



## An overview of pavement performance requirements for the Moving Ahead for Progress in the 21st Century Act

In January 2015, the U.S. Department of Transportation published a Notice of Proposed Rule Making (NPRM) in the Federal Register, to propose performance management regulations related to assessing the condition of bridges on the National Highway System (NHS), pavements on the Interstate system, and pavements on the non-Interstate NHS as required by the Moving Ahead for Progress in the 21st Century Act (MAP-21). The pavement performance portion of that NPRM will be the focus of this folio.

### ***Target setting and “significant progress”***

- States must set targets for each of the four proposed pavement performance measures.
- States must establish 2-year (midpoint) and 4-year (full performance period) targets as part of the Baseline Performance Report (due October 2016). Adjustment of the 4-year target is allowed at the target period’s midpoint.
- State DOTs are required to coordinate with relevant Metropolitan Planning Organizations (MPOs) on the selection of targets.
- The MPOs have the option of setting their own respective 4-year targets or aligning with WSDOT targets. The MPOs must set their targets within six months of the state setting its targets.
- For Washington, the primary task of implementing the MAP-21 Pavement NPRM will be in setting targets for the non-Interstate NHS, which will involve collaboration between the state and MPOs to set targets in an atmosphere of uncertain future funding.
- For Interstate pavement lane miles in poor condition, states must set targets equal to or less than 5 percent (the required minimum pavement condition level). A state may set a target that are worse than baseline pavement condition as long as it is less than 5 percent in poor condition. For example, if 3 percent of a state’s Interstate pavement lane miles have a baseline condition of “poor”, the state is allowed to set a target of 4 percent, which may occur due to lack of funding or changing priorities. This target is worse

than the baseline level, but does not exceed the required minimum condition level of no more than 5 percent of Interstate pavements in poor condition.

- The Federal Highway Administration (FHWA) will assess whether the state has made “significant progress” toward meeting National Highway Performance Program (NHPP) targets after the midpoint and full performance periods. **“Significant progress” means pavement condition has improved from the baseline level or its condition is better than the target.** Therefore, a decline in condition can be considered significant progress if it is above the target. Due to the phasing in of requirements for Interstate pavements, FHWA will not assess significant progress for Interstates until the Full-Performance Period Progress Report.

### **Summary of required performance measures**

The FHWA draft rules for MAP-21 require all states to report on the following pavement performance measures:

- Percentage of pavements on the Interstate system in good condition
- Percentage of pavements on the Interstate system in poor condition
  - To maintain the minimum pavement condition level, no more than 5 percent of Interstate pavement lane miles can be in poor condition
- Percentage of pavements on the National Highway System (excluding the Interstate system) in good condition
- Percentage of pavements on the National Highway System (excluding the Interstate system) in poor condition

## Washington National Highway System pavement inventory and conditions

Washington's National Highway System (NHS) consists of 14,718 lane miles of pavement, 77 percent of which is managed by WSDOT. The remaining 23 percent of NHS pavement is managed by local agencies. The total NHS lane miles include 3,999 lane miles of Interstate pavements that are managed by WSDOT.

WSDOT completed a preliminary analysis of MAP-21 pavement conditions based on its Pavement Management System for state-owned pavements and Highway Performance Monitoring System (HPMS) sample sections for locally-owned pavements. As of December 2013, 13 percent of Washington state's total non-Interstate NHS lane miles were in good condition and 6.4 percent were in poor condition, using the MAP-21 proposed pavement condition criteria. In addition, 22.7 percent of Interstate lane miles were in good condition and 3.8 percent were in poor condition as shown in the table at right.



### Pavement condition assessment

The MAP-21 rules propose assessing pavement conditions based on International Roughness Index (IRI), cracking, rutting (for asphalt pavements) and faulting (for jointed concrete pavements). The table below shows the proposed thresholds for determining whether pavement segments of 0.1 mile are in good, fair, or poor condition based on these metrics.

For asphalt and jointed concrete pavements, a 0.1 mile segment is considered in good condition if all three metrics are rated as good; it is considered poor if two or more metrics are rated as poor. To calculate the percent of the system in good or poor condition, the conditions for the 0.1 mile segments are rolled up for the entire state. These pavement measure calculations are summarized in the table below.

#### Proposed pavement condition thresholds for MAP-21

	Good	Fair	Poor
International Roughness Index (IRI) [inches/mile]	< 95	95 - 170 95 - 220 <sup>1</sup>	> 170 > 220 <sup>1</sup>
Cracking (%)	< 5	5 - 10	> 10
Rutting (inches)	< 0.20	0.20 - 0.40	> 0.40
Faulting (inches)	< 0.05	0.05 - 0.15	> 0.15

Data source: Federal Highway Administration.

Note: 1 In urbanized areas where the population is one million or more.

#### Washington state National Highway System (NHS) pavement inventory As of December 2013; MAP-21 requirements pertain to NHS lanes only

	All public roads – total lane miles NHS and non-NHS	National Highway System – total lane miles <sup>1</sup>	Interstate – total lane miles
State-owned	18,662	11,397	3,999
Locally-owned	152,637	3,321	
Total	171,259	14,718	3,999

Data source: WSDOT Pavement Office.

Note: 1 Includes Interstate lane miles.

#### NHS pavement conditions by lane mile (Interstate and non-Interstate) As of December 2013

PAVEMENT CONDITION	Good		Poor	
	Lane Miles	Percent	Lane Miles	Percent
<b>Interstate<sup>1</sup></b>				
State-owned	908	22.7%	152	3.8%
<b>Non-Interstate<sup>2</sup></b>				
State-owned	1,908	17.8%	182	1.7%
Locally-owned <sup>3</sup>	257	2.4%	1,801	16.8%
Total non-Interstate	2,165	13.0%	1,983	6.4%

Data source: WSDOT Pavement Office.

Notes: Lane miles of pavement in fair condition not included. 1 Interstate percentage based on 3,999 total miles. 2 Non-Interstate NHS percentages based on 10,719 miles. 3 Locally-owned pavement is owned by counties and cities.

### Pavement data collection for MAP-21 purposes

WSDOT surveys all NHS routes as part of the HPMS reporting process, which has been in place for many years. This means that IRI, rutting and faulting information collected is already compliant. One change will be to submit rutting and faulting into the HPMS for all sections as opposed to just the HPMS sample sections, the current standard. Submitting rutting and faulting data for the full extent of the NHS will not pose an issue for WSDOT.

There is a gap in data collection between current standard and MAP-21 proposed rules for cracking data along locally-managed NHS roads.

- For **locally-managed NHS roadways**, cracking is only analyzed and reported for the HPMS sample sections. Cracking requires manual review of images collected during the survey.
- For **WSDOT maintained roadways**, cracking is collected according to MAP-21 standards (for the full extent [entire length of the roadway] of the NHS).

WSDOT has the ability to report IRI, rutting, cracking and faulting metrics in 0.1 mile segments, as required by MAP-21. WSDOT currently reports cracking, rutting and faulting data for samples of the NHS for one lane in one direction every other year.

*continued on page 4*





# Reporting on pavement conditions

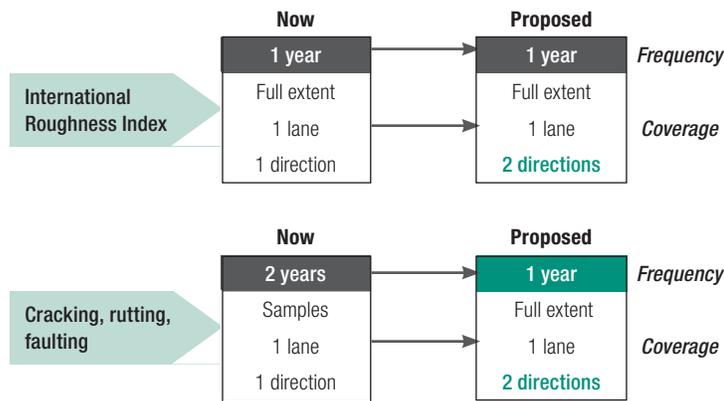
States currently report on pavement conditions to FHWA through HPMS, which will continue under MAP-21. At present, states report International Roughness Index (IRI) data annually for the entire NHS by June 15, and report cracking, rutting and faulting metrics biennially for sample sections of pavement on the NHS.

The proposed MAP-21 rules would require reporting IRI, cracking, rutting and faulting on the full extent of Interstate pavements annually. For non-Interstate NHS pavements, these four metrics would be reported in HPMS biennially for the full extent of the system. However, the requirement for cracking, rutting, and faulting data for non-Interstate NHS roads is phased-in and not required until the 2020 reporting year. The current and proposed reporting requirements are summarized in the tables below.

Reports are structured on a 4-year reporting cycle, with midpoint (2-year) reports. Between October 2016 and October 2020, state DOTs will be required to submit three performance reports to FHWA:

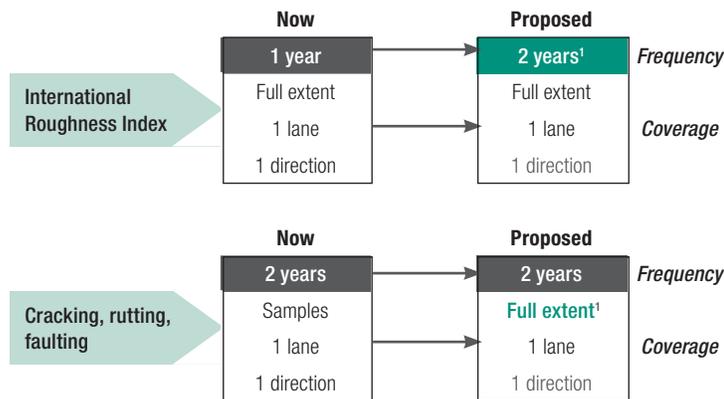
- **Baseline Performance Report:** In this report, states must establish 2-year and 4-year targets, describe baseline conditions, urbanized area

## Reporting requirements – Interstate pavements



Data source: Federal Highway Administration.

## Reporting requirements – non-Interstate NHS pavements



Data source: Federal Highway Administration.

Note: 1 Beginning collection in 2018/2019 and reported in 2020.

boundaries and population data, NHS limits, and relationships with other performance expectations.

- This report will include HPMS data collected in 2014 and 2015. States will be able to adjust the 4-year targets in the Mid Performance Progress Report based on data collected in 2016 and 2017.
- To allow for the phasing in of new reporting requirements for Interstate pavement conditions, states are only required to establish 4-year targets for Interstate pavements in the Baseline Performance Report that is due October 2016. Both 2-year and 4-year targets are required for non-Interstate NHS pavements.
- **Mid Performance Progress Report:** States must report on 2-year conditions and performance, investment strategy effectiveness and discuss progress in achieving targets. States have the option to adjust 4-year targets at this time. In this report, states may include a discussion of target achievement and extenuating circumstances.
  - Since states are not required to establish 2-year targets for Interstate pavements in the Baseline Performance Report, they would use the Mid Performance Progress Report to update baseline condition/performance data and, if necessary, adjust the 4-year targets.
- **Full Performance Progress Report:** This report includes the same content as the Mid Performance Period Progress Report, but reports on the 4-year targets. If a state has not made significant progress for achieving the NHPP targets in two consecutive biennial determinations, then the state DOT will include a description of the actions they will undertake to better achieve the NHPP targets in the next performance period. Even though significant progress is assessed for all four pavement performance measures, pavement condition penalties only apply for Interstate pavements.
  - As part of the Full Performance Progress Report, MPOs will report targets and progress toward the achievement of targets. MPOs will report their established targets, performance, progress, and achievement of the targets to their respective state DOT in a manner that is agreed upon by both parties and documented in the Metropolitan Planning Agreement.

## Interstate minimum condition requirements

For a minimum condition level, MAP-21 proposes that no more than 5 percent of the Interstate system lane-miles be in poor condition. The FHWA will assess if a state DOT has maintained this minimum condition level after the first full year of data collection and annually thereafter. Therefore, the first determination would be made in 2017, after a full year of data collection in 2016. The FHWA expects to reassess this minimum condition level after the completion of the first full performance period (reported in 2020) to determine if additional system improvements can be achieved through adjustments to the required minimum condition level.

## Data collection, *continued from p. 2*

- The MAP-21 NPRM proposes changing the collection of this data from samples to the full extent of the system for both directions and report annually for **Interstate pavements**.
- Cracking, rutting and faulting data for **non-Interstate NHS pavements** would continue to be reported biennially for one lane in one direction.

## Penalties

A state will be penalized if it does not meet the Interstate pavement minimum condition requirement (see green box on page 3) for two consecutive calendar years. The FHWA will notify state DOTs annually of their compliance status with regard to the minimum condition requirement prior to October 1 of the year in which the determination is made. If the minimum condition level is not met for two consecutive calendar years, the state must obligate National Highway Performance Program (NHPP) and transfer Surface Transportation Program (STP) funds. Specifically, if the state is out of compliance for the two most recent years, they would be required to obligate the following:

- From the amount apportioned to the State for the NHPP, an amount that is not less than the Interstate Maintenance apportionment for fiscal year 2009 plus 2 percent per year compounded annually for the five additional fiscal years after 2013.
- For apportioned transfer Surface Transportation Program funds, an amount equal to 10 percent of Interstate Maintenance apportionment for fiscal year 2009.

These funds would need to be used to improve Interstate pavement conditions (as provided under the pre-MAP-21 Interstate Maintenance Program). This requirement will remain in effect until the Interstate system pavement condition exceeds the minimum condition level.

### What is the current distribution of funds?

**Pavement:** The Surface Transportation Program (STP) is the most flexible FHWA funding program and the one that provides the most financial support to local agencies. This program allocates more than \$90 million dollars per year from FHWA through WSDOT to local agencies. MPOs, Regional Transportation Planning Organizations and County lead agencies prioritize and select projects based on their regional priorities.

### For more information

**Pavement condition data:** Pat Whittaker, HPMS/Functional Class Manager of WSDOT's Transportation Data & GIS Office, at (360) 570-2370 or [WhittaP@wsdot.wa.gov](mailto:WhittaP@wsdot.wa.gov).

**Pavement condition information:** Dave Luhr, WSDOT State Pavement Management Engineer, at (360) 709-5405 or [LuhrD@wsdot.wa.gov](mailto:LuhrD@wsdot.wa.gov).

## Available Data

- Pavement condition assessment report of the National Highway System (NHS)

### Pavement condition:

- International Roughness Index (IRI) data for the full extent of state highway NHS and local roads
- Rutting data for state highway NHS roads and select sample segments for local NHS roads
- Concrete faulting data for state highway NHS roads and select sample segments for local NHS roads
- Cracking data for state highway NHS roads and select sample segments for local NHS roads

### Pavement inventory:

- Number of lanes for the full extent of principal arterials and NHS
- Bridge location for the full extent of principal arterials and NHS
- Roadway surface type (by various types of asphalt or concrete) for the full extent of state highway NHS and by sample segments for local NHS roads

Note: Data is available for county and city levels and can be provided by the MPO boundaries.

## Purpose of reporting requirements

In July 2012, the Moving Ahead for Progress in the 21st Century Act (MAP-21) became law. Included in the law was a Declaration of Policy: "Performance management will transform the Federal-aid highway program and provide a means to the most efficient investment of Federal transportation funds . . ."

The primary objectives of MAP-21 are to increase the transparency and accountability of states for their investment of federal taxpayer dollars into transportation infrastructure and services nationwide, and to ensure that states invest money in transportation projects that collectively make progress toward the achievement of national goals. The new rules will require reporting performance on the following areas: Safety; Pavement and Bridge; System Performance/Congestion; Freight, and Congestion Mitigation and Air Quality (CMAQ).

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