SUPPORTING PRESERVATION WITH ROBUST DATABASES

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AUGUST 28, 2012
OPTIMIZE PRESERVATION

- Right Treatment
- Right Time
- Right Pavement
Concept of Pavement Preservation

- Original Pavement
- Pavement Preservation Actions
- Major Rehabilitation Trigger
OVERVIEW

• HISTORICAL APPROACHES
• TYPES OF DATA RECOMMENDED
• MONITORING ACTIVITIES
• FUTURE RESEARCH AND PLANNING
HISTORICAL APPROACHES

- Experience of maintenance personnel
- Fixed timing of treatments
- Set to specific budgets
- Set to productivity of in-house resources
TYPES OF RECOMMENDED DATA

- Climate
- Traffic
- Inventory Data
- Materials / Construction
- Pavement Performance
CLIMATE DATA

- Temperature
- Precipitation
- Solar Radiation
TRAFFIC DATA

- Volume
- Weight
- User Delays
INVENTORY DATA

• Data of Construction
• Maintenance and Rehabilitation History
• Type of Pavement / Cross Section
• Location
MATERIALS / CONSTRUCTION DATA

- Temperature at time of construction
- Application rates
- Mix designs
- QC/QA data
- Equipment
PERFORMANCE DATA

• Distress
• Surface Friction
• Ride Quality
OVERVIEW

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• FUTURE RESEARCH AND PLANNING
PERFORMANCE DATA

Functional Capacity: ride quality
  • Roughness (IRI)
  • Surface Friction

Structural Capacity: Load carrying capacity
  • Distress Survey (Fatigue / Rutting)
  • Deflection Testing
DATA COLLECTION SYSTEMS

Photolog

GPR

Geometry & Spatial

• HPMS curve
• Grade
• Cross slope
• Centerline mapping
• Spatial referencing for GIS integration

Pavement Condition

• Roughness
• Texture
• Rutting
• Surface Distress

Assets

• Inventory
• Location
• Offset
• Height & Width
• Condition
SURFACE FRICTION

• AASHTO T 242: Frictional Properties of Paved Surfaces Using a Full-Scale Tire
• ASTM E 274: Skid Resistance of Paved Surfaces Using a Full-Scale Tire
Structural Evaluation

Types of Deflectometers:

• Benkleman Beam
• Falling Weight Deflectometer
• Traffic Speed Deflectometer
5422 0000
9-Kip Load, All Sensors

D1 – deflection right under dropped load.
Indicative of pavement strength

D7 – deflection under sensor farthest from dropped load.
Indicative of subgrade strength

Deflection of pavement in 1/1000’s of an inch

Higher deflections on AC

Lower deflections on PC; lowest on CRCP typically

Distance from begin of Control Section

Layer boundaries

Bridge

4”-6” AC
9” CABB

3” AC
11” CABB

9” CRCP
4” AC Base
# Core Logs

## Coring Log

<table>
<thead>
<tr>
<th>County</th>
<th>OKTuskeen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Section</td>
<td>5422 0000</td>
</tr>
<tr>
<td>Bore Number</td>
<td>5</td>
</tr>
<tr>
<td>Date Cored</td>
<td>3/16/2005</td>
</tr>
<tr>
<td>Highway</td>
<td>I-40</td>
</tr>
<tr>
<td>Milepost</td>
<td>14</td>
</tr>
<tr>
<td>Nearest Town</td>
<td>Pharoah</td>
</tr>
<tr>
<td>Lane Direction</td>
<td>East</td>
</tr>
</tbody>
</table>

**Core Data**

- Surface Material Type
- Stripping or Separation in Asphalt
- Honeycomb or "D" Cracking in PCC
- Reinforcing Fabric Present
- Other Notes

- AC
- PCC
- Stripping
- Separation
- Honeycomb
- "D" Cracking
- N/A

**Core Layer Data (From Top to Bottom)**

<table>
<thead>
<tr>
<th>Layer Type</th>
<th>Thickness (in.)</th>
<th>Layer Characteristics</th>
<th>Deterioration of Layer Materials?</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCC</td>
<td>9.50</td>
<td>CONTINUOUSLY REINFORCED CONCRETE</td>
<td>□</td>
</tr>
<tr>
<td>AC</td>
<td>3.50</td>
<td>TYPE B</td>
<td>□</td>
</tr>
<tr>
<td>SUBGRADE</td>
<td></td>
<td>CLAYEY SILT</td>
<td>□</td>
</tr>
</tbody>
</table>

Total Core Thickness 13.00

Stabilized Subgrade Beneath Pavement or Sub-base?  □ Yes  □ No  □ Unknown
Pavement Monitoring

Consistent Pavement Evaluation data helps:

- Establish serviceability map of pavement network
- Develop strategies
- Establish long-term performance database

Assess Pavement Performance
Monitoring of Network

2005

GIS Distress Condition Maps

McKinney, Texas

2006
OVERVIEW

• HISTORICAL APPROACHES
• TYPES OF DATA RECOMMENDED
• MONITORING ACTIVITIES
• FUTURE RESEARCH AND PLANNING
Preservation Treatments for various distresses

**Asphalt-Surfaced Pavement:**
- Chip Seals
- Fog Seals
- Slurry Seals
- Micro-Surfacing
- Thin Overlays
- Profile Milling
- Crack Sealing

**PCC-surfaced Pavement:**
- Joint Resealing
- Crack Sealing
- Spall Repair
- Dowel Bar Retrofit
- Full and Partial Depth Repair
- Diamond Grinding and Grooving
FUTURE RESEARCH & PLANNING

• LTPP Pavement Preservation Experiments
• NCHRP Research Activities
• NCPP and FPP Initiatives
• Academia
RESEARCH AND PLANNING GOALS

• Quantify Return on Investment
• Life Cycle Cost Analysis
• Comparisons to current methods
“If you don’t know where you are going, you will wind up somewhere else.”

Yogi Berra
QUESTIONS?

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