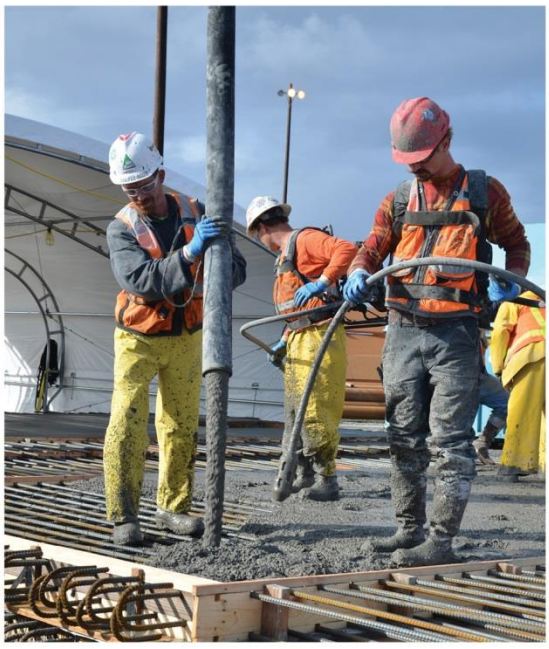
September 2016

Washington State Department of Transportation

MAP-21 Initial State Performance Report

MAP-21



Washington State Department of Transportation

The Washington State Department of Transportation's responses to the Federal Highway Administration's request for an Initial State Performance Report for the Moving Ahead for Progress in the 21st Century are as follows:

i. The condition/performance of the National Highway System (NHS) in the State;

a. This requirement is deemed satisfied for State DOTs that have already reported to the National Bridge Inventory and the Highway Performance Monitoring System

WSDOT response:

The WSDOT Bridge and Structures Office submitted the necessary reports to the National Bridge Inventory in April 2016.
Additionally, the WSDOT Transportation Data, GIS & Modeling Office submitted the necessary reports to the Highway Performance Monitoring System in July 2016.

ii. The effectiveness of the investment strategy document in the State Asset Management plan for the NHS;

a. For State DOTs that have developed a State Asset Management Plan for the NHS, State DOT's should provide an assessment of its effectiveness.
b. For State DOTs that have not yet completed a State Asset Management Plan for the NHS, provide a description of the processes being used or will be used to develop a plan.

WSDOT response:

WSDOT will use a Transportation Asset Management Plan (TAMP) help make management and investment decisions across its transportation assets and to support the state's transportation goals, legislative direction and federal requirements. The department considers asset management to be a critical component of Practical Solutions as a way to cost-effectively and efficiently manage the physical assets of Washington's transportation system.

Among the benefits of the TAMP is that transportation assets will be viewed as a system or network of assets that facilitate investment trade-offs. The TAMP identifies WSDOT assets, the expected performance and the criteria to measure the performance. It also pinpoints the triggers for operations, maintenance or preservation activities, and the investment strategies to achieve the expected performance. The asset management approach considers potential risks of failure along with historical asset performance to analyze and prioritize problem areas. Any future reconstruction or replacement is therefore planned and prioritized within the highway construction program.

In preparation for final rule making and for submittal of the TAMP, the department has begun the development of a plan that conforms to the requirements of FHWA's Notice of Proposed Rule Making issued on February 20, 2015. This work is being developed at the technical level through the Highway Asset Management Technical Advisory Group (HAMTAG). The HAMTAG is a team of WSDOT's highway asset management experts who understand how to develop strategic initiatives to manage the performance of the state's highway assets. This group is comprised of senior and mid-level managers and subject matter experts who regularly collaborate with the Capital Program Development and Management Office in the development of the Transportation Asset Management Plan proposals for the department's Executive Steering Committee (ESC).

Participants on the HAMTAG represent Pavement Management, Bridge Management, Traffic Management, Maintenance, Planning, Safety Systems Management, Strategic Assessment, Information Technology, Environmental Services and WSDOT's regional offices. The responsibilities of the technical group include identification of strategic initiatives to preserve the performance of assets at their lowest life cycle cost.

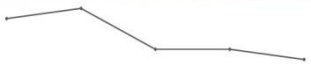
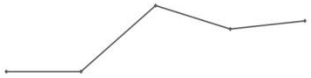
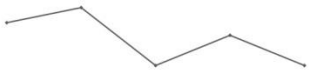
What are the investment strategies used by WSDOT to prioritize projects and achieve expected performance?
WSDOT prioritizes projects based on a high-benefit/low-cost philosophy aimed at improving the operating efficiency of the system. As a result, projects included in the plan reflect WSDOT's incremental, tiered approach to ensure every improvement builds upon previous work so that no work is wasted. This approach separates strategies into three investment tiers to be implemented incrementally to maximize every dollar invested. The three tiers are:

1) Low-cost projects that deliver high return on capital investment and have short delivery schedules.
2) Moderate to higher-cost projects that provide additional benefits for both highways and local roads.
3) Highest-cost projects that deliver long-term solutions and corridor-wide benefits.

The tiered approach addresses the greatest number of capital needs with the least amount of capital investment. The department has adopted the following investment strategies for roadway and bridge preservation.

See next page which features WSDOT's MAP-21 Bridge and Pavement Performance Dashboard.

Bridge and Pavement Performance Dashboard

WSDOT performance measure	Previous period	Current period	Goal	Goal met	Five-year trend *(unless noted)*	Desired trend
Bridges					53.5 Million Square Feet of Bridge Deck	
Percentage of state bridges in fair or better condition by bridge deck area (Annual measure: calendar years 2015 & 2016, GNB 62, p. 14)	92.1%	91.2%	≥90.0%	✓		↑
State bridges load restricted or load posted; Number of bridges (Annual measure: fiscal years 2015 & 2016, GNB 62, p. 18)	120	126	N/A	N/A		↓
Current steel bridge painting backlog; Millions of dollars (Annual measure: fiscal years 2015 & 2016, GNB 62, p. 20)	$394.0	$414.5	N/A	N/A		↓
Steel bridge projected 10-year painting backlog; Millions of dollars (Annual measure: fiscal years 2015-2025 & 2016-2026, GNB 62, p. 20)	$684.0	$706.6	N/A	N/A		↓
Current state bridge deck area due or past due for replacement; Millions of dollars (Annual measure: fiscal years 2015 & 2016, GNB 62, p. 19)	$70.8	$115.6	N/A	N/A	 (Two-year trend)	↓
State bridge projected 10-year deck area due or past due for replacement; Millions of dollars (Annual measure: fiscal years 2015-2025 & 2016-2026, GNB 62, p. 19)	$71.5	$726.5[1]	N/A	N/A	 (Two-year trend)	↓
Structurally deficient state bridges (MAP-21); Percentage of deck area (Annual measure: fiscal years 2015 & 2016, GNB 62, p. 15)	7.9%	8.8%	≤10.0%	✓		↓
Pavement					18,680 Lane Miles of Pavement	
State highway pavement[2] in fair or better condition; Percentage of total (Annual measure: calendar years 2013 & 2014, GNB 60, p. 11)	92.6%	93.3%	≥90.0%	✓		↑
Highway pavement asset sustainability ratio; Long term service replenishment rate[3] (Annual measure: calendar years 2013 & 2014, GNB 60, p. 11)	65%	53%	≥90.0%	–		↑
Highway pavement deferred preservation liability (backlog); Millions of dollars (Annual measure: calendar years 2013 & 2014, GNB 60, p. 11)	$391	$351	$0	–		↓
Highway pavement remaining service life Percentage of total useful life (Annual measure: calendar years 2013 & 2014, GNB 60, p. 11)	46.1%	46.9%	45%-55%	✓	 (Four-year trend)	↑

Data source: WSDOT Office of Strategic Assessment and Performance Analysis.

Notes: N/A = not available: goal has not been set. Dash (—) = goal was not met in the reporting period. 1 The significant increase in projected liabilities is due to the detrioration of physical assets and changes in accounting. Since 2009, many concrete overlays could not be adequately maintained as a result of budget constraints and are now coming due for rehabiliation. A change in accounting for projected asset deterioration to more accurately capture future needs was also implimented in FY2016. 2 Data includes only conditions for asphalt and concrete pavement; budget constraints prohibited data collection for chip seal pavement. Condition data is weighted by Vehicle Miles Travelled (VMT).

Roadway Preservation

WSDOT has developed aggressive strategies during the last several years to increase efficiency and help counter the effects of the pavement preservation funding shortfall. Each strategy is designed to either accomplish transportation goals at a lower cost and/or extend the pavement life for a given set of conditions.

In 2010, WSDOT began emphasizing the coordination between maintenance and capital preservation. Better coordination with maintenance makes use of more cost-effective treatments than using preservation alone and more seamlessly addresses the needs of state-maintained roadways. The department's investment strategies use the practical design approach to make project decisions that focus on the specific problem that the project is intended to address. This performance-based approach looks for lower cost solutions in order to meet specific performance criteria, specifically:

1) Converting asphalt surfaces to chip seal - The lifecycle annual cost for a chip seal surfaced pavement is approximately one-third the cost of an asphalt surface.
2) Strategic pavement maintenance - Performing maintenance treatments at the appropriate time (before rehabilitation is needed) extends pavement life and results in lower annual cost. In August 2014, WSDOT implemented a policy that no pavement rehabilitation should take place without first using strategic maintenance to extend pavement life.
3) Prioritizing cost effective projects - The WSDOT prioritization process avoids reconstruction, emphasizes lower annual cost, and takes into consideration traffic volume.

In order to maintain an acceptable condition rating for the state-owned portion of the National Highway System, WSDOT estimates the need to invest approximately $250 million per year in roadway preservation. The distribution goal to maintain an "acceptable" condition rating estimated to be a 60%-30%-10% split between Hot Mix Asphalt (HMA), Portland cement concrete pavement (PCCP), and Bituminous Surface Treatment (BST). This investment distribution gives WSDOT the ability to improve the overall pavement network.

The department plans to mitigate a majority of the asphalt backlog, keep chip seal roadways in good condition and keep concrete roadways serviceable. Additionally, a primary concern regarding concrete roadways is a larger investment will be necessary for concrete roadway improvements in the future as many concrete lane miles reaching critical age and performance levels.

Strategic asset management and new funding improves short- and long-term pavement conditions
2013 compared to 2014

	Pavement annual performance measures[1]		2013	2014	Agency goal[2]	Goal met	Progress	Desired Trend
Short term	**Percent of pavement in fair or better condition** measured for asphalt and concrete pavement (chip seal data was not collected in 2013 or 2014 due to budget constraints). Condition is shown by lane miles as well as weighted by the Vehicle Miles Traveled to reflect road use.	Lane miles	93.3%	93.4%	90%	✓	↑	↑
		VMT	92.6%	93.3%				
Long term	**Asset Sustainability Ratio** measures the years of pavement service life replenished through rehabilitation, divided by the service life consumed annually.		65%	53%[3]	90%	–	↓	↑
	Remaining Service Life measures the remaining useful life before rehabilitation or replacement is needed for a given section of the roadway (shown as a percent of the total useful life and as average years remaining).		46.1% (7.29 yrs)	46.9% (7.37 yrs)	45% to 55%	✓	↑	↑
	Deferred Preservation Liability (backlog) estimates the accumulated cost in current dollars to fund the backlog of past due (deferred) pavement rehabilitation work.		$391 million	$351 million[4]	$0	–	↓	↓

Data source: WSDOT Pavement Office.
Notes: 1 All measures, except for deferred preservation liability, are weighted by Vehicle Miles Traveled to better capture the typical road user's experience. Calculations for all measures, excluding percent of pavement in fair or better condition, include all pavement types (asphalt, chip seal and concrete).
2 Agency also has goals for Results Washington and the Governmental Accounting Standards Board—see p. 18 for more information. 3 Measure did not meet goal in 2014—see p. 12 for more information. 4 Measure did not meet goal in 2014—see p. 14 for more information.

Bridge Preservation

In order to begin to address the backlog in bridge preservation an investment level of approximately $400-$500 million per biennium is needed. The department's investment strategy prioritizes:

1) Preserving Border Bridges
2) Scour Mitigation - Armoring the foundations of bridges evaluated and determined to be at high risk for future scour.
3) Replacing deteriorated bridge elements - WSDOT performs major preservation repairs by addressing specific bridge elements to address bridges in poor condition. The most common types of repairs include floating bridge anchor cable replacement, expansion joint replacement and concrete column repair.
4) Painting steel bridges - A protective paint coating on a steel bridge is essential to prevent corrosion, extend the bridge's service life and keep the bridge in fair or better condition. Continuing to keep up with painting can prevent the number of bridges in poor condition from increasing.
5) Repairing concrete bridge decks - WSDOT is working to reduce the number of bridges classified as structurally deficient by addressing bridges with the highest benefits and the most cost savings. One strategy is to repair and rehabilitate concrete bridge decks to extend their service life compared to replacing the entire bridge deck.

Washington achieves goal of keeping structurally deficient bridge deck area below 10% statewide

As of June 2016; Percent of bridge deck area considered structurally deficient (SD); Deck area in millions of square feet

	National Highway System		Statewide	
	Deck area[1]	Number of bridges	Deck area[1]	Number of bridges
WSDOT owned	44.4	2,259	53.5	3,294
Amount SD (%)	*4.1 (9.2%)*	*99*	*4.7 (8.8%)*	*154*
Locally owned[2]	4.6	189	17.8	4,041
Amount SD (%)	*0.5 (10.0%)*	*19*	*1.2 (7.0%)*	*188*
Total	49.0	2,448	71.3	7,335
Amount SD (%)	*4.6 (9.3%)*	*118*	*5.9 (8.3%)*	*342*

Data source: WSDOT Bridge and Structures Office and WSDOT Local Programs Office.
Notes: Structurally deficient is equal to the state's poor condition rating. 1 Due to rounding, some percentages are not computable based on numbers in the table. 2 Bridges owned by counties and cities.

With capital investment strategies focused on replacing bridge elements, painting and deck rehabilitation projects, there is a limited amount of funding left to address other types of bridge work such as seismic retrofit, replacement of timber and older bridges, and other special bridge repairs. To maintain the expected bridge performance, WSDOT's Bridge Maintenance program is expected to maintain structures at a serviceable level until a capital project is programmed.

WSDOT has 91.2% of its bridges by deck area in fair or better condition, meeting performance goals

Number of bridges and percent of bridges by deck area by condition category; Deck area in millions of square feet

STRUCTURAL CONDITION		2011	2015	2016	Trend
GOOD/VERY GOOD Bridges in good condition range from those with no problems to those having some minor deterioration of structural elements.	Bridge deck area	16.1	19.2	19.8	↑
	Percent of deck area	31.1%	36.0%	36.9%	
	Number of bridges	1,460	1,628	1,678	↑
FAIR Primary structural elements are sound; may have minor section loss, deterioration, cracking, spalling or scour. This is the most cost-effective time to rehabilitate before the underlying structure is damaged.	Bridge deck area	30.9	29.9	29.1	↓
	Percent of deck area	59.7%	56.1%	54.3%	
	Number of bridges	1,589	1,522	1,462	↓
GOOD/VERY GOOD & FAIR TOTALS: Goal = 90% or more deck area in fair or better condition	Bridge deck area	47.0	49.1	48.9	↓
	Percent of deck area	90.8%	92.1%	91.2%	
	Number of bridges	3,049	3,150	3,140	↓
POOR A bridge in poor condition has advanced deficiencies such as section loss, deterioration, scour, or seriously affected structural components, and may have weight restrictions. A bridge in poor condition is still safe for travel.	Bridge deck area	4.8	4.2	4.7	↑
	Percent of deck area	9.2%	7.9%	8.8%	
	Number of bridges	155	138	154	↑

Data source: WSDOT Bridge and Structures Office.
Notes: The above data shows WSDOT-owned bridges, culverts, and ferry terminals over 20 feet in length that carry vehicular traffic. All numbers shown in the table above are based on the revised "out-to-out" calculation method (which includes curbs and rails on the bridge) instead of the bridge width curb-to-curb. The 2011 data has been updated using this revised calculation method.

iii. A description of State DOT's progress in achieving performance targets;

a. State DOTs that have established targets should provide a description of the target establishment process including how coordination with relevant MPOs and other agencies occurred in the selection of targets.

b. State DOTs that have not established targets should provide a description of the planned processes for target establishment including how coordination with relevant MPOs and other agencies will occur in the selection of targets.

WSDOT response:

Throughout the process of reviewing/providing feedback to the various MAP-21 transportation performance management-related proposed rules, WSDOT and Municipal Planning Organizations (MPOs) in Washington state have collectively been engaged to provide the most thorough comments possible to the federal docket. In addition, WSDOT and MPOs have identified a structured and unified process for moving forward with setting the various MAP-21 performance measure targets. The following two-page Washington State MAP-21 folio depicts these collaborative efforts.

Washington State Department of Transportation

May 2015 – Edition 1

Target setting collaborative framework for the Moving Ahead for Progress in the 21st Century Act (MAP-21)

Target Setting Framework Group responsible for process, data and target decisions

The Target Setting Framework Group includes WSDOT representatives and Metropolitan Planning Organization (MPO) directors. This group meets quarterly following the WSDOT/MPO/Regional Transportation Planning Organization (RTPO) Coordinating Committee meeting. The Target Setting Framework Group will address issues organized into three types of decision points: process, data and target setting.

For **process decisions**, the group will decide how early and often WSDOT and MPOs will engage each other, and the types of engagement are best for each.

The group has decided to resolve differences by:

- acknowledging the difference in viewpoints;
- discussing the impact of having the difference;
- participating in open discussions with the full group;
- clarifying positions from all sides;
- listing facts, assumptions and beliefs for each position;
- aiming for consensus;
- inviting minority reports, and
- voting on targets and other key decisions

For **data decisions**, the group will address the types of data to be used; the roles and responsibilities for data collection and analysis, and the process by which MPOs will report their established targets, performance progress, and achievements.

The group will also make advisory **target setting decisions.** Their final recommendations will be forwarded to the responsible agencies–individual MPOs as well as WSDOT's Executive Leadership Team and Secretary of Transportation Lynn Peterson. Responsible agencies may adopt or modify the proposed targets. Prior to adoption of the final targets, the Secretary may consult with the Governor's office to ensure alignment with the Governor's strategic directions.

Purpose of collaboration

In July 2012, the Moving Ahead for Progress in the 21st Century Act (MAP-21) became law. MAP-21 requires both states and Metropolitan Planning Organizations (MPOs) to set performance targets and requires collaboration among these responsible agencies. While WSDOT and Washington state MPOs each have individual responsibilities to take action to set targets, the agencies have been in the process of developing roles and responsibilities since mid-2014 to establish a framework for collaboration in the target setting process.

This folio describes the organizational structure to facilitate the collaborative process that will include the Target Setting Framework Group, Target Setting Working Group and Target Setting Technical Teams.

Target Setting Working Group discusses policy and process issues, prepares recommendations

The Target Setting Working Group is a small group of WSDOT staff and MPO representatives. The group meets monthly (typically via conference call). In addition to discussing policy and process issues in-depth and preparing recommendations for the Target Setting Framework Group, the Working Group collaborates on clarification and fact-finding activities to support the operation of the Target Setting Framework Group.

Target Setting Technical Teams lend expertise to methodology and data requirements

The Target Setting Technical Teams dig deep into Notices of Proposed Rule Making (NPRMs) methodology and data requirements in order to ensure all pertinent MAP-21 facts are understood by target setting participants, making a smoother process for transitioning into MAP-21 performance requirements.

Separate Target Setting Technical Teams will be formed around each of the MAP-21 performance target areas. Outcomes from Target Setting

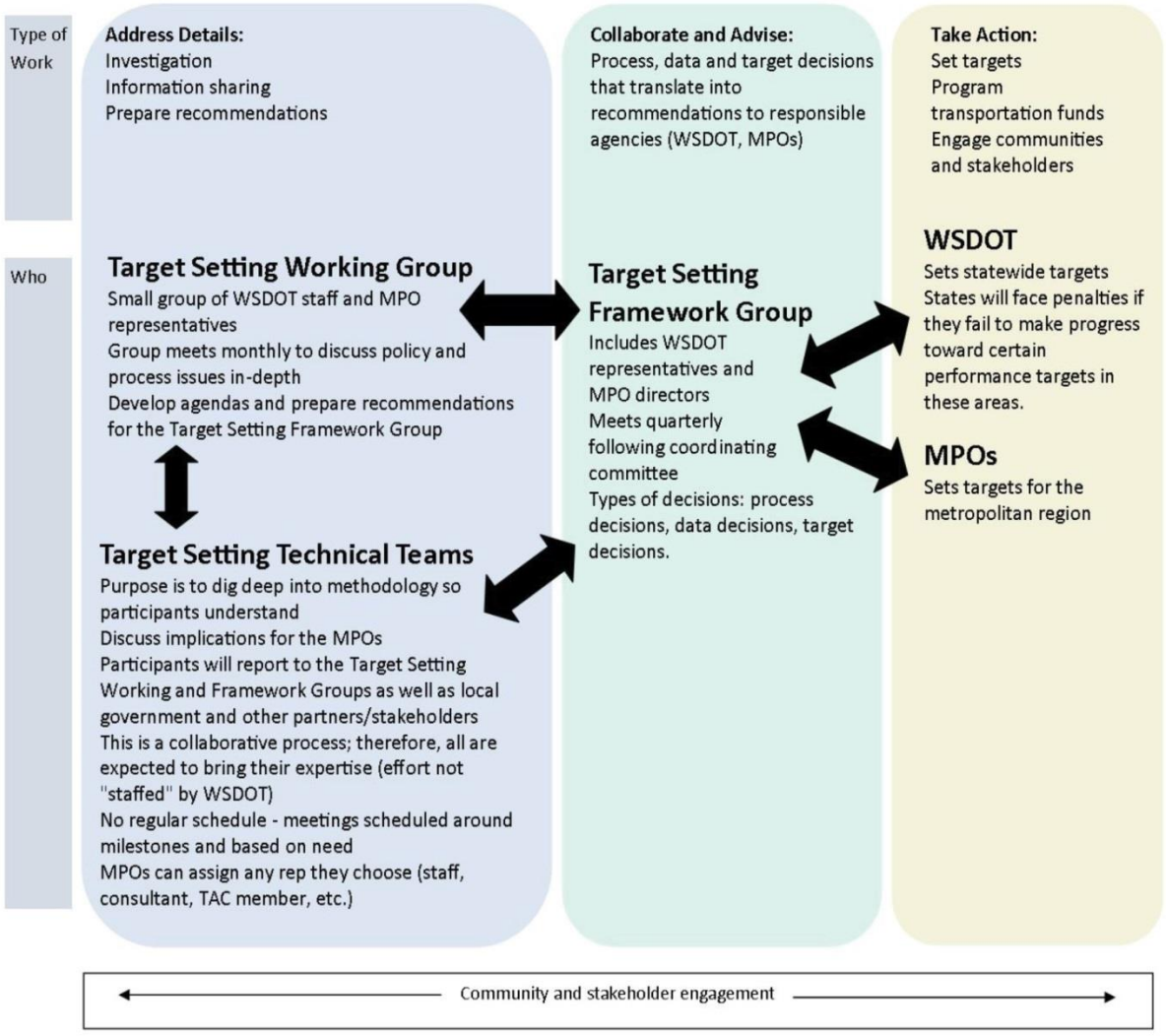
Continued on p. 2

Target Setting Technical Teams lend expertise to methodology and data requirements

Continued from p. 1

Technical Team meetings will be reported to the Working Group and Framework Group. Participants are expected to report back to their respective WSDOT or MPO representative as well as local government and other partners/stakeholders. While the MPOs can assign any subject matter expert they choose (staff, consultant, TAC member, etc.) to the group, the number of members is limited to experts that are actively engaged in conducting analysis. Because this is a collaborative process (not "staffed" by WSDOT), all are expected to bring their expertise to the table and invest time and effort to conduct needed analysis. The Technical Teams meet based on need, particularly around milestones.

The Technical Teams analyze and vet WSDOT's target proposal for state targets. These groups also discuss implications for the MPOs. For state targets, WSDOT will make initial target recommendations that will be provided to the Technical Teams to be assessed for feasibility, impact and data needs and then presented to the Working Group and Framework Group for consideration. The initial targets may reflect the minimum MAP-21 threshold assumptions in line with revenue and funding scenarios.



For more information, contact Daniela Bremmer, WSDOT Office of Strategic Assessment and Performance Analysis • BremmeD@wsdot.wa.gov or Kerri Woehler, WSDOT Office of Multimodal Planning • WoehleK@wsdot.wa.gov.

iv. A description of the ways in which the State DOT is addressing congestion at freight bottlenecks. (https://www.transportation.gov/freight/NFSP)

WSDOT response:

Currently, there is no nationally accepted definition and methodology for identifying freight bottlenecks. The System Performance/Freight/CMAQ NPRM provided a proposed definition for truck bottlenecks, dataset and speed threshold for identifying freight bottlenecks, and WSDOT is awaiting the final rulemaking to provide a formal definition for freight bottlenecks. This first step is needed before states can conduct data analysis to locate freight bottlenecks and develop strategies to address them.

WSDOT is currently updating its State Freight Mobility Plan, and will complete it by December 2017 as required by FAST Act. As part of the freight plan update, WSDOT will be developing an inventory of facilities with freight mobility issues--such as bottlenecks--as well as strategies to address issues at bottlenecks.

WSDOT is also working on developing a freight investment plan as part of the freight plan update, including a fiscally-constrained prioritized freight project list for consideration for National Freight Highway Program funding. By funding freight priority projects, these investments will contribute to reducing congestion and improving overall performance of the National Highway Freight Network.

Additional Information:
WSDOT produces MAP-21 folios (http://wsdot.wa.gov/accountability/MAP-21) that help customers more easily understand the various transportation performance-related rules and their implications for Washington State.

In addition, WSDOT publishes the *Gray Notebook* (http://www.wsdot.wa.gov/Accountability/GrayNotebook/navigateGNB.htm), which is the agency's award-winning quarterly performance report.