Advancing Pavement Evaluation to Support Engineering & Investment Decisions

Jerome Daleiden, P.E.
Thomas Burchett,
Andy Mergenmeier, P.E.

Wednesday, May 20, 2015
Overview

• Why?
• How?
• What’s next?
Why New Standards?

1. AASHTO Provisional Standards
   PP-38 and PP-44 in early 2000’s
   R 38 and R 55 today
2. Development of newer technology
3. Opportunity to improve accuracy
4. National infrastructure funding support
<table>
<thead>
<tr>
<th>Methodology</th>
<th>Fast</th>
<th>Safe</th>
<th>Repeatable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Windshield</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semi-Automated</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Automated</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>
How

• Task group
  ▪ States
  ▪ Industry
  ▪ FHWA

• Drafted Protocols
  ▪ Transverse profile
  ▪ ACP cracking
PP 70 - Collecting Transverse Pavement Profile

PP 69 - Determining Pavement Deformation Parameters and Cross-Slope from Collected Transverse Profiles
Transverse Profile Collection

Scan Lane + 400 mm

Lane Line

Resolution within 1mm

≤10mm
Transverse Profile Collection

±10° max
1. Calculate Cross-slope

- Roadway
- Center of Lane
- Shoulder

- Average elevation of left ½ lane
- Average elevation of right ½ lane
1. Calculate Cross-slope

Roadway

\( C_L \)

Center of Lane

Average elevation of left \( \frac{1}{2} \) lane

Average elevation of right \( \frac{1}{2} \) lane
2. Calculate Percent Deformation:
3. Calculate Rut Depths

Roadway

\[ \text{Transverse Profile Analysis} \]
4. Calculate Rut Area
Standards for Cracking

PP 68 - Collecting Images of Pavement Surfaces for Distress Detection

PP 67 - Quantifying Cracks in Asphalt Pavement Surfaces from Collected Images Utilizing Automated Methods
Standard for Collecting Images

- **Image Characteristics**
  - Lighting
  - Image Width
  - Image Length
  - Image Resolution

- **Detection Minimums**
  - False Positives

- **Reporting**
  - Image format
  - Positioning

100 m Max.

4.0 m minimum
4.25 m preferred
Uses 5 zones
Classifies into 3 types
- Longitudinal
- Transverse
- Pattern
Classifies by extent and severity
Standard for Quantifying Cracks
Improving the Quality of Pavement Surface Distress and Transverse Profile Data Collection and Analysis

1. Preparation
2. Verification
3. Precision and Bias Studies
4. Implementation
First Meeting was May 2014
  - Various subcommittees formed and contributing

Transverse Profile
  - Initiatives to date
    - Focused on verification of collection technology
    - Study of Technology Overview on Validating 3D Transverse Profile & Pavement Surface Distress

Cracking
  - Initiatives to date
    - Focused on analysis of images
Anticipated Projects

• NCHRP 1-57 Standard Definitions for Comparable Pavement Cracking Data

• Standard Data Format RFP for 2D/3D Pavement Image Data

• Transverse Profile Calibration
1. AASHTO Standards have been created  
   a.) ACP Cracking  
   b.) Transverse Profile  
2. Pooled Fund Study TPF-5(299)  
   a.) Formed as focal group  
   b.) Facilitate advancement  
3. Encourage participation from all  
   a.) Questions  
   b.) Comments  
   c.) Help with revisions