MDSHA Pavement Network

Network Facts

17,000 lane-miles of pavement

Seven Engineering Districts

AADT Distribution

- 9%
- 30%
- 28%
- 33%

<5000  5000-20000  20000-50000  >50000
Background

MDSHA Network
~15,000 mainline lane-miles

~2,000 ramp lane-miles
Program Funds

Major Projects
$400 to $500 million

System Preservation Projects
$400 to $500 million

Fund 77 Program
$400 to $500 million

$150 to $175 million
Fund 77 Plan - Forecasts

Existing Budgets

- Approximately a 6.6% increase in funding over 5 FY’s or 1.3% per year
- Approximately $4 to $7 million in state operational maintenance
Material and Construction Costs

• Construction material costs continue to rise
  – Liquid Ton of AC up 162% (Jan-04 to Sep-06)
  – Portland Cement up 38% (Jan-04 to Mar-07)*
  – Steel up 58% (Jan-04 to Mar-07)*
  – Aggregate up 27% (Jan-04 to Mar-07)*

• Escalation results in 25-30% increase in HMA

• Significant costs difference between Districts

*Data from the US Department of Labor
Previous Preservation Process

Defined Budget

Roadway Distress

Political & Administrative Decisions

Pavement Recommendations

“Mill 2 in., put back 6 in.”

US 50 - Vienna to Linkwood
MD 97 - MD 32 to MD 26
I-70 - MD 75 to US 40
MD 2 - MD 100 to 5th Ave.
MD 65 - Sharpsburg to MD 68
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MD 97 - MD 32 to MD 26
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MD 65 - Sharpsburg to MD 68

Project Level Driven

District Develops Fund 77 Priority List
MDSHA Business Plan - Goals

• Maintain annually at least 84% (CY 2002 pavement conditions) of the SHA pavement network in acceptable **riding quality condition**.

• Maintain annually at least 84% of the SHA pavement network in acceptable **overall pavement condition** (cracking, rutting, ride).

• Goal is to maintain and not improve.
Current Preservation Process

• Performance Monitoring

• Modeling and Optimization Analysis

• Target Development

• Project Selection and Design

• WORK IN PROGRESS!
Performance Monitoring

- 10,000 miles annually

- ARAN
  - Ride Quality
  - Rutting
  - Cracking

- Friction

- Construction History Database
Performance Modeling: Deterministic Curves

(Flexible Pavement with High Level of Traffic)
Target Development

Optimization Process

Pavement System Preservation Target Goals
By Engineering District:
- Total Cost
- Lane Miles
- Benefit to Network

Chief Engineer’s Office
Preservation Targets – FY 2008

FY 2008 District Fund 77 Improvement Type Targets

- 15-year: $6.3, 27 lane-miles
- 12-year: $54.8, 278 lane-miles
- 8-year: $44.8, 243 lane-miles
- 5-year: $20.0, 150 lane-miles
- 4-yr MT: $5.3, 86 lane-miles
- 2-yr MT: $1.7, 53 lane-miles

Budget ($1,000,000) vs. Lane-Mile Target

District: 15-year, 12-year, 8-year, 5-year, 4-yr MT, 2-yr MT
Accomplishments

MDSHA Lane-Miles Improved

<table>
<thead>
<tr>
<th>Year</th>
<th>Fund 77 - Resurface</th>
<th>Fund 77 - Maintenance</th>
<th>Other Funds - Resurface</th>
<th>Operational Maintenance</th>
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<tr>
<td>2005</td>
<td>765</td>
<td>292</td>
<td>159</td>
<td>182</td>
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<td>2006</td>
<td>766</td>
<td>377</td>
<td>120</td>
<td>314</td>
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</table>

Total 1,398 Lane-miles Improved

Total of 1,577 Lane-miles Improved
What We Are Doing:

• Districts determine project candidates
  – Still prioritize by Worst-First
  – They determine the fix
    • Pavement Division determines life, materials, ride targets

• If goals are met, all done. When goals are not met, choose different fixes or different candidates
Preventative Maintenance (2-year or 4-year):

- Crack Sealing
- Partial- or Full-Depth patching
- Grinding only
- Slurry Seal

- As Tony Kornheiser says: “That’s it. That’s the list!”
Preventative Maintenance (2-year or 4-year):

- No PCC preventative maintenance program
  - Any maintenance is reactive

- Expected life of maintenance treatments not clearly defined
Treatments

Rehabilitation (5, 8, 12 or 15-year):

- Involves at least an overlay
- Patching, grinding, wedge/level all project dependent
- Design life based on 1993 AASHTO
- Looking at allowing for longer design lives
Two primary contract types:

- Single-Ad
- Areawide
- Both are Low-Bid

- Design-Build becoming more prevalent, but have not yet been used in System Preservation

- Warranties have been non-starters
Opportunities for Improvement

Training

• Tremendous turnover
• Reorganization
• Hiring Freeze
• We are NOT aware of all tools in toolbox
Opportunities for Improvement

- Contractors – limited pool

- Many roads not structurally adequate

- Decision making of which roads to fix, and what fixes to apply: in wrong hands?

- Capturing Maintenance activities
Opportunities for Improvement

Creating Understanding

• Districts have a hard time understanding “benefit”
  – Remaining Service Life a solution?

• Not clear to politicians what “their” money is buying
What We Should Be Doing:

- Districts determine project candidates, based on remaining-life groups
- **DO NOT** Prioritize by Worst-First
- Districts need more guidance in determining correct fix, and more guidance on what candidates are in which remaining-life groups
- Pavement Division needs guide for determining “The Right Fix at the Right Time”
Summary

Strengths:
• Rehabilitation Design Guide (200+ page Maryland Pavement Design Guide)
• Setting network-level targets

Opportunities for Improvement:
• Making network targets understandable and translatable into actual projects
• Maintenance Design Guide (No guide exists in Maryland…yet)
Conclusion/Questions

Contact:

Geoff Hall, P.E.
Chief, Pavement & Geotechnical Division
Maryland State Highway Administration
410-321-3110
ghall1@sha.state.md.us