

Comments of the Washington State Department of Transportation  
to the Federal Highway Administration  
in Docket Number FHWA 2013-0054

National Performance Management Measures;  
Assessing Performance of the National Highway System, Freight Movement on the Interstate System, and  
Congestion Mitigation and Air Quality Improvement Program  
August 18, 2016

The Washington State Department of Transportation (WSDOT) appreciates the opportunity to collaborate with AASHTO, Washington state MPOs, FHWA, and USDOT to prepare for MAP-21 rulemaking. In general, WSDOT supports the National Performance Management Measures relating to **system performance, freight and CMAQ** (23 CFR Part 490, **Federal Register Vol. 81**, No. 78). These comments are specific to impacts to WSDOT, and are offered to FHWA as a response to the proposed rule.

## WSDOT BACKGROUND

WSDOT staff has extensive experience in systems and freight analysis. WSDOT has been publishing its system performance report since 2001. WSDOT is considered among the nation's leaders in performance measurement and has an extensive framework for data collection, processing, analysis and reporting through the annual *Corridor Capacity Report (CCR)* – WSDOT's comprehensive annual analysis of multimodal state highway system performance. WSDOT used truck freight performance measures—including truck travel time and reliability—to track the performance of truck freight corridors and completed research in 2015 to evaluate NPRMDS data quality and test an initial set of truck performance measures (including delay and frequency of congestion) that could be produced with the NPMRDS.

Additionally, WSDOT distributes CMAQ funding directly to the Metropolitan Planning Organizations, which then select and fund projects. Currently, WSDOT receives CMAQ project information and enters the project and emissions data in the CMAQ Public Access System. In Washington, CMAQ funds support projects intended to reduce congestion and greenhouse gas (GHG) emissions from the highway system, including ferry, bike and pedestrian, and transit projects. WSDOT has a strong history of estimating and reporting congestion on the state's major urban corridors where Greenhouse Gas (GHG) emissions is one of the key measures.

## WSDOT SUPPORT OF MULTIMODAL & GHG MEASURES

Other organizations, such as Transportation for America and Transportation Choices, have voiced concerns over the lack of multimodal measures in the 3<sup>rd</sup> NPRM, suggesting alternative measures like percent of system that meets FHWA sidewalk guidance. WSDOT is considered a leader in comprehensive system performance analysis, and currently produces a set of multimodal, corridor-based measures as part of the *Corridor Capacity Report*. This report expands on person throughput by measuring transit, rail, ferries, and HOV performance. WSDOT agrees measures that take land use and alternative modes into consideration along with community engagement better represent the spectrum of transportation capacity along a corridor. WSDOT will continue to explore opportunities to advance the state of the practice in this regard.

Unlike the other measures proposed, federal legislation does not require a GHG measure, but in the NPRM FHWA asked for comments on such a measure. WSDOT proactively collaborated with seven other state DOTs supportive of a GHG measure and developed a common response. These states finalized a letter that has been signed by each CEO of these eight State DOTs.

## **PART I: WSDOT'S KEY COMMENTS SUMMARIZED**

WSDOT is among the nation's leaders in using transportation system performance management as a tool for data-driven decisions and agrees that performance management increases accountability and transparency. WSDOT welcomes FHWA's framework for national, high-level performance indicators, while respectfully noting potential issues and suggesting improvements to the rule:

1. ***Inconsistent data processing creates burden and confusion:*** The proposed rule would require different data preparation for each measure, ranging from handling null and outlier values differently, to using a different number of decimal places for each step in a calculation. Asking for a metric to be reported at thousandth, hundredth, and tenth decimal places implies a level of accuracy in the dataset that does not exist. The rule also proposes using different percentiles for general traffic and freight and excluding holidays and grouping time periods differently based on the measure. The data processing requirements as currently proposed do not provide any additional level of information and increase the burden of analysis.

**Proposal:** To facilitate consistent methodology throughout the rule, State DOTs should be able to prepare the dataset once and use it for all proposed metrics and measures. Nulls and outliers should be removed or replaced consistently, similar thresholds and timeframes should be used for similar measures, and decimal places should be kept consistent.

2. ***Incomplete data and travel time at posted speed imputation provides inaccurate results:*** FHWA's White Paper on NPMRDS Missing Data and Outlier Analysis showed that Washington state data is the second to last ranked state for NPMRDS completeness, with much of the data gaps occurring during peak periods. Per Puget Sound Regional Council's preliminary review, the NPMRDS coverage in 2015 was less than half of freeway time segments and less than 20% of NHS arterial time segments in the Central Puget Sound region. As a diagnostic tool for vehicular freeway performance this rule works relatively well. However, limited data availability for arterials and the lack of multimodal recognition makes this an inadequate tool to measure arterial performance. Additionally, the nature of freeway travel is significantly different than travel on arterials and makes the use of similar measures between arterials and freeways difficult. This data completeness problem is particularly acute for non-Interstate NHS routes, where a robust collection of reliable data may not exist for several more years. At least three to five years of good data with proper analysis and training would be necessary before WSDOT could reasonably be expected to establish meaningful targets.

With such a high percentage of error, the result from the NPMRDS Missing Data and Outlier Analysis white paper showed that doing nothing with missing data resulted in closer to ground truth outcomes than imputation with speed limit travel times. This indicates that missing data is not limited to lower traffic density but also during congested periods, which would lead to an inaccurate assessment of roadway performance. Even if this completeness issue improves over time with better reception rates, etc., replacing missing data with travel time at posted speeds will make the initial true congestion condition look better than it is, artificially affecting trends with the calculated measures declining over time even if actual roadway performance improves. Other issues with using the simplistic imputation method of travel time at the posted speed limit for some of the calculated measures (but not others) are that TT@PSL on signalized arterials will return relatively faster speeds

than free flow (especially as it does not take weather or visibility limitations into account). Shorter TMC segments would also be prone to greater shifts than other null/outlier procedures. WSDOT, other State DOTs, universities, and private companies have completed research, finding that data providers' current best practice imputation method of replacing missing data with median historical travel speeds was the option closest to ground truth data.

**Proposal:** WSDOT requests that a fully populated travel time dataset including sample size be provided to State DOTs so that the dataset is pre-cleaned and ready to be used to calculate all performance measures consistently in this NPRM. Traveler information companies and State DOTs already implementing system performance reporting have demonstrated the accuracy of much more sophisticated imputation methods than the speed limit-based imputation prescribed in the proposed rule. Providing a fully populated dataset would reduce time and resources required. If a fully populated dataset is not available, the rule should not apply except with respect to years for which FHWA has provided the NPMRDS in a usable format with "no assembly required".

- 3. *Technical challenges require support:*** Standard software is not powerful enough to handle the huge datasets from which the measures would be derived, and states would need to create or use a conflated roadway network dataset before beginning to calculate the proposed measures. Navigating the technical complexities of the rule will translate to an enormous burden on State DOT and MPO resources. For example, the excessive delay measure would require working with approximately 1,100 of Washington's 6,100 TMC segments—that's over 115 million travel times to be evaluated, which will require powerful software and technical expertise. Additionally, each segment with excess delay must be correlated to a traffic volume. Traffic volume data is not available at the same granularity as excess delay—especially on non-Interstate NHS roadways—and collection points do not directly correlate to the NPMRDS segments. Further, the proposed rule requires highway classification by Interstate v. Non-Interstate for some measures, and Freeway/expressway v. Arterial for the delay measure. These HPMS functional class code attributes are not currently included for the TMCs in the NPMRDS, which would require substantial effort from each state to integrate, as using ROUTE\_TYPE and ROUTE\_NAME attributes results in errors. Determining where delay exists would require functional classes to be identified and assigned or joined to the links in order to apply the 35 mph and 15 mph thresholds, which would require conflation. Urbanized area boundaries for the regions where delay must be calculated would also need to be linked with the NPMRDS, as these are currently maintained in State DOTs' linear road referencing systems.

**Proposal:** WSDOT requests that FHWA make it a requirement to provide technical assistance resources, including providing the conflated roadway network to State DOTs as soon as possible, in an effort to assist with the complex calculations of the performance measures in this proposed rule. Ideally the NPMRDS would include for each TMC the HPMS Functional Class code, Urban Area identifier, MPO identifier, speed limit, and traffic volume data. FHWA should also procure services from the vendor to handle state segmentation conflation on a recurring basis to ensure more states are making use of the data for internal purposes. In addition, WSDOT suggests that FHWA study the added value of allowing grouping of NPMRDS TMCs and the effects on the final measures.

4. ***Opportunities for measuring person throughput:*** FHWA requested comment on approaches for gathering throughput data, as the currently proposed measures do not completely capture or consider actual system efficiency and desired outcomes (people and goods moved and efficient connections). While existing throughput data collection varies state by state, there is no current systemic way to incorporate throughput data into the measures.

**Proposal:** FHWA should develop volume profiles for each day and each 5-minute bin to match the travel time dataset, which would be a start in developing person throughput information and maximum throughput threshold speeds. WSDOT also recommends FHWA explore cutting-edge multimodal system performance evaluation methods used by State DOTs and MPOs to propose multimodal measures that include person throughput.

5. ***Lack of State DOT resources:*** To implement this rule and meet its obligations, State DOTs and MPOs must find additional resources (both in employees and funding) to complete the extensive workload that is necessary to accomplish the large-scale cross-agency collaboration as the rule requires. Additionally, states must develop their own process and tool for conflating roadway network, processing NPMRDS data and calculating those metrics. In addition, despite multiple recruitment attempts, WSDOT has not been able to secure technical staff with skillsets needed to manage the implementation of these data and metric requirements. Likewise, Washington MPOs have expressed significant concern over meeting the proposed requirements due to a lack of resources, especially in the smaller urban and rural areas. Considering the significant staff and resource needs the performance analysis and reporting will require, not enough emphasis has been placed on the “Recognition of Fiscal Restraint”.

**Proposal:** Because the NPMRDS is a national dataset and it is inefficient for each state to develop its own process and tool, WSDOT proposes FHWA develop and fund a national level tool for calculating proposed metrics and measures (and imputation for data gaps) for all states to minimize burden and ensure reporting consistency in the process. The use of a fully populated travel time dataset would eliminate issues stemming from data gaps, using travel time at posted speed limit, and outlier method inconsistency. This would lend itself to a meaningful and consistent way to draw national trends/conclusions. The resource issue would be further magnified if states no longer had access to the NPMRDS and were required to acquire it or a comparable dataset on their own.

6. ***Time-intensive coordination requirements between operating entities:*** As written, the proposed rule would require extensive collaboration between State DOTs and MPOs (especially around large urbanized areas that cross state borders) to develop roadway segmentation, desired peak hour travel times for each of Washington’s approximate 1,100 urban (1M+) reporting segments, and 2- and 4-year targets for each applicable urbanized area. Setting these various standards could become a lengthy and politically sensitive process within MPOs as the governance structures consist of multiple jurisdictions and agencies. The negotiation process between all partner agencies for determining how or whether the roadway segments should be grouped in an applicable urbanized area could take an extended period of time while placing an enormous strain on both State DOT and MPO resources. What if this coordination work cannot be completed within the time allotted?

**Proposal:** WSDOT requests that FHWA study the added value of requiring agreement between State DOTs and MPOs on the various pieces of the rule and reconsider the short amount of time allowed to conduct this process.

7. ***Lack of clarity on final authority:*** WSDOT agrees with allowing states flexibility in coordinating with the MPOs to set baselines, thresholds, reporting segments and targets. While the State DOT/MPO relationship for setting targets is fairly clear, the relationship for how baselines, thresholds, and reporting segments are determined is vague and does not delineate final authority. Who has final jurisdiction to make the decision if the State DOT and an MPO don't agree on segments, desired speeds, baselines etc.?

**Proposal:** WSDOT proposes FHWA clarify the process for determining baselines and thresholds to match the target establishment relationship noted in this rule (this is also a precedent set in the pavement and bridge rule). This would allow the organization with ownership of the roadway segment and the reporting responsibility for meeting targets to define the baseline and threshold for the reporting segments within that jurisdiction. For statewide targets, State DOTs would be held accountable, so State DOT targets should be the default solution if agreement can't be reached. Additionally, WSDOT recommends that those who ultimately receive and administer CMAQ funds (MPOs in Washington state's case) should take the lead on individual target setting for that measure.

8. ***Managed lanes consideration omitted in system performance calculations:*** As written, the measures in the proposed rule will likely mask benefits from HOV and HOT lanes, toll roads, transit, and other operational enhancements and could discourage investment in these best practice procedures.

**Proposal:** WSDOT requests that FHWA either seek a way to differentiate the data with the data provider, or account for HOV, HOT, toll roads, and other managed lanes. For example, TMC segments that have one of these managed lane options could account for a 25% reduction in the metric calculation. In addition, FHWA could take the presence of transit and other multimodal options on a TMC segment into consideration to give appropriate credit in metric and measure calculations. For example, FHWA could provide credit based on the percent of NHS mileage with transit alternatives to single occupancy driving.

9. ***Emissions measure reporting timing disadvantageous for smaller urban areas:*** The rule proposes that emission reductions should be reported at the time of first funding. However, MPOs in smaller urban areas that do not receive large amounts of CMAQ funding sometimes use multiple years' allocations to fund a single project. This would lead to situations where MPOs will have no reportable benefits for certain years (and potentially entire reporting periods), which could give the false impression that an MPO failed to meet a target.

**Proposal:** Emissions reductions should be reported after projects are operational, not when the project is first funded. This will allow MPOs to measure emissions reduction performance after the projects are operational.

10. **Reliability measure inconsistency between freight and general traffic:** Trucks and cars use the same systems and it is not practical to impose more stringent requirements on truck travel time reliability. Trucks have unique operating characteristics (larger, heavier, slower acceleration, etc.) that make achieving these higher standards more difficult, and WSDOT's analyses of the NPMRDS show that trucks travel at relatively slower speeds compared to non-freight personal vehicles at the same location and time period.

**Proposal:** WSDOT recommends a consistent reliability measure for system performance and freight that uses the 80<sup>th</sup> percentile travel time for both subsets of the data. FHWA, MPOs, State DOTs, and other experts have determined this percentile is where organizations can make impacts with operational strategies. Using the same measure framework for freight and general traffic would ease data calculation and provide consistency.

11. **Congestion thresholds disconnected from roadway characteristics:** As written, the proposed rule uses static speeds as thresholds for freight congestion (50 mph) and excessive delay (35 mph and 15 mph). Not only is the freight congestion speed threshold unreasonably high given the unique operating characteristics of trucks, but many of Washington's Interstate segments use variable speed limits as a way to ease congestion or have lower posted speed limits for trucks (sometimes below 50 mph). It would be inaccurate to classify those locations as congested. Using static thresholds in general does not take into account posted speed limits or road user expectations.

**Proposal:** WSDOT proposes using 70% of posted speed limit for the freight congestion and desired peak period travel time thresholds, and 60% of posted speed limit for the excessive delay thresholds. This would not only streamline the metric calculations and required coordination with other operating entities, but would give a more accurate representation of user experience. See <http://www.wsdot.wa.gov/planning/CongestionCriteria> or [http://wsdot.wa.gov/publications/fulltext/graynotebook/CCR14\\_methodology.pdf](http://wsdot.wa.gov/publications/fulltext/graynotebook/CCR14_methodology.pdf) for more detail.

12. **Reporting timelines too short:** Given the complexity of the rule and the significant resource requirements, WSDOT is concerned the 1.5 months allotted is not sufficient time to adequately analyze, compare, and compile the extracted data into the biennial reports. For the October 2018 due date for the baseline report, there is not enough time for WSDOT and all of the state MPOs to phase in and work through segment definition, data analysis, and target setting.

**Proposal:** WSDOT proposes the stated timeline be adjusted so that State DOTs be given at minimum the same amount of time to analyze, compare, and compile the data into biennial reports as FHWA has to prepare and deliver the data for State DOT usage.

13. **Calculation methods overly complex, do not align with nationally accepted best practices:** Overall, the metrics and calculation methods proposed by this rule are extremely complex even for a seasoned performance organization like WSDOT, and are very different from the industry-accepted methods published through various nationally-renowned system performance publications.

**Proposal:** WSDOT suggests that FHWA simplify the metric calculation processes and adopt the state of the art methodologies followed by nationally-renowned reports such as the Urban Mobility Report (in publication since 1984), Urban Congestion Report published by the FHWA Office of Operations and best practices used by states (such as WSDOT's annual *Corridor Capacity Report* in publication since 2001).

14. ***National-level measures are higher level indicators and should be calculated by FHWA for federal use:*** The measures FHWA is proposing are in the form of one number for an entire state, MPO, or urbanized area, and provide national-level indicators that could assist decision making at the federal level. FHWA has stated the purpose of these performance measures is to support better decision making as the country works to provide a safe and effective transportation system within a limited budget. While the measures proposed by FHWA provide a general indicator of the function of the overall national transportation system, state decision making requires more detailed information and data. Requiring individual agencies to calculate national-level indicators is an inefficient use of scarce resources.

**Proposal:** WSDOT requests FHWA to reevaluate the efficiency of requiring all individual agencies to calculate rolled-up, national-level indicators.

15. ***FHWA should process data and calculate all metrics and measures to reduce errors and ensure consistency:*** For better decision making, most State DOTs already use localized information and detailed analysis determined by states' needs and priorities to fully understand the nature of and potential remedies for transportation needs. If FHWA requires national level indicators of the transportation system, those should be produced, or at least funded, at the national level by FHWA. The NPMRDS is national in scope, and all but Subpart H of the proposed measures could be calculated directly in conjunction with AADT data through HPMS already reported to FHWA. If the AADT data was not sufficient, FHWA could require states to report more volume, functional class, and speed limit data, which would be much less resource-intensive than the rule's requirements as proposed. This would ensure consistent process and accomplish the same nation-wide representation of our transportation system in a more efficient manner. Requiring State DOTs to establish segments, hourly volumes, aggregate delay, use different thresholds for each calculation, etc., introduces many places for error and inconsistencies that are difficult to track. Looking at differences in performance measures from year to year, State DOTs would have difficulty determining whether these differences were caused by error or changes in travel patterns, rendering an outcome without any added value.

**Proposal:** WSDOT recommends that FHWA use the NPMRDS and a few pieces of state-provided data to conflate the datasets and calculate the national transportation system performance measures internally, or alternatively allow states with existing extensive system performance measures to submit their individual system performance reports to FHWA. If State DOTs or MPOs have no system performance management in place, FHWA could direct them to use the NPMRDS and proposed performance measures included in the rule.

## **PART II: WSDOT'S SECTION-BY-SECTION, PRELIMINARY ANALYSIS OF THE RULE**

### ***SUBPART A—GENERAL INFORMATION***

#### **490.101 Definitions**

##### WSDOT AGREES...

- ***With the definitions for--*** Full Extent, HPMS, Mainline highway, measure, metric, Performance period, Reporting segment, Target, Travel time data, Travel time reliability, and Travel time segment.

##### WSDOT DISAGREES...

- ***With the definition of freight bottleneck--*** **Proposal:** WSDOT recommends the term be changed to "truck freight bottleneck" since it only applies to truck traffic, and not other modes such as rail or waterway.
- ***With the 50 mph threshold speed to define truck freight bottlenecks--*** WSDOT has defined five types of truck freight bottlenecks in its State Freight Plan which are different from FHWA's proposed definition. **Proposal:** WSDOT recommends leaving it to State DOTs to define and identify truck freight bottleneck locations instead of using a single threshold for the entire nation. Additionally, segments of the Interstate System not meeting thresholds for truck freight congestion might not be actual bottlenecks. For example, some Interstate segments have a posted speed less than 50 mph, the congestion threshold, and it is incorrect to classify those locations as truck freight bottlenecks.
- ***With the lack of direction or resources for states to exclude ramps, shoulders, turn lanes, etc. from system performance measures--*** While WSDOT agrees with excluding ramps, etc. from system performance measure calculation, the agency is concerned that states will need to do significant work conflating the NPMRDS in order to do this. While including non-mainline highway segments would negatively skew results, by requiring exclusion of ramps, shoulders, turn lanes, etc., each state will likely have to undergo the conflation process before beginning measure calculation. The NPMRDS is sometimes accurate in correctly using "I-" to begin route\_number designations, but this is not always the case. Thus, there is no systemic method for excluding these segments, and to ensure accuracy the dataset would have to be conflated or each State DOT would need to manually check every TMC segment to make sure a non-mainline segment has not been included. **Proposal:** WSDOT recommends that FHWA enlist HERE to do a thorough check of their route\_number field or provide the conflated dataset to State DOTs as soon as possible.

#### **490.103 Data Requirements**

##### WSDOT AGREES...

- ***That the NPMRDS should be provided to State DOTs by FHWA to be used for national-level performance measures--*** as it is the most consistently available nationwide observed data tied to a location.
- ***With all States and MPOs using the NPMRDS travel time datasets to calculate the measures for assessing NHS performance, freight movement, and CMAQ program--*** This will ensure data consistency and comparability for different measures across various states. **Proposal:** WSDOT suggests that FHWA calculate the proposed measures for all states to ensure consistency in methodology that would lead to a meaningful way to draw national trends and conclusions.

### WSDOT DISAGREES...

- ***With the timeline for completing progress reports--*** WSDOT and MPOs are concerned about resource constraints and reporting timelines. As proposed, states will only have 3 and 1.5 months for NPMRDS and CMAQ data, respectively, to complete analyses for their Biennial Performance Reports (Baseline, Mid Performance, and Full Performance). WSDOT does not believe this will be adequate time for State DOTs and MPOs to complete their analyses and compile reports.
- ***With using system-wide performance measures to inform data-driven infrastructure decisions--*** WSDOT utilizes a corridor-based approach to evaluate system performance as it allows the state to manage systems based on important functions and characteristics that will be missed by simply having urban/non-urban measures system-wide.
- ***With State DOTs and MPOs having to negotiate and agree on reporting segment definition (and desired speeds) on each of Washington's 6,100 segments--*** This represents a significant staffing and planning effort for MPOs, State DOTs, and other reporting agencies (for desired peak period travel times). In addition, this could become a lengthy and politically sensitive process within an MPO as the governance structure consists of multiple jurisdictions and agencies. Who has final jurisdiction to make the decision if the State DOT and an MPO do not agree on segments, desired speeds, baselines, or targets, or a decision cannot be made in time to meet reporting requirements? **Proposal:** The system operator/owner should be able to define segments, desired speeds, and respective baselines and targets, followed by coordinating approval with other relevant organizations as suggested in the rule.

### QUESTIONS OR CLARIFICATIONS

- WSDOT requests that FHWA provide more details on the 11-year undiscounted incremental cost for Scenario 1 and Scenario 2 mentioned on p. 23810, specifically estimated costs of obtaining the NPMRDS to individual states if not provided by FHWA after the contract ends. Additionally, for WSDOT to support allowing states to use different data sources instead of the NPMRDS, the agency requests FHWA to release data source criteria quality standards and expectations to ensure consistency with reported outcomes.
- How long does FHWA have to approve the use of equivalent data sources for the travel time dataset? What happens if FHWA doesn't approve the sources? **Proposal:** WSDOT suggests adding a deadline for local FHWA offices to approve a state's proposed equivalent dataset and reporting segments.
- The proposed reporting and data release timelines seem to depend on states getting their HPMS data to FHWA in a timely fashion. What happens if states are not timely? Furthermore, would states that have met the data submittal deadline have to wait for untimely states to submit their data before FHWA extracts and releases the data back to all the states? Could this process be completed on a state-by-state basis?
- Please clarify what kind of documentation will be adequate for demonstrating coordination between State DOTs and MPOs for establishing reporting segments. Will meeting notes, a signed agreement or MOU, etc... be adequate?
- WSDOT requests to see FHWA's research behind setting reporting segment length caps at 0.5 miles for urban areas and 10 miles for rural areas. **Proposal:** Additionally, WSDOT recommends that wording of this sentence (see p. 23897) be adjusted so as not to be misinterpreted as allowing longer groups of TMCs (one 'reporting segment') if one of the TMCs within the group is longer than the threshold.

### **490.105 Establishment of Performance Targets**

#### WSDOT AGREES...

- ***That states should be able to set their own targets for their relevant highway systems***
- ***That states should coordinate with neighboring states for urban areas that cross borders***

- ***With allowing State DOTs to adjust an established 4-year target in the Mid Performance Period Progress Report--*** There are many external factors beyond the control of State DOTs that impact progress toward achieving targets.
- ***With the requirement to provide performance analysis for system performance, freight, and excessive delay measures based on calendar years and the on-road mobile source emissions measures based on federal fiscal years--*** The CMAQ on-road mobile source emissions measure would not involve the NPMRDS, and the separate analysis timeline aligns with current CMAQ reporting.
- ***That phasing in the non-Interstate reliability measure is appropriate due to missing NPMRDS data--*** This approach will allow FHWA or State DOTs to absorb the workload to complete analyses for biennial reports and understand the implications of the data issues during the first reporting cycle. **Proposal:** WSDOT requests that all measures proposed in this rule be considered for phase-in until the dataset's coverage issues are resolved.

#### WSDOT DISAGREES...

- ***With the reporting deadlines--*** Refer to 490.103 comment on progress reports for more explanation.
- ***With requiring State DOTs set targets for on-road emissions measures first; flexibility is needed--*** In Washington state, CMAQ funds are passed to the MPOs, which administer programs in their areas. WSDOT does not control how the funds are spent. **Proposal:** WSDOT suggests that states have flexibility in determining the appropriate target setting entity; whether it be a State DOT or the MPOs. In Washington's case, MPOs should take the lead on individual target setting since they administer the programs. Then, if necessary, the targets could be rolled up statewide.
- ***With the premise that the measures in this NPRM would support FHWA's stated national transportation goals--*** These measures do not completely capture or consider actual system efficiency and desired outcomes (people and goods moved and efficient connections).
- ***That should states choose to develop measures and targets beyond those required, they be required to report them to FHWA in an approved format.*** If this were to be broadly interpreted as existing performance management and measures, it would be very burdensome to those states with longstanding performance reporting histories.

#### QUESTIONS OR CLARIFICATIONS

- Roles in establishing performance targets for State DOTs and MPOs are unclear. WSDOT requests that FHWA clarify the following:
  - Are State DOTs responsible for informing and/or working with MPOs to set or adjust one urbanized area target? WSDOT expects this would be an enormous strain on resources, considering *all* MPOs must be involved in target setting for the LOTTR measures and freight measures (as clarified in one of FHWA's webinars).
  - Are State DOTs responsible for reporting MPOs targets? Please clarify "upon request" (see p. 23899).
  - How often will MPOs be able to adjust their targets, thus requiring DOTs to report? It is also unclear if all MPOs have to set targets and also whether or not only MPOs containing part or all of a UZA with more than 1 million in population have to establish/evaluate extra performance measures—can FWHA clarify?
  - While the webinars stressed the idea of State DOTs and MPOs coordinating on shared targets when boundaries overlap, the rule language makes it seem that DOTs can autonomously set goals (and adjusted 4-year targets) and then allow MPOs to agree or set their own targets within 180 days. Does this satisfy the "to the maximum extent practicable" requirement?

- Who has final jurisdiction to make the decision if the State DOT and an MPO don't agree on a target that crosses boundaries?
- WSDOT is concerned that requiring MPO reporting to come through State DOTs would put the burden for coordinating all reporting on State DOTs only. Could FHWA clarify what happens if the MPOs don't report on time?
- If an MPO sets its own target for a performance measure, how will that affect determination of significant progress for the State DOT?
- Could FHWA clarify the purpose of having State DOTs report metrics for all mainline highways on the NHS annually? Under the proposed schedule, State DOTs provide NHS data annually to FHWA for the HPMS data source, then FHWA gives the NPMRDS and HPMS documents back to the State DOTs every two years to calculate measures, set goals, and compile their Mid Performance and Full Performance Progress Reports, which does not seem efficient for State DOTs.

#### 490.107 Reporting on Performance Targets

##### WSDOT AGREES...

- ***That multimodal freight performance should be considered in existing transportation planning and programming efforts--*** Freight bottlenecks are multimodal and multifaceted, and each state may use a different approach to define, identify and classify freight bottlenecks. WSDOT agrees that State DOTs should reference their activities that focus on improving freight bottlenecks in their baseline performance period reports.

##### WSDOT DISAGREES...

- ***With requiring State DOTs to discuss how established targets in paragraph 490.107(b)(1)(ii)(A) support expectations documented in longer range plans--*** There may be states that do not have an asset management plan or a long-range statewide plan updated by October 1, 2018, especially because the FHWA rules for these plans have not been finalized. **Proposal:** WSDOT suggests deleting 490.107(b)(1)(ii)(C) as 23 Sec 135 already requires the asset management plan and long-range statewide plans to include a description of the performance measures and targets used and to include a report.
- ***That State DOTs should be required to address freight bottlenecks as part of the National Strategic Freight Plan--*** The draft National Strategic Freight Plan did not identify specific locations of freight bottlenecks nationwide.
- ***With the timeline for submittals in 2016--*** State DOTs are responsible for submitting comments/questions on the NPRM by August 20, 2016, and then submitting the Initial State Performance Report on October 1, 2016. This is not adequate time to get responses back from FHWA in time to complete a comprehensive Initial Report. It was also indicated in the system performance webinar that DOTs would receive additional information/guidelines for the Initial Report sometime in summer 2016; waiting for and adequately processing this information could affect the timeline. **Proposal:** WSDOT recommends that FHWA delay the date of the Initial State Performance Report until at least October 1, 2018. WSDOT believes that the intent of Congress on writing MAP-21 was to have a baseline report soon after the national-level performance measure rules had been finalized. A date of October 1, 2016 is too early in the process for any type of substantive reporting by the State DOTs or USDOT in implementing the MAP-21 performance management requirements.
- ***With the timelines for State DOTs and MPOs to submit reports to FHWA given data release dates--*** Data for the final year of the performance period is not released until August 15 of the year the Full and new Baseline reports are due, which gives DOTs only 1.5 months to conduct analyses and complete both the required Biennial Reports.

- ***That additional CMAQ reporting should be required--*** CMAQ project information is already being input into the CMAQ database.

#### QUESTIONS OR CLARIFICATIONS

- Is the electronic template for reporting to FHWA available? If not, WSDOT suggests adding a condition for what happens if it is not ready by October 1, 2016 when the Initial Performance Report is due to FHWA.
- WSDOT requests clarification on if MPOs' system performance reports are expected to be identical to State DOTs' system performance reports. If so, this would be redundant work that drains resources from both entities, and WSDOT believes there should be one report that an agency would submit and the partner agencies would endorse.
- Starting with the second performance period, State DOTs will be submitting the Baseline Report for the new performance period and the Full Report for the prior performance period on the same day. How will DOTs establish new 2-year or 4-year targets for the new performance period without first receiving FHWA's assessment on significant progress toward targets based on conditions/performance measures within the Full Report from the previous performance period?
- WSDOT requests clarification on the MPA acronym in the right column at the bottom of p.23861; could this be added to Section II: Acronyms and Abbreviations on p. 23812?

#### **490.109 Assessing Significant Progress toward Achieving the Performance Targets for the National Highway Performance Program and the National Highway Freight Program**

##### WSDOT DISAGREES...

- ***With requiring State DOTs to report progress on an annual basis--*** The FHWA requested comment on whether it should require State DOTs to more frequently (e.g., annually) evaluate and report the progress they have made. WSDOT would not support a higher frequency, as it already conducts its own annual system performance analysis, and the additional federal reporting requirement would require additional state resources.
- ***WSDOT disagrees with the current list of extenuating circumstances given on p. 23905--*** WSDOT is concerned that the list of extenuating circumstances is not comprehensive. The current list only includes natural or man-made disasters, sudden discontinuation of federal data, and/or new regulations. **Proposal:** WSDOT suggests that "insufficient funding" be added to the list.

#### QUESTIONS OR CLARIFICATIONS

- How much time will FHWA have to make the determination of significant progress? It seems if a State DOT is off target and in need of making significant progress but unaware whether it is making significant progress toward its targets, the State DOT will experience a detrimental position between submitting the Mid-Point Performance Progress Report and receiving an official determination from FHWA.
- It is unclear whether FHWA's concept of "significant progress" aligns with the stated national transportation goals. WSDOT questions if summarizing any of the proposed measures up to a statewide level will produce results that show "significant progress," as congestion is growing every day. Many of the state's mobility projects are aimed at simply maintaining current conditions or increasing person throughput (versus improving travel time). It often takes mega-projects to begin to change congestion levels in urban areas. Further, improvements to congestion in some areas might be lost when rolling up the measures to a statewide level. Alternatively, the proposed measures could incentivize improvement projects at locations on the margin where DOTs can more easily improve performance instead of where they are needed most.

#### 490.111 Incorporation by reference

No Comment

### ***SUBPART E—NATIONAL PERFORMANCE MANAGEMENT MEASURES TO ASSESS PERFORMANCE OF THE NATIONAL HIGHWAY SYSTEM***

#### 490.501 Purpose.

##### WSDOT DISAGREES...

- ***With the concept of significant reduction in congestion stated as the goal of this section of the NPRM--*** (p. 23807) In urban areas with significant latent demand it is not easy to reduce congestion region-wide. What level of funding would be available for reducing congestion significantly? Transportation improvements would most likely be offset by the increase in travel demand.

#### 490.503 Applicability.

##### WSDOT AGREES...

Peak Hour Travel Time

- ***With FHWA's proposal to limit the peak hour travel time measure to urbanized areas with populations greater than 1 million--*** The urban areas with populations greater than 1 million usually experience longer peak hour travel times.

##### WSDOT DISAGREES...

Travel Time Reliability

- ***With the wording of--*** “This measure would compare the longest travel time or slowest speed that occurs during a specified time frame to a reference travel time or speed for a transportation facility” in relation to the LOTTR measure (p. 23809 and 23873). This could lead to confusion, as the measure requires using the 80<sup>th</sup> percentile, but this language uses “longest,” which could be interpreted as the 100<sup>th</sup> percentile travel time.

### QUESTIONS OR CLARIFICATIONS

Travel Time Reliability

- Does the wording “any time period” (p. 23873—“What that really means is that the number of miles on the Interstate or Non-Interstate NHS that performed in a reliable manner will be those miles where the travel time during **any time period** of the “daylight” hours (6 a.m. to 8 p.m.), 7 days a week, did not surpass the normal travel time by more 50 percent.”) apply to after calculating the annual averages for the 5-minute bin, or is this for any individual day in the analysis period?
- WSDOT requests FHWA make its analysis and research on the 1.5 threshold public. While WSDOT understands FHWA’s rationale behind the 1.5 threshold for deciding a reporting segment reliable versus unreliable, it does not solve the issue of commutes during peak hours (user experience). **Proposal:** WSDOT proposes that because the FHWA-proposed measures are at a high level—one number to define an entire state or urbanized area—it would be best to use high-level data instead of the proposed extensive granular analysis requirements.

Peak Hour Travel Time

- If the word “desired” was purposely left out of the definition at the bottom of p. 23873, it would change states’ interpretation of the target setting: “The FHWA is proposing to define *Desired Peak Period Travel Time* as the travel time during 3 morning peak hours and the 3 evening peak hours, for each reporting segment in urbanized areas with a population over 1 million.”

#### 490.505 Definitions.

##### WSDOT AGREES...

###### Travel Time Reliability

- ***With the 80<sup>th</sup> percentile travel time as a way to gauge operational strategies compared to that for the normal travel time--*** As the agency can make more of an impact with operational strategies at the 80th percentile travel time. WSDOT also agrees with the 50th percentile travel time as a normal travel time measure for this analysis if missing data is consistently replaced with historic data.

##### WSDOT DISAGREES...

###### Peak Hour Travel Time

- ***With requiring DOTs to coordinate with all operating agencies for “desired peak period travel times”--*** As the resource impacts would be extensive. Agreeing to common standards among agencies for this metric for AM and PM peak hours for each of Washington’s approximately 1,100 reporting segments in urbanized areas over 1 million would pose serious challenges given each agency’s emphasis and interest areas. **Proposal:** WSDOT proposes the "desired peak period travel time" to be a percent of posted speed limit such as maximum throughput speed during peak hour. All agencies involved ultimately strive for the maximum throughput along the corridor, but this threshold occurs at various speeds depending on road characteristics, which would require conflation and other calculations. Thus, WSDOT proposes to use 70% of the posted speed as the threshold for defining “desired peak period travel time.”
- ***With FHWA compiling a nationwide performance measure dataset based on states’ differing Desired Peak Period Travel Times--*** This seems problematic, as states will be compared by the public and media even with varying DPPTTs. Additionally, the ability for data-driven investment decision making will be compromised by the varying DPPTTs.

##### QUESTIONS OR CLARIFICATIONS

###### Travel Time Reliability

- Does “*travel time segment*” in the following from p. 23874 refer to the reporting segment (TMCs) or the 5-minute bin? Does “*that time period*” refer to the 5-minute bin or the entire hour-long period? “*The 50th percentile relates to the travel time that occurs in the middle of a distribution of all travel times for that travel time segment during that time period over a 1-year reporting period.*”

###### Peak Hour Travel Time

- Does “*The FHWA is proposing to define Peak Hour Travel Time as the hour that contains the longest annual average travel time during the peak period of each non-holiday weekday.*” mean DOTs should average all 5-minute bins in an hour and then over the year or vice versa?

#### 490.507 National Performance Management Measures for System Performance.

No Comment

#### 490.509 Data requirements.

##### WSDOT DISAGREES...

###### Travel Time Reliability

- ***That if ‘All Vehicle’ travel times are missing (meaning both truck and car travel times are both missing) it should be replaced with travel times at posted speeds--*** WSDOT has found the assumption behind this imputation approach—that a lack of vehicles present during a 5-minute bin on a roadway segment indicates uncongested conditions—is invalid. WSDOT completed research in 2015 that showed missing data replacement with historical data was better than the

proposed statistical imputation technique. Data completeness issues partly stem from limited size of the probe vehicle fleet (regardless of congestion), as well as a correlation with segment length. Shorter TMC segments have less data points reported, which could potentially make a congested condition look better than it is on the ground. Then, as data completeness improved over time, the calculated measure would indicate a declining trend (due to the imputation method), even if actual roadway condition is improving. FHWA's White Paper on "NPMRDS Missing Data and Outlier Analysis" found that using imputation based on posted speed limit increased the percent error substantially across all highway types, up to 50%. When the PHTTR measure was calculated for Seattle's non-interstate roadways in the white paper, doing nothing resulted in a final measure of 39.3-47.7%, but when the speed limit infill approach was used, the final value ranged from 47.7-100% of mileage meeting expectations, depending on data completeness. This shows a very unsteady range and a high percentage of error using the speed limit infill method, indicating the measure would be likely to change over time due to the data quality improving, not actual system performance improvement. **Proposal:** WSDOT proposes using median historical travel speeds to impute missing data (see Key Comment #2 above).

- ***That the reporting segment lengths are appropriate for the reliability measure--*** The requirements for short reporting segments (half a mile in urban areas, 10 miles in non-urban areas) for a reliability measure are not consistent with existing best practices. The main principle behind travel time reliability is to measure travelers' experience with consistency of trip travel times, which translates to longer reporting segments more comparable to typical traveler trip lengths. It has also been shown that reporting segment length can make a significant difference when computing the percentiles used in reliability measures; e.g., although travel time on a short congested road segment can be unreliable, other parts of the trip tend to normalize this high unreliability for the short segment. Thus, a reliability measure that uses very short reporting segments is likely to inflate the level of unreliability beyond that experienced by travelers or shippers.

#### QUESTIONS OR CLARIFICATIONS

- The following phrase from p. 23876 conflicts with the statement that segments should be fully within UZA boundaries from p. 23897 (490.103(g)(3)): "*Reporting segments, as defined in 490.101, include one or more travel time segments and must be contiguous so they cover the full extent of the mainline highways of the NHS in the State.*" So if a TMC is halfway across a UZA border, should it be included or not?
- Was 490.509(a)(2) intentionally left as "[Reserved]"?
- **Proposal:** WSDOT requests that PSL (Posted Speed Limit) be added to Section II: Acronyms and Abbreviations on p. 23812.

#### **490.511 Calculation of System Performance Metrics.**

##### WSDOT AGREES...

###### Travel Time Reliability

- ***With the measurement equation for LOTTR and that the median travel time is most representative of travelers' typical experiences--*** **Proposal:** WSDOT requests that "average" metrics elsewhere in the rule should use median instead. For example, the LOTTR metric itself is calculated by *averaging* travel times then sorting them and taking the *median*. WSDOT reiterates its request to use consistency in data preparation requirements so that the same prepared data can be used for all measure calculations.

###### Peak Hour Travel Time

- ***That FHWA should not plan to approve or judge the Desired Peak Period Travel Time levels or the policies that will lead to the establishment of the levels--*** As different agencies have different approaches for their policies on setting these standards.

WSDOT DISAGREES...

- **With the annual metric reporting cycle--** As it would be too burdensome to agencies.
- **With the assumption that a lack of vehicles during a 5-minute bin equates to uncongested conditions--** WSDOT requests that the method for handling null values and outliers should be the same for all measures in Part 490. **Proposal:** A consistent replacement methodology should be instituted for all performance measures in this NPRM so that the dataset can be cleaned and prepared once and then used to calculate all measures.

## Travel Time Reliability

- **With the final reliability measures (that gives % system reliable), as they do not attempt to show the intensity of travel time unreliability--** Instead it takes into account the sections that are meeting the requirement and calculates the percentage to see if that met the agreed upon target. This approach does not address problem locations but looks at overall health of the system from a very high-level, leading to a macroscopic evaluation using a microscopically detailed travel time dataset at a 5-minute bin level. It is the intensity and extent of unreliability that needs to be measured as opposed to the extent of reliability, which would be more suited to suburban areas.
- **That the LOTTR metric calculation should be analyzed differently than PHTTR—Proposal:** WSDOT recommends that the LOTTR use smaller time periods (1 hour instead of longer blocks) so that more variability occurs from day to day rather than within the time blocks and it's more true to the accepted reliability definition. This would also make the data preparation for LOTTR and PHTTR calculations more similar.

## Peak Hour Travel Time

- **With the PHTTR metric using average peak hour travel times--** WSDOT would prefer to use 50<sup>th</sup> percentile travel times (after the WSDOT-suggested replacement of missing data is taken into account) instead of average to stay consistent with other normal travel time measures and because median better represents travelers' typical experience. Using the median travel time would also mitigate the need to filter out outliers.
- **With the 2 mph and 100 mph thresholds for outliers--** Deleting travel speeds below 2 mph would eliminate potentially meaningful data points, as sometimes incidents or winter weather conditions lead traffic to stay still for several minutes. The NPMRDS Missing Data and Outlier Analysis White Paper showed that removing low speeds (1 mph, 2 mph, and 5 mph) all had a significant effect on the measures, making them look higher than the baseline, especially for the non-interstate measures. Additionally, on certain congested interstate segments, where stop-and-go conditions prevail, removal of lower outliers would have a significant impact on the metric calculation for each epoch. **Proposal:** WSDOT requests that FHWA procure sample size data to be able to differentiate the 0 mph data from the lack of data with NPMRDS. WSDOT agrees that upper outliers should be removed, (but for all proposed measures in the same manner), as this would likely not impact the cumulative probability function. This would make Average Travel Time closer to the 50<sup>th</sup> percentile (which WSDOT supports using for this purpose). However, WSDOT recommends that FHWA reconsider the upper threshold based on the findings from the NPMRDS Missing Data and Outlier Analysis White Paper where the results remained nearly the same for 80 mph and 90 mph outlier removal. Additionally, flexibility should be encouraged and FHWA should allow agencies to set their own lower and upper boundaries for the speeds and replace the data points based on trend analysis. One way of doing this would be cutting it at 2 times the standard deviation from the mean to account for 95% of the dataset.
- **With the Peak Hour Travel Time calculation using 12 in the denominator-- Proposal:** Since the Peak Hour Travel Time calculation would not address missing data, WSDOT suggests replacing '12' in the equation with 'N', where N = the number of 5-minute bins within peak hour i. Max N = 12. This change would not be needed if WSDOT's request for a consistent null/outlier procedure is taken into account.

- ***With the resources required to develop automation for the peak hour travel time measure--*** State DOTs or MPOs would need to develop more robust processing systems or scripts to flag whether the highest peak hour travel time occurs during morning or evening, then compare with the corresponding peak period travel time, which could be resource-intensive.
- ***With the proposed rule potentially encouraging manipulation of Desired Peak Period Travel Times or reporting segments--*** Depending on agencies' priorities, the desired peak period travel times (or reporting segments themselves) could be manipulated based on the significance that a particular reporting segment has among the partner agencies compared to the list of other priorities. **Proposal:** WSDOT recommends that FHWA direct agencies with jurisdiction over each roadway segment to define the Desired Peak Period Travel Time for that segment.
- ***That holidays are only excluded for the PHTTR measure--*** State DOTs are still responsible for system performance on holidays. **Proposal:** WSDOT recommends that FHWA remove this requirement in order to make the data preparation consistent for all the measures. Otherwise, WSDOT requests an explicit list of holidays in order to correctly calculate PHTTR.

#### QUESTIONS OR CLARIFICATIONS

- How do HPMS reporting requirements change with the introduction of MAP-21 reporting requirements if the NPMRDS is used opposed to a state-generated volume dataset which is not based on the TMC segmentation or reporting segments? WSDOT requests clarification on how the NPMRDS based travel times are intended to be treated in light of existing standards for HPMS reporting.
- Even though the reporting period is 2018-2021, the data for the reporting period will be 2017-2020? On p. 23907 the proposed rule says "*Starting in 2018 and annually thereafter, State DOTs shall report the metrics, as defined in this section, in accordance with the HPMS Field Manual by June 15th of each year for the previous year's measures...*" Does this mean the first June 15th deadline is supposed to be June 15, 2018? This would mean State DOTs are providing data for 2017, which is outside of the stated 1st Performance Period of Jan. 1, 2018 - Dec. 31, 2021. Or is the first metric reporting due date June 15, 2019, providing metrics data for 2018?

#### Travel Time Reliability

- WSDOT requests clarification on what "5-minute population" means in the following sentence at the top of p. 23907: "*This data set shall include, for each reporting segment, a ranked list of average travel times for all traffic ('all vehicles' in NPMRDS nomenclature), to the nearest second, for 5 minute periods of a population that:*"

#### Peak Hour Travel Time

- How should State DOTs calculate travel time at posted speed limit when the speed limit changes halfway through a TMC? Additionally, speed limits sometimes change over time (and some roadway segments in Washington have variable speed limit signs to manage traffic flow), which will affect results and have different effects on the measures, reducing the usefulness for comparison. Even the first step of finding the correct locations and date of speed limits could be a very complex task for any State DOT to undertake.

#### 490.513 Calculation of System Performance Management Measures.

##### WSDOT DISAGREES...

- ***That highway users will become frustrated when the LOTTR and PHTTR are more than 1.5--*** As it purely depends on one's commute from their origin to destination. For example, a 30-mile home to work trip on the NHS roadway would be frustrating when a trip that ideally takes 30 minutes ends up taking 45 minutes or longer, but that the frustration is not the same as a 5-minute travel time ending up to be 7.5 minutes. Applying the 1.5 factor for every segment universally does not appropriately represent road users' perceptions, as most of it depends on user

expectations for the corridor. Different thresholds should be considered for different TMC lengths, since they might vary by more than 10 miles.

#### QUESTIONS OR CLARIFICATIONS

##### Peak Hour Travel Time

- On p. 23879 the proposed rule says “*This PHTTR level represents a condition where observed (or estimated) travel times in large urbanized areas are no more than 50 percent higher than what would be desired for the roadway, as identified by the State DOT and MPO.*” Why does it include the “or estimated” piece if no adjustments are to be made for missing or null data, as previously stated?

### ***SUBPART F—NATIONAL PERFORMANCE MANAGEMENT MEASURES TO ASSESS FREIGHT MOVEMENT ON THE INTERSTATE SYSTEM***

#### **490.601 Purpose.**

No Comment

#### **490.603 Applicability.**

No Comment

#### **490.605 Definitions.**

No Comment

#### **490.607 National performance management measures to assess freight movement on the Interstate System.**

#### WSDOT DISAGREES...

##### Truck Travel Time Reliability

- ***With using the 95th percentile travel time for freight in place of the 80th percentile travel time-***  
- For the same reasons that FHWA has quoted on how State DOT operational enhancements are reflected at the 80th percentile, not at the 95th percentile level. Moreover, if freight and cars occupy the same roadway, WSDOT does not understand the goal of holding the freight reliability measure to a higher standard as they are all using the same Interstate System. Additionally, unique operating characteristics for trucks (larger, heavier, slower acceleration/deceleration characteristics, etc.) make achieving this higher standard more difficult. A SHRP 2 research project indicated that the 95th percentile travel times usually involve non-routine events that are difficult to predict and are well outside of an agency's ability to control (for example: extreme weather, law enforcement criminal investigations, and similar events). WSDOT research also found that the reported average truck speeds in NPMRDS data are more variable than those collected by traditional fixed sensors due to the relatively small sample size of the vehicle probe fleet, biasing the data toward slower moving vehicles. These data limitations cause the travel time distribution curve to be heavily skewed toward longer travel times compared to actual roadway performance, and using the 95th percentile would most likely capture the outliers in the NPMRDS, and overestimate the longest travel times of trucks. **Proposal:** WSDOT recommends that the reliability measures for system performance and freight be calculated the same way (80<sup>th</sup> percentile travel time) for “all vehicles” and “freight” data, with the same thresholds, as the vehicle groups use the same roadway lanes and are part of the same traffic flow.

## QUESTIONS OR CLARIFICATIONS

- Isn't the requirement to report by TMCs? What is the intent of the following statement on the bottom right of p. 23882? "*The FHWA intends to conduct this conflation, if needed, if State DOTs choose to report the metrics by Travel Time Segment codes.*"

### **490.609 Data Requirements**

#### WSDOT AGREES...

##### Truck Travel Time Reliability

- ***That when truck travel times are missing from the Travel Time Dataset, they should be replaced with an observed travel time that represents all traffic on the roadway during the same 5-minute bin--*** Because trucks are moving in the same traffic flow as cars, the observed travel time for all traffic is a reasonable estimate for truck travel time for the same 5-minute bin.

#### WSDOT DISAGREES...

##### Truck Travel Time Reliability

- ***That in other cases when neither truck nor car data is available the missing truck travel time should be replaced with the calculated travel time based on posted speed limit--*** Replacing missing values with travel time at posted speed will introduce significant errors to freight performance calculations and make the calculated measure look better than actual roadway performance. **Proposal:** WSDOT proposes that when all vehicle data for that 5-minute bin is missing, that the missing data be replaced with median travel time data of all vehicles for that 5-minute bin within the analysis year. This is something that would be most efficiently corrected for the nationwide NPMRDS by FHWA. See explanation above for 490.509 for WSDOT's reason behind recommending using historic data instead of posted speed limit data.

### **490.611 Calculation of Freight Movement Metrics.**

#### WSDOT AGREES...

##### Truck Travel Time Reliability

- ***With the focus on both truck travel speeds and the travel time reliability for truck travel as Interstate System freight performance measures--*** Alone, truck travel speeds do not necessarily tell us how well the system is performing for trucks, other than to tell us they are moving slowly in urban areas. Reliability for truck travel is frequently a more important metric.
- ***With using 50th percentile travel time as the normal truck travel time for the reliability metric calculation--*** The 50th percentile provides a better measure of central tendency of the typical travel time compared to average travel time once missing data is replaced.

#### WSDOT DISAGREES...

##### Truck Travel Time Reliability

- ***With using the 95<sup>th</sup> percentile truck travel time for the truck reliability measure--*** WSDOT recommends replacing it with 80<sup>th</sup> percentile. **Proposal:** See 490.607 above for explanation.

##### Percent Interstate Uncongested

- ***With using average truck speed as the metric for calculating the proposed mileage uncongested measure--*** **Proposal:** WSDOT recommends using the 50th percentile as the metric for normal truck travel time. This will ensure consistency with what is used in the truck travel time reliability metric. Median speed (50th percentile) is more appropriate to estimate the average traffic condition for the heavily skewed travel time distribution in the NPMRDS, and could avoid biases caused by data outliers.

## QUESTIONS OR CLARIFICATIONS

- WSDOT has concerns with reporting metrics to HPMS in the form of TMC segments, as HPMS segments are much smaller than TMC segments. HPMS segmentation is based on numerous factors and contains many tiny segments less than 0.1 miles long. The freight measures would be calculated based on performance measure reporting segments, which cannot be disaggregated into smaller segments. WSDOT requests clarification from FHWA about how reporting segments should be reconciled with the HPMS system currently split by HPMS segment. See 490.511 comment for more context.

### **490.613 Calculation of Freight Movement Measures.**

#### WSDOT AGREES...

- ***That proposed freight measures should be calculated based on the length of roadway segments, and not factor in truck volume--*** The proposed measures, percent of the Interstate system mileage providing for reliable truck travel times and percent of the Interstate system uncongested, are calculated based on the length of roadway segments, and do not capture the weight of truck volumes in the results. WSDOT supports using this simple and straightforward mileage-based approach, which would make it easier for states to compute the freight measures and comply with reporting requirements. Introducing truck volumes into the freight measures would create significant additional work for states to interpolate and estimate truck volume data for every TMC segment and every 5-minute bin. WSDOT agrees that it is inappropriate to introduce estimated or modeled truck volume data for these measures.

#### WSDOT DISAGREES...

##### Truck Travel Time Reliability

- ***With using 1.5 as the threshold for determining reliable truck travel times--*** It is difficult to understand the implications of selecting 1.5 without testing it using the NPMRDS and verifying it with other data sources and local knowledge. Additionally, this same 1.5 threshold is proposed for the system performance reliability metric, yet the freight metric would use a 95<sup>th</sup> percentile travel time instead of the 80<sup>th</sup> percentile like regular traffic. WSDOT does not support this higher level of expectation for more reliable freight movement considering freight is part of general traffic with no freight-only facilities. Based on WSDOT's observation and analysis of the NPMRDS, trucks travel at relatively slower speeds compared to non-freight personal vehicles during the same 5-minute interval at the same location. It is not reasonable to impose more stringent requirements on truck travel time reliability compared to general traffic travel time reliability.

##### Percent Interstate Uncongested

- ***With the 50 mph speed threshold to define congested conditions for freight movement--*** Considering freight characteristics, 50 mph for this definition is unrealistically high. Freight performance metrics and measures should be identical with the system performance measures, as all vehicle share the same roadway and experience similar traffic conditions. Reporting the freight movement differently from all vehicle movement would be misleading. See recommendation in 490.505 for 70% of posted speed limit that WSDOT considers to be representative of "congested" conditions for general traffic, identifying deficiencies for mobility improvements. Trucks with slower operating speeds should be at a lower threshold or at the very minimum, the same as the general traffic threshold. Of additional concern, the 50 mph threshold as proposed makes no distinction between urban and rural segments and speeds on the Interstate, which erroneously implies congestion in rural areas is similar to congestion in urban areas.

## QUESTIONS OR CLARIFICATIONS

### Percent Interstate Uncongested

- WSDOT requests that FHWA share in more detail its outreach to the freight community that led to selecting the 50 mph threshold and 1.5 ratio using 95<sup>th</sup> percentile travel times. Responses from the trucking industry, the type of research, surveys, and more would be helpful for WSDOT to understand what led to this determination.

### ***SUBPART G—NATIONAL PERFORMANCE MANAGEMENT MEASURES FOR ASSESSING THE CONGESTION MITIGATION AND AIR QUALITY IMPROVEMENT PROGRAM—TRAFFIC CONGESTION***

#### **490.701 Purpose.**

No Comment

#### **490.703 Applicability.**

##### WSDOT AGREES...

- ***With FHWA's proposal to limit the excessive delay measure to urbanized areas with populations greater than 1 million--*** The urban areas with populations greater than 1 million usually experience excessive delay.

##### WSDOT DISAGREES...

- ***That the traffic congestion measure should apply to all large urban areas with maintenance or nonattainment areas--*** WSDOT believes that the traffic congestion measure should only apply to large urban areas with maintenance or nonattainment areas that have on-road mobile sources as a major contributor. For example, an urbanized area should not have to implement this measure because of a PM<sub>2.5</sub> problem in one area that is primarily caused by wood smoke.

#### **490.705 Definitions.**

##### WSDOT DISAGREES...

- ***With the 35 mph and 15 mph speed thresholds for the excessive delay measure calculation--*** Across states and even within states, Interstate and non-Interstate roadways often have different speed limits or varying number of traffic controls and pedestrian crossings on rural arterials, for example. Aggregation of total excessive delays nationwide would not have reasonable meaning using these thresholds. Further, if the thresholds do not take speed limit into account, it could incentivize operating agencies to raise speed limits to balance the total delay result—at the risk of compromising safety and roadway efficiency. **Proposal:** WSDOT requests more information about why these speeds were chosen, but ultimately recommends using 60% of posted speed limit for the thresholds. This definition will help with accurate evaluation of traffic congestion delay, as different roadways have different speed limits. It is also important that FHWA take these thresholds into consideration when defining system performance and freight measures.
- ***With splitting out the speed thresholds by different functional class split than other measures in this proposed rule.*** Splitting out the subpart G delay calculation by Interstate/freeway/expressway (functional classes 1 and 2) is inconsistent with the Interstate-only (functional class 1) split for subpart E and subpart F. The method proposed in this rule would require functional classes to be identified and assigned or joined to the links in order to apply the volume thresholds, which would require conflation by each state, a monumental task. **Proposal:** WSDOT requests that FHWA use consistent categories for performance measures so that data preparation can be standardized.
- ***With the accuracy of the per capita qualification in the delay formula--*** This produces misleading measure values when comparing urbanized areas that have varying mode splits (e.g. if a good portion of residents take public transit). Further, urban areas with a lot of through traffic

will have misleading high values because the delay is being experienced by travelers from outside of that urban area that are passing through on the congested highways. **Proposal:** WSDOT proposes to derive the delay measure by dividing the total annual excessive delay by an estimated commuter population rather than overall population.

#### QUESTIONS OR CLARIFICATIONS

- Does or should the excessive delay measure account for weather conditions, collisions, incidents or construction zones?
- “*Lower functional classifications*” in the following sentence from p. 23910 would technically mean lower than 1-3; WSDOT requests FHWA clarify: “*For the purposes of this rule, the speed threshold is 35 miles per hour on Interstates (Functional Class 1) and other freeways and expressways (Functional Class 2) and 15 mph on other principal arterials (Functional Class 3) and other roads with lower functional classifications that are included in the NHS, as defined by FHWA: HPMS Functional Classifications.*”

#### **490.707 National performance management measure for Traffic Congestion.**

##### WSDOT DISAGREES...

- ***With linking delay measures and projects--*** “*Use of an excessive delay measure relates to the widespread use of delay-related metrics to justify congestion-related CMAQ projects, an important consideration when looking at what projects will help meet targets...*” WSDOT believes linking the measure to funding too closely could negatively change how states, counties and cities fund or prioritize projects. An example would be focusing a project on a reporting segment that is just slightly over the set thresholds instead of the areas that need it the most in order to impact the final number of hours of excessive delay.

#### QUESTIONS OR CLARIFICATIONS

- FHWA requested comments on existing methods to reliably weight the highway delay metric by “total vehicle occupants” rather than “total number of vehicles”. WSDOT currently uses vehicle occupancy data by corridor for the annual *Corridor Capacity Report*. Historic person occupancy data collected on major Puget Sound roadways allows WSDOT to estimate per capita measures, but only at specific locations. **Proposal:** If transit or multimodal data was to be included, WSDOT suggests it come from the American Community Survey.

#### **490.709 Data Requirements**

##### WSDOT DISAGREES...

- ***With the extent of the analysis required for this proposed excessive delay measure--*** Unlike the system performance and freight measures proposed in this NPRM that use average travel time data for each 5-minute bin, this traffic congestion measure requires that every 5-minute travel time for the entire year (105,000+) for each segment be evaluated against FHWA-established threshold values by functional class, which would require conflation before beginning. **Proposal:** WSDOT requests that FHWA take on or fund the calculation of this measure. Approximately 1,100 of Washington state’s 6,100 segments are in an area potentially requiring excess congestion calculations—that’s over 115 million travel times to be evaluated, which will require powerful software and technical know-how. Additionally, each segment with excess delay must be correlated to a traffic volume. Traffic volume data is not available at the same granularity as excess delay, especially on non-Interstate NHS roadways, and collection points do not directly correlate to the NPMRDS segments. That will require establishing correlations between the two datasets, which is additional work. If the same thresholds are being used across the country, as is proposed (which requires no coordination for State DOTs and MPOs to decide), FHWA should,

at a minimum, complete the comparison of segments to the thresholds. By completing this work at the national level, FHWA would ensure that the work is done consistently and save the states from having to complete this work individually.

- ***With the hourly traffic volume estimate procedure in FHWA's proposed rule--*** This estimated data will not be entirely sufficient in determining delay. Currently, volumes are only estimated at specific points on the roadways, and reported as a daily figure. Applying these volumes at a granular level as the NPRM proposes—to other nearby TMCs and attempting to distribute it among the 5-minute bins—could produce inaccurate results. **Proposal:** WSDOT suggests FHWA take the AADT information from each state's HPMS submittal and develop traffic volume profiles by time of the day and day of the year at a 5-minute bin level for each reporting segment. This would greatly reduce the analytical resource burden in imputing the traffic volumes from AADT (which are estimates to begin with) and would provide consistent methodology and confidence for FHWA in the metric calculation due to different levels of states' technical expertise. This task would also help FHWA to generate the conflation process between NPMRDS and HPMS volume datasets that would provide computational capabilities at a 5-minute bin level. Because there is no coordination required for State DOTs and MPOs to decide upon a threshold for baseline calculation purposes, this is a measure that FHWA can take upon itself to calculate nationwide in a consistent manner.
- ***That population numbers used in the delay measure should be kept constant for the duration of the performance period--*** This would give an inaccurate picture of congestion in fast-growing cities as more people use the roadways. **Proposal:** WSDOT requests that the delay measure be derived by dividing the total annual excessive delay by an estimated commuter population. As delay is correlated to population and MPA boundaries, we propose to use updated population numbers for the measure calculation.

#### QUESTIONS OR CLARIFICATIONS

- What is the intent of including “some” in the following: “*To calculate the measure, State DOTs also would need to provide estimates of hourly traffic volume that can be applied to some or all portions of the NHS in areas applicable to this measure.*” (p. 23884)?
- Would the proposed rule require State DOTs to submit which of the two volume methods they used for **each** reporting segment? This would be a large dataset.
- Will there be guidelines on expectations for the “continuous count stations” allowable for the volumes used in the excessive delay measure? What resources would WSDOT need to comply with this requirement?

#### **490.711 Calculation of Congestion Metric.**

##### WSDOT AGREES...

- ***That FHWA should conduct the NPMRDS travel time conflation nationwide for consistency--*** But would request FHWA to require itself to provide the conflated dataset back to the agencies to use for delay calculation purposes. FHWA should also develop volume profiles for each day and each 5-minute bin to match the travel time dataset, which would be a start in developing person throughput information and maximum throughput threshold speeds and travel times to use as desired travel times. **Proposal:** WSDOT proposes that FHWA should take on the metric and measure calculations for all states while collecting information from states and MPOs through the HPMS reporting process. This would save extensive resources for state agencies, as the HPMS reporting process at State DOTs is an established process.

### WSDOT DISAGREES...

- ***With the null/outlier procedure for the excessive delay measure not lining up with the system performance or freight measures--*** WSDOT interprets the proposed procedure for this measure to be excluding 5-minute bins with no recorded travel times, as well as those data points of over 300 seconds (5 minutes). **Proposal:** WSDOT requests that the procedure for null and outlier values be the same for all measures in this NPRM (preferably states being provided a fully populated travel time dataset), or at least consistent with the <2 mph or >100 mph thresholds set in the peak hour travel time measures.
- ***With the exclusion of HOV, HOT, ETL or Hard Running Shoulder lanes in the excessive delay calculation--*** This could mask the benefits from these operational enhancements, and could incentivize State DOTs to prioritize solutions that only cater to the problems this particular measure would highlight instead of planning with the entire system in mind.

### QUESTIONS OR CLARIFICATIONS

- Will FHWA consider states' conflated NHS roadway lengths? WSDOT currently uses conflated segment length in 2013 geometry, but plans to re-do the conflation to reduce error rates and incorporate scheduled updates. When re-conflation occurs, the length of TMCs would more accurately reflect our state's NHS (by 2018). Preparing datasets before the reporting cycle begins will be difficult, as NHS coverage and TMC distances both consistently change in the NPMRDS with each static file version. These changes would alter results and introduce errors unless FHWA issues guidance on how to deal with these changes. The network definition should be stable for trend analysis purposes, especially as measures are rolled up to an annual report.
- *"Where excessive delay is measured"* leads to confusion in the following sentence: *"Hourly volume estimation for all days and for all reporting segments where excessive delay is measured, as specified in 490.709(c)."* In the section (c) it references, there is no specification that only volumes on segments where there is delay should be included. Does the reference back to section (c) only intend to point back to details about how volumes can be collected?
- The following sentence from p. 23886 could be interpreted as suggesting (1) the proposed rule incorporates occupancy data, when it does not and/or (2) that total population is equal to regular highway users: *"The FHWA recognizes that the proposed method would apply a delay per highway user to total vehicles to identify the total excessive delay of vehicles."*
- The Excessive Delay calculations shown on p. 23911 and p. 23912 have conflicting decimal place specifications—one says to the nearest thousandths of an hour, while the other says in hundredths of an hour.
- The Annual Hours of Excessive Delay per Capita decimal place specifications conflict (p. 23912)—one location says it shall be computed to the nearest hundredth and the other says to the nearest tenth.
- The hourly traffic volume calculation on p. 23912 divides the hourly volume by 12, yet labels the formula as for the hour, instead of a 5-minute bin. Is this a mistake?
- Even though the reporting period is 2018-2021, the data for the reporting period will be 2017-2020? See explanation of question in 490.511.

### **490.713 Calculation of Congestion Measure.**

#### QUESTIONS OR CLARIFICATIONS

- Are DOTs and MPOs in urban areas within multiple state and MPO boundaries required to calculate and submit the same measure for the entire urban area, but different targets if they wish? What if state or MPO measure calculations do not match? See Maryland example on p. 23887 for context.

## ***SUBPART H—NATIONAL PERFORMANCE MANAGEMENT MEASURES FOR ASSESSING THE CONGESTION MITIGATION AND AIR QUALITY IMPROVEMENT PROGRAM—ON-ROAD MOBILE SOURCE EMISSIONS***

### **490.801 Purpose.**

#### **QUESTIONS OR CLARIFICATIONS**

- The majority of the performance measures proposed under the requirements in this NPRM rely on measurements taken in real time, e.g., travel time. For the emissions performance measure FHWA has proposed using the emissions reduction estimates submitted by MPOs before projects are implemented. Emissions reductions are often estimated differently by different MPOs; sometimes even similar projects within an agency have vastly different estimates. To date, WSDOT has not received feedback from FHWA on the quality of the estimates included in the CMAQ Public Access System. Additionally, the rule states that FHWA is developing tools to address consistency and completeness of emissions estimates. Because of the noted issues and a disconnect between this performance measure and planning activities, it seems premature to begin reporting on these measures. If these tools are developed, when will this be and how will DOTs be expected to switch over to the new tools?

### **490.803 Applicability.**

#### **WSDOT AGREES...**

- ***That emissions reduction measure reporting should only be required in non-attainment or maintenance areas--*** Under the proposed rule, State DOTs and MPOs would report total estimated reduction for all CMAQ-funded projects and all criteria pollutants in non-attainment and maintenance areas only. WSDOT agrees that no new burdens should be imposed on areas in attainment, aligning with the Clean Air Act.

#### **WSDOT DISAGREES...**

- ***That the emissions measure should apply to all projects financed with CMAQ funds regardless of urban area size, as this relates to smaller areas of the state--*** Because these areas don't receive large amounts of CMAQ funding, the number of projects can vary widely from year to year. Due to the limited funding available, MPOs may use multiple years' allocations to fund a single project. Because emissions reductions are only reported at the time of first obligation, this would lead to situations where MPOs will have no reportable benefits for certain years (and potentially entire reporting periods). This could give the false impression that an MPO failed to meet a target. Also, with the potential for a limited sample size of past projects for these smaller MPOs, setting realistic targets may prove challenging. **Proposal:** The requirement in subpart H should be limited, like the congestion measure, to urbanized areas with a population of over one million that are in nonattainment or maintenance status for listed pollutants. Such a modification would be consistent with congressional intent, as well as avoid skewing smaller urban areas' performance measures.

### **490.805 Definitions.**

No Comment

#### 490.807 National performance management measure for assessing on-road mobile source emissions for the purpose of the Congestion Mitigation and Air Quality Improvement Program.

##### WSDOT DISAGREES...

- ***With using CMAQ projects that fund operations improvements or are aimed at increasing person throughput to show a reduction in emissions--*** Latent demand often replaces any capacity made available by operational improvements. Increases in person throughput do not necessarily show any reductions in emissions.

##### QUESTIONS OR CLARIFICATIONS

- The NPRM refers to the cumulative emissions reductions of CMAQ projects over the 2- and 4-year reporting periods. This language (p. 23913) is confusing and could be interpreted to mean that a project reported in year 1 gets its reduction multiplied by four to capture the emissions saved throughout the full reporting period. During the May 3, 2016, webinar FHWA clarified that each project only gets counted once. Please provide clarification in the final rule.

#### 490.809 Data Requirements

##### WSDOT AGREES...

- ***With aligning the CMAQ measure to current CMAQ reporting requirements, practices, and data systems--*** until FHWA can develop better reporting tools and metrics to determine the effectiveness of CMAQ funds at reducing emissions and track which projects offer the most benefits. WSDOT currently enters CMAQ project data received from MPOs into FHWA's database. As proposed, however, the rule would require extracting the relevant projects from the database and summing emissions reductions. **Proposal:** WSDOT requests that the database systems be consolidated to reduce redundancy and unnecessary workload on State DOTs staff. This viewpoint is consistent with the *Consistency with Current CMAQ Reporting Requirements and Practices* viewpoint discussed on p. 23817, and the first measure discussed as an option on p. 23829. **Proposal:** Further, WSDOT requests that State DOTs be given discretion to determine if quantitative CMAQ reporting be required. The proposed rule seeks ideas on dealing with missing data—having the opportunity to update information is good, but WSDOT does not want to have to update if it is determined that it is not a good use of resources.
- ***That collecting emissions data on a project-by-project basis through vehicle probing or another means would be cost-prohibitive and take years to collect useable data--*** (see p. 23830). **Proposal:** WSDOT recommends that FHWA create a look-up table to update periodically that lists emission reductions that may be expected for a range of smaller projects. Such a table would eliminate the need for State DOTs and MPOs to conduct project-specific modeling for smaller projects such as intersection improvements that typically receive CMAQ funding, as they could simply use the reference value(s) from the FHWA look-up table for CMAQ reporting purposes.

##### WSDOT DISAGREES...

- ***With the emissions reduction reporting process--*** Emissions should be reported when they are realized, i.e., when projects are opened to traffic. During the May 3, 2016, webinar FHWA clearly stated that CMAQ project reductions are only reported in the CMAQ Public Access System the first time the project has funds obligated. Also during the webinar, FHWA clarified that for the on-road emissions performance measure, emissions are reported in the year the project opened to traffic. The rule text sounds like emissions are counted in the year the project is first funded, which is not logical. Please provide clarification of when projects are reported in the CMAQ database versus how they are reported in the performance reports.

### QUESTIONS OR CLARIFICATIONS

- WSDOT requests that FHWA clarify which year the first March 1<sup>st</sup> and July 1<sup>st</sup> due dates apply to: *“The State DOT shall: (1) Enter project information into the CMAQ project tracking system for each CMAQ project funded in the previous fiscal year by March 1st of the following fiscal year; and (2) Extract the data necessary to calculate the on-road mobile source emissions measures as it appears in the CMAQ Public Access System on July 1st for projects obligated in the prior fiscal year.”*
- The discussion on missing data in the CMAQ Public Access System on p. 23836 mentions incomplete emissions estimates. Does FHWA want State DOTs to adopt a process they determine to include these incomplete emissions estimates?

#### **490.811 Calculation of Emissions Metric.**

No Comment

#### **490.813 Calculation of Emissions Measure.**

No Comment

## **PART III: CONSIDERATION OF A GREENHOUSE GAS EMISSION MEASURE**

WSDOT collaborated with the Departments of Transportation from the following states to develop shared comments on a potential greenhouse gas emissions (GHG) performance measure:

- California
- Colorado
- Delaware
- Minnesota
- Oregon
- Pennsylvania
- Vermont

The group came to consensus on the comments as they are submitted in the multi-state letter ([http://wsdot.wa.gov/publications/fulltext/graynotebook/MAP-21/GHG\\_MultiStateLetter.pdf](http://wsdot.wa.gov/publications/fulltext/graynotebook/MAP-21/GHG_MultiStateLetter.pdf)). The WSDOT comments below support and expand upon the comments in the shared letter.

### **WSDOT-Specific GHG Measure Perspectives**

Currently, the transportation sector is the number one source of greenhouse gas (GHG) emissions in the U.S. We need a national performance measure for GHGs to encourage and track efforts to reduce GHG emissions from the transportation sector.

We request national leadership on this issue to encourage action to reduce transportation GHG emissions. States vary in their development of specific plans to reduce emissions and their internal capacity to effectively track and reduce CO<sub>2</sub> to meet goals. To get a more complete understanding of the current status of State DOTs ability to address system-wide GHG emissions, FHWA may want issue a full NPRM to allow for broad comment on the specifics of a proposed policy.

We propose a measure with a low barrier to entry that should not add substantial new costs or administrative burdens to State DOTs, but will help develop a knowledge base in all states. This should be considered a first step toward the GHG emissions goals outlined in the Paris Climate Accord.

Some key points to highlight in our proposal include the following:

- The measure should be required for all State DOTs; GHG emissions have the same impact, regardless of where they are emitted.
- Linking the measure to funding will ensure GHG emissions are adequately addressed and progress is made.
- The measure should **not** be connected to NEPA or Conformity at this time.
- FHWA should work with states to develop guidance and procedures to ensure consistent target setting and reporting.
- FHWA should provide direct support to State DOTs who have not previously addressed GHG emissions.

**The following comments are responses to questions presented by FHWA in the NPRM.**

1. *Should the measure address all on-road mobile sources or should it focus only on a particular vehicle type (e.g., light-duty vehicles)?*

The proposed measure should include all on-road mobile source vehicle types. Flexibility should be allowed for states to also report non-road emissions.

2. *Should the measure be normalized by changes in population, economic activity, or other factors (e.g., per capita or per unit of gross state product)?*

WSDOT prefers a total emissions (mass-based) measure to ensure progress toward meaningful emissions reductions.

Nonetheless, including both total and per capita metrics can help inform the national discussion and empower state decision makers. Total emissions are important because truly addressing climate change requires a reduction in emissions below current and historical levels. On the national level, total emissions are important as the ultimate metric used to describe U.S. on-road mobile sources emissions. At the state level, per capita emissions may also be informative for policy makers. State total emissions may be influenced by in/out migration, which is largely beyond DOT control.

Guidance should be provided for both metrics, including parameters about what population numbers to use such as the population of registered drivers.

3. *Should the measure be limited to emissions coming from the tailpipe, or should it consider emissions generated upstream in the life cycle of the vehicle operations (e.g., emissions from the extraction/refining of petroleum products and the emissions from power plants to provide power for electric vehicles)?*

The measure should be limited to tailpipe emissions.

Tailpipe emissions are the largest source of transportation emissions. Limiting the measure to tailpipe emissions will simplify the calculations and allow transportation agencies to focus on aspects of the sector that they are more able to influence. Lifecycle emissions are more difficult to estimate and are largely captured and regulated separately.

We acknowledge that limiting the measure to tailpipe emissions would not account for the electricity used to power vehicles with electric drivetrains. Many of the state DOTs are working with stakeholders and other state agencies regarding the EPA Clean Power Plan, state renewable portfolio standards, state and regional cap and trade programs, and permitting requirements that all seek to address emissions from the electricity sector.

4. *Should the measure include non-road sources, such as construction and maintenance activities associated with Title 23 projects?*

The measure should estimate emissions based on state gasoline and diesel fuel sales that capture on-road tailpipe emissions.

If a non-fuels sales based measure is selected (e.g., vehicle mile traveled), then construction and maintenance activities should NOT be included at this time. Construction is typically completed by contractors so collecting usage data would be difficult and may pose legal challenges. Further, construction and maintenance emissions are a small fraction of on-road mobile source emissions.

Multiple states have researched reporting construction and maintenance emissions and found that analyzing these emissions requires significant staff resources but provides little value, considering the relatively small contribution of these activities to the total emissions. Still, we encourage flexibility for states who wish to report non-road CO<sub>2</sub> emissions, for states with fuel sales that include non-road fuel sales, or for State DOTs who want to conduct separate inventories of non-road sources to help monitor impacts of non-road strategies. Currently motor gasoline fuel sales data from EIA does not differentiate end source use but EIA does provide diesel fuel estimates by end use including the on-highway and off-highway categories.

5. *Should CO<sub>2</sub> emissions performance be estimated based on gasoline and diesel fuel sales, system use (vehicle miles traveled), or other surrogates?*

CO<sub>2</sub> emissions performance should be based on gasoline and diesel fuel sales. States should be allowed to use separate methodology if approved by FHWA as equivalent or superior.

Gasoline and diesel fuel sales have a direct correlation to CO<sub>2</sub> emissions and the data is already available to FHWA via the U.S. Energy Information Administration and GHG emission inventories prepared by many state environmental agencies. FHWA should work with states on a standard process for this approach, including consideration of a potential reporting time lag. FHWA should work with Energy Information Administration (EIA) to obtain data in a timely manner. This approach requires minimal staff resources from the State DOTs, allowing agencies to focus efforts on the target setting and planning needed to meet those targets, rather than calculating the measure. A VMT measure would require DOTs to redirect staff resources to this effort.

FHWA should also work with State DOTs to develop staff expertise and high-quality data to support a future modeled approach (e.g., VMT, speed, and vehicle characteristics) to evaluate statewide

transportation CO<sub>2</sub> emissions. Most State DOTs currently lack modeling expertise and high-quality statewide data (e.g., VMT, speed, and vehicle characteristics) are not available in many states. For example, it can be difficult to collect VMT data for local roads. A future measure based on vehicle miles traveled (VMT) would be informative for policy-makers and may be required by state regulations. Allowance should be made for states that can demonstrate a rigorous approach to VMT-based reporting. FHWA should also work with states on a standard process for this approach and use this opportunity to coordinate on methods for improving current VMT data provided by FHWA to states.

Regardless of the way the measure is calculated, demand management will remain a powerful policy lever, and FHWA should provide states and MPOs with guidance on VMT reduction strategies.

6. *Due to the nature of CO<sub>2</sub> emissions (e.g. geographic scope and cumulative effects) and their relationship to climate change effects across all parts of the country, should the measure apply to all States and MPOs? Are there any criteria that would limit the applicability to only a portion of the States or MPOs?*

The measure should apply to all states and be reported by the State DOTs.

All CO<sub>2</sub> emissions are created equal and have the same effect on the climate, regardless of whether they come from a large state or a small metropolitan area. A fuel sales-based measure will capture CO<sub>2</sub> emissions from urban and rural areas alike. Highly populated urban areas produce more aggregate CO<sub>2</sub> emissions but also have more options for reducing emissions than less densely populated areas. Therefore, MPOs will play a critical role in reducing transportation CO<sub>2</sub> emissions and should be encouraged to participate in intra-state target-setting discussions.

7. *Would a performance measure on CO<sub>2</sub> emissions help to improve transparency and to realign incentives such that State DOTs and MPOs are better positioned to meet national or multi-state regional climate change goals?*

A CO<sub>2</sub> emissions measure should improve transparency.

Transportation should be responsible for its fair share of CO<sub>2</sub> reductions. FHWA should work with State DOTs to develop a national climate change goal for transportation that aligns with the 21<sup>st</sup> Conference of the Parties of the United Nations Framework Convention on Climate Change (aka, “Paris Agreement”). Once a national climate change goal is established, states should use the CO<sub>2</sub> performance measure to drive decisions that help to meet, or exceed, national climate change goals.

8. *The target establishment framework proposed in this rulemaking requires that States and MPOs would establish 2 and 4 year targets that lead to longer term performance expectations documented in longer range plans. Is this framework appropriate for a CO<sub>2</sub> emissions measure? If not, what would be a more appropriate framework?*

A CO<sub>2</sub> emissions measure should have 4-year and 20-year targets.

Many infrastructure investments take years to plan, scope, design, and build or implement, so it is unlikely that significant changes to statewide CO<sub>2</sub> emissions could be demonstrated using a 2-year target. Emission reductions for 4-year periods may be small, but should show continued progress

toward longer term goals. A 4-year short-term target would also align the CO<sub>2</sub> measure with other national system performance measure reporting to promote consideration of the CO<sub>2</sub> effects when making investment decisions.

Major changes to the transportation system and system operations are needed to significantly reduce CO<sub>2</sub> emissions and avoid the most serious effects of climate change. This will be a long-term effort. A 20-year long-term CO<sub>2</sub> performance target is recommended to align with the long-range planning timeline. The hope is that alignment will help fit consideration of CO<sub>2</sub> emissions into the planning and project selection process.

9. *Should short term targets be a reflection of improvements from a baseline (e.g., percent reduction in CO<sub>2</sub> emissions) or an absolute value?*

Targets should be based on percent reductions from a mass-based 2005 baseline.

Targets based on a percent reduction should support State DOTs who want to calculate progress toward CO<sub>2</sub> reduction goals of the “Paris Agreement.” For State DOTs with state GHG reduction goals, these goals are also based on percent reductions from a baseline year. Calculating the percent reduction requires calculation of absolute values of GHG emissions, which may also be a useful tool for state policy discussions, at their discretion. However, absolute value CO<sub>2</sub> emissions are not recommended as a required target metric.

A 2005 baseline year is recommended to align goals with the 2005 baseline year used for CO<sub>2</sub> reduction goals in the “Paris Agreement.”

Note: At the national level, per capita emissions will need to decrease by more than the total reduction goal percentage to accommodate an increasing population. For states experiencing above average population growth, it could be possible for total emissions to increase and per capita emissions to decrease. Setting targets for emissions for both total emissions and emissions per capita will help State DOTs tell the full “emissions story”.

10. *What data sources and tools are readily available or are needed to track and report CO<sub>2</sub> emissions from on-road sources?*

Transportation fuel sales data are available with a 1- to 2-year time lag in some states and with a 2- to 3-year lag from the Energy Information Administration (EIA). The CO<sub>2</sub> performance measure should be based on the EIA dataset and provided to State DOTs by FHWA. States should be allowed to use a separate methodology, if approved by FHWA as equivalent or superior.

States will need additional tools to determine their target and understand the probable efficacy of potential reduction strategies. Outreach from FHWA to state environmental agencies, private fuel wholesalers, and EIA is encouraged to support faster fuels sales data reporting at the state level.

FHWA is encouraged to work with State DOTs to develop guidance for each specific step in the target setting and reporting process.

11. *What tools are needed to help transportation agencies project future emissions and establish targets for a CO<sub>2</sub> emission measure?*

FHWA should provide states estimates of “business as usual” emissions in target years based on rules on the books and that align with state estimates of emissions, population growth, etc., including transportation fuel CO<sub>2</sub> reports.

FHWA should provide detailed information on the effectiveness of various strategies to reduce emissions.

FHWA should provide information on EIA assumptions regarding population growth, vehicle technology adoption rates, and similar inputs.

FHWA should provide direction on using population forecasts to determine per capita CO<sub>2</sub> emissions.

FHWA should provide estimates of state emissions from annual EIA forecasts.

*12. How long would it take for transportation agencies to implement such a measure?*

Reporting timelines for a CO<sub>2</sub> measure should be consistent with reporting for other national system performance measures. Reporting timelines should account for fuel sales data reporting schedules and allow states a reasonable time period to prepare reports once the data is available.

State DOTs should be able to set targets for a fuel-sales based CO<sub>2</sub> measure within two years of the publication date for the final rule. For some State DOTs, forecasting future CO<sub>2</sub> emissions will involve significant coordination with other state and federal agencies.

A VMT-based CO<sub>2</sub> measure is more complex than the fuel-sales based CO<sub>2</sub> measure proposed by this group of State DOTs because it would require additional data, including VMT and vehicle speeds. A VMT-based CO<sub>2</sub> measure would take 3-5 years to implement because many State DOTs currently lack the data, staff, and expertise to prepare this type of analysis.

*13. Additionally, the FHWA requests data about the potential agency implementation costs and public benefits associated with establishing a CO<sub>2</sub> emissions measure.*

The fuel-sales based CO<sub>2</sub> measure we propose should have minimal implementation costs since FHWA would provide the critical fuel sales data and projections from EIA. A VMT-based CO<sub>2</sub> measure would require State DOTs to dedicate staff to this effort and incur new ongoing costs.

The amount of public benefit will depend on how ambitious State DOTs are in their target-setting.

FHWA should also consider the potential costs of inaction on the national scale. At a minimum, climate change is expected to increase the frequency and severity of extreme weather events, which will have major financial consequences for State DOTs and the national economy as a whole.

States vary in their development of specific plans to reduce emissions and their internal capacity to effectively track reduce CO<sub>2</sub> to meet goals. The fuel-sales based CO<sub>2</sub> measure we propose will support the development of this knowledge base in all states. The measure should also encourage ambitious target-setting and allow State DOTs with existing agency or state GHG emission reduction goals to pursue those separate efforts.