiscal year 2002.

Responsible Personnel:

- The employee responsible for achievement of this objective is the Traffic Maintenance Supervisor.
 - The employee responsible to assure recycled material is used in the manufacture of signs is the Sign Shop Manager.
- The employee responsible for distributing recycled sign material for fabrication and for maintaining inventory controls is the Stock Clerk.
- The employees responsible for inventory control and developing the quarterly tracking reports is the Account Technician.
- The employee responsible for the training, awareness, and competence of Sign Section personnel in meeting this EMP is the Sign Shop Manager.

Resources:

Personnel: New Full Time
Positions: Environmental/Safety Coordinator
Stock Control Supervisor

<i>Financial:</i> Personnel:	\$70,000.00
Construction:	\$124,000.00
Total Costs:	\$194,000.00
Expected Savings:	\$1,100.00

Other: Construct lean-to off Building D for used sign material storage
Install steel I-beam pallet compatible shelving in lean-to off Building D for recycled material storage.

Schedule:

- | | |
|----------------------------------|---------------|
| 1. Initiate Sign Fabrication EMP | April 1, 2002 |
| 2. Complete Initial EMP | July 1, 2003 |
| 3. Quarterly Tracking Reports | April 1, 2002 |

Tasks:

- | | |
|--|-----------------|
| 1. Fill Positions | January 1, 2002 |
| 2. Initiate Training | January 1, 2002 |
| 3. Construct Lean-to | March 1, 2002 |
| 4. Sign Fabrication Procedures Initiated | April 1, 2002 |
| 5. Complete Shelving | June 1, 2002 |
| 6. Review Sign Fabrication Section EMP | July 1, 2002 |
| 7. EMP Training Records Established | January 1, 2002 |

Operational Controls:

1. Sign Fabrication work orders:
 - Generated by Bureau of Traffic personnel.
 - Field crew requests form for replacement sign.
 - Material request form for sign from District, Bureau of Turnpikes, and other state agencies to the Sign Shop Manager.
2. Orders reviewed by Sign Shop Manager and/or Stock Control Supervisor.
3. Material Request submitted to Stock Clerk. Completed signs distributed.
4. If material needed for fabrication, Stock Clerk determines blank material use.
5. Blank material to Sign Shop Manager for sign fabrication or to NH State Prison Sign Shop for sign fabrication.

Training, Awareness, and Competence:

- All Sign Section personnel will be trained in the EMS environmental policy.
- All Sign Section personnel will receive specific training relating to tasks that will aid in meeting the goals of this EMP.
- The Bureau of Human Resources will maintain records of all completed employee orientation and training.

Performance Tracking:

- Baseline data for this EMP includes the average of five years of new sign material. Target goals relate to this five-year average
- Quarterly reports will be prepared to identify progress in meeting the target for this EMP.
- The Sign Section Fabrication EMP will be reviewed at least annually or when the dynamics of the program changes. Such changes may include:
 - ✓ Objectives and Targets may be modified,
 - ✓ New legal requirements are introduced or added,
 - ✓ Progress is not made on the Objectives and Targets,
 - ✓ Processes, services or activities have changed.

Approved by _____

William Lambert, Bureau Administrator