



U.S. Department of Transportation
Federal Highway Administration



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US Pavement Performance Measures and Support Activities

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Image: FHWA

Outline: US Pavement Performance Measures and Support Activities

- US Transportation Pooled Fund (TPF) Program
- US National Pavement Performance Measures
- TPF-5(299) study activities and NCHRP program



Transportation Pooled Fund Process in the US

- Web Page: <http://www.pooledfund.org/>
- State Highway Agencies (SHA), commercial entities, and Federal Highway Administration (FHWA) to combine resources and achieve common research goals.
- Lead Agency (SHA or FHWA) Contact
 - Creates and Post the Solicitation
 - Organizations Make Commitments
- Majority of funds are USDOT funds distributed to State Highway Agencies



Transportation Pooled Fund Procedures Manual

- Technical Advisory Committee (TAC)
 - Each funding organization selects one person
 - Role of TAC
 - Select projects to undertake
 - Monitor projects
- [http://www.pooledfund.org/Reports/Pooled_Fund_Program_Procedures_Manual_\(Revised_2017\).pdf](http://www.pooledfund.org/Reports/Pooled_Fund_Program_Procedures_Manual_(Revised_2017).pdf)



International Participants welcomed

- Participate as fund contributor – formal process
 - Participate as friend – informal process
- <http://www.pooledfund.org/AuthorizedReports/Pooled%20Fund%20Website-International%20Participants.pdf>
- Discuss TPF-5(299) activities later



US National Pavement Performance Measures

- US Government Programs – Performance Based
- Effective May 2017
- Most SHA's have own Pavement Performance Measures



US National Pavement Performance Measures

Performance Target	Interstate Condition	Non-Interstate NHS Condition
<i>Two-year</i>	% Good	% Good
	% Poor	% Poor
<i>Four-year</i>	% Good	% Good
	% Poor	% Poor

Interstate – Multi-Lane Motorway with full access control



Data Needed for Calculating the National Pavement Measures

Condition Data:

- Roughness (IRI)
- Rutting (asphalt (flexible) pavements only)
- Cracking
- Faulting (concrete (rigid) pavements only)
- Can use Present Serviceability Rating (PSR) only where speed limit < 40 mph



Determining Condition for a Section (0.1 mile ~.16km)

Evaluate each of the metrics for the section to determine whether the section is good, fair or poor with respect to:

- Asphalt: IRI, rutting, cracking %
- Jointed Concrete Pavement (JCP): IRI, faulting, cracking %
- Continuously Reinforced Conc. Pvt. (CRCP): IRI, cracking %

Determine overall condition for the section based on the number of metrics that are good, fair and poor



Pavement Condition Thresholds

	Good	Fair	Poor
IRI (inches/mile)	<95	95-170	>170
Rutting (inches)	<0.20	0.20-0.40	>0.40
Faulting (inches)	<0.10	0.10-0.15	>0.15
Cracking (%)	<5	5-20 (asphalt) 5-15 (JCP) 5-10 (CRCP)	>20 (asphalt) >15 (JCP) >10 (CRCP)

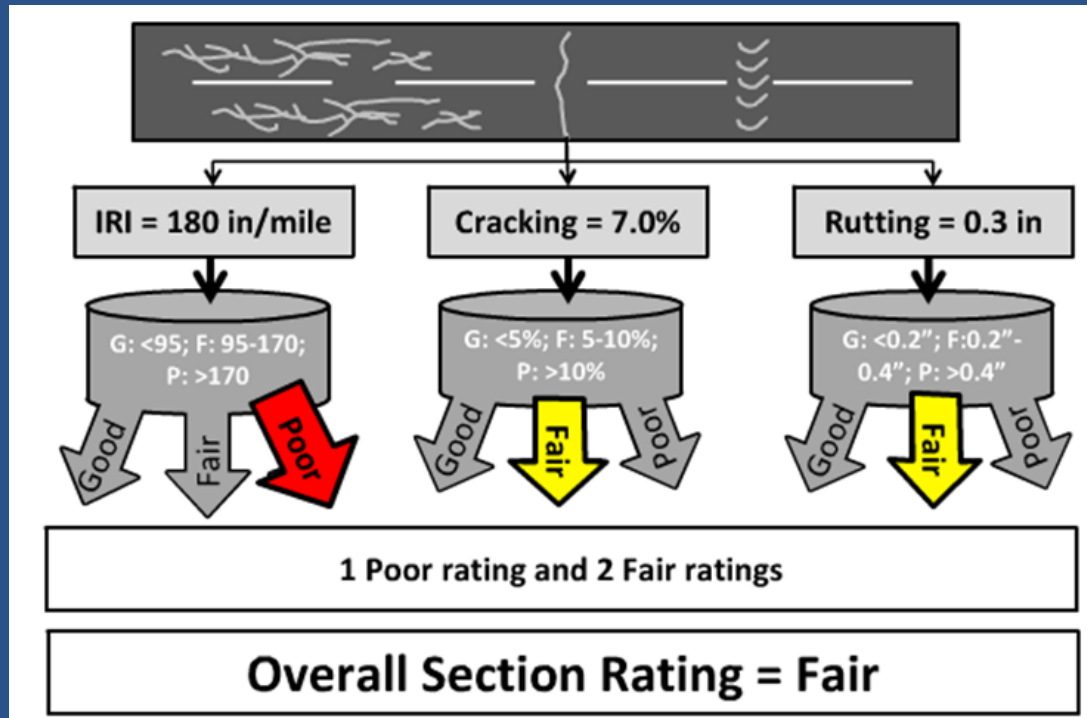
95 in/mi~1.5 m/km
0.2 in~5 mm
0.1 in~2.5 mm



Calculation of Pavement Measures

	Pavement Type		
	Asphalt and Jointed Concrete	Continuous Concrete	
Overall Section Condition Rating	3 metric ratings (IRI, cracking and rutting/faulting)	2 metric ratings (IRI and cracking)	Measures
Good	All three metrics rated "Good"	Both metrics rated "Good"	percentage of lane-miles in "Good" condition
Poor	≥ 2 metrics rated "Poor"	Both metrics rated "Poor"	percentage of lane-miles in "Poor" condition
Fair	All other combinations	All other combinations	

Pavement Metric Rating Example: Asphalt Surfaces, Interstate



TPF-5(299) Study Formation

- Started 2014
- Why formed
- Administration
- Activities



Why Formed

- Rutting/Cracking Technical Working Group (TWG) formed in 2006
 - Volunteer cooperation
 - Did not have the mechanism to conduct studies (\$\$\$\$)
 - In April 2013, TWG recommended pooled fund study due to the success of TPF-5(063) Pavement Profiling (IRI)
 - TPF-5(063) developed the certification, verification, and specifications for longitudinal profile (IRI)



Administration

- FHWA is lead Agency
- Technical Advisory Committee – 21 funding agencies
 - Approval
- Friends – all others
 - Provide input, collaboration, assistance
- Funding commitment – over \$2 million
 - Other funds



Activities

TPF-5(299) Objectives: Improve the Quality of Pavement Surface Distress and Transverse Profile Data Collection and Analysis by assembling SHAs, FHWA, and industry representatives to:

- Identify data collection integrity and quality issues
- Identify data analysis needs
- Suggest approaches to addressing identified issues and needs

Based on this information, the SHAs and the FHWA will:

- Initiate and monitor projects intended to address identified issues and needs
- Disseminate results
- Assist in solution deployment



Activities

- Support Road Profiler User Group (RPUG) organization
- Develop research needs statements
 - AASHTO, TRB, FHWA – funding by others



AASHTO-NCHRP Program – funding research

- All SHA's are members of AASHTO
- SHA's receive funding from USDOT for research
- SHA's through AASHTO select research projects – NCHRP
 - National Performance Measures – financial support



Activities

Development of Standard Data Format for 2-Dimensional and 3-Dimensional (2D/3D) Pavement Image Data that is used to determine Pavement Surface Condition and Profiles – contract complete

- Follow up contract: Evaluation of Proposed Standard Data Format and Compression Algorithms for 2D/3D Pavement Surface Image – final report 2019
 - Separate data collection from analysis
 - Reprocess data when new analysis algorithms are developed
 - Apply analysis algorithms to 2D/3D digital images from different sources
 - Share data efficiently between users, software tools and electronic platforms



Activities – Transverse Profile (Rutting)

- TPF-5(299)/FHWA contract: “Calibration, Certification, and Verification of Transverse Pavement Profile Measurements”, final report 2020
 - Standards exist for longitudinal profile (IRI)
- NCHRP 20-07/Task 411 Review and Update of AASHTO R87, Determining Pavement Deformation Parameters and Cross-Slope from Collected Transverse Profiles, contract expected to be awarded fall 2018 (1 year contract)
 - Improve existing definitions



Activities - Cracking Data Collection and Analysis

- NCHRP 01-60, Measuring the Characteristics of Pavement Surface Images and Developing Standard Practices for Calibration, Certification, and Verification of Imaging Systems, awarded September 2018, contract length 3 ½ years
 - Objective: Develop standards to assess the quality of pavement surface digital images
- NCHRP 01-57A, Standard Definitions for Comparable Pavement Cracking Data, contract completion 2019 - data analysis (AASHTO R 85)
 - Improve existing definitions



Activities - Cracking Data Collection and Analysis

- TPF-5(299)/FHWA contract: Developing Guidelines for Cracking Assessment for Use in Vendor Selection Process for Pavement Crack Data Collection/Analysis Systems and/or Services, contract completion 2019
 - Objective: Develop contract language for agencies to use when procuring pavement cracking data collection/analysis systems and/or services.



Activities

- Jointed Concrete Pavement Faulting Collection and Analysis Standards, contract awarded September 2018, contract length 3 ½ years
 - Standards exist for longitudinal profile (IRI)
- Guidance for Quality Management of Pavement Surface Condition Data Collection and Analysis, contract award expected winter 2018/19, contract length 3 ½ years
 - Develop Quality Management Plan guidelines for pavement surface condition data collection and analysis



Consider Cooperating

- 21 State DOT agencies providing funds
- Pooled Fund Study National site:
 - <http://www.pooledfund.org/Details/Study/543>
- SharePoint site for TPF-5(299):
 - <https://collaboration.fhwa.dot.gov/default.aspx>
 - Register



Acronyms

- American Association of State Highway and Transportation Officials: AASHTO
- National Cooperative Highway Research Program: NCHRP
- Request for Proposals: RFP
- State Highway Administration: SHA
- Technical Working Group: TWG
- Transportation Pooled Fund: TPF



Questions?

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