National and International Perspective on Asset Management

May 10, 2006

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Michigan Department of Transportation
AASHTO Subcommittee on Asset Management

Mission: Advance the State-of-the-Practice of Asset Management in State DOT’s to optimize resources utilizing performance based goals and measures regarding operation, preservation, and improvement of transportation systems for member agencies.
AASHTO Subcommittee on Asset Management

- Focus on implementation

- Develop, improve, promote, and support the use of management systems, economic evaluation tools, and tradeoff analysis methods

- Share information application of performance measurement and decision making tools

- Education and training
Meetings

- May 2004 - Charleston, NC
- Sept 2004 - Peer to Peer, Washington, DC
- Sept 2004 - Philadelphia, PA
- Jan 2005 - Washington, DC
  - With TRB subcommittee
- April 2005 - International Scan
- July 2005 – Boston, MA
  - With TRB subcommittee
- Sept 2005 - Nashville, TN
- Jan 2006 – Washington, DC
  - With TRB subcommittee
- July 2006 - Traverse City, MI
- Aug/Sept 2006 Domestic Scan
Strategic Plan Initiatives
Develop and Promote Tools (Goal 1)

- Asset Manager NT/ PT AASHTOWare product (NCHRP 20-57)
  - Project task force
    - Wisconsin, Montana, New York, Pennsylvania, Michigan, District of Columbia

- Status
  - Solicitation for Community of Early Adapters
    - Nine participating states: Michigan, New York, Kansas, Wisconsin, Pennsylvania, Oregon, South Carolina, South Dakota and District of Columbia
    - Need ten states to move forward
Strategic Plan Initiatives
Communication (Goal 2)

- Website updated
- State contact list
- Draft standard presentations & speeches
Strategic Plan Initiatives
Assisting in Assessing and Implementing Principles (Goal 3)

- Maintaining the AASHTO AM Guide
- Comprehensive training opportunity list
- Capacity building program
  - Peer to Peer
- Joint meetings with TRB
- 6th National Conference on Asset Management – Nov 1-3 Kansas City, MO
  - Combined with Pavement Preservation Workshop Oct 31 - Nov 1
- Updated NHI Asset Management Course
Strategic Plan Initiatives
Develop and Document Understanding of AM (Goal 4)

- Upcoming synthesis on bridge data
- Asset management approach for drainage infrastructure and culverts
- Workshop on tunnel management systems
- Scan tours
  - International – Spring 2005
  - Domestic – Fall 2006
    - Michigan, Florida, Ohio, Oregon, Utah, Washington, and Minnesota
Purpose

Investigate best case examples of asset management techniques and processes in the world…and identify lessons and applications for the U.S.

Sponsored by AASHTO, FHWA, and NCHRP
Drivers for Adopting Asset Management Approaches

- Limited resources
- Increasing demands
- Credibility with elected officials and the public, that is, linking funding to system performance
- Strategic oversight where private provision of services was used
What we found...

- Long term commitment to developing an asset management program
- Organization structures
- Integrated policy
- Performance measures
- AM plan sample components
- Management systems and data collection
- Prioritization and scenario analysis
- Life cycle costing and risk assessments
- Public involvement
Queensland’s Business 
Decision-Making Needs - Corporate Level

- Road condition performance reporting
- Network asset investment studies
- Corridor planning
- Asset valuation

Chart 1.1

Consumption of economic benefit curve
Based on ESA's growing at 5% per annum and terminal value of 21%.

<table>
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<th>Years</th>
<th>0</th>
<th>5</th>
<th>10</th>
<th>15</th>
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<td>Value</td>
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<td>80%</td>
<td>70%</td>
<td>60%</td>
<td>50%</td>
<td>40%</td>
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- Written-down value (%)
- Depreciable Component = 79%
- Terminal Value 21%
- RUL = 16.5 years
Performance Measures in Alberta

- Three key measures
  - Condition
  - Utilization
  - Functionality

- Common framework across infrastructure types

- Ministries develop specific measures
Pavement Roughness was a Key Performance Measure Almost Everywhere

Pavement inventory and condition report in Victoria

TRENDS IN ROUGHNESS FOR ALL ARTERIAL ROADS

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<th>Year</th>
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Highways Agency Pavement Management System Overview

- Road Condition Information
  - TRACS
  - SCRIM
  - Deflectograph
  - Visual Survey

- Information Services
  - Scheduled Road Works
  - LAN Access

- Video
  - Accident
  - Safety

- Network Data Repository
  - Confirm

- Public Website
  - Traffic England Website

- SWEEP
  - Scheme WLC analysis

- Budget Need
  - Network WLC Model

- Asset Information
  - Network Definition
  - Inventory
  - Construction
  - Commercial Traffic
  - Documents

- Network Definition
- Inventory
- Construction
- Commercial Traffic
- Documents
SCRIM+
Network Pavement Condition Measuring Vehicle
These information systems produce a wide range of useful information.

Some no more than basic inventory data, while others can produce performance and condition reports….for example
### Use of Asset Data in New South Wales

#### Route Performance

**Melbourne to Brisbane Corridor**
**Link MB2 & MB3, SH17**

Sheet 8 of 11

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<th>Route Performance</th>
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**USAGE**

**Current (2002)**

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**10 Year Projection (2012)**

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**Route Performance Values**

- **Range** - shows the proportion of the section in a particular "bin"
  - Roughness (counts/km) Lane Width (m)
    - > 70
    - 70 - 110
    - 111 - 140
    - > 140
  - Deficiency - applies to whole section
    - Bridge Width (each instance)
      - Narrow
      - Very Narrow
  - Sight Distance
    - < 15% below standard
    - > 15% below standard
  - Crashes
    - 25 - 37.5 per 100km
    - > 37.5 per 100km
  - Traffic LoS
    - C
    - D, E, F
  - Overtaking
    - 25% - 35% of traffic following
    - > 35% of traffic following

**Melbourne to Brisbane Corridor**

- **PROPOSED PLAN OF WORKS**
  - As at June 2002
  - Financial Year Ending 03 04 05 06 07 08 Post 08

**PROJECT NAME**

- A 4-7 km north of Gilgandra
- B 10-18 km north of Gilgandra
- C Hodgkiss Creek
- D Bidden Creek
- E 34-36 km north of Gilgandra
- F Wallumburrawang Creek Deviation
- G Uargon Creek

**Note:**

Maintenance projects are not shown. The location and timing of these works vary in response to asset condition and user costs so as to minimise the whole of life costs of maintaining the network to agreed condition.

Non location specific minor works not displayed.

26-02-2003
Approaches to Technical Analysis

- In only a few cases was any effort made to conduct analysis-driven trade-off assessments; those that did were heavily based on engineering judgement.

- However, it was clear that all of the agencies were working toward such a capability.
Project Prioritization - Alberta

**Infrastructure Requirements**
- Provincial Highways
- Health Facilities/Equip.
- School Facilities/Equip.
- Post-Secondary Facilities
- Water and Wastewater
- Community Facilities
- Housing
- Other Infrastructure

**Prioritization Criteria**
- Program Delivery
- Infrastructure Performance
- Economic Benefits
- Cost Avoidance/Saving
- Cost-Effectiveness
- Strategic Alignment

**Cross-Government Priorities**

**Prioritized Project List**
Life Cycle Costing

Life cycle costing (also known as “whole-of-life” costing) has been adopted in each site as the basic approach toward program and project costing. Importantly, data identification and collection were targeted to support this approach.
Efforts have been made in each case to reach out to public officials, stakeholders and, in some cases, to the general public, in conveying the importance of an asset management policy.
Lessons for the U.S.

Asset Management programs have been used successfully to justify transportation funding (even in tight economic times) and to convey to decision makers that the investment is being delivered in the most cost effective manner possible.
Adopting an asset management approach in an organization does not mean that everything has to change.

Asset management efforts are data-driven. However, developing an asset management culture in an organization does not have to await the many years it might take to develop database information systems.
Data should have a clear purpose and be directly related to asset management decision making. Data collection costs should be tracked and data itself treated as an asset, with the same design, build, operate, maintain and life cycle cost analysis as is used for other assets.
Creating asset manager positions or at least assigning responsibilities for the asset management function are important foundations for an effective management program.

Asset management efforts are best achieved when they are linked to strategic goals and desired outcomes.
Trade-off analysis techniques are more complex than simply assessing priorities within one asset category. The scan team did not find any case where technically-based cross asset trade-off tools were used. This is an important area for further development in the U.S.
Cross-functional teams, consisting of engineers, planners, finance analysts, operations staff, and communications experts can best understand the many different aspects of asset management, such as data collection, developing strategies, and quality assurance.
Asset management training for all levels of transportation officials is an important initiative for changing the culture of an organization and in establishing asset management expectations among key stakeholders.
Task 1: Initiate a study “Develop a national TAM model for the Interstate System” to determine the benefits of using asset management plans for all segments of the Interstate Highway System.

Key factors should include a risk analysis for system failure and a look at the physical degradation and its impact on the remaining service life, and overall decreased operation of the system without a comprehensive national vision and plan. The study should also list potential national performance indicators (18 months).

Approved $500,000 - NCHRP
In sum….

It is clear that asset management as an organizational culture, a “business decision-making process” and as a policy direction is a critical foundation for transportation programs that are facing significant capital renewal and preservation needs. The U.S. is clearly facing such a challenge.
Questions?