

Transportation Performance Management

Overview of Performance Measures: Pavement Condition to Assess the National Highway Performance Program

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Highway Information Seminar

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U.S. Department of Transportation
Federal Highway Administration



Contents

- Requirements (What is required?)
- Scheduling (When it is due?)
- Role of Data

Acronyms

- CRCP: Continuously Reinforced Concrete Pavement
- HPMS: Highway Performance Monitoring System
- IRI: International Roughness Index
- JCP: Jointed Concrete Pavement
- NHPP: National Highway Performance Program
- NHS: National Highway System
- PMS: Pavement Management System
- PSR: Present Serviceability Rating
- STP: Surface Transportation Program
- TPM: Transportation Performance Management



TPM Legislative Intent and Expectations for Pavements

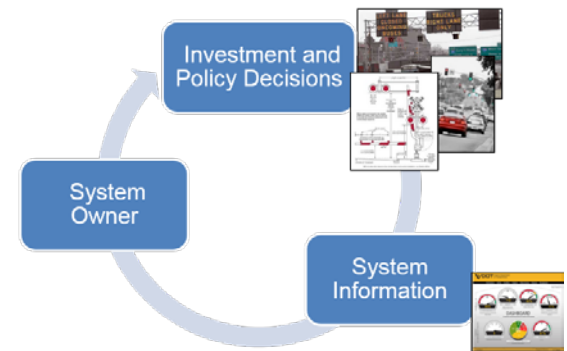


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Intent of the Legislation (23 USC 150)

- Focus on national goals
- Transparency
- Accountability
- Condition of pavements on the National Highway System (NHS)



...State of Good Repair...

TPM Expectations

States expected to:

- Upgrade planning processes
- Develop and use asset management plans
- Set performance targets
- Report conditions (performance)

[23 USC 119, 134, 135, and 150]



Challenges

- NHS ownership
- Information gaps
- Resource inequities
- Local vs. State vs. national priorities
- Regional economies
- Political realities
- Setting meaningful targets



National Pavement Performance Measures



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Pavement TPM Regulations

- Detailed in “National Performance Management Measures for Assessing Pavement Condition,” 23 CFR 490 Subpart C
- Establishes measures for State DOTs and MPOs to use to carry out the NHPP
- Includes requirements to assess progress on achieving condition targets for NHS pavements
- Establishes minimum condition requirements for Interstate pavements



Pavement TPM Regulations: Performance Measures (23 CFR 490.307)

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



Pavement TPM Regulations: Calculating Metrics and Measures

- Highway Performance Monitoring System (HPMS) data used by FHWA to calculate good/poor metrics and measures
- Combines consideration of roughness, cracking and rutting/faulting
 - Present Serviceability Rating (PSR) for lower speed roads
- Measures aggregated by lane miles
- HPMS pavement data collection requirements revised to require more comprehensive collection of data for NHS routes



Data Needed to Calculate the National Pavement Measures

Inventory Data:

- NHS extent
- Section length
- Facility type
- Through lanes*
- Functional system
- Surface type
- Structure type
- Urban Code



* Directional Through lanes for dual-carriage reporting for Interstates (optional)

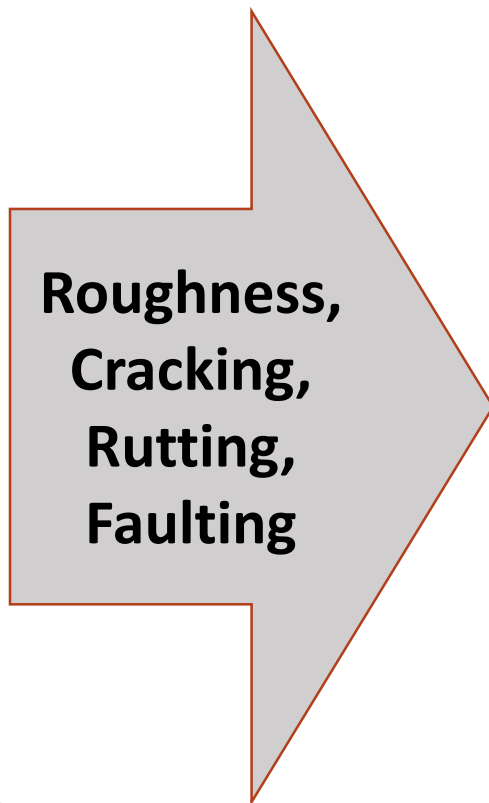
Data Needed to Calculate the National Pavement Measures

Condition Data:

- Roughness (IRI) (MRI)
- Rutting (asphalt pavements only)
- Cracking Percent
- Faulting (concrete pavements only)
- Can use PSR only where speed limit < 40 mph



Pavement TPM Regulations: Required Data Reporting



	Interstate	Non-Interstate	
	April 15	June 15	<i>Due Date</i>
	Every Year	2 Years	<i>Frequency</i>
	Full Extent 1 Lane 1 Direction	Full Extent 1 Lane 1 Direction	<i>Coverage</i>

Determining Condition for a Section

- 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 %
 - JCP: IRI, faulting, cracking %
 - CRCP: IRI, cracking %
 - Determine overall condition for the section based on the number of metrics that are good, fair and poor
- OR**
- If the posted speed limit < 40 mph:
 - Calculate from PSR: Scale = 0 to 5



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)
PSR	PSR ≥ 4.0	2.0 ≤ PSR ≤ 4.0	PSR ≤ 2.0

Pavement Measures Calculation

	Pavement Type		Measures
	Asphalt and Jointed Concrete	Continuous Concrete	
Overall Section Condition Rating	3 metric ratings (IRI, cracking and rutting/faulting)	2 metric ratings (IRI and cracking)	
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	



State Pavement TPM Regulations: Interstate Minimum Condition and Penalty

- A minimum pavement condition for the Interstate System is no more than 5% in Poor condition
- FHWA will assess this minimum condition annually, using data in the HPMS as of June 15
- If the minimum condition threshold is not met, the penalty is that the State must obligate a specified percentage of its NHPP and Surface Transportation Program (STP) funds to address Interstate conditions
- 1st assessment will occur in 2019

June						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

Calculating Pavement Performance Targets



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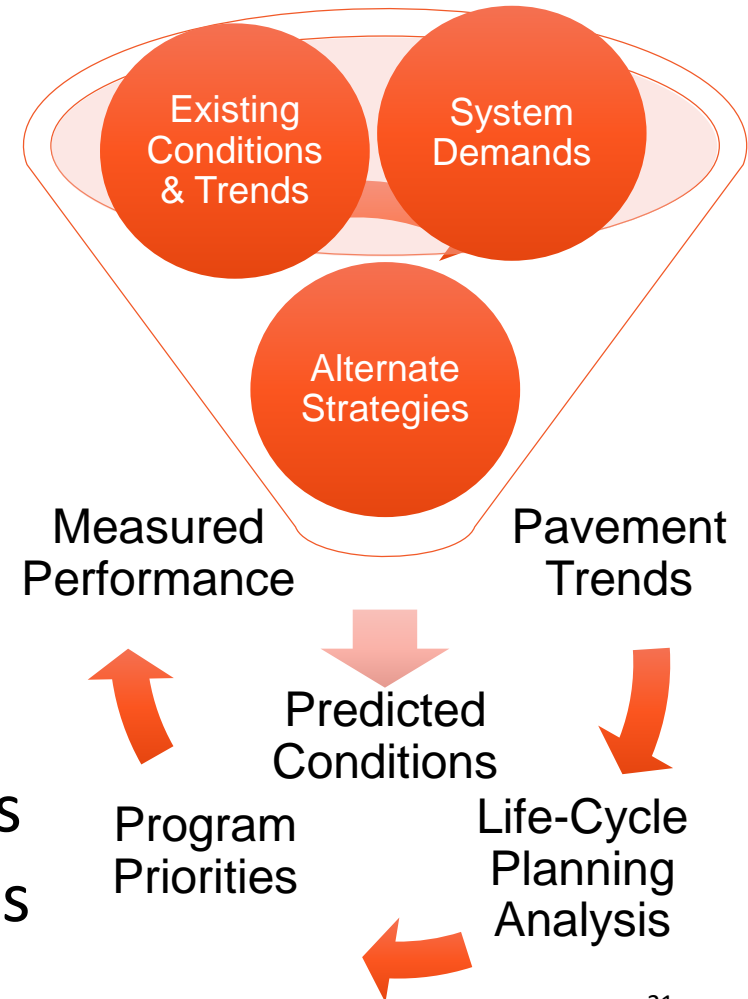


Pavement Performance Data: Supporting Target Setting

- Available data: What data are available to support predictions of performance?
- Pavement performance trends: What drives anticipated conditions?
- Variability in the data
- Analysis of alternate strategies, costs and timing
- Tolerance for risk

Recommended Analysis Components

- Determine what drives pavement performance
- Conduct life-cycle planning analysis including risk tolerance for alternate strategies
- Identify program priorities given constraints, historical performance, system demands and tradeoffs with other assets



Target-Setting Tools

- Every State is required to have a PMS with certain basic analytical functionality
- MPOs and other agencies may need to leverage State PMS resources to support their analyses
- In some cases, the necessary functionality may be provided by a mix of different systems and analytical tools



Pavement Performance Reporting



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State Pavement Performance Reporting: What's Required

State Reports:

- **Baseline** Report by Oct. 1 of the first performance year
- **Mid Period** Progress Report by Oct. 1 of the third performance year
- **Full Period** Progress Report by Oct. 1 of the fifth year **following** the performance period



Why Report on Performance?

- Evaluate the impact of Federal-aid funds on the national goal set for infrastructure condition
- Report to the public on pavement conditions, significant progress and target achievement in each State
- Report to Congress on the condition and performance of the Federal-aid highway system



...Tell the story...

State Performance Progress Report Contents

Contents	Baseline	Mid Period	Full Period
2-year targets	X		
4-year targets	X		
Basis for targets	X		
Baseline conditions	X		
Ties to other plans	X		
Actual conditions		X	X
Progress discussion		X	X
Investment strategy discussion		X	X
Adjusted four-year targets		X	
Extenuating circumstances		X	X
NHPP target achievement discussion		X	X



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Questions?



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