Proposed Standards for Measurement of Cracking and Rutting

ETG on Quantification of Pavement Cracking and Rutting  May 2009

US Department of Transportation
Federal Highway Administration
Why New Standards?

1. Expiration of AASHTO Provisional Standards PP-38 and PP-44
2. Development of newer technology
3. Increasing need for precision and accuracy
Rutting
Provisional Standard 38
Now AASHTO Standard R 48-09

2300 mm (90 in.) (min.)
Length set by user

D5
D4
D3
D2
D1

Reference Plane

Centerline

Inside Wheelpath
Outside Wheelpath
Proposed new Standards for Transverse Profile

1. Transverse Profile Measurement
2. Transverse Profile Analysis
Data Standards - Transverse Profile Measurement

Scan Lane + 400 mm

Resolution within 1mm

≤10mm

Lane Line
Transverse Profile

±5° max
Transverse Profile Analysis

1. Calculate Cross-slope

Roadway

\( C_L \)

Center of Lane

Shoulder

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

Average elevation of right \( \frac{1}{2} \) lane
Transverse Profile Analysis

1. Calculate Cross-slope

Roadway

Center of Lane

Average elevation of left ½ lane

Average elevation of right ½ lane
2. Calculate Percent Deformation:
Transverse Profile Analysis

3. Calculate Rut Depths

Road

Shoulder
Transverse Profile Analysis

3. Calculate Rut Depths

Roadway

CL

3  1  2  4  5
Transverse Profile Analysis

3. Calculate Rut Depths
Transverse Profile Analysis

4. Calculate Rut Area

Lane

C L

3 1 5

2 4
Cracking
Provisional Standard 44
Expiring in 2009
Provisional Standard 44

- 0.125 m = 0.41 ft
- 0.75 m = 2.5 ft
- 3.6 m = 12 ft

Survey Strip
2.500 m

*Optional

- Inside WP
- Area between WPs
- Outside WP

*Varies

Adjacent Lane

Pavement Surface
Survey Lane

Usual Lane Width 3.6 m

Shoulder of Adjacent Lane
Proposed Standard for measuring pavement cracking

- Image Characteristics
- Detection Minimums
- Reporting
Pavement cracking

100 m Max.

4.0 m minimum
4.25 m preferred
Pavement cracking

Detection Criteria:

Resolution $\leq 1$ mm

Min. Detection

- 30% if width is $\leq 3$ mm
- 50% if width is 3 mm to 5 mm
- 85% if width is $\geq 5$ mm wide

False positives $\leq 3$ m in 50 m$^2$

Crack width within 20%
Proposed Standard for analyzing pavement cracking

- Uses 5 zones
- Classifies into 3 types
- Classifies by extent and severity
Pavement cracking
ETG Activities:

1. Finalize R48 (5-point Rutting Method)
2. Submit Proposals for Automated Methods to AASHTO SOM Technical Committee 5a.
3. Conduct Verification Project
4. Present Methodology to Pavement Community.
5. Work with AASHTO Committee to finalize standards.
ETG State Members:

Rick Miller, Kansas DOT
John Andrews, Maryland DOT
Jeff Seiders, Texas DOT
Bouzid Choubane, Florida DOT
Cole Mullis, Oregon DOT
Judith Corley-Lay, North Carolina DOT
Todd Copenhaver, Texas DOT
ETG Industry Members:

Gary Elkins, MACTEC
Chuck Larson, STANTEC
Frank Holt, Dynatest
Richard Fox-Ivey, Fugro-Roadware
Jerry Daleiden, FCLAU
ETG FHWA Members:

Thomas Van, HQ Asset Management
Jack Springer, TFHRC
Andrew Mergenmeier, RC
Mike Moravec, HQ Pavements
For more information:

Thomas Van  
FHWA – Office of Asset Management  
Tel. 202-366-1341  
Email: thomas.van@dot.gov