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# Pilot Evaluation of the Cracking Protocol From LTPP MDS Workshop Surveys

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U.S. Department  
of Transportation

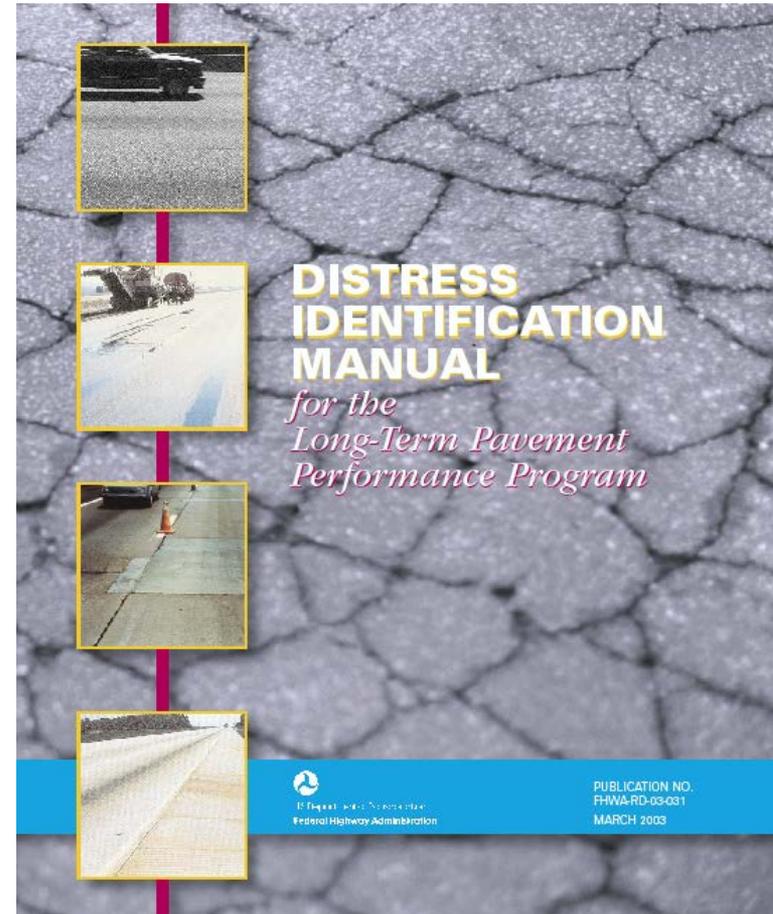
**Federal Highway  
Administration**



**LONG TERM  
Pavement  
PERFORMANCE**

# LTPP Study

- Conducting manual surveys over past 20 years
- Conduct Workshops Annually for all Raters



# LTPP Study

- All ratings
  - Same Day
  - Same Section
- Reference Surveys
  - “Ground Truth”
  - Consensus of Instructors
  - Immediately before individual ratings



# Fatigue Cracking

- Normally occurs in Wheel Paths.
- Develops into a characteristically chicken wire or alligator pattern in later stages.
- Must have a quantifiable area.



# Fatigue Cracking

- Low severity has no or only a few connecting cracks. No spalling, no sealant, no pumping.
- Moderate severity has complete pattern. Cracks may be spalled, may be sealed, no pumping.
- High severity has moderate or severe spalling. Pieces may move under traffic, may be sealed, may have pumping.



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# Longitudinal & Transverse Cracking

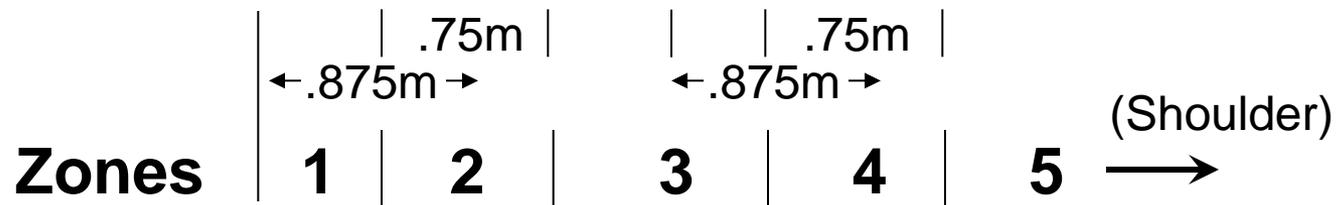
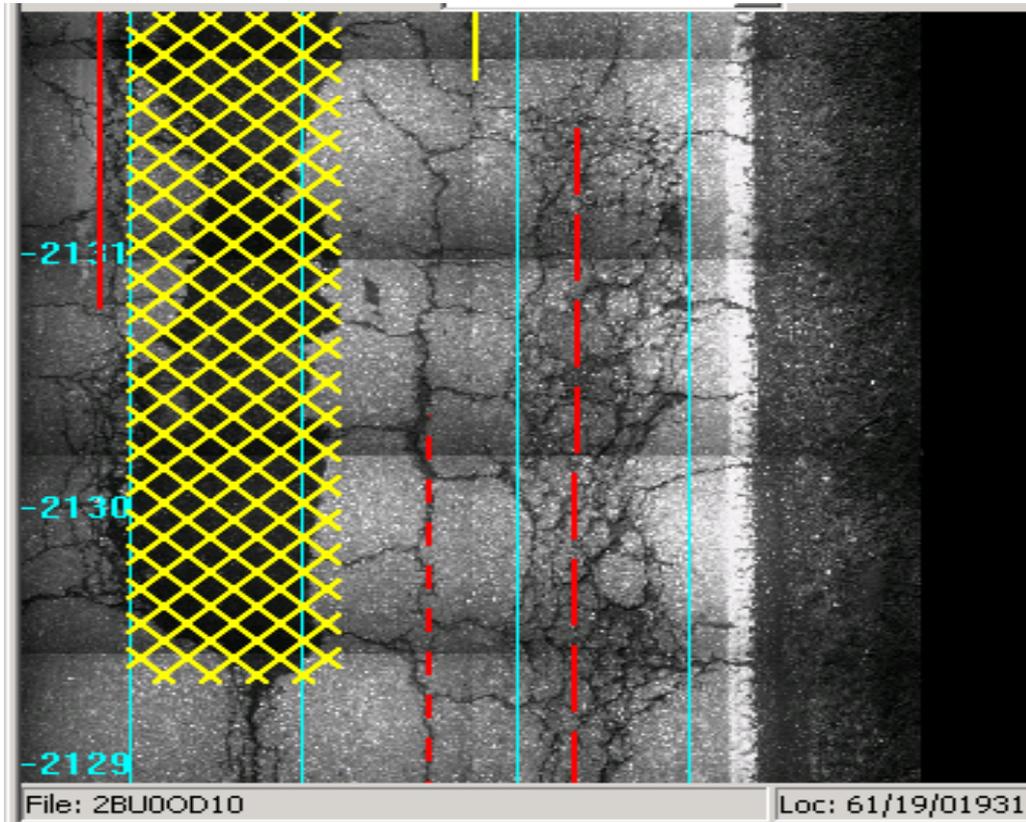
- Longitudinal - Cracks predominantly parallel to the pavement centerline. Location is Significant (wp/nwp).
- Transverse - Cracks predominantly perpendicular to the pavement centerline
- Severities
  - Low: < 6mm wide or sealed cracks
  - Moderate: < 18mm or any crack with adjacent low severity random cracking.
  - High: > 18mm or any crack with adjacent moderate to high severity random cracking.



# Standard for analyzing cracking

- Classifies into 3 types
  - Longitudinal
  - Transverse
  - Pattern
- Classifies by extent and severity

# Pavement Cracking



# Ultimate Objective

- “Precision and Bias” comparison
- Using “Ground truth” of workshop

# Factors That Affect Variability

- Clarity of Distress Protocols
- Quantity
- Severity
- Environment
  - Temperature
  - Moisture,
  - Sunlight and
  - Angle of sun
- Rater proficiency
- Rater visual acuity

# Initial Questions

- Section 8, “Data Reporting”
  - Says 22 values?
  - 3 sets of length and width for 5 zones = 30?
- For pattern cracking
  - Are we recording “width of the cracks?”
  - Or width of the pattern?
- When recording “average width”
  - How frequently should a measurement be taken?

# LTPP Study Global Trends

- Individual rater variability
  - For any given distress type/severity combination
  - Is typically large
  - And increases as the distress quantity increases
- Total distress group means
  - Are generally close to the reference value
  - With less scatter than the individual severities
  - Showing significant differences in distinguishing severities
- For closely related distresses
  - Such as fatigue and longitudinal wheelpath cracking
  - Compensatory differences were observed
- Generating a composite score produced greater agreement

# Pilot Study Observations

- “crack width” had more variability than “crack length”
- Unclear on how to note “random associated” cracking
  - Is this “pattern”?
  - Really?
- Unclear where/how to report width of pattern?
- Surveyors questioned,
  - Is this protocol truly documenting what agencies need?