Washington State Department of Transportation

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WSDOT, MPOs moving toward TPM targets for System Performance, Freight and CMAQ measures

WSDOT, in collaboration with Metropolitan Planning Organizations, finalized Transportation Performance Management (TPM, formerly MAP-21) targets for highway system performance, freight and Congestion Mitigation and Air Quality (CMAQ) on May 20, 2018. With the 2-year performance period ending Oct. 1, 2020, the state is making progress toward meeting the 4-year targets. As part of PM3 (as the rule is commonly referred to), recipients of federal aid transportation funds will make transportation investments that show progress toward the following national goals:

- Congestion reduction – To achieve a significant reduction in congestion on the National Highway System;
- System reliability – To improve the efficiency of the surface transportation system;
- Freight movement and economic vitality – To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development; and
- Environmental sustainability – To enhance the performance of the transportation system while protecting and enhancing the natural environment.

A number of tools and resources were used to analyze required data for target setting including the TPM web tool, WSDOT's Corridor Capacity Report, Texas Transportation Institute measure calculation work (a pooled fund study), data from the American Community Survey, CMAQ Public Access System and analysis of the state freight system plan and other modal plans. Requirements related to data, thresholds, metrics, and measure calculation methods are stipulated by FHWA/USDOT. The WSDOT/MPO technical team used historic trend data and the average compound annual growth to set the 2-year and 4-year highway performance targets.

TPM performance measures by program area	Baseline data	2-year target[1]	2-year actuals	2-year target met	4-year target[1]
Combined Rule (PM3) 23 CFR Part 490 ID No. 2125-AF54					
Highway System Performance (Congestion)					
Percent of person-miles traveled on the Interstate System that are reliable	73.3%	70%	77%	Yes	68%
Percent of person-miles traveled on the Non-Interstate NHS System that are reliable	77%	N/A[3]	80.8%	N/A[3]	61%
National Freight Movement Program					
Truck Travel Time Reliability (TTTR) Index	1.63	1.70	1.54	Yes	1.75
Congestion Mitigation & Air Quality Program					
Non-Single Occupancy Vehicle (SOV) travel in Seattle urbanized area (NHS)	32.0%	32.8%	33.1%	Yes	33.2%
Peak hours of Excessive Delay per capita in Seattle urbanized area (NHS)	23.0	N/A[3]	23.2	N/A[3]	28
All Pollutants (kg/day)[2]	1,658.640[2]	366.285	1,222.870	Yes	658.300
Carbon Monoxide (CO) (kg/day)[2]	313.160[2]	309.000	714.710	Yes	309.060
Particulate Matter less than 10 microns (PM_{10}) (kg/day)[2]	435.690[2]	0.305	274.640	Yes	224.000
Particulate Matter less than 2.5 microns ($PM_{2.5}$) (kg/day)[2]	36.820[2]	2.100	56.750	Yes	8.700
Nitrogen Oxides (NOX) (kg/day)[2]	872.970[2]	54.880	176.770	Yes	116.540

Notes: Federal rule allows state and MPOs to adjust four-year targets during the mid-performance progress report. There are no monetary penalties involved with PM3. **1** Two- year and four-year target periods for PM3 end October 1, 2020, and October 1, 2022, respectively. **2** Base emissions are for the four-year period 2013-2016 as reported in the CMAQ Public Access System. **3** These targets are not required for the 2-year Mid-Performance Period Progress Report.

How FHWA measures system performance, freight movement, congestion mitigation, and air quality

Tracking reliable travel times on interstate, non-interstate roads

Level of Travel Time Reliability (LOTTR) is defined as the ratio of longer travel times (80th percentile) to a "normal" travel time (50th percentile), using data from FHWA's National Performance Management Research Data Set or equivalent. Data are collected in 15-minute segments during four time periods:

- Morning peak (6-10 a.m. Monday-Friday)
- Midday (10 a.m. to 4 p.m. Monday-Friday)
- Afternoon peak (4-8 p.m. Monday-Friday)
- Weekends (6 a.m. to 8 p.m.)

The measures are the percent of person-miles traveled on the NHS that are reliable (with 1.5 TTR or less being reliable and more than 1.5 TTR being considered unreliable). Person-miles take into account the users of the NHS. Data to reflect the users includes all vehicles.

Travel Time Reliability

Level of Travel Time Reliability (LOTTR)	Ratio of longer travel times (80th percentile) to normal travel times (50th percentile)
	NPMRDS data, 15-minute segments during morning peak, mid-day, evening peak, and weekends
	Percent person-miles (required occupancy input)

Implementation timeline for DOTS		Interstate	Non-Interstate NHS
Establish targets	May 20, 2018	2- and 4-year targets	4-year target
Report baseline performance	Oct. 1, 2018	Required	Required
Report mid-performance progress	Oct. 1, 2020	4-year targets not adjusted	
Report first 4-year performance progress and second performance reporting cycle begins	Oct. 1, 2022	Required	Required

Assessing the reliability of freight movement

The Truck Travel Time Reliability (TTTR) metric is defined as the ratio of the longer truck travel time (95th percentile) to a "normal" truck travel time (50 percentile). It is computed for five time periods:

- Morning peak (6-10 a.m. Monday-Friday)
- Midday (10 a.m. to 4 p.m. Monday-Friday)
- Afternoon peak (4-8 p.m. Monday-Friday)
- Weekends (6 a.m. to 8 p.m.)
- Overnights for all days (8 p.m.-6 a.m.)

The TTTR measure is calculated by multiplying each segment's maximum TTTR metric with its length, and then divided by the total mileage of Interstate System.

WSDOT and MPOs can obtain the necessary data from FHWA's National Performance Management Research Data Set (NPMRDS), which includes truck travel times for the full Interstate System. However, WSDOT and the MPOs can also opt to use an equivalent, FHWA approved data set instead.

Freight Reliability

Interstate Truck Travel Time Reliability Index (TTTR)	Five time periods/NPMRDS segment: Weekday morning peak, mid-day, evening peak; weekend days; and overnight (all days)
	TTTR metric: 95th percentile divided by normal travel times (50th percentile)
	TTTR measure: sum (each segment length times the maximum TTTR metric over five time periods) divided by total interstate length

Implementation timeline for DOTS		Interstate
Establish targets	May 20, 2018	2- and 4-year targets
Report baseline performance	Oct. 1, 2018	Required
Report mid-performance progress	Oct. 1, 2020	4-years targets not adjusted
Report first 4-year performance progress and second performance reporting cycle begins	Oct. 1, 2022	Required

Analyzing excessive delay during peak congestion times

The Peak Hour Excessive Delay (PHED) measure initially applies to urbanized areas of more than one million population that include nonattainment or maintenance areas (ozone, carbon monoxide or particulate matter). This population threshold decreases to include areas of more than 200,000 for the second performance period (which begins October 1, 2022). All States and MPOs with NHS mileage overlapping within an applicable urbanized area must coordinate on a single, unified target.

Four-year targets were reported in the October 1, 2018 baseline performance period report as states were not required to report 2-year targets or baseline condition for this specific measure for the first performance period. WSDOT opted to provide this information to FHWA to complement data for the mid-performance period progress report.

In the first mid-performance period progress report (which was due October 1, 2020) 4-year targets could be adjusted, and 2-year conditions and performance were reported as baselines.

Traffic congestion are measured by the annual hours of PHED per capita on the NHS. The threshold for excessive delay is based on the travel time at 20 mph or 60% of the posted speed limit travel time, whichever is greater, and will be measured in 15-minute intervals. Peak travel hours are defined as 6-10 a.m. on weekday mornings; the weekday afternoon period is 3-7 p.m. or 4-8 p.m., providing flexibility to DOTs and MPOs. The total excessive delay metric is weighted by vehicle volumes and occupancy. WSDOT must report on metrics annually for all mainline highways on the NHS for all applicable urbanized areas.

Peak Hour Excessive Delay

Peak Hour Excessive Delay (PHED) per capita on the NHS	Excessive delay based on travel time of 20 mph or 60% of posted speed limit, whichever is greater (NPMRDS)
	Measured for 15-minute periods during morning and evening weekday peak hours
	Weighted by volumes and occupancy

Implementation timeline for DOTS		NHS in urbanized areas (UAs)
Establish targets	May 20, 2018	4-year targets for UAs greater than 1 million and non-attainment or maintenance air quality
Report baseline performance	Oct. 1, 2018	Report targets only, no baseline performance
Report mid-performance progress	Oct. 1, 2020	4-years targets not adjusted. Report 2-year actual data that serves as baselines
Report first 4-year performance progress and second performance reporting cycle begins	Oct. 1, 2022	Required

Calculating the percent of Non-Single Occupancy Vehicle travel

The rule initially applies to urbanized areas of more than 1 million people include air quality nonattainment or maintenance areas (ozone, carbon monoxide or particulate matter). The population threshold changes to areas of more than 200,000 for the second performance period, which begins October 1, 2022 (see chart above at right). All States and MPOs with NHS mileage that overlaps within an applicable urbanized area coordinated on a single, unified target and reported on the measures for that area May 20, 2018.

There are three options to calculate modal share:

1) A minimum option for measurement will use the American Community Survey Commuting (Journey to Work) data from the U.S. Census Bureau (used by WSDOT)

Non-Single Occupancy Vehicle Travel

Non-Single Occupancy Vehicle (SOV) travel in urbanized areas	Carpool, vanpool, public transportation, commuter rail, walking, biking and telecommuting
	Three options to compute: ■ American Community Survey (ACS) Commute data, U.S. Census Bureau ■ Local commuting survey data ■ Modal volume/usage data

Implementation timeline for DOTs		NHS in urbanized areas (UAs)
Establish targets	May 20, 2018	2- and 4-year targets for UAs greater than 1 million and non-attainment or maintenance air quality
Report baseline performance	Oct. 1, 2018	Report target, baseline and methodology
Report mid-performance progress	Oct. 1, 2020	4-year targets not adjusted
Report first 4-year performance progress	Oct. 1, 2022	Required
Second performance reporting cycle begins	Oct. 1, 2022	Applies to UAs greater than 200,000

2) Localized surveys

3) Volume/usage counts for each mode to determine the percent non-SOV travel, and will be encouraged to report any data not available in national sources today (such as bike counts) to FHWA

Determining progress toward total emissions reduction

The rule applies to all air quality nonattainment and maintenance areas—for ozone, carbon monoxide, course particulate matter (less than 2.5 to 10 micrometers in diameter) and fine particulate matter (2.5 micrometers or smaller)—in Washington. Targets must reflect cumulative emissions reductions to be reported in the in CMAQ Public Access System.

CMAQ performance measure applicability in Washington state

MPO	Maintenance areas	UA population	Emissions measure	Traffic congestion measure
PSRC	PM_{10}, $PM_{2.5}$	>1,000,000	Yes	First period
Thurston	PM_{10}	>200,000	Yes	Second period
Vancouver	None	>1,000,000	No	No
Yakima	PM_{10},CO	>200,000	Yes	No
Spokane	PM_{10},CO	>1,000,000	Yes	Second period

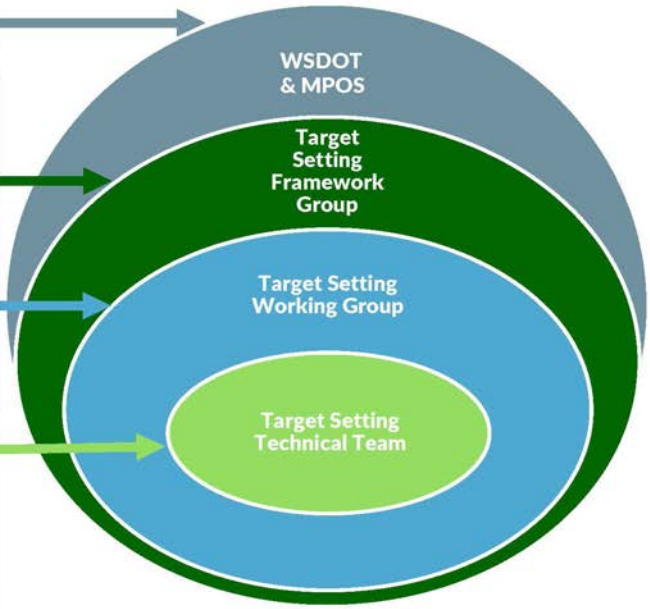
Collaboration and decision making process for PM3 target setting

WSDOT & MPOs: Groups collaborated to set statewide targets, program transportation funds and will continue to engage communities and stakeholders.

Target Setting Framework Group: This group included WSDOT representatives and MPO directors and was responsible for process, data and target decisions.

Target Setting Working Group: This small group of WSDOT staff and MPO representatives discussed policy and process issues in-depth and was responsible for developing the agendas and preparing recommendations for the TPM Target Setting Framework Group.

Target Setting Technical Teams: These groups' purpose was to dig deep into the methodology of data collection and analysis used to establish targets. The groups were comprised of representatives and subject matter experts from WSDOT and MPOs.



Consequences of not making significant progress toward TPM targets

When significant progress toward NHPP and NHFP targets is not made on System Performance and CMAQ congestion measures, WSDOT must document the actions it will take to achieve its targets. The Freight Reliability target, if missed, requires WSDOT to provide documentation in its next performance target report, including an inventory of truck bottlenecks and descriptions of funding allocation to improve bottlenecks, and actions it will undertake to achieve the targets. There are no penalties for missing other targets.

For more information

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Important dates for PM3 performance measures

Oct. 1, 2017	First Performance Period for Emissions Reduction Measure starts
Jan. 1, 2018	Performance Period for First Performance Period
May 20, 2018	States set Performance Targets for First Performance Period
Nov. 16, 2018	MPOs accept WSDOT targets or set own
Oct. 1, 2018	Baseline Performance Period Report due
Oct. 1, 2020	Mid-Performance Period Progress Report due (2-year); target adjustment due if needed
March 31, 2021	MPOs target adjustments due if needed
Oct. 1, 2021	First Performance Period for Emissions Reduction Measure ends
Oct. 1, 2022	Full-Performance Period Progress Report due (4-year) and second performance reporting cycle begins and baseline report is due

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