

Transportation Performance Management

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***National Performance Management  
Measures: Pavement and Bridge Condition to  
Assess the National Highway Performance  
Program***

Final Rule Webinar

May 31, 2017



U.S. Department of Transportation  
Federal Highway Administration



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## *A Message From*



**Gloria Shepherd**

FHWA Acting Executive Director

## *TPM: Putting the Pieces Together*

- National Goals
- Measures
- Targets
- Plans
- Reports
- Accountability and Transparency



# *Agenda*

- Introduction
- Measures for Assessing Pavement Condition
  - What stayed the same?
  - What changed?
- Measures for Assessing Bridge Condition
  - What stayed the same?
  - What changed?
- Target Establishment and Reporting
- What's Next?



# *Introduction*



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## *Why Are We Doing Performance Management?*

- Provide the **most efficient investment** of Federal transportation funds
- Refocus on **national transportation goals**
- Increase **accountability and transparency**
- **Improve decision-making** through performance-based planning and programming

# ***FHWA TPM Rulemaking: Status***

<b>TPM Related Rules</b>	<b>Final Rule Published</b>	<b>Rule Effective Date</b>
Safety Performance Measures	March 15, 2016	April 14, 2016
Highway Safety Improvement Program	March 15, 2016	April 14, 2016
Statewide and Non-Metropolitan Planning; Metropolitan Planning	May 27, 2016	June 27, 2016
Highway Asset Management Plans for NHS	October 24, 2016	October 2, 2017
Pavement and Bridge Condition Measures	January 18, 2017	May 20, 2017
Performance of the NHS, Freight, and CMAQ Measures	January 18, 2017	May 20, 2017*

\* Except for portions of the rule related to the percent change in CO2 emissions from 2017 (GHG measure). Those portions are delayed and FHWA will be publishing an NPRM in the Federal Register pertaining to this measure.



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# ***Summary of New 23 CFR Part 490***

## **National Performance Management Measures**

**Subpart A: General Information (Target Establishment, Reporting, and NHPP and NHFP Significant Progress Determination)**

Subpart B: Measures to Carry Out the Highway Safety Improvement Program (HSIP)

**Subpart C: Measures for Assessing Pavement Condition**

**Subpart D: Measures for Assessing Bridge Condition**

Subpart E: Measures to Assess Performance of the National Highway System (NHS)

Subpart F: Measure to Assess Freight Movement on the Interstate System

Subpart G: Measures to Assess the CMAQ Program – Traffic Congestion

Subpart H: Measure to Assess the CMAQ Program – On-Road Mobile Source Emissions





# Final Measures: Pavement and Bridge Condition

Measure Area	Performance Measures
National Performance Management Measures to Assess Pavement Condition (Subpart C)	<ul style="list-style-type: none"> <li>• Percentage of pavements of the Interstate System in Good condition</li> <li>• Percentage of pavements of the Interstate System in Poor condition</li> <li>• Percentage of pavements of the non-Interstate NHS in Good condition</li> <li>• Percentage of pavements of the non-Interstate NHS in Poor condition</li> </ul>
National Performance Management Measures to Assess Bridge Condition (Subpart D)	<ul style="list-style-type: none"> <li>• Percentage of NHS bridges classified as in Good condition</li> <li>• Percentage of NHS bridges classified as in Poor condition</li> </ul>

Note: These measures contribute to assessing the National Highway Performance Program (NHPP)



# Summary of Comments

- 127 public comments
  - From State DOTs, MPOs, local governments and agency associations, and others (e.g. individuals, industry members)
- Overall support, with some general concerns:
  - Applicability of the measures
  - Minimum condition levels
  - Pavement data collection and reporting
  - Pavement metric threshold
  - Handling missing pavement data
  - Element-level bridge data
  - Definition of structurally deficient bridge



# ***FAST Act Changes***

FAST Act required updates:

- **Significant progress**: Number of determinations triggering State DOT actions for not making significant progress towards achieving target
  - **NPRM**: Based on two consecutive biennial determinations
  - **Final Rule**: Based on each biennial determination
  
- **Interstate pavement**: Number of determinations triggering penalty if below minimum condition level
  - **NPRM**: Penalty if Interstate pavement condition is below minimum condition level for two consecutive years
  - **Final Rule**: Penalty if Interstate pavement condition is below minimum condition level for the most recent year



# *National Performance Management Measures for Assessing Pavement Condition*



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## *What Stayed the Same?*

- Performance measures
- Applicability and definitions
- Data Quality Management Program
- Data sources

# § 490.307 Performance Measures

Pavement Condition Measures	
Interstate System	Non-Interstate NHS
Percentage of pavements of the Interstate System in <b>Good</b> condition	Percentage of pavements of the non-Interstate NHS in <b>Good</b> condition
Percentage of pavements of the Interstate System in <b>Poor</b> condition	Percentage of pavements of the non-Interstate NHS in <b>Poor</b> condition

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## ***§490.303 Applicability and §490.305 Definitions***

- **Applicable network – NHS**
  - State DOTs are required to establish targets representing the full extent, regardless of ownership
- **Mainline highways only**
  - Includes through travel lanes only
    - Excludes ramps, shoulders, turn lanes, crossovers, rest areas

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## ***§ 490.319(c) Data Quality Management Program***

- Required for each State DOT, one year after effective date
- Addresses quality of all data collected to report pavement metrics
- Includes, at minimum, methods and processes for:
  - Data collection equipment calibration and certification
  - Certification process for performing manual collection
  - Data quality control measures before and during collection
  - Data sampling, review and checking processes
  - Error resolution procedures and data acceptance criteria
- Submit any proposed significant change for approval



# § 490.309 Data Sources

## HPMS Field Manual (State DOTs report for each pavement section)

	Condition Metrics*	Inventory Data Elements	Effective Date
<b>Interstate System</b>	IRI, <i>Rutting,</i> <i>Faulting,</i> <i>Cracking Percent</i>	Through Lanes Surface Type Structure Type	January 1, 2018
<b>Non-Interstate NHS</b>	IRI, <i>Rutting,</i> <i>Faulting,</i> <i>Cracking Percent</i>	Through Lanes Surface Type Structure Type	January 1, 2020

*\*Per the existing HPMS Field Manual, only IRI and the inventory data elements are currently required for all segments of the NHS. This requirement changes on the effective date shown.*



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## *What Changed?*

- Data requirements and missing data
- Minimum condition requirements
- Pavement condition thresholds and data collection options
- Metric thresholds
- HPMS data collection and submittal requirements

# § 490.309 Data Requirements

	NPRM	Final Rule
<b>Interstate System</b>	<ul style="list-style-type: none"> <li>• IRI, Cracking Percent, Rutting, and Faulting in both directions</li> <li>• Missing, invalid, unresolved data considered “Poor”.</li> </ul>	<ul style="list-style-type: none"> <li>• IRI, Cracking Percent, Rutting, and Faulting in <b>one direction</b></li> <li>• Missing, invalid, unresolved data: no more than 5.0 percent.</li> </ul>
<b>Non-Interstate NHS</b>	<ul style="list-style-type: none"> <li>• IRI, Cracking Percent, Rutting, and Faulting in one direction</li> <li>• Missing, invalid, unresolved data considered “Poor”.</li> </ul>	<ul style="list-style-type: none"> <li>• IRI, Cracking Percent, Rutting, and Faulting in one direction</li> <li>• Missing, invalid, unresolved data: no more than 5.0 percent.</li> </ul>

# § 490.315 Minimum Condition Requirements and § 490.315 Penalties

	NPRM	Final Rule
<b>Interstate System</b>	<ul style="list-style-type: none"> <li>Percentage in Poor condition: no more than 5 percent.</li> </ul>	<ul style="list-style-type: none"> <li>Percentage in Poor condition: no more than 5.0 percent.*</li> </ul>
<b>Non-Interstate NHS</b>	<ul style="list-style-type: none"> <li>No Minimum Condition or Penalty</li> </ul>	<ul style="list-style-type: none"> <li>No Minimum Condition or Penalty</li> </ul>
<b>Penalty</b>	<p>If minimum not met for <b>two consecutive determinations</b>, State DOT must obligate NHPP &amp; transfer STP funds</p>	<p>If minimum not met for <b>each determination</b>, State DOT must obligate NHPP &amp; transfer STP funds</p>

\*Alaska: 10 percent



# § 490.311 and § 490.313 Pavement Condition Thresholds and Data Collection Options

	NPRM	Final Rule
PSR	Not permitted	PSR permitted on <i>routes with posted speed limit &lt;40mph</i>
IRI Threshold	Poor: 220 in/mi in urbanized areas 170 in/mi for most roads	Poor: 170 in/mi for <i>all</i> roads (No urbanized area exception)
Cracking Percent Threshold	>10% = poor	CRCP: >10% = poor Jointed concrete: <b>&gt;15% = poor</b> Asphalt: <b>&gt;20% = poor</b>
Faulting Threshold	<0.05 = good	<b>&lt;0.10</b> = good

## § 490.311 Metric Thresholds in Final Rule

Rating	Good	Fair	Poor
IRI <i>(inches/mile)</i>	<95	<b>95-170</b>	<b>&gt;170</b>
PSR* <i>(0.0-5.0 value)</i>	≥4.0	2.0-4.0	≤2.0
Cracking Percent <i>(%)</i>	<5	<i>CRCP: 5-10 Jointed: 5-15 Asphalt: 5-20</i>	<i>&gt;10 &gt;15 &gt;20</i>
Rutting <i>(inches)</i>	<0.20	0.20-0.40	>0.40
Faulting <i>(inches)</i>	<b>&lt;0.10</b>	0.10-0.15	>0.15

\*PSR may be used only on routes with posted speed limit < 40mph.

# § 490.309 HPMS Data Collection and Submittal Requirements: Interstate Pavements

		Current	NPRM	Final Rule
<b>International Roughness Index</b>	<i>Due Date</i>	June 15	<b>April 15</b>	April 15
	<i>Collection Frequency</i>	1 year	1 year	1 year
	<i>Coverage</i>	Full Extent 1 Lane 1 Direction	Full Extent 1 Lane <b>2 Directions</b>	Full Extent* 1 Lane <b>1 or More Directions</b>
<b>Cracking Percent, Rutting, Faulting</b>	<i>Due Date</i>	June 15	<b>April 15</b>	April 15
	<i>Collection Frequency</i>	2 years	<b>1 year</b>	1 year
	<i>Coverage</i>	Samples 1 Lane 1 Direction	<b>Full Extent</b> 1 Lane <b>2 Directions</b>	Full Extent* 1 Lane <b>1 or More Directions</b>



# ***§ 490.309 HPMS Data Collection and Submittal Requirements: Non-Interstate NHS Pavements***

		Current	NPRM	Final Rule
<b>International Roughness Index</b>	<i>Due Date</i>	June 15	June 15	June 15
	<i>Collection Frequency</i>	1 year	<b>2 years</b>	2 years*
	<i>Coverage</i>	Full Extent 1 Lane 1 Direction	Full Extent 1 Lane 1 Direction	Full Extent 1 Lane 1 Direction
<b>Cracking Percent, Rutting, and Faulting</b>	<i>Due Date</i>	June 15	June 15	June 15
	<i>Collection Frequency</i>	2 years	2 years	2 years*
	<i>Coverage</i>	Samples 1 Lane 1 Direction	<b>Full Extent**</b> 1 Lane 1 Direction	Full Extent** 1 Lane 1 Direction

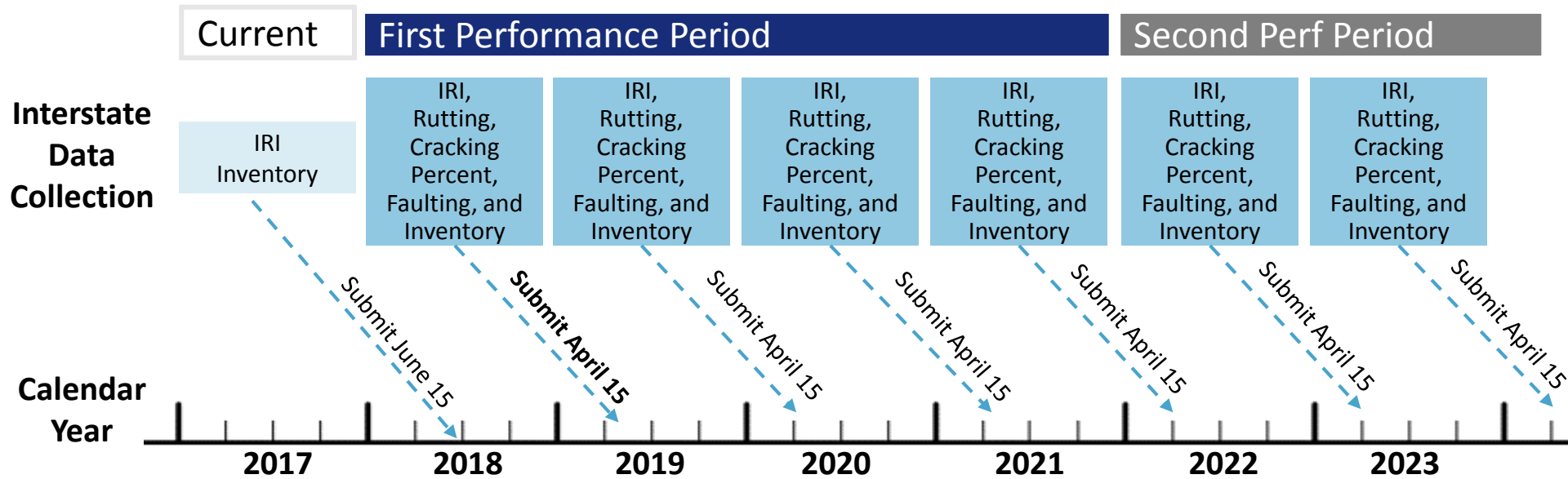
\*Data submittal occurs annually

\*\*Data collection begins January 1, 2020 24

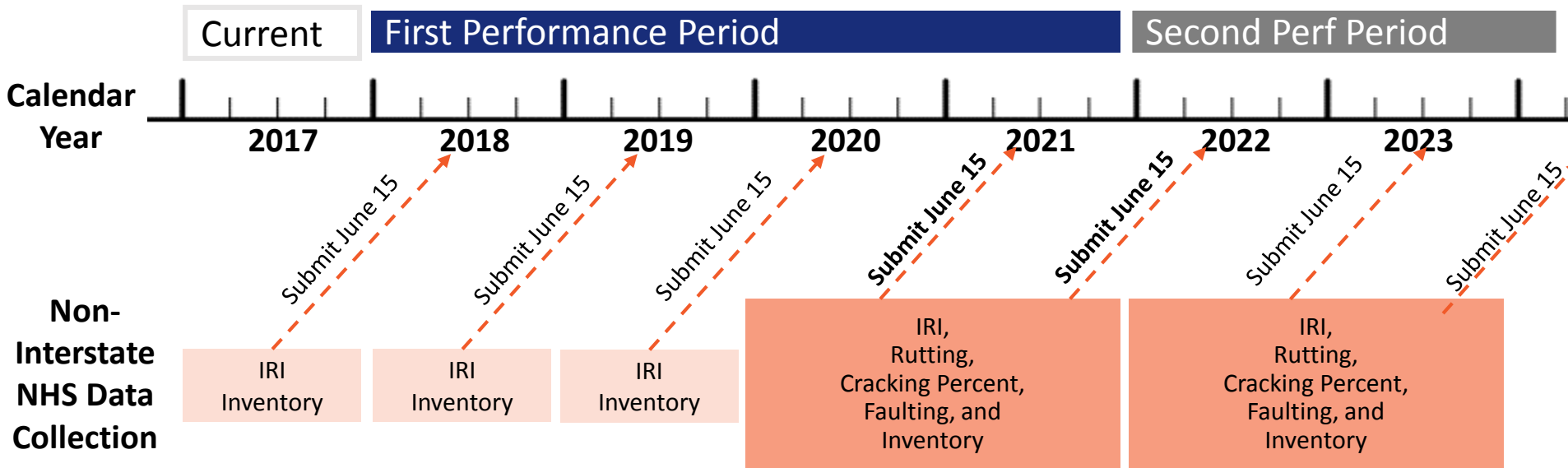




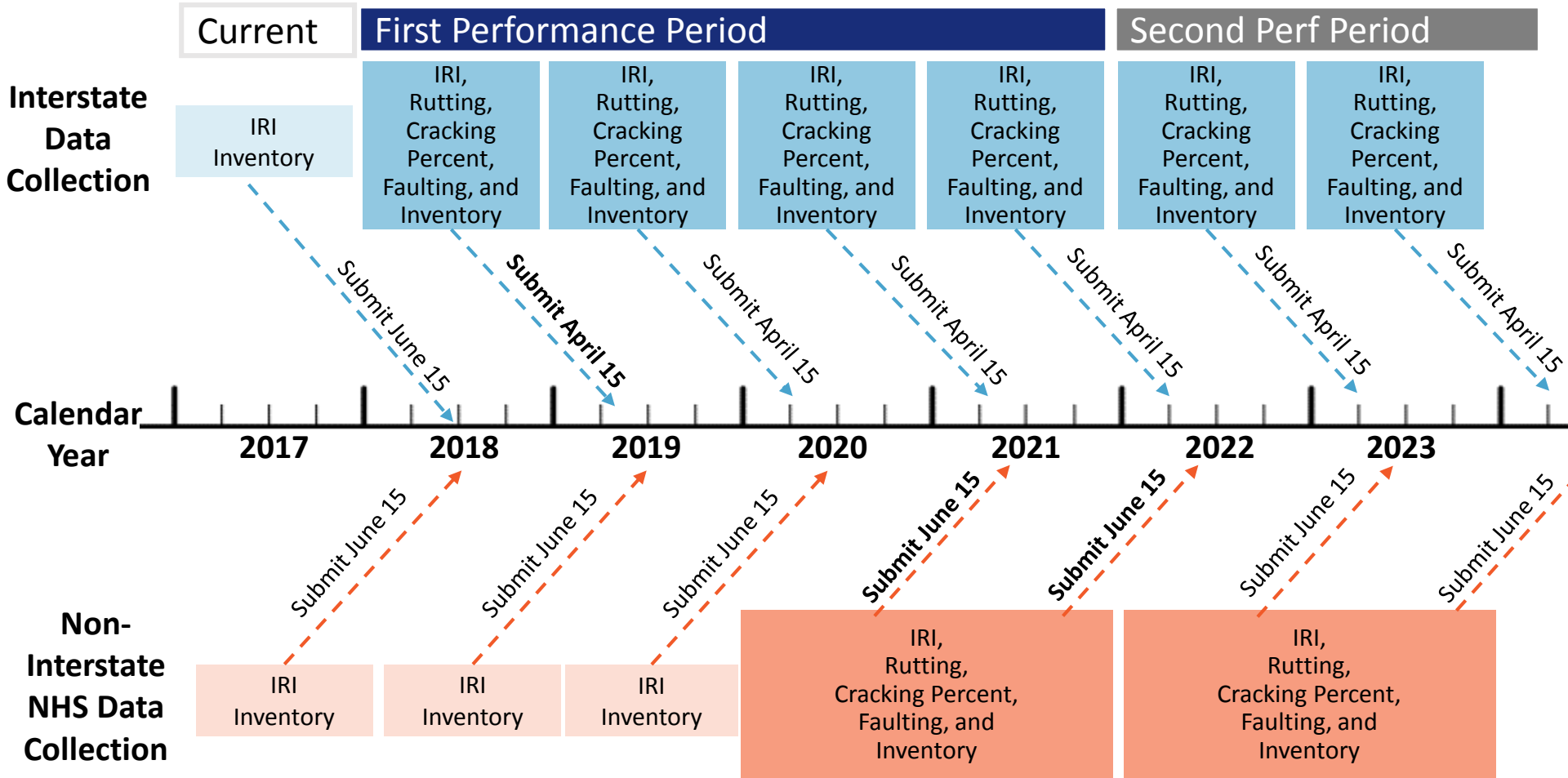
# § 490.309 State DOT Pavement Data Submittal



# § 490.309 State DOT Pavement Data Submittal



# § 490.309 State DOT Pavement Data Submittal



# *National Performance Management Measures for Assessing Bridge Condition*



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## *What Stayed the Same?*

- Performance measures
- Applicable bridges
- Data sources
- Metric thresholds
- Performance measure calculations
- Minimum condition level & penalty provision
- Deck area calculation
- Reporting deck area for border bridges
- Submitting NBI data to FHWA

# *§ 490.407 National Performance Management Measures for Assessing Bridge*

## Bridge Condition Measures

All NHS Bridges

Percentage of NHS bridges classified as in **Good** condition

Percentage of NHS bridges classified as in **Poor** condition



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## ***§ 490.403 Applicability***

- **Applicable bridges:**
  - Bridges carrying the NHS
    - Includes highway bridges on on- and off-ramps connected to the NHS
    - Includes bridges that cross State borders

# § 490.409 Data Sources

## National Bridge Inventory (NBI)

	Current & NPRM	Final Rule
<b>Bridge Condition and Structurally Deficient Classification</b>	58 – Deck 59 – Superstructure 60 – Substructure 62 – Culverts 67 – Structural Evaluation 71 – Waterway Adequacy	58 – Deck 59 – Superstructure 60 – Substructure 62 – Culverts
<b>Deck Area Calculations</b>	32 – Approach Roadway Width 49 – Structure Length 52 – Deck Width	32 – Approach Roadway Width 49 – Structure Length 52 – Deck Width



## § 490.409 Metric Thresholds

NBI Rating Scale  
(from 0 – 9)

9	8	7	6	5	4	3	2	1	0
Good			Fair		Poor				

Deck (Item 58)	$\geq 7$	5 or 6	$\leq 4$
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Superstructure (Item 59)	$\geq 7$	5 or 6	$\leq 4$
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Substructure (Item 60)	$\geq 7$	5 or 6	$\leq 4$
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Culvert (Item 62)	$\geq 7$	5 or 6	$\leq 4$
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## ***§ 490.409 Measure Calculations***

Percent Classified as in Good condition:

$$100 * \frac{\sum_{g=1}^{\text{GOOD}} [\text{Length} * \text{Width}]_{\text{Bridge } g}}{\sum_{s=1}^{\text{TOTAL}} [\text{Length} * \text{Width}]_{\text{Bridge } s}}$$

Percent Classified as in Poor condition:

$$100 * \frac{\sum_{p=1}^{\text{POOR}} [\text{Length} * \text{Width}]_{\text{Bridge } p}}{\sum_{s=1}^{\text{TOTAL}} [\text{Length} * \text{Width}]_{\text{Bridge } s}}$$

Calculations are taken to one tenth of a percent



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## ***§ 490.411 Minimum Condition and § 490.413 Penalty Provision***

- Minimum condition level:  $\leq 10.0\%$  of total deck area of NHS bridges classified as Structurally Deficient
- Penalty: If for **3 consecutive years** the minimum condition level is not met, State must **obligate and set aside NHPP funds** for eligible bridge projects on the NHS

## ***§ 490.411 Minimum Condition Level Calculation***

Percent Classified as Structurally Deficient:

$$100 * \frac{\sum_{SD=1}^{\text{STRUCTURALLY DEFICIENT}} [\text{Length} * \text{Width}]_{\text{Bridge SD}}}{\sum_{s=1}^{\text{TOTAL}} [\text{Length} * \text{Width}]_{\text{Bridge } s}}$$

Calculation is taken to one tenth of a percent

# § 490.411 Deck Area Calculation

	Current	NPRM and Final Rule
<b>Performance Measure Calculation</b>	n/a	49 – Structure Length x 52 – Deck Width, or 32 – Approach Roadway Width
<b>Minimum Condition Level and Penalty Provision Calculation</b>	49 – Structure Length x 52 – Deck Width	49 – Structure Length x 52 – Deck Width, or 32 – Approach Roadway Width
<b>Effective Date</b>	Until December 31, 2017	Beginning January 1, 2018



# Reporting Deck Area for Border Bridges\*

	Current	NPRM and Final Rule
<b>Contribution to State Total</b>	Deck area contributes only to State total for the State(s) that submits the border bridge NBI data	Deck area of border bridges is counted toward <b>both States' totals</b>
<b>Duplicate Data</b>	If both States submit NBI data for a bridge, the deck area is counted toward both States' totals	<b>States must submit NBI data for all bridges</b> , and deck area is counted toward both States' totals

\*As described in Final Rule preamble: 82 Fed. Reg. 5944



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## ***§ 490.411 Submission of NBI Data to FHWA***

- State DOTs will submit their most current NBI data on highway bridges no later than March 15 of each year.

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## *What Changed?*

- Definition of structurally deficient



# § 490.405 & 490.411 Definition of Structurally Deficient

	Current and NPRM	Final Rule
<b>Definition</b>	Bridges with any component condition rating $\leq 4$ , structural evaluation $\leq 2$ , or waterway adequacy $\leq 2$	Bridges with any component condition rating $\leq 4$
<b>NBI Items</b>	58 – Deck 59 – Superstructure 60 – Substructure 62 – Culvert 67 – Structural Evaluation 71 – Waterway Adequacy	58 – Deck 59 – Superstructure 60 – Substructure 62 – Culvert
<b>Effective Date</b>	Until December 31, 2017	Beginning January 1, 2018



# *Target Establishment and Reporting*



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## **§ 490.105 Establishing Targets – State DOTs**

- Establish 2-year and 4-year targets for each performance period
  - First set of targets within 1 year of the effective date of the final rule: May 20, 2018
  - Targets must be reported to FHWA by October 1, 2018.
- Adjustment of 4-year target allowed at the mid-point of performance period

## ***§ 490.105 Establishing Targets - MPOs***

- Establish 4-year targets by supporting the State DOT target or establishing a quantifiable target
  - Establish targets within 180 days relevant State DOT(s) establish targets
  - A multistate planning area - may choose different target establishment options for the portion of the planning area within each State

## **§ 490.107 Reporting on Performance Targets**

### **– State DOTs**

- **Baseline Performance Period Report:**
  - Baseline condition/performance;
  - 2- and 4-year targets; etc.
- **Mid Performance Period Progress Report:**
  - 2-year condition/performance;
  - 2-year progress in achieving performance targets;
  - Adjusted 4-year targets (optional);
  - Investment strategy discussion; etc.
- **Full Performance Period Progress Report:**
  - 4-year condition/performance;
  - 4-year progress in achieving performance targets;
  - Investment Strategy discussion; etc.

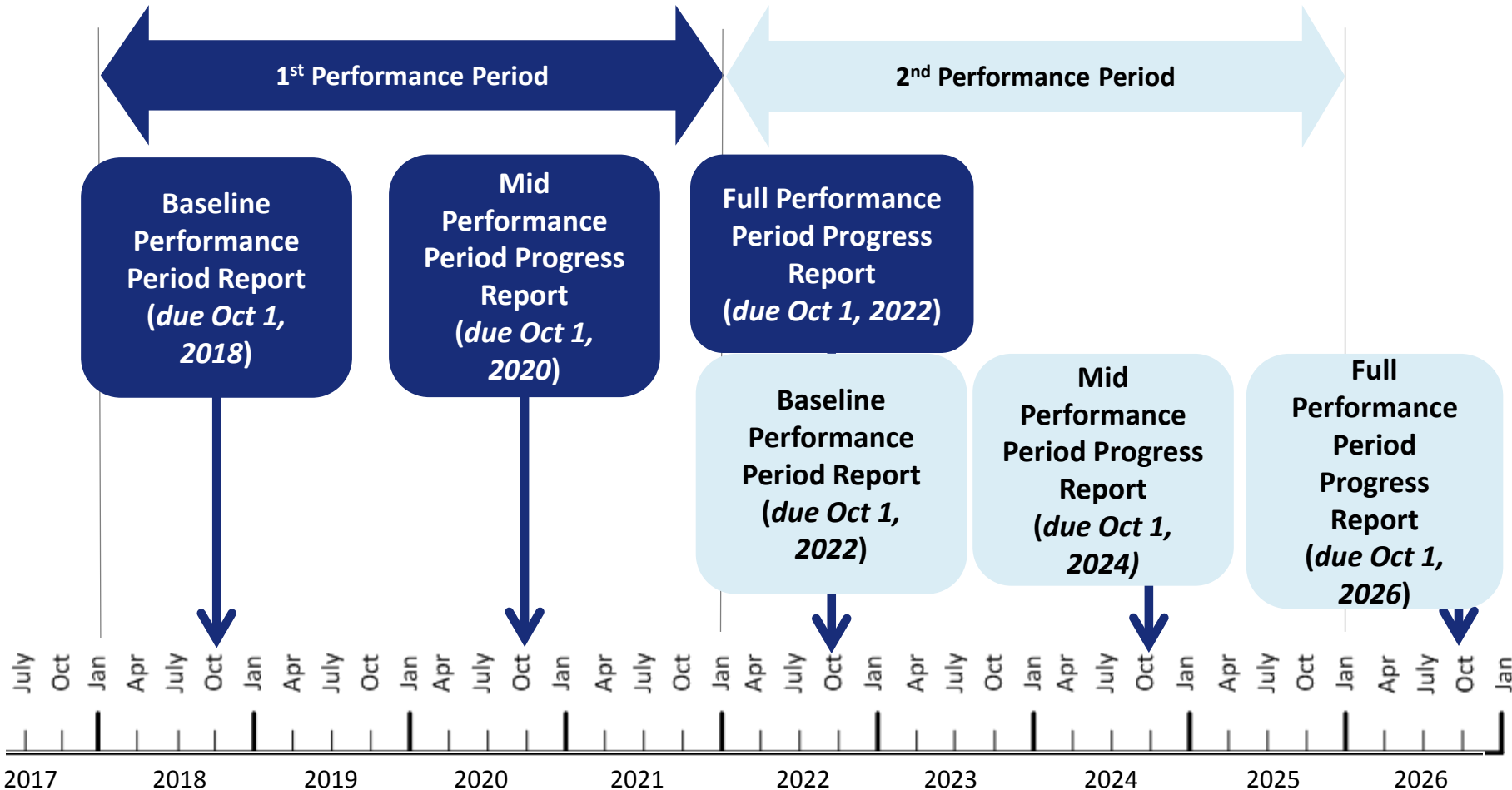
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## ***§ 490.107 Reporting on Performance Targets - MPOs***

### Reporting includes:

- Targets to respective State DOT(s) in a manner that is documented and mutually agreed upon by both parties
- Baseline level and progress toward targets in Metropolitan Transportation Plan

# § 490.105 & 490.107 Timeline for Performance Periods and State DOT Biennial Performance Reporting



## **§ 490.109 Significant Progress Determination**

- Applies to all targets in this rule
  - Interstate and non-Interstate NHS pavement condition measures, and Bridge condition measures
- FHWA assessment of State DOT target achievement (every 2 years)
  - The actual condition/performance level is better than the baseline, or
  - The actual condition/performance level is equal to or better than the established target
- Consequences of not making significant progress
  - State DOT documents the actions it will take to achieve target
- Extenuating circumstances may be considered



## ***§ 490.105, 490.107 & 490.109 First Performance Period: Phase-In Requirements***

- Applies to first performance period and Interstate pavement condition measures only
- Reporting
  - **First Baseline Performance Period Report (due October 1, 2018)**
    - State DOTs establish and report their 4-year targets.
    - State DOTs are not required to report baseline condition/performance nor 2-year targets
  - **First Mid Performance Period Progress Report (due October 1, 2020)**
    - State DOTs report the 2-year condition/performance as the baseline condition/performance
    - State DOTs may adjust their 4-year targets
- Significant Progress Determination
  - In 2020, at the midpoint of the first performance period, FHWA will not make a determination of significant progress toward the achievement of 2-year targets for the Interstate pavement condition measure

# *What's Next?*

Roles and Resources



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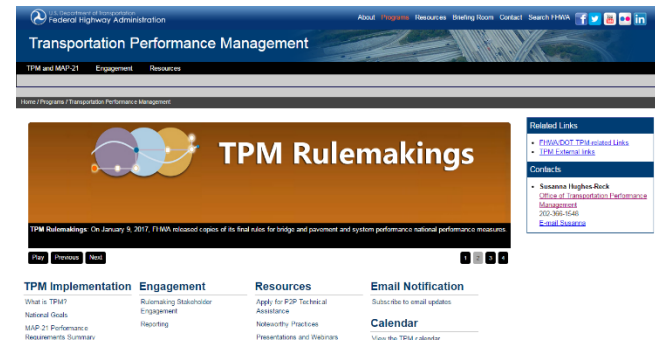
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## *Roles of State DOTs and MPOs in Implementing Final Rule*

- Read the final rule
- Contact your FHWA Division office with questions
- Coordinate with other agencies
- Establish coordinated targets
- Collect and submit data
- Report progress

## ***FHWA's TPM Website***

- Visit <http://www.fhwa.dot.gov/tpm/> to find the latest resources:
  - Guidance
  - Training
  - TPM Toolbox
  - TPM Workshop request form
  - Webinar recordings, presentations, fact sheets, noteworthy practices, and more...



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## *TPM Implementation Workshops*

- AM Plan Implementation
- PM2 and PM3 Rule Implementation
- 4 Regional Workshops based on DFS area
  - Mid-America: Kansas City, MO, June 20-23
  - Southern: Raleigh, NC, July 11-14
  - TBD: August
  - TBD: September

## *TPM Guidance*

- Technical Advisories
  - Asset Management, Target Establishment for the Long Term, How the TIP helps to achieve the targets in the LRP and How the System Performance Report describes progress toward achieving targets
- Guidebooks
  - TPM Investment Strategy Analysis
    - (summer 2017)
  - TPM Target Setting Coordination
    - (summer 2017)
  - Analyzing Freight Bottlenecks for TPM
    - (Winter 2017)

# TPM Toolbox

- Visit <http://www.tpmtools.org>
  - Assess your agency's level of TPM maturity
  - Use the practical tools to move your agency to the next level in a range of performance areas



## TPM Guidebook

The TPM Implementation Guidebook provides clear practical actionable steps that state DOT leadership, management, and staff can implement to enhance performance management practices.

## Self-Assessment

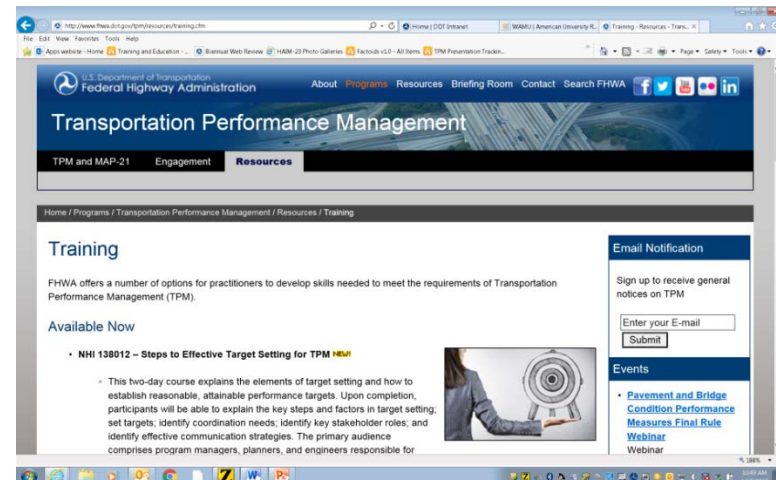
The TPM self-assessment helps to determine your organization's level of performance management maturity. Your assessment results are linked directly to the guidebook and other resources on this site.

## TPM Resources

The TPM Resources Library contains best practices, precedents, and other helpful resources. Browse the library or quickly navigate to a specific document using our search tools.

# TPM Training through NHI

- Available Now:
  - Overview of MAP-21 TPM (w/ FAST Act updates)
  - TPM for Safety
  - Performance-based Planning and Programming
  - Steps to Effective Target Setting
  - The Role of Data in TPM





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# *Final Rule in the Federal Register & Docket*

- **Federal Register**

<https://www.federalregister.gov/documents/2017/01/18/2017-00550/national-performance-management-measures-assessing-pavement-condition-for-the-national-highway>

- **Docket**

<https://www.regulations.gov/docket?D=FHWA-2013-0053>



*Questions?*



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## ***Contacts***

For questions or more information, please contact:

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