Maryland’s Perspective on Pavement Condition Data for Pavement Preservation

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Condition Data – Maryland’s Perspective

How long do preservation treatments last?

How can they be used more?
Condition Data – Maryland’s Perspective

Overview

• Why pavement condition data – relevant to preservation – matters

• Types and Quality needed
Condition Data – Maryland’s Perspective

Why does relevant-to-preservation condition data matter?

• Historical focus on worst-first… on rehab
  ➢ Too far gone for Preservation
  ➢ Geared to Rehab (IRI, etc.)
  ➢ Hard to justify not picking the worst
How can focus move away from rehab to preservation?

- Balanced approach
  - Mix of Good, Fair, Poor
  - Have justification for not picking the worst
Condition Data – Maryland’s Perspective

How to justify not picking the worst?

Benefit/Cost

- Type of data
- Quality of data
Condition Data – Maryland’s Perspective

Type and Quality of data

- Objective
- Reliable
- Useful
- Repeatable

Require automatic detection
Condition Data – Maryland’s Perspective

Why are type and quality of data important?

- If relevant type is not collected:
  - Difficult to identify preservation candidates
- If quality is lacking,
  - Preservation will not be cost-effective

Preservation will not get chosen.
Condition Data – Maryland’s Perspective

The fill-in-the-blank doesn’t last long enough!

Preservation will not get chosen.

Prove that wrong:

- Quantify the performance extension
- Quality data is needed
Performance Extension

How is “Condition” measured?
Defining Condition

Ride quality? Cracking? Overall?

Several ingredients make up Condition.

• Important to distinguish – and measure – all of them.
Types of Distresses for Preservation

Several distresses fixable (or ed by Preventive Maintenance

If we can identify these, Preservation has a MUCH better chance at success.
Block Cracking
Block Cracking

Can network-level collection occur?

No

• Needs reliable way to distinguish structural and surficial cracks
Joint-Reflective Cracking

Composite Pavement – PCC joints reflect through HMA.
Joint-Reflective Cracking

Can network-level collection occur?

Yes, but

• Needs excellent inventory (pavement structure)
Longitudinal/Transverse Crack
Longitudinal/Transverse Cracking

Can network-level collection occur?

Not really

- Needs reliable way to distinguish structural and surficial cracks
Oxidation
Oxidation

Can network-level collection occur?

No
Polished Aggregate
Polished Aggregate

Can network-level collection occur?

YES

• Needs texture and skid truck
Rutting/Ponding
Rutting/Ponding

Can network-level collection occur?

YES
Raveling
Can network-level collection occur?

Indirectly, Maybe

• Needs texture and raveling detection
# Collection of Distresses

<table>
<thead>
<tr>
<th>Distress Type</th>
<th>Needed Collection Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Block Cracking</td>
<td>• Reliable crack width</td>
</tr>
<tr>
<td>L/T Cracking</td>
<td>• Network-Level Deflection</td>
</tr>
<tr>
<td></td>
<td>• Crack sealant detection</td>
</tr>
<tr>
<td></td>
<td>• Layer bonding</td>
</tr>
<tr>
<td>Joint-Reflection Cracking</td>
<td>• Reliable crack width</td>
</tr>
<tr>
<td>Distress Type</td>
<td>Needed Collection Method</td>
</tr>
<tr>
<td>--------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Oxidation</td>
<td>• Color</td>
</tr>
<tr>
<td>Polished Aggregate</td>
<td>• Texture</td>
</tr>
<tr>
<td></td>
<td>• Skid Truck</td>
</tr>
<tr>
<td>Rutting/Ponding</td>
<td>• ARAN (or similar)</td>
</tr>
<tr>
<td>Raveling</td>
<td>• Texture</td>
</tr>
<tr>
<td></td>
<td>• Raveling</td>
</tr>
</tbody>
</table>
Types of Condition Data

Currently collected:

• Cracking – by zone
• Rutting
• Skid
• Texture
• Raveling
Collection Methods

Need:

- Color/Aging
- Network-Level Deflection
- Network-Level Layer Bonding
- Crack Sealant Detection
Types of Condition Data for Preservation

What preservation treatments are affected by missing data?

Pretty much all of them.
Example – Micro-surfacing

What does this fix or prevent?

• Low severity surface cracks
• Rutting
• Friction problems
• Aging
• Raveling
Example – Micro-surfacing

Can we collect this?

- Low severity surface cracks
- Rutting
- Friction problems
- Aging
- Raveling
Example – Micro-surfacing

Can we collect this?

• Low severity surface cracks
• Rutting
• Friction problems
• Aging
• Raveling
Example – Micro-surfacing

Can we collect this?

- Low severity surface cracks
- Rutting
- Friction problems
- Aging
- Raveling
Condition Data

But Wait...

THERE'S MORE!
Quality of Condition Data

Small condition window for Preservation

• If road really is better – preservation is not cost-effective
• If road really is worse – too late for preservation
Quality of Condition Data

The dog that didn’t bark.

- Life-extending benefit of preservation =
  - Performance with preservation
    VERSUS
  - Performance without preservation
Life Extension – Condition Improvement

Graph showing the relationship between pavement condition and age, with condition improvement at specific ages indicated by red arrows.
Life Extension – Slower Deterioration

- Slower Deterioration
Quality of Condition Data

The dog that didn’t bark.

- For this concept to work:
  - Little room for data variability
  - Data **MUST** be high quality
Summary of Needs

Do you want preservation?

We need:

- Texture
- Raveling
- Ponding
- Color

- Bonding of layers
- Network-level deflection
- Reliable crack width
- Crack sealant

Well, do ya, punk?
Summary of Needs

And we need this data to be:

- Objective
- Reliable
- Repeatable
- Fast
Summary of Needs

Once we have it, we can:

• Determine how long each preservation treatment **actually** lasts

• **Competently** identify preservation candidates
Questions?

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