



WSDOT establishes MAP-21 pavement performance targets

The Federal Highway Administration (FHWA) published in the Federal Register (82 FR 5886) a final rule establishing performance measures for State Departments of Transportation (DOTs) to use in managing pavement and bridge performance on the National Highway System (NHS). The National Performance Management Measures; Assessing Pavement Condition for the National Highway Performance Program and Bridge Condition for the National Highway Performance Program Final Rule addresses requirements established by the Moving Ahead for Progress in the 21st Century Act (MAP-21) and reflects passage of the Fixing America's Surface Transportation (FAST) Act. The rule was effective May 20, 2017.

Targets established May 20, 2018

WSDOT has been proactive in working with MPOs and local agencies with regard to the implementation of federal pavement performance measures for the NHS. Collaborative efforts to establish targets by May 20, 2018, included meetings with all MPO directors and WSDOT representatives; responsible for helping make policy, process, data and advisory target setting decisions as well as in-depth discussions between subject matter experts; responsible for better understanding final federal rule requirements and their implications.

The latest data available for Interstate pavement in Washington is from the 2015 and 2016 data collection period. In Washington, 32.5% of interstate pavement is in good condition and 3.6% is in poor condition (using FHWA criteria). Non-interstate NHS pavement is 18% in good condition and 5% in poor condition. This condition data addresses motor vehicle travel lanes only, not shoulders that serve as elements of the active transportation network.

FHWA has confirmed pavement targets should be based on expected performance with available funding. The targets are not meant to be aspirational values or goals related to desired funding. An evaluation of

pavement data collected from the NHS resulted in the targets for pavement performance (see below). WSDOT's experience has proven that pavement condition indexes calculated over an entire network do not change rapidly, especially in the short-term. The 2- and 4-year targets are based on current conditions. As stated within the final rule, the 2-year (2020) target is expressed using International Roughness Index (IRI) only. The 4-year (2022) target is expressed using all criteria (see page 2 for details).

Meeting the additional requirement

A separate requirement determined by FHWA is that the percent of Interstate pavement in poor condition cannot exceed 5%. This performance criterion is a special requirement mandated by Congress, and is the only pavement performance measure that results in a funding penalty if it is not met. The penalty requires the State to obligate a specified percentage of its National Highway Performance Program (NHPP) and Surface Transportation Program (STP) funds to correct the Interstate pavement conditions until the minimum threshold is met (see p. 4 for more details).

In the short term, an investigation of currently programmed projects shows that projects in the construction plan for 2017-2020 will improve the condition of about 70% of the concrete lane-miles currently in poor condition. This will ensure the FHWA threshold of 5% of Interstate pavement in poor condition is not reached, and the expected percentage of poor pavement should be less than 3% in 2020. Given the long-term status of aging concrete pavement, 4% is a reasonable target for the percentage of Interstate pavement in percent poor condition in 2022.

The combination of asphalt and concrete renewal expected in the future should leave the percent good in relatively stable condition, and a reasonable target for interstate percent good is 30%.

MAP-21 performance measures by program area

	Current data	2-year target ¹	4-year target ¹	Penalty
Pavement (PM2) 23 CFR Part 490 ID No. 2125-AF53				
Percent of Interstate pavement on the NHS in good condition	32.5%	N/A	30%	No
Percent of Interstate pavement on the NHS in poor condition	3.6%	N/A	4%	Yes
Percent of non-Interstate pavement on the NHS in good condition	18%	45%	18%	No
Percent of non-Interstate pavement on the NHS in poor condition	5%	21%	5%	No

Notes: During the phase-in of MAP-21 requirements, only the first two-year target uses IRI only. MPOs do not report two-year targets. "Current data" is relative to the four-year targets only.

¹ Two-year and four-year target periods for PM2 end October 1, 2020, and October 1, 2022.



Washington National Highway System pavement inventory and conditions

Washington's National Highway System (NHS) consists of 14,789 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 4,026 lane miles of Interstate pavements that are managed by WSDOT (see charts at right).

Assessing pavement conditions

The MAP-21 rules assess pavement conditions based on International Roughness Index (IRI), cracking, rutting (for asphalt pavements) and faulting (for jointed concrete pavements). The table below shows the 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.

Definitions and criteria for good, fair and poor conditions¹

	Asphalt	Concrete	Good	Fair	Poor
International Roughness Index (IRI) (inches/mile)	✓	✓	< 95	95 - 170	> 170
Cracking (%)	✓	✓	< 5	CRCP: 5 - 10 Jointed: 5-15 Asphalt: 5-20	> 10 > 15 > 20
Rutting (inches)	✓		< 0.20	0.20 - 0.40	> 0.40
Faulting (inches)		✓	< 0.10	0.10 - 0.15	> 0.15
Present Serviceability Rating (PSR ²) (0.0-5.0 value)	✓	✓	<4.0	2.0-4.0	<2.0

Data source: Federal Highway Administration.

Note: 1 To be poor, at least two criteria must be poor. To be good, all three criteria must be good, everything else is fair. 2 PSR is a composite of cracking and rutting and may only be used on routes with posted speed limits under 40 mph.

Washington state National Highway System (NHS) pavement inventory As of December 2016; MAP-21 requirements pertain to NHS lanes only

	All public roads – total lane miles NHS and non-NHS	National Highway System – total lane miles ¹	Interstate – total lane miles
State-owned	18,715	11,452	4,026
Locally-owned	148,529	3,337	
Total	167,244	14,789	4,026

Data source: WSDOT Pavement Office.

Note: 1 Includes Interstate lane miles.

Collecting pavement data for MAP-21

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.

One challenge with the final rules is cracking data, which has not previously been fully collected for locally-managed NHS roads. However, WSDOT has worked with MPOs and confirmed collection methodology consistent with the MAP-21 Final rules.



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. Beginning April 15, 2019, and each April 15 thereafter, state DOT's will submit Interstate data that conforms to the final rules.

The final 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 October 1, 2022 reporting year. The final rule reporting requirements are summarized in the tables at right.

Reports are structured on a 4-year reporting cycle, with midpoint (2- year) reports. Between October 2018 and October 2022, state DOTs will be required to submit three performance reports to FHWA:

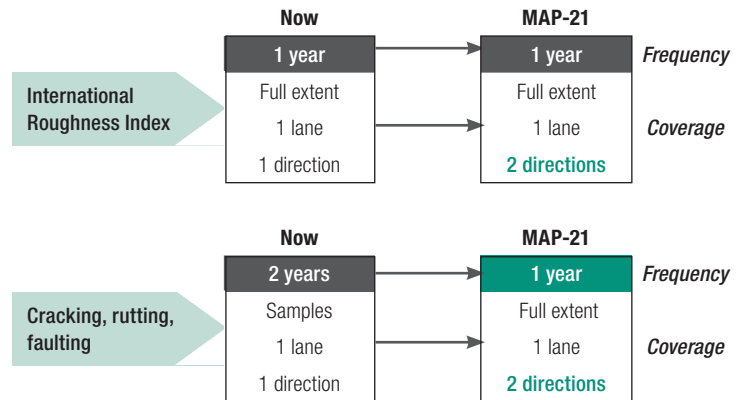
Baseline Performance Report: In this report, states must establish 2-year and 4-year targets, describe baseline conditions, urbanized area boundaries and population data, NHS limits, and relationships with other performance expectations.

- This report will include HPMS data collected in 2016 and 2017. States will be able to adjust the 4-year targets in the Mid Performance Progress Report based on data collected in 2018 and 2019.
- 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 1, 2018. 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.

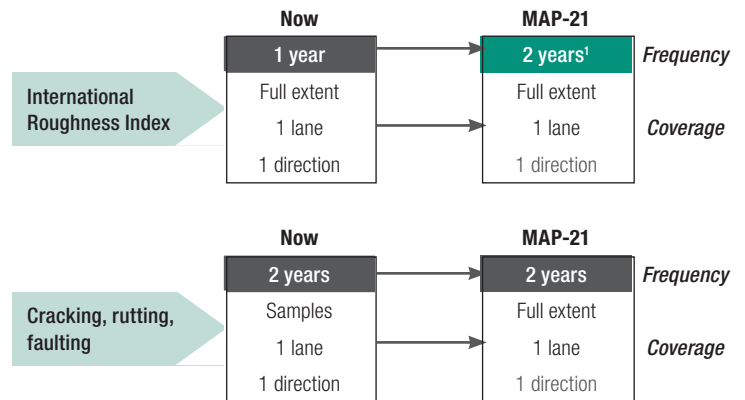
- Because states are not required to establish 2-year targets for Interstate pavements in the Baseline Performance Report, they would use the Mid Performance Progress Report to update baseline condition/performance data and, if necessary, adjust the 4-year targets.

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 2020/2021 and reported in 2022.

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 states 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 2019, after a full year of data collection in 2018. The FHWA expects to reassess this minimum condition level after the completion of the first full performance period (reported in 2022) to determine if additional system improvements can be achieved through adjustments to the required minimum condition level.

Penalties

A state will be penalized if it does not meet the Interstate pavement minimum condition requirement. 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, the state must obligate National Highway Performance Program (NHPP) and transfer Surface Transportation Program (STP) funds. Specifically, if the state is out of compliance, 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.

Pavement condition information: Kim Willoughby, WSDOT State Pavement Management Engineer, at (360) 709-5405 or WillouK@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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