



MAP-21 and Pavement Management

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Background

- MAP-21 signed into law on July 6, 2012
- MAP-21 Effective Date was October 1, 2012
- MAP-21 primarily implemented in statute through Title 23, U.S.C. (with regard to highways)
- FHWA has responsibility to interpret laws and develop rules for implementation.
- Three Notices of Proposed Rulemaking (NPRM) related to pavements:
 - Statewide and Metropolitan Planning (published June 2, 2014; past deadline for comments)
 - Pavement and Bridge Performance Measures (published January 5, 2015; comment period extended to May 8, 2015)
 - Asset Management Plan (published February 20, 2015; comments due April 21, 2015)

Emphasis on Performance Management

Established in Title 23, U.S.C.

Sec. 150. National goals and performance management measures

(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 by refocusing on national transportation goals, increasing the accountability and transparency of the Federal-aid highway program, and improving project decisionmaking through performance-based planning and programming.

(b) National Goals. - It is in the interest of the United States to focus the Federal-aid highway program on the following national goals:

(1) Safety. - To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.

(2) Infrastructure condition. - To maintain the highway infrastructure asset system in a state of good repair.

Performance
measures
and targets

(A) provide States, metropolitan planning organizations, and other stakeholders not less than 90 days to comment on any regulation proposed by the Secretary under that paragraph;

(B) take into consideration any comments relating to a proposed regulation received during that comment period; and

(C) limit performance measures only to those described in this subsection.

(3) National highway performance program. - NHPP

(A) In general. - Subject to subparagraph (B), for the purpose of carrying out section 119, the Secretary shall establish -

(i) minimum standards for States to use in developing and operating bridge and pavement management systems;

(ii) measures for States to use to assess -

(I) the condition of pavements on the Interstate system:

(II) the condition of pavements on the National Highway

System (excluding the Interstate):

(III) the condition of bridges on the National Highway System;

(IV) the performance of the Interstate System; and

(V) the performance of the National Highway System (excluding the Interstate System);

(iii) minimum levels for the condition of pavement on the Interstate System, only for the purposes of carrying out section 119(f)(1); and

Relates to
penalty for %
Poor Interstate

Proposed Definitions for Good / Poor

(to be poor, at least 2 criteria must be poor)

(to be good, all 3 criteria must be good)

(everything else is fair)

TABLE 5—PROPOSED PAVEMENT CONDITION RATING THRESHOLDS

Surface type	Metric	Metric range	Rating
All pavements	IRI	<95	Good.
		95–170: Areas with a <u>population less than 1,000,000.</u>	Fair.
		95–220: Urbanized areas with a <u>population of at least 1,000,000.</u>	Fair.
		>170: Areas with a population less than 1,000,000.	Poor.
		>220: Urbanized areas with a population of at least 1,000,000.	Poor.
Asphalt Pavement and Jointed Concrete Pavement.	Cracking_Percent	<5%	Good.
		5–10%	Fair.
		>10%	Poor.
Asphalt Pavement	Rutting	<0.20	Good.
		0.20–0.40	Fair.
		>0.40	Poor.
Jointed Concrete Pavement	Faulting	<0.05	Good.
		0.05–0.15	Fair.
		>0.15	Poor.

WSDOT prefers speed limit criteria



phased in

Performance Measure Data Collection

- Currently the pavement condition on all NHS is collected and reported by WSDOT through HPMS (Highway Performance Monitoring System)

This includes:

- IRI plus cracking, rutting, and faulting for all WSDOT NHS (Interstate and non-Interstate)
- IRI plus **sampling** for cracking, rutting, and faulting for all local road NHS

About 60% of
WSDOT network

About 20% of
statewide NHS

- This WSDOT data collection is planned to continue, and will be expanded to include the new full extent requirements (no sampling) of MAP-21, so local agencies will not have to collect data for performance reporting.

Performance Measure Targets

- Statewide (4-year) Targets are required for:
 - % Interstate in poor condition (set by FHWA)
 - % Interstate in good condition
 - % non-Interstate in poor condition
 - % non-Interstate in good condition
- Targets can be adjusted at the mid-point of the 4-year period
- MPO Targets (same format as State targets)
 - Can agree to State targets, or
 - Can develop targets for MPO
- State and MPOs must coordinate on selection of targets

(A) In general. - The metropolitan transportation planning process shall provide for the establishment and use of a performance-based approach to transportation decisionmaking to support the national goals described in section 150(b) of this title and in section 5301(c) of title 49.

(B) Performance targets. -

(i) Surface transportation performance targets. -

(I) In general. - Each metropolitan planning organization shall establish performance targets that address the performance measures described in section 150(c), where applicable, to use in tracking progress towards attainment of critical outcomes for the region of the metropolitan planning organization.

(II) Coordination. - Selection of performance targets by a metropolitan planning organization shall be coordinated with the relevant State to ensure consistency, to the maximum extent practicable.

(ii) Public transportation performance targets. - Selection of performance targets by a metropolitan planning organization shall be coordinated, to the maximum extent practicable, with providers of public transportation to ensure consistency with sections 5326(c) and 5329(d) of title 49.

(C) Timing. - Each metropolitan planning organization shall establish the performance targets under subparagraph (B) not later than 180 days after the date on which the relevant State or provider of public transportation establishes the performance targets.

Performance Measure Targets

(c) MPO report. MPOs shall establish targets in accordance with § 490.105 and report targets and progress toward the achievement of their targets in a manner that is consistent with the following:

(1) The MPOs shall report their established targets to their respective State DOT in a manner that is agreed upon by both parties and documented in the Metropolitan Planning Agreement in accordance with part 450 of this chapter.

(2) The MPOs shall report baseline condition/performance and progress toward the achievement of their targets in the system performance report in the metropolitan transportation plan in accordance with part 450 of this chapter.

Performance Measures, Targets, and Reporting

First Full Performance Period Timeline		Baseline	Mid-Term	Full
Performance Report Due Date		10/1/2016	10/1/2018	10/1/2020
Data Collection	Calendar Years	2014-15	2016-17	2018-19
	Interstate	Current HPMS (IRI plus other samples)	All	
	Non-Interstate	Current HPMS (IRI plus other samples)		All
Performance Measures	Interstate	Not Submitted, Updated at Mid-Term	All	All
	Non-Interstate	IRI Only	IRI Only	All
State Performance Targets	Interstate	2 Year: Exempt 4 Year (Full Target)	Adjust 4 Year Target	Explanation of Measures vs. Targets
	Non-Interstate	2 Year (IRI Target) 4 Year (Full Target)	Explain 2 Year Target vs. Actual and Adjust 4 Year Target	
Assessment of State Significant Progress		Interstate	Exempt First Period Only	Yes
		Non-Interstate	N/A	Yes (IRI Target)

WSDOT comment: Why report IRI data only? Include sample data for cracking, rutting, etc.

MPOs are only required to set 4 year targets. MPOs do not report targets in the Baseline, Mid-Term or Full Performance Reports, but instead report them to the State (6 months after the State Targets), and as part of their metropolitan transportation plan. See 490.105(f) and 490.107(c)

MAP-21 Pavement Performance

National Highway System MAP-21 Preliminary Analysis using all measures

	Local Agency	State Highway	MAP-21 Reported
Percentage of pavements in Good Condition on the <i>Interstate</i> System		22.7%	22.7%
Percentage of pavements in Poor Condition on the <i>Interstate</i> System	Only measure with penalty	3.8% ≤ 5%	3.8%
Percentage of pavements in Good Condition on <i>non-Interstate</i> NHS	2.4%	17.8%	13.0%
Percentage of pavements in Poor Condition on <i>non-Interstate</i> NHS	16.8%	1.7%	6.4%

*Preliminary analysis based on WSDOT data for State Highway (complete coverage) and HPMS Sample Sections for Local Agency (16% coverage).

MAP-21 Pavement Performance

National Highway System MAP-21 Preliminary Analysis by MPO

	Local Agency		State Highway		Combined	
	Poor	Good	Poor	Good	Poor	Good
BFCG	6.1%	2.3%	0.6%	22.6%	2.4%	15.8%
CWCOG	47.0%	0.0%	0.7%	12.5%	16.9%	8.1%
LCVMPO	0.0%	0.0%	12.6%	0.0%	6.6%	0.0%
PSRC	12.7%	0.0%	2.5%	12.0%	7.6%	6.0%
RTC	8.0%	2.5%	1.8%	10.7%	4.1%	7.7%
SMPO	0.0%	0.0%	5.4%	23.7%	4.7%	20.4%
SRTC	19.5%	0.0%	5.0%	18.8%	12.7%	8.8%
TRPC	15.0%	20.0%	0.3%	16.3%	8.8%	18.4%
WCOG	4.7%	0.0%	3.6%	16.4%	4.0%	10.1%
WVTC	25.1%	1.5%	0.5%	10.2%	2.0%	9.7%
WWVMPO	47.5%	0.0%	0.0%	48.2%	20.5%	27.4%
YVCOG	46.7%	3.0%	0.2%	22.4%	19.4%	14.4%
<i>Grand Total</i>	16.7%	2.4%	1.7%	17.8%	6.4%	13.0%

*Preliminary analysis based on WSDOT data for State Highway (complete coverage) and HPMS Sample Sections for Local Agency (16% coverage).

Asset Management Plan

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TITLE 23, U.S.C.

Performance
Management

Sec. 119

Sec. 119. National highway performance program

(a) Establishment. - The Secretary shall establish and implement a national highway performance program under this section.

(b) Purposes. - The purposes of the national highway performance program shall be -

(1) to provide support for the condition and performance of the National Highway System;

(2) to provide support for the construction of new facilities on the National Highway System; and

(3) to ensure that investments of Federal-aid funds in highway construction are directed to support progress toward the achievement of performance targets established in an asset management plan of a State for the National Highway System.

Asset Management Plan (cont.)

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TITLE 23, U.S.C.

Sec. 119

(e) State Performance Management. -

(1) In general. - A State shall develop a risk-based asset management plan for the National Highway System to improve or preserve the condition of the assets and the performance of the system.

(2) Performance driven plan. - A State asset management plan shall include strategies leading to a program of projects that would make progress toward achievement of the State targets for asset condition and performance of the National Highway System in accordance with section 150(d) and supporting the progress toward the achievement of the national goals identified in section 150(b).

(3) Scope. - In developing a risk-based asset management plan, the Secretary shall encourage States to include all infrastructure assets within the right-of-way corridor in such plan.

(4) Plan contents. - A State asset management plan shall, at a minimum, be in a form that the Secretary determines to be appropriate and include -

- (A) a summary listing of the pavement and bridge assets on the National Highway System in the State, including a description of the condition of those assets;
- (B) asset management objectives and measures;
- (C) performance gap identification;
- (D) lifecycle cost and risk management analysis;
- (E) a financial plan; and
- (F) investment strategies.

(5) Requirement for plan. - Notwithstanding section 120, with respect to the second fiscal year beginning after the date of establishment of the process established in paragraph (8) or any subsequent fiscal year, if the Secretary determines that a State has not developed and implemented a State asset management plan consistent with this section, the Federal share payable on account of any project or activity carried out by the State in that fiscal year under this section shall be 65 percent.

Asset Management Plan (cont.)

a performance-based program.” As proposed in section 450.306(d)(4)(i) of the Transportation Planning NPRM (RIN 2125–AF52), MPOs would be required to include in the metropolitan planning process the asset management plan developed in accordance with this rulemaking. As a result, FHWA believes that State DOTs should coordinate with MPOs during the development of the asset management plan.

Asset Management Plan (cont.)

§ 515.007 Process for establishing the asset management plan.

(a) A State shall develop a risk-based asset management plan that describes how the highway network system, including the NHS, will be managed to achieve a desired level of condition and performance while managing the risks, in a financially responsible manner, at a minimum practicable cost over the life cycle of its assets. The State DOT shall develop and use, at a minimum the following processes to prepare its asset management plan:

(1) A State DOT shall establish a process for conducting performance gap analysis to identify deficiencies hindering progress toward improving and preserving the NHS and achieving and sustaining the desired state of good repair. At a minimum, the State DOT

Asset Management Plan (cont.)

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§ 515.007 Process for establishing the asset management plan.

(2) A State DOT shall establish a process for conducting life-cycle cost analysis for an asset class (i.e., a group of assets with the same characteristics and function) or asset sub-group (i.e., a group of assets within an asset class with the same characteristics and function) at the network level (network to be defined by the State DOT). As a

the sub group, or other appropriate grounds. A life-cycle cost analysis process shall, at a minimum, include the following:

(i) Desired condition for each asset class or asset sub-group;

(ii) Identification of deterioration models for each asset class or asset sub-group;

(iii) Potential work types, including the treatment options for the work types, across the whole life of each asset class or asset sub-group with their relative unit cost; and

(iv) A strategy for managing each asset class or asset sub-group by minimizing its life-cycle costs, while achieving the performance targets set by the State

Asset Management Plan (cont.)

§ 515.007 Process for establishing the asset management plan.

(3) A State DOT shall establish a process for developing a risk management plan.

This process shall, at a minimum, produce the following information:

(i) Identification of risks that can affect the NHS condition and effectiveness as they relate to the safe and efficient movement of people and goods, including risks associated with current and future environmental conditions, such as extreme weather events, climate change, seismic activity, and risks related to recurring damage and costs as identified through the evaluation carried out under § 515.019;

(ii) An assessment of the identified risks to assets and the highway system included in the plan in terms of the likelihood of their occurrence and their impact and consequence if they do occur;

(iii) An evaluation and prioritization of the identified risks;

(iv) A mitigation plan for addressing the top priority risks;

(v) An approach for monitoring the top priority risks; and

(vi) A summary of the evaluations carried out under § 515.019 that discusses, as a minimum, the results relating to the State's existing pavements and bridges on the NHS, and

Relates to facilities requiring repair or reconstruction due to emergency events.

Asset Management Plan (cont.)

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§ 515.007 Process for establishing the asset management plan.

(4) A State DOT shall establish a process for the development of a financial plan that identifies annual costs over a minimum period of 10 years. The financial plan shall, at a minimum, include:

(i) The estimated cost of expected future work to implement investment strategies contained in the asset management plan, by State fiscal year and work type;

(ii) The estimated funding levels that are expected to be reasonably available, by fiscal year, to address the costs of future work types. State DOTs may estimate the amount of available funding using historical values where the future funding amount is uncertain;

(iii) Identification of anticipated funding sources; and

(iv) An estimate of the value of the agency's pavements and bridge assets and the needed investment on an annual basis to maintain the value of these assets.

WSDOT asked if "value" could be expressed in terms of Remaining Service Life

Asset Management Plan (cont.)

(5) A State DOT shall establish a process for developing investment strategies meeting the requirements in § 515.009(f). This process must describe

§ 515.009 Asset management plan requirements.

(8) Investment strategies.

(e) An asset management plan shall cover, at a minimum, a 10-year period.

(f) An asset management plan shall establish and discuss a set of investment strategies leading to a program of projects that would

(1) Achieve and sustain a desired state of good repair over the life cycle of the assets,

(2) Improve or preserve the condition of the assets and the performance of the NHS relating to physical assets,

(3) Make progress toward achievement of the State targets for asset condition and performance of the NHS in accordance with 23 U.S.C. 150(d), and

(4) Support progress toward the achievement of the national goals identified in 23 U.S.C. 150(b).

(g) A State DOT must include in its plan a description of how the analyses required under § 515.007 support the State DOT's strategies. The plan also must describe how the strategies satisfy the requirements in paragraph (f)(1) through (4) of this section.

(h) A State DOT should select such projects for inclusion in the STIP to support its efforts to achieve the goals in paragraphs (f)(1) through (4) of this section.

Asset Management Plan (cont.)

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§ 515.007 Process for establishing the asset management plan.

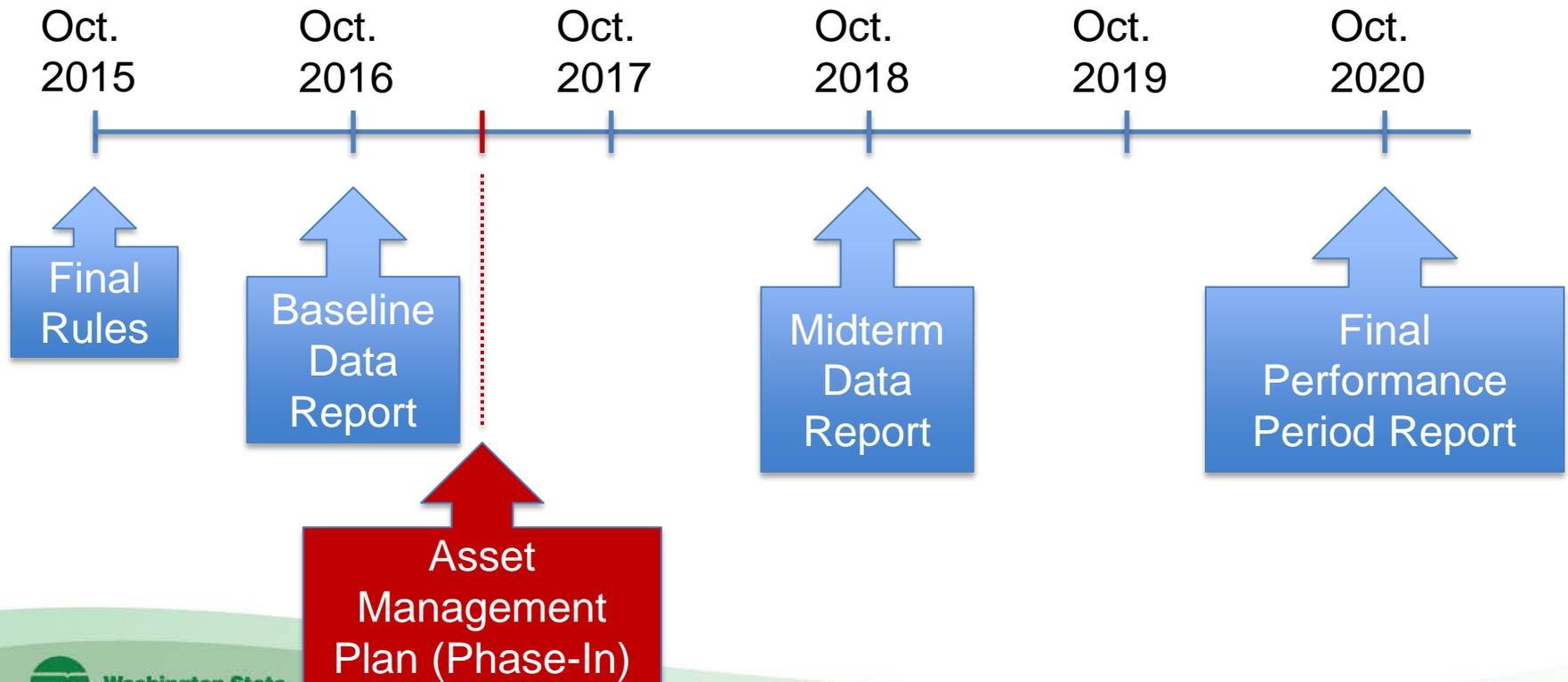
(b) Each State DOT shall use bridge and **pavement management systems to analyze the condition of Interstate highway pavements, non-Interstate NHS pavements, and NHS bridges** in accordance with 23 U.S.C. 150(c)(3)(A)(i), **for the purpose of developing and implementing the asset management plan** required under this part. These bridge and **pavement management systems shall include**, at a minimum, formal procedures for:

- (1) **Collecting, processing, storing, and updating inventory and condition data** for all NHS bridge and pavement assets;
- (2) **Forecasting deterioration** for all NHS bridge and pavement assets;
- (3) **Determining the life-cycle benefit-cost analysis** of alternative strategies (including a no action decision) for managing the condition of all NHS bridge and pavement assets;
- (4) **Identifying short- and long-term budget needs** for managing the condition of all NHS bridge and pavement assets;
- (5) **Determining the optimal strategies** for identifying potential projects for managing pavements and bridges; and
- (6) **Recommending programs and implementation schedules** to manage the condition of all Interstate highway pavements, non-Interstate NHS highway pavements, and NHS bridge assets within policy and budget constraints.

MAP-21 Asset Management NPRM

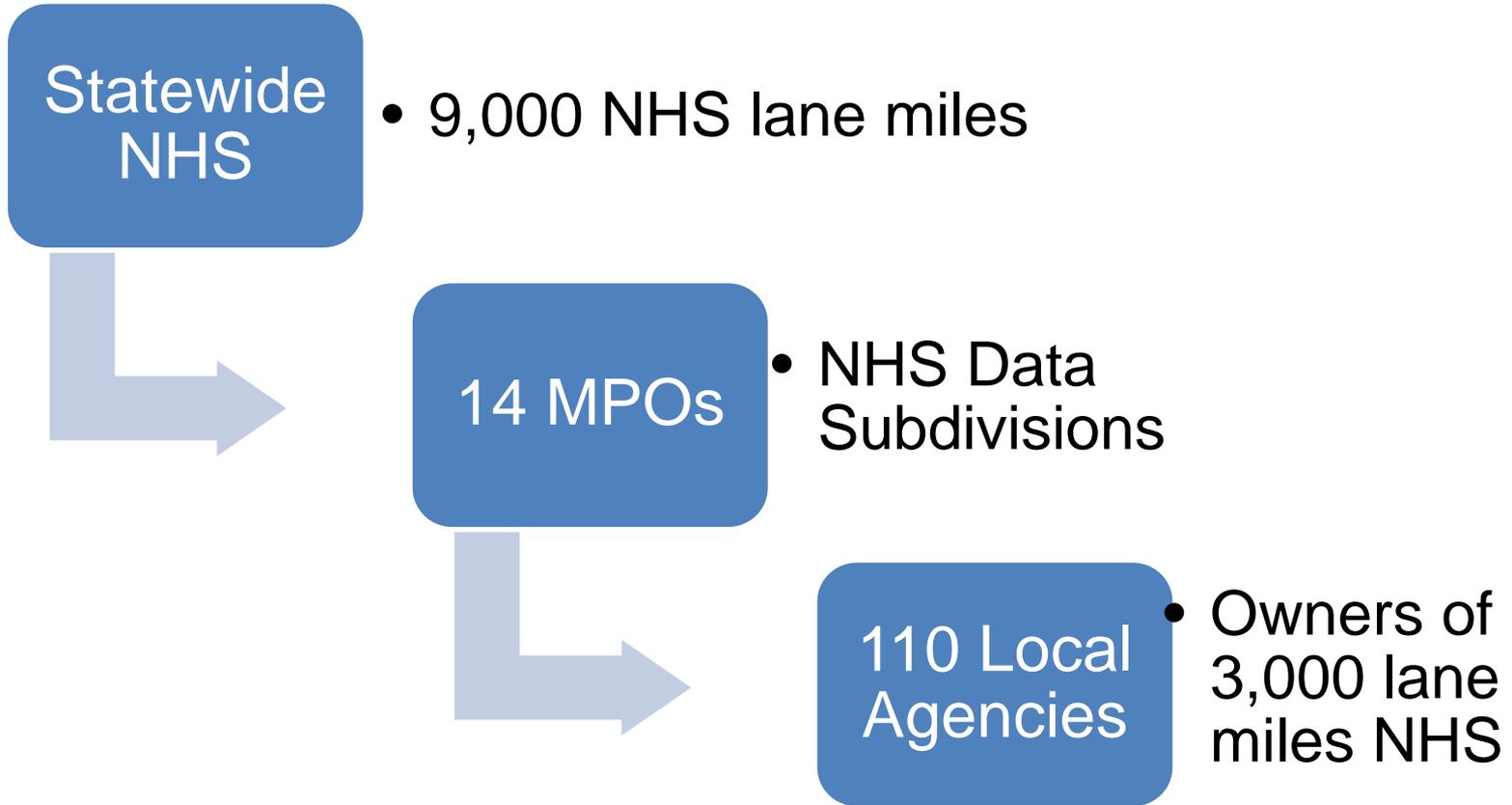
Time Schedule:

- Requires submission of Asset Management Plan within 1 year (can be partial submission – called “Phase-In”)
- Final submission (after Phase-In) within 18 months.



MAP-21 Asset Management NPRM

Washington State NHS



MAP-21 Pavement Performance Target Setting

What factors will affect target setting?

FHWA

- Very little guidance in the draft NPRM.
- No penalties involved with not meeting targets. If targets are not met, report must indicate what steps are being taken to improve.
- Declining targets (say, due to reduced resources) can be used.
- Desire to implement best practices.

Methods

- Consideration of public (user costs)
- Consideration of current and future funding scenarios
- Agency implementation of asset management principles (performance management, cost effectiveness, asset stewardship)

State – Local Coordination Required for Many Areas

Target Setting

- MPO & WSDOT
- 2-year (State) and 4-year (State & MPO) targets

Asset Management

- Inventory Data and Life-Cycle Costs (all 110 local agencies)
- Strategy and Approach to Asset Management
- Procedures for Risk Analysis
- Development of Investment Strategies
- Development of Financial Plans

Review

- Requirements are found in statute; FHWA determines details
- 3 NPRMs (Metropolitan Planning, Performance Measures, Asset Management) are related
- WSDOT does NHS pavement data collection
- Target Setting
 - States report to FHWA
 - MPOs report to States
 - No penalty for not achieving targets, except for % Poor Interstate
- Asset Management NPRM
 - Most impact; extensive requirements
 - Requires State, MPO, Local Agency coordination