

AASHTO PRACTITIONER'S HANDBOOK

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DEVELOPING AND IMPLEMENTING AN ENVIRONMENTAL MANAGEMENT SYSTEM IN A STATE DEPARTMENT OF TRANSPORTATION (DOT)

DOTs face ever-mounting pressure to enhance environmental and business performance and to demonstrate their commitment to environmental stewardship. This Handbook provides recommendations for developing and implementing an Environmental Management System (EMS) to help meet these goals and expectations.

Issues covered in this Handbook include:

- Understanding what constitutes an EMS
- Using Plan–Do–Check–Act for an effective EMS
- Providing environmental and business value to your organization
- Using AASHTO's EMS roadmap
- Applying an EMS to any activity or facility
- Deciding upon a focus for initial efforts
- Identifying expectations and objectives
- Building upon existing successes
- Measuring performance
- Continually improving performance

The Practitioner's Handbooks are produced by the Center for Environmental Excellence by AASHTO. The Handbooks provide practical advice on managing the range of environmental issues that arise during transportation agency activities.

This Handbook is intended for use by managers and others who are responsible for coordinating compliance with a wide range of regulatory requirements. With these needs in mind, this Handbook includes:

- key issues to consider;
- a background briefing;
- practical tips for developing and implementing an EMS.

In addition, key documents and other reference information for this Handbook are posted on the Center's web site at <http://environment.transportation.org>



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Overview



Environmental Management Systems (EMSs) have demonstrated measurable environmental as well as business performance improvements for numerous Federal, state, and local governments and private sector companies throughout the United States over the last decade. Recognizing these benefits, several state departments of transportation (DOTs) have developed and implemented EMSs to achieve similar enhancements in various transportation activities and facilities.

EMSs also offer the means to pursue, as well as demonstrate, an organization's commitment and methods to achieve environmental stewardship. This demonstration of commitment and methods is increasingly reflected in directives, legislation, and stakeholder expectations.

Environmental benefits realized through DOT EMSs include:

- Reductions in the number and severity of compliance incidents,
- Pollution and waste quantity reductions,
- Recovered resources, and
- Streamlined permit and document reviews and approvals.

Business performance improvements attained through these EMS initiatives include:

- Reduced regulatory oversight schedule and cost burdens,
- Faster project delivery and, in turn, labor savings through streamlined reviews and approvals,
- Increased work force efficiency, and
- Cost savings and cost avoidances.

This Handbook introduces EMS concepts, describes basic EMS components that can be applied to any DOT activity or facility, and presents suggestions on how to consider, develop, and implement an EMS. The EMS approach and content described herein are based upon well-established overall approaches as well as detailed actions. At the higher levels of a DOT, an EMS provides the structure to establish (possibly as a component of other strategic and business planning efforts) broad environmental performance goals, objectives, and targets and to assess organizational performance in meeting these goals. At the "detail" level of a DOT, an EMS provides the instructions, training, assignments, and performance monitoring methods to meet performance goals on a day-to-day basis. This Handbook updates, refines, and expands upon the information presented in the *AASHTO EMS Implementation Guide* which was originally issued in August 2003.

Appendix A presents an example that demonstrates how the information provided in this Handbook can be used to develop and implement an EMS in a DOT.

Key Issues to Consider

Considering Use of an EMS

- Is an EMS already in place or are you establishing a new EMS?
- How can you get approval to take the first steps toward an EMS? If management is already interested generally what are the next steps?
- What are the "drivers" (internal and/or external) for establishing or expanding an EMS in your DOT?
- What DOT activity or facility should be the focus of the EMS?

- Who are the stakeholders, internal as well as external, for the EMS?
- Will the EMS be a stand-alone effort?
- What additional resources will you need to establish an EMS?
- How will you define initial responsibilities and expectations?

Developing an EMS

- Who will lead EMS development efforts in your organization? Who will support these efforts?
Is a team approach needed?
- How can you identify and select a DOT's EMS objectives, measures, and targets?
- Should you start big or small with an EMS?
- How can you prepare a plan for EMS development and implementation?
- Who would be involved in (i.e., directly support) subsequent EMS efforts? Who would be affected by these efforts?
- How should these personnel be informed of their involvement? When should they be informed?

Implementing an EMS

- What are your basic requirements/desired results for detailed EMS instructions and practices in the selected focus area?
- How can we determine when to use or modify existing initiatives and practices for the EMS?
- How can we integrate an EMS with other quality and continual improvement efforts?
- How can we determine when to develop new EMS practices (e.g. work instructions or responsibilities)?
- Should we develop an EMS manual or document?
- What is contained in an EMS training program?
- How do you roll out the EMS in a unit, region/district, or facility? Does it help to roll out the EMS in stages (e.g., as a pilot in one district or facility)?
- How can you track and use performance monitoring and assessment information?
- What can you do to identify and implement corrective and preventive actions to maintain and enhance performance?
- How do you track EMS performance/results?
- Can anything be done to improve performance?
- How would you use EMS performance information in dealings with regulators?
Elected officials? The public? Other stakeholders?

Maintaining an EMS

- Once implemented, can an EMS continue without oversight and guidance?
- Who would keep an EMS going?
- Are there any opportunities for improvement? How would you identify these opportunities?
- What would be the next focus for a DOT's EMS?

Background Briefing

Defining an EMS. *An EMS is the organizational structure and associated responsibilities and processes, procedures, and tools for integrating environmental considerations and objectives into the ongoing management decision-making processes and operations of an organization.* An EMS is not simply an information system, document, compliance checklist, set of plans, or project.

EMS PROCESSES, PROCEDURES, AND TOOLS

Process. A series of activities used to manage environmental performance. Processes are fulfilled through and may include one or more procedures.

Procedure. A defined series of steps used to perform an activity or process. Procedures are documented and communicated to ensure consistency. Consistency is also achieved through training in use of the procedures. Procedures may also be referred to as work instructions or standard operating procedures (SOPs).

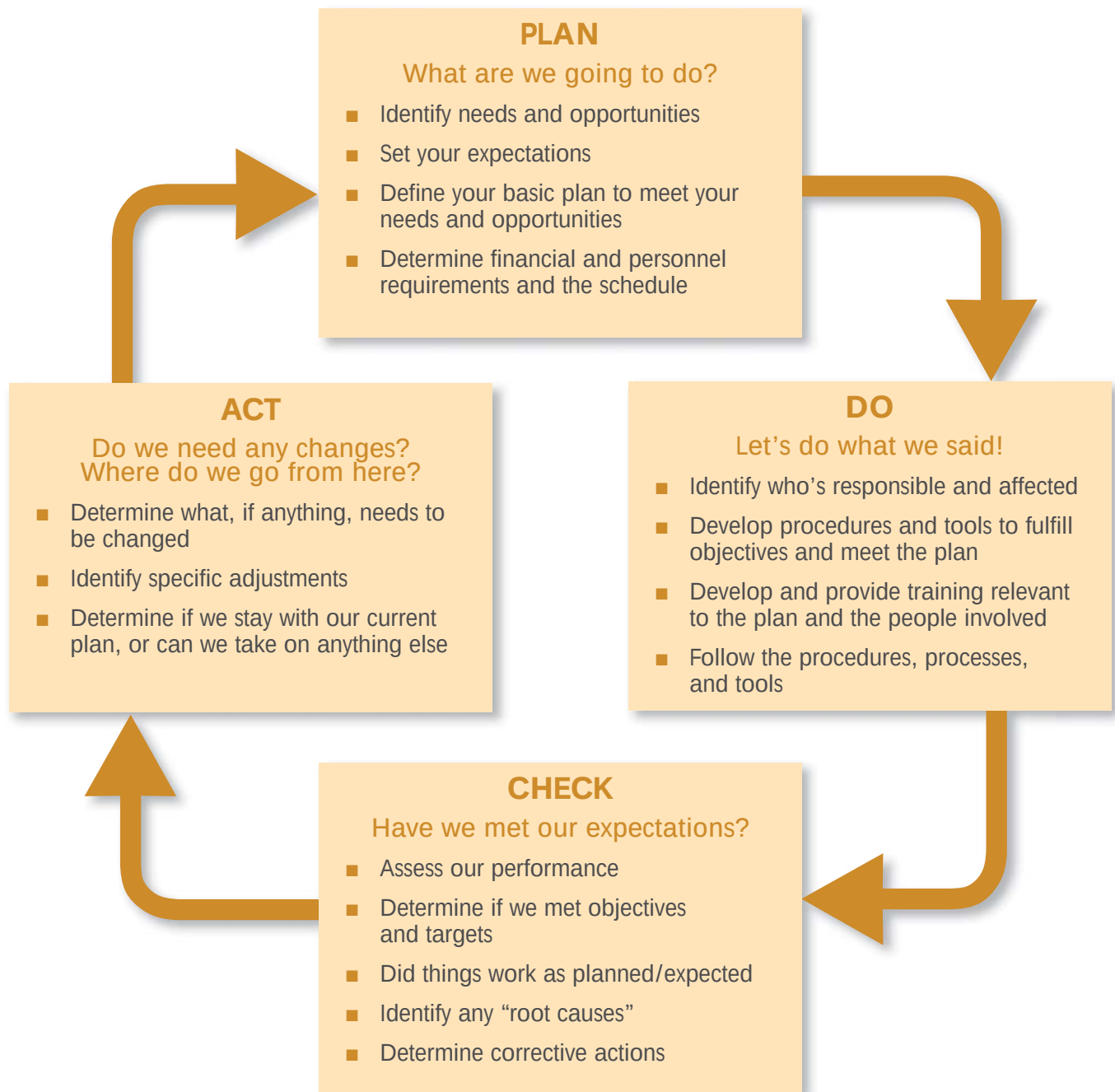
Tool. An aid that facilitates task completion. A tool may be used to reduce the level of effort required for a task, improve consistency, and/or aid in record keeping (e.g. a form, a template, or an electronic data or record capture system).

The above EMS definition incorporates key elements of definitions presented in EPA's Compliance Focused Environmental Management System (CFEMS) guidance and the International Organization for Standardization (ISO) 14001 Environmental Management System (EMS) Standard. The EPA and ISO definitions incorporate additional specific requirements that reflect the compliance and conformance needs of EPA and ISO. In non-enforcement actions, EPA and Federal Environmental Executive EMS information and guidance generally reflects the criteria and approach of the ISO 14001 Standard. The AASHTO definition, originally developed in 2003, provides greater flexibility for DOTs to implement EMSs that meet their specific needs and objectives.

ISO 14001 Use and Certification. ISO is an international organization that has established standards in numerous areas to provide consistency in compliance and conformance throughout the world. ISO 14001 is the Standard for EMSs and is comprised of 17 basic elements and numerous criteria within each element, including requirements for document control and record keeping. Certification to ISO 14001 requires routine third-party audits (costing several thousand dollars a year for a typical DOT unit or facility) and is based on conformance to all criteria. It is important to note that while a very small number of state and Federal government agencies and facilities have obtained certification, DOT implementation of an EMS as described in this Handbook does not require ISO certification. An EMS that is not ISO-certified can provide substantial environmental and business performance enhancements for DOTs. Pursuit of ISO-certification should be considered on its own environmental and business merits.

EMS and Environmental Stewardship. Over the last decade there has been an ever-increasing demand for DOTs to practice environmental stewardship in all facets of their operations—from planning through routine maintenance. Environmental stewardship means making decisions and conducting operations in a manner to protect and improve the environment. An EMS directly supports environmental stewardship by providing the means to routinely and consistently consider (not just on a project-by-project basis) environmental effects and requirements in transportation decision-making as well as day-to-day activities.

The Plan–Do–Check–Act Approach. A common, well accepted framework for any management system that strives for continual improvement is the Plan–Do–Check–Act structure. This framework has been proven over a number of years in a wide variety of applications in both government and industry. The concepts behind this framework, which can be easily understood by personnel at all level of an organization, can be easily adapted for a management system, be it environmental or otherwise. Following is an illustration of the Plan–Do–Check–Act structure—the arrows highlight the systematic continual improvement nature of this approach.



Value of an EMS. DOTs and other public sector organizations that have implemented EMSs have achieved *environmental as well as business benefits*. These include:

- Significant reductions in the time and effort to obtain project and permit reviews and approvals.
- Enhanced and ensured compliance.
- Ensured tracking and fulfillment of project environmental commitments.
- Savings through reductions in resources required and wastes to be disposed.
- Increased productivity—more project work from same work force; no need to revisit work site to correct environmental mistakes.

A recent AASHTO report¹ found that 27 state DOTs either had implemented or were in the process of developing EMSs. This level of activity reinforces the growing awareness on the part of DOTs of the performance achievements available through an EMS.

Elements of an EMS. As developed by AASHTO, and other government and private sector organizations, EMSs are comprised of the following elements which are fundamentally consistent with EPA's Compliance Focused EMS (CFEMS) guidance and the ISO 14001 EMS Standard.

- **Environmental Policy.** Statement of the broad environmental goals and commitments of the organization; the policy should be signed by senior management.
- **Focus.** The activity and/or facility to be addressed by initial and, if applicable, subsequent EMS efforts.
- **Requirements.** DOT directives and regulatory requirements relevant to the focus area and that set minimum compliance and conformance constraints.
- **Expectations.** Performance (environmental and business) objectives, measures, and targets.
- **Responsibilities.** The personnel who will lead EMS efforts as well as the personnel (at all levels) who will use the EMS.
- **Processes, Procedures, and Tools.** Refer to the definitions provided at the beginning of the Background Briefing.
- **Training.** Description of how involved and affected personnel can follow the procedures.
- **Assessment.** Performance evaluation (vis-à-vis expectations).
- **Review.** The actions and responsibilities to attain, maintain, and improve performance.

AASHTO EMS Process Roadmap. The EMS Process Roadmap presented on the following page can be used by transportation professionals at various levels and in various units (environmental as well as non-environmental) to help develop and implement an EMS in their DOT. This Roadmap is based upon the Plan–Do–Check–Act approach and incorporates the elements and qualities described above. The Roadmap sequence and steps are fundamentally consistent with the EPA's CFEMS and the ISO 14001 EMS Standard.

Phases of EMS Efforts. Any DOT's use of an EMS moves through four basic phases—consideration, development, implementation, and maintenance. Following are descriptions of these phases with Plan–Do–Check–Act references included in parentheses.

- **Consideration (Plan).** The DOT evaluates its overall environmental constraints and opportunities and determines that an EMS can be of value.
- **Development (Plan).** The DOT defines its EMS focus and expectations, and identifies the basic process(es) or activities that the EMS will address.
- **Implementation (Do, Check).** The DOT constructs, uses, and (if necessary) revises the procedures and tools that are required for the EMS.
- **Maintenance (Check, Act).** The DOT reviews its processes and procedures, and uses its tools on an ongoing basis to make sure that performance expectations continue to be met. Through this review, the DOT may find opportunities to improve or expand the focus of the EMS.

Keys to Success. Experience with EMS efforts in public and private sector organizations reveal several common actions that will ensure the success of EMS efforts—from both an implementation as well as results perspective. These keys to success include:

- Provide management commitment—resources, finances, stated commitment, and ongoing oversight.
- Establish clear, measurable expectations—with objectives, and performance measures and targets that address a specific EMS focus.
- Involve all affected employees—in development and implementation.

¹ See AASHTO's Standing Committee on Highways, Subcommittee on Construction, Environment and Human Resources Section, *Environmental Management Systems Implementation Update* (August 2006). This document is available at <http://environment.transportation.org>.