TPM System Performance, Freight and CMAQ

WSDOT, MPOs set 2023 and 2025 TPM targets for System Performance, Freight and CMAQ measures

WSDOT, in collaboration with Metropolitan Planning Organizations, finalized its four-year Transportation Performance Management targets for highway system performance, freight and Congestion Mitigation and Air Quality (CMAQ) on December 16, 2022.

WSDOT's methodology for setting its new PM3 performance targets to be reported on October 1, 2024 and October 1, 2026 included:

- **Congestion and freight –** Evaluated pre-COVID trend (2017-2019 data) and COVID trend (2020-2021 data); and used the average growth rate between those two to set new 2-year and 4-year targets.
- **CMAQ peak hour delay –** Based on the Texas Transportation Institute's recommended methodology, held the 4-year target from the first, 4-year cycle (2018-2021) the same for second, 4-year cycle (2022-2025) 2- and 4-year targets.
- **CMAQ Non-SOV –** Evaluated 2017-2019 pre-COVID trend and use 2019 as baseline data to set the new 2-year and 4-year targets.
- **CMAQ emissions –** MPOs evaluated actual federal fisal year (FFY) 2018-2021 emission values based on projects in maintenance areas in the CMAQ Public Access System. MPOs identifed their FFY 2022-2025 target contributions based on projects selected for funding in maintenance areas, and WSDOT added these MPO values to get a statewide figure for each pollutant. Baselines for FFY 2022-2025 are based on 4-year actuals from FFY 2018-2021.

TPM performance measures by program area	4-year targets 2021[1]	4-year actuals 2021[1]	Desired trend	2-year targets 2023[2]	4-year targets 2025[2]
Combined Rule (PM3) 23 CFR Part 490 ID No. 2125-AF54	**1st reporting period (2018-2021)**			**2nd reporting period (2022-2025)**	
Highway System Performance (Congestion)					
Percent of person-miles traveled on the Interstate System that are reliable	68.0%	82.4%	↑	77.2%	72.5%
Percent of person-miles traveled on the Non-Interstate NHS System that are reliable	61.0%	87.8%	↑	88.1%[3]	88.4%
National Freight Movement Program					
Truck Travel Time Reliability (TTTR) Index	1.75	1.49	↓	1.51	1.53
Congestion Mitigation & Air Quality Program					
Peak hours of Excessive Delay (PHED) per capita in Seattle urbanized area	28.0	18.9	↓	28.0	28.0
Peak hours of Excessive Delay per capita in Spokane urbanized area	N/A	11.4	↓	10.0	10.0
Peak hours of Excessive Delay per capita in Tri-Cities urbanized area	N/A	3.9	↓	4.5	4.5
Non-Single Occupancy Vehicle (SOV) travel in Seattle urbanized area	32.2%	36.4%	↑	35.5%	36.8%
Non-Single Occupancy Vehicle travel in Spokane urbanized area	N/A	24.2%	↑	24.0%	25.1%
Non-Single Occupancy Vehicle travel in Tri-Cities urbanized area	N/A	20.6%	↑	21.4%	21.9%
Particulate Matter less than 2.5 microns ($PM_{2.5}$) (kg/day)[2]	8.7000	49.230	↓	2.160	5.310
Nitrogen Oxides (NOx) (kg/day)[2]	116.540	18.320	↓	42.640	84.120
Particulate Matter less than 10 microns (PM_{10}) (kg/day)[2]	224.000	-95.154	↓	223.838	447.676
Carbon Monoxide (CO) (kg/day)[2]	309.060	793.068	↓	19.274	34.928

Notes: Federal rule allows state and MPOs to adjust four-year targets during the mid-performance (2-year) progress report. There are no monetary penalties involved with PM3.
1 The first reporting period is from 2018-2021 (Oct. 1, 2017 through Sept. 30, 2021 for CMAQ) with data and actuals submitted Dec. 16, 2022. **2** The current two-year target period for PM3 is for calendar years 2022-2023 with data and actuals submitted on October 1, 2024. The current four-year target period for PM3 is for calendar years 2022-2025 (Oct. 1, 2021 through Sept. 30, 2025 for CMAQ) with data and actuals submitted on October 1, 2026. These reports align with the federal fiscal year, which runs October 1 through September 30.

Washington meets targets for reliable travel times on interstate, non-interstate roads

Washington met its 4-year targets for Highway System Performance during the 2018-2021 reporting period. WSDOT reported 82.3% of person-miles traveled on the Interstate System were reliable during this period, achieving the target of being higher than 68.0%.

WSDOT also reported 87.7% of person-miles traveled on the Non-Interstate NHS System were reliable, achieving the target of being higher than 61.0%.

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 while data to reflect the users includes all vehicles.

Washington meets freight movement reliability target

Washington met its 4-year target for Truck Travel Time Reliability (TTTR) Index during the 2018-2021 reporting period. WSDOT reported 1.49 of TTTR index in 2021, achieving its target to not exceed 1.75.

The Truck Travel Time Reliability 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. to 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 uses FHWA's National Performance Management Research Data Set (NPMRDS) to compute TTTR measure, and report the progress to FHWA.

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)

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 and report baseline performance	Dec. 16, 2022	2- and 4-year targets
Report mid-performance progress	Oct. 1, 2024	4-years targets and report 2-year actual data
Report 4-year performance progress. Third performance reporting cycle begins.	Oct. 1, 2026	Required

Seattle area meets target for Peak Hour Excessive Delay, Spokane and Tri-Cities areas report PHED performance

The Seattle urbanized area met its target for Peak Hour Excessive Delay per capita for the first, 4-year period (2018-2021) with 18.9, which was lower than the 4-year target of 28.0. While no targets were required for the Spokane and Tri-Citiies urbanized areas, their 4-year actual for PHED was 11.4 and 3.9, respectively.

The Peak Hour Excessive Delay (PHED) measure for the second, 4-year performance period applies to urbanized areas of more than 200,000 population that include nonattainment or maintenance areas (ozone, carbon monoxide or particulate matter). All states and MPOs with NHS mileage overlapping within an applicable urbanized area must coordinate on a single, unified target. In the second mid-performance period progress report (due October 1, 2024) 4-year targets can be adjusted, and 2-year actual conditions are reported.

Traffic congestion is 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.

Seattle urbanized area meets Non-SOV travel target, Spokane, Tri-Cities urbanized areas report performance

The Seattle urbanized area met its Non-Single Occupancy Vehicle (SOV) travel target for the 2018-2021 reporting period with 36.4%, higher than the goal of 32.2%. While no targets were required for the Spokane and Tri-Cities urbanized areas during this period, their actual non-SOV travel was 24.2% and 20.6%, respectively.

The rule for the second, 4-year performance period applies to urbanized areas of more than 200,000 people include air quality nonattainment or maintenance areas (ozone, carbon monoxide or particulate matter). All states and MPOs with NHS mileage that overlaps within an applicable urbanized area coordinated on a single, unified target and reported the measures for that area Dec. 16, 2022.

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)

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

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

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 and report baseline performance	Dec. 16, 2022	2- and 4-year targets for UAs greater than 200,000 and non-attainment or maintenance air quality
Report mid-performance progress	Oct. 1, 2024	4-years targets and report 2-year actual data
Report 4-year performance progress and third performance reporting cycle begins.	Oct. 1, 2026	Required

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 CMAQ Public Access System.

CMAQ performance measure applicability in Washington state

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

TPM rules for system performance

Measure groups	Performance measures	Measure/target applicability	Metric data source and collection frequency	Metric
System Performance	Percent of person-miles traveled on the Interstate System providing for reliable travel	Mainline of the interstate system within a state or each MPO	All traffic/vehicles data in NPMRDS or equivalent every 15 minutes	Level of Travel Time Reliability (LOTTR)
	Percent of person-miles traveled on the non-Interstate NHS providing for reliable travel	Mainline of the non-interstate system within a state or each MPO	All traffic/vehicles data in NPMRDS or equivalent every 15 minutes	LOTTR
Freight Movement	Truck travel time reliability index (TTTR)	Mainline of the interstate system within a state or each MPO	Truck data in NPMRDS or equivalent every 15 minutes	TTTR Index
Congestion Mitigation & Air Quality	Annual hours of peak-hour excessive delay per capita	Mainline of NHS in urbanized areas with populations over 200,000/1 million in non-attainment and maintenance for any CMAQ criteria pollutants	All traffic/vehicles data in NPMRDS or equivalent every 15 minutes (bus, car and truck volumes) in HPMS; occupancy factors published by FHWA	Total peak hour excessive delay person hours
	Percent of non-Single Occupancy Vehicle travel	Urbanized areas with populations over 200,000 in non-attainment and maintenance for any CMAQ criteria pollutants	ACS, local survey or local counts (includes bicycle/pedestrian counts)	Percent of non-SOV travel
	Total emissions reduction	All non-attainment and maintenance areas for CMAQ criteria pollutants	CMAQ public access system	N/A

Progress and penalties:

As part of PM3, 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.

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, descriptions of funding allocation to improve bottlenecks, and actions it will take to achieve the targets. There are no penalties for missing other targets.

For more information:

System Performance: Sreenath Gangula, Assistant Director, Performance Management Office, Transportation Safety & Systems Analysis Division at (360) 705-6888, sreenath.gangula@wsdot.wa.gov.

Freight: Wenjuan Zhao, Multimodal Freight Systems Planning Engineer for Rail, Freight, and Ports Division at (360) 705-6990, wenjuan.zhao@wsdot.wa.gov.

CMAQ Emissions: Lindsay Taylor, Transportation Planning Specialist at (206) 440-4549, lindsay.taylor@wsdot.wa.gov.

TPM reporting action timeline

Nov. 7, 2022	Performance Management Form (PMF) opens for DOTs to submit biennial reports
Dec. 16, 2022	Final day for DOTs to submit biennial reports
Dec. 19, 2022 - Jan, 13, 2023	FHWA Division Office reviews DOT biennial reports
Jan, 17 - Jan. 30, 2023	If necessary, DOTs respond to any FHWA Division Office comments, and resubmit the PMF
Jan. 30, 2023	PMF closes and data archived
March 2023	FHWA communicates Significant Progress Determinations to State DOTs
July 2023	FHWA posts data on the State Performance Dashboard