ASSET MANAGEMENT: NDDOT STYLE

Presented via Video Recording at IHEEP Conference June 2014

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Asset Management Language

- **Asset Class** = each type of asset
  - Pavement preservation
  - Bridge preservation
  - Equipment
  - Signs
  - Etc.

- **Cross-Asset** = analysis between/among asset classes
  - E.g. compare pavement preservation to signs
Asset Management Language

- Acronyms:
  - AASHTO = American Assoc. of State Highway & Transportation Officials
  - BMS = Bridge preservation Management System
  - HPCS = Highway Performance Classification System
  - FHWA = Federal Highway Administration (United States of America)
  - LOS = Level of Service
  - MMS = Maintenance Management System
  - NDDOT = North Dakota Department of Transportation
  - P/AM = Planning/Asset Management Division (NDDOT)
  - PMS = Pavement preservation Management System
  - STIP = Statewide Transportation Improvement Program
  - TAM = Transportation Asset Management
  - TAM = Transportation Asset Management Plan
Asset Management Language

• Tradeoff Analysis
  • Like a “slider” moving $’s from one asset class to another.
  • Shows estimated outcome of investment decisions.

• Optimization Analysis
  • A logic-driven computation recommending the “best” investment regimen for or between asset classes.
  • Typically, based on benefit-cost analysis.
Asset Management in General

ROADWAY FUNDING SCENARIO

% Increase in Roadway Funding = 55%
% Decrease in Roadway Funding = 0%

<table>
<thead>
<tr>
<th>Year</th>
<th>Existing Projected Roadway Funding</th>
<th>Increased or Decreased Roadway Funding</th>
<th>Avg Network IRI</th>
<th>% Miles Excel/Good</th>
<th>% VMT Excel/Good</th>
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<td>2010</td>
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*Based on dTIMS analysis with 7% inflation and 3%/yr increase. (rural network, 2009 base data).
**Max 100% increase, max 75% decrease.
*Yr 2010 includes Stimulus Funding.

IRI ranges
- Excellent <=60
- Good 61-99
- Fair 100-145
- Poor >145

% Increase in Roadway Funding = 55%
% Decrease in Roadway Funding = 0%

% Increase in Roadway Funding = 55% : % VMT Excel/Good

Projected Average Network Condition - IRI

Projected Average Network Condition - % Miles Meeting IRI Guidelines

2010 includes 60 mill stimulus
Total 2010-2014 = (State O.A. - $10,000 seats - $5,000 bridges - $2,500 T.E. - 10% safety, capacity, & misc.) + 15% state max
Total 2015 = Total 2014 * 1.03
Asset Management in General

- NDDOT uses
  - Tradeoff for cross-asset information
  - Typically, optimization within asset classes

- Two ways to use TAM
  - Strategic-level tool
    - System-wide analysis
    - E.g. “the average condition is predicted to be...”
  - Tactical-level tool
    - Project and operational elements are recommended
    - E.g. “the recommended optimum series of projects to do is...”
Asset Management in General

Strategic Level

System-wide analysis
## Tactical Level

### Asset Management in General

<table>
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<tr>
<th>Hwy</th>
<th>Dir</th>
<th>From_Description</th>
<th>To_Description</th>
<th>District</th>
<th>dTMS Suggested Treatment</th>
<th>Year</th>
<th>Length</th>
<th>Committed Treatment</th>
<th>Com Year</th>
<th>Treatment from Priority System</th>
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Asset Management Principles

TAM is a way of thinking, not a piece of software.
Asset Management Principles

- Provides information to decision makers... does **not** make decisions

- Fundamentally, TAM is a:
  - Goal-Oriented,
  - Data-Driven
  - Decision-Making Process
History of TAM in NDDOT

- Formal performance reporting & TAM for ~10 yrs.

- Progress made in some areas (not in others); in common:
  - Provided information
    - e.g. during STIP approval, showed predicted HPCS report.
  - Asked for feedback on outputs & processes.
  - Made simplifying assumptions
    - e.g. straight line deterioration curves
  - System-level forecasting vs. segment-level processes.
  -Talked about system-level performance measures
History of TAM in NDDOT

- Jan. 2011 – Planning/Asset Mgmt. Division formed
  - No TAM experience at practitioner level
- Stood up AASHTO TAM Guide Study Group (08/2012)
  - Maintenance, Bridge, FHWA, Programming, and P/AM (11 people)
Planning Process Flow

Continuous Improvement

1. Review Goals
2. Implement
3. Develop Plan for Closing the Gap
4. Identify Gap
5. Self Assessment
History of TAM in NDDOT

- Wrote our first Draft TAMP
  - Based on self assessment & gap analysis outlined in TAM Guide Vol. II
  - Mostly documents current processes
  - Details improvement plan (implementation plan)
    - Process plan, not roadway project list
Purpose of TAM for NDDOT

- Goals are to answer:
  - How much funding is needed to maintain LOS?
  - What LOS can be provided for a given funding level?
  - Where is the best place to spend any given dollar?
TAM Self Assessment

- System Monitoring and Feedback
- Proactive Role in Policy Formulation
- Decision Support Tools
Hub and Spoke Design

- Human Resources
- Buildings
- Bridge Preservation
- Safety
- Assets
- ITS Equip.
- Fleet
- Non-Fleet Equip.
- Pavement Preservation
- Functional Capacity
- Urban NHS
- Cash

Tradeoff Hub
Planning Process Flow

Continuous Improvement

1. Review Goals
2. Identifying Gap
3. Develop Plan for Closing the Gap
4. Implement
5. Self Assessment
Overall TAM Process

Bridge

Pres.

Real-Time Estimate of Asset System Condition

Tradeoff

Hub

Pavement

Pres.

Asset System Condition & Suggested List of Projects

Buildings
TAM Conclusions

- **TAM = a way of thinking**
  - It’s a process to reach a specific goal
  - It is not a piece of software.

- Will never be “implemented”...always implementing
  - Continuous-improvement, incremental process.

- Don’t expect to skip stages of development maturity
  - If parts are at “Initial” stage, they won’t be “Best Practice” tomorrow.
Thank You!

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