2006 Summer Meeting
AASHTO Subcommittee on Highway Construction

Computers and Technology Session
Wednesday, August 8, 2006

Environmental Management & Environmental Information Management Systems
Presentation Objectives

- Introduce the AASHTO Center for Environmental Excellence Services
- Describe the AASHTO/FHWA Environmental Management System Technical Assistance Program
- Describe the NCHRP 25-23(2) Project-Environmental Information Management & Decision Support System Software Development
AASHTO Center for Environmental Excellence

- MISSION: PROMOTE ENVIRONMENTAL EXCELLENCE IN THE EFFICIENT DELIVERY OF TRANSPORTATION SERVICES.

- VISION: MEMBER ORGANIZATIONS HAVE THE TOOLS AND AWARENESS NECESSARY TO BE EXCELLENT STEWARDS OF THE ENVIRONMENT IN CARRYING OUT THEIR MISSIONS
Center for Environmental Excellence
Customer Service Areas

Information Sharing
Training
Technical Assistance
About The Center

The American Association of State Highway and Transportation Officials (AASHTO) Center for Environmental Excellence has been developed in cooperation with the Federal Highway Administration to promote environmental stewardship and to encourage innovative ways to streamline the transportation delivery process. The Center is designed to serve as a resource for transportation professionals seeking technical assistance, training, information exchange, partnership-building opportunities, and quick and easy access to environmental tools.

Learn More about The Center »

Technical Assistance Program

The AASHTO Center for Environmental Excellence Technical Assistance Program offers a team of highly qualified and experienced experts on-call and ready to assist transportation and environmental agency officials in improving environmental performance and program delivery. The team members individually or as a team supply strategic environmental analysis and focused environmental management technical advice through short-term assignments.

Learn More about the Technical Assistance Program »

Center Products & Programs

- 2006 National Competition for Best Practices in Context Sensitive Solutions (CSS)
- 2005 Context-Sensitive Solutions Competition
- 2004 Smart Growth Competition
- 2003 Best Practices in Environmental Stewardship Competition
- 2002 Smart Growth Competition
- DOT-Funded Positions Report
- Environmental Management Systems Products
Center Technical Assistance

- Experts available to provide states with strategic advice on improving environmental performance and program delivery
- FHWA/AASHTO Environmental Management System (EMS) Technical Assistance Program
AASHTO-FHWA
EMS Technical Assistance Program

**Vision:** Environmental considerations are systematically integrated into all transportation program delivery processes & decisions

**Goal:** To enhance transportation program delivery and environmental stewardship through the application of EMS plan-> do->check->act concepts

**Objectives:** 1) To greatly increase the awareness & understanding of EMS concepts & sound business reasons for applying them & 2) To promote EMS technology transfer through technical assistance, networking, mentoring, & training
EMS Technical Assistance Program

Service Areas

- On-Site EMS Orientation
- On-Site EMS Training Sessions
- On-Site EMS Work Plan Development
- EMS Development & Operation Mentoring
AASHTO/FHWA EMS Technical Assistance Application Process

Step 1 - State DOT Completes On-Line Application for Technical Assistance

Step 2 - AASHTO & FHWA EMS Work Group Evaluates, Scores, & Approves Application

Step 3 - AASHTO & State DOT Develop Technical & Cost Proposal for Technical Assistance

Step 4 - AASHTO & State DOT Execute a Technical Assistance Agreement
Potential Construction EMS Focus Areas

- Incorporation of environmental commitments from planning & design
- Constructability of environmental measures in preliminary & final design plans
- Clarity of construction contract language covering environmental measures
- Constructability of environmental permit conditions
Potential Construction EMS Focus Areas-Continued

- Contractor pre-qualification requirements for environmental measures
- Construction inspection pre-qualification requirements for environmental measures
- Pre-bid conference coverage of environmental measures
- Pre-construction conference coverage of environmental measures
Potential Construction EMS Focus Areas-Continued

- Partnering agreements environmental measures
- Construction work plan & schedule environmental measures
- Utility relocation plan environmental measures
- Construction environmental monitoring & reporting requirements
- Construction borrow, waste, & staging areas environmental measures
Potential Construction EMS Focus
Areas-Continued

- Contractor value engineering proposal
  environmental measures
- Construction plan modification
  environmental measures
- Construction budget environmental
  measures
- Construction inspection of environmental
  measures
Potential Construction EMS Focus Areas-Continued

- Construction material testing environmental measures
- Use of environmentally friendly (recyclable, non-toxic) construction materials
- Incentives & disincentives for environmental measures
- As built drawings of environmental measures
Potential Areas to Integrate Environmental Protection & Enhancement Measures

- Agency & construction organization business plan & budget
- Construction management system
- Construction specifications
- Construction office & field manuals
- Construction policies & procedures
- Construction training program
- Construction QC/QA program
- Construction work plans
- Contractor pre-qualification
Environmental Information Management & Decision Support System (EIM & DSS)

NCHRP 25-23(2)-Software for an EIM & DSS

Objective: To design, test, & demonstrate a prototype software for an EIM & DSS that builds on the concepts presented in NCHRP Report. 481. The software shall support decisions in transportation planning, programming, project development, operations, and maintenance.
The EIM&DSS Fits into The ISO 14001 Framework:

ISO 14001

Decision Support System

Environmental Information Management
ISO 14001 EMS Definition

- The part of the overall management system that includes organizational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy.
EPA EMS Definition

- A set of processes and practices that enable an organization to reduce its environmental impacts and increase its operating efficiency
EIM & DSS System Concept

EIM&DSS Data

Business Data  Spatial Data

Other Agency Data

Application Server

Map Interface

Long-Term Planning  Project Development  Asset Definition  Commitment Tracking  Requirements/Best Practices
EIM & DSS System Design

Key Points

- Web-based system
- Flexible data structure
  - Allow agencies to configure specific attributes for each entity (e.g., plan, project, asset)
  - Use basic set of tables for planning, project development, & maintenance
EIM & DSS System Design
Key Points-Continued

- Mapping
  - Map interface supported for display and selection
  - Useful but optional – fully functional without the map
- Use of document links to provide a level of integration with other systems and data
EIM & DSS Main Screen & Navigation
(From Report 481 Concept)

Select a module or a location

Planning
Programming
Project Dev.
Maintenance
Operations
Closure
Mitigation & Enhancement
Compliance

GIS

Admin
Workflow
Content Mgmt.

Reports
Documents
Regulations
Public Involv.
Models
BMPs
System Design
Screen Schematic
EIM & DSS System Design Modules

- **Long-term planning**
  - Defining of long-term plans and plan alternatives, along with associated environmental management data
  - Detailing environmental analyses performed for a plan and the impacts determined from an analysis
  - Detailing public involvement steps and actions for a plan
  - Associating plans and projects
EIM & DSS System Design Modules - Continued

- Project development
  - Defining projects and project alternatives, along with associated environmental management data
  - Detailing environmental analyses performed for a project and the impacts determined from an analysis
  - Detailing public involvement steps and actions for a project
  - Associating projects and assets
EIM & DSS System Design Modules - Continued

- Asset definition
  - Viewing and editing data for roads, bridges and/or other assets, as well as associated environmental management data
  - Detailing any analyses, impacts, or public involvement steps for an asset (e.g., for a maintenance facility)
  - Associating assets with map features
Commitment tracking

- Detailing commitments and related actions
- Associating commitments with a specific plan, project or asset
Requirements/Best Practices

- Detailing requirements and/or best practices associated with environmental management
- Grouping requirements/practices into sets
- A plan, project or asset alternative can have a requirement set associated with it
EIM & DSS Content Management is a Critical Success Factor

- Assure that the value of data exceeds the cost of data collection over the full life cycle of the data.
- Assure the quality and completeness of the data.
- Assure that responsibility is assigned for data collection, updating, and maintenance for the full life cycle of the data.
- Assure that the financial resources are available to maintain the data over the lifecycle of the data.
EIM & DSS Software Status

- **Schedule**
  - Fall 2006 – Project Finalized
  - Early 2007-Potential AASHTO Ware
  - Pooled Fund Project Solicitation to Deploy Software
EIM & DSS Software Contact Information

Andrew Lemer, NCHRP 25-23(2) Project Manager
NCHRP
202-334-2006
ALemer@nas.edu

Bill Robert, NCHRP 25-23(2) Principal Investigator Cambridge Systematics
100 Cambridge Park Drive
Cambridge, MA 02140
617-354-0167
wrobert@camsys.com
AASHTO Center for Environmental Excellence Information

Shannon Eggleston
seggleston@aashto.org
(202) 624-3649

www.environment.transportation.org
Thank You!

AASHTO EMS Technical Assistance
Program Information

Wayne W. Kober
AASHTO Consultant
(717) 502-0179
wwkpa@earthlink.net