Integrating Preventive Maintenance into Pavement Management

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Presentation Approach

- Review the use of pavement management to support agency decisions
- Identify gaps that exist in supporting preventive maintenance programs
- Identify steps that can be taken to integrate these programs
But First…

✿ A message from your sponsor…

National Highway Institute (NHI) Course 131104, 
PAVEMENT PRESERVATION: INTEGRATING PAVEMENT PRESERVATION PRACTICES AND PAVEMENT MANAGEMENT

Delivery expected in 2004
Use of Pavement Management

- **Strategic Level**
  - Committed Projects

- **Network Level**
  - Inventory
  - Analysis
  - Feedback

- **Project Level**
  - Final Project Selection
  - Analysis

- **Preservation Strategy and Funding Level**
  - Decision Criteria
  - Work Plan Development
  - Potential Project List
Support for Strategic Decisions

- Set performance standards or goals
- Distribute funds among districts or programs
- Establish a preventive maintenance program
Support for Network Decisions

- Identify treatment needs
- Prioritize needs
- Recommend projects within budget constraints
- Illustrate the long-term impacts under various scenarios
Support for Project-Level Decisions

- Finalize treatment selection
- Design the selected treatment
- Finalize project cost estimates
Linking Management Levels

- Strategic Goal for Road Conditions
- Multi-Year Work Plan
- Current Condition
- Annual Work Plan
- Time
- Road Conditions

Diagram:
- Linking Management Levels
- Time轴
- Road Conditions
- Current Condition
- Multi-Year Work Plan
- Annual Work Plan
- Strategic Goal for Road Conditions
The primary focus of these activities has been on resurfacing activities...

...preventive maintenance programs require a focus on ALL preservation activities
Desired Support for Preventive Maintenance

- Demonstrate the benefits associated with preventive maintenance
- Estimate funding needs to achieve specific targets or goals
- Allocate available funding cost-effectively
- Identify and prioritize treatment needs
Existing Gaps

Data collection activities
- Are the triggers for preventive maintenance being collected?
- Is the data collection frequency sufficient to identify preventive maintenance treatments on a timely basis?
Existing Gaps

Condition indexes

- Do the condition indices provide the information necessary to trigger preventive maintenance treatments?

Composite Indexes

Versus

Individual Indexes
Existing Gaps

Performance models

- Do we have the information necessary to develop performance models for preventive maintenance treatments?
Existing Gaps

Treatment triggers and impact models

- Does the pavement management system have access to the information that triggers preventive maintenance activities?
- Can the pavement management system model the impacts associated with the application of a preventive maintenance treatment?
Sample Impact Model

Preventive Maintenance

Rehabilitation

Reconstruction
Approaches To Integration - 1

Pavement sections that are NOT candidates for rehabilitation or reconstruction are identified as candidates for preventive maintenance.

Rehabilitation and Reconstruction OR Preventive Maintenance Candidate
Preventive maintenance treatments are considered collectively as a treatment and the specific treatment is not identified.

Treatments Considered:
- Preventive Maintenance
- Thin Overlay
- Mill and Fill
- Structural Overlay
- Reconstruction
Specific preventive maintenance treatments are recommended based on information available in the pavement management system.
Sample Decision Tree for Cracking

Load Associated
- Fatigue
  - Not appropriate for preventive maintenance
- Longitudinal
  - ADT < 1000
    - Crack fill or chip seal
  - 1000-5000
    - Crack fill or chip seal
  - > 5000
    - Crack seal or thin HMA overlay

Non-Load Associated
- Transverse
- Shrinkage
  - Fog seal or chip seal or thin HMA overlay
Steps To Improve Integration

- Identify your needs
- Identify the gaps
- Develop a plan
  - Identify data sources
  - Collect data needed to support analysis
- Implement the plan
Benefits to Integration

- More coordinated work plans developed to accomplish agency goals
- Better able to demonstrate the benefits in using preventive maintenance treatments
- Better informed to make decisions about treatment needs