

Background Paper:
Air Quality Update
Changes to National Ambient Air Quality Standards
(NAAQS) and Potential Implications to WSDOT

February 11, 2010

Preface

This OneDOT background paper is intended to inform regional planning organizations (MPO & RTP) and WSDOT executives about recent changes adopted and proposed by the Environmental Protection Agency (EPA) to the Clean Air Act regulations. These new regulations are more stringent and could result in more violations of the air quality standards, leading to new “nonattainment” area designations.

“Conformity” under the clean air regulations is required for transportation plans, programs, and projects in nonattainment areas. Demonstrating “conformity” involves a complex modeling process and requires significant expenditures from each affected MPO. As a new federal transportation act is debated, it will be important to discuss addressing the issue of increasing revenue for air quality work. Without new revenue, these new EPA regulations are essentially unfunded mandates.

New and Proposed National Ambient Air Quality Standards (NAAQS) and Potential Implications for WSDOT and Washington State

The U.S. Environmental Protection Agency (EPA) is proposing changes to the Clean Air Act (CAA) National Ambient Air Quality Standards (NAAQS). If enacted these changes could impact existing air quality maintenance areas and result in new “nonattainment” area designations in Washington State.

Nonattainment areas are those not achieving NAAQS, and include nearby areas that are contributing emissions. Once a nonattainment area achieves the standard, it must demonstrate that it is maintaining the standard for the next 20 years.

“Transportation conformity” is the process of demonstrating that an area is achieving and/or maintaining the NAAQS. Transportation conformity is demonstrated through review of transportation plans that outline future transportation investments and how those investments will affect air quality. Failure to demonstrate conformity can result in the loss of federal funding for all projects except those specifically targeting air quality improvements.

The proposed changes include more stringent NAAQS and modeling requirements for particulate matter of less than 2.5 micrometers (PM_{2.5}) in diameter; nitrogen dioxide (NO₂); ground level ozone (O₃). The changes will effect conformity determinations for Transportation Improvement Programs (TIPs) and transportation plans.

The following is a summary of the upcoming known and proposed changes and the potential implications to WSDOT and Metropolitan Planning Organizations.

- 24-hour PM_{2.5}
- 1-hour NO₂
- 8-hour O₃
- New air quality emissions model: EPA MOVES 2010

SUMMARY OF CHANGES TO AIR QUALITY REGULATIONS

Update	Affected Area/MPO	Potential Effects	Next Steps
<p>I. PM_{2.5} <i>24-hour standard for particulate matter less than 2.5 microns in diameter</i></p>	<p>Nonattainment designation (12/14/09): <i>Wapato Hills</i> portion of Tacoma/ Pierce County (see attached map – Figure 1)</p> <p>MPO: Puget Sound Regional Council (PSRC) must demonstrate “attainment” by 12/14/10</p>	<p>If transportation is determined a “significant” contributor ($\geq 10\%$), then transportation plans & programs will be subject to PM_{2.5} conformity beginning in 2010.</p> <p>New State Implementation Plan (SIP) must be prepared to outline the steps for attaining and maintaining new PM_{2.5} standard.</p> <p>SIP could affect project programming if planned projects don’t improve air quality.</p> <p>PM_{2.5} emissions for some projects in new nonattainment/ maintenance areas may have to be modeled.</p>	<ol style="list-style-type: none"> 1. Puget Sound Clean Air Agency (PSCAA) will determine transportation’s contribution to total area emissions are “significant” 2. PSRC will model the current project list and compare with a modeled no-build scenario. New projects cannot increase emissions. 3. PSRC must demonstrate conformity by 12/14/10. 4. Interagency Consultation (Air Quality Roundtable) begins and meets monthly to ensure conformity by 12/14/10. 5. PSCAA & Ecology (ECY) initiate SIP process (3-years)
<p>II. NO₂ <i>1-hour standard for Nitrogen dioxide</i></p>	<p>Final rule signed January 21, 2010. Effective date will occur soon, when announced in Federal Register.</p> <p>New nonattainment designations: None</p> <p>MPO: State lacks NO₂ monitors but monitoring will be required for metropolitan areas with >500,000 population.</p>	<p>No immediate effects.</p> <p>No monitoring data, so areas will be considered “unclassifiable.”</p> <p>Once monitors are installed, areas could violate the standard if exceedances are recorded over a three-year period. At that point, the area would fall into nonattainment and transportation conformity would be required.</p>	<ol style="list-style-type: none"> 1. ECY must install and operate the newly required near-road and community-scale monitoring network by 2013. 2. WSDOT will coordinate with ECY on monitor placement.

Update	Affected Area/MPO	Potential Effects	Next Steps
III. O₃ <i>8-hour standard for ozone</i>	New: proposed standard between 0.06-0.07ppm Current: 0.075 ppm. The final level will determine affect on MPOs. Known monitor data: 0.070 ppm = PSRC; 0.060 ppm = SRTC, TRPC, RTC	No immediate effects. The NPRM proposes accelerated conformity process. Official nonattainment designations to be made by August 2011. Some existing monitoring data exists. If data is validated and areas found to violate the new standard, they will be subject to conformity in two years. Potential Puget Sound nonattainment area could include Island, Skagit, Snohomish, King, Kitsap, Pierce, and Thurston counties.	NPRM is under review by WSDOT and comments are being developed (due March 22, 2010). If violation occurs, new nonattainment areas will be developed by ECY and EPA, in part, through interagency consultation.
IV. EPA MOVES 2010 <i>EPA model update will replace Mobile 6.2/CAL3Q HC</i>	Immediate: PSRC for 2006 PM _{2.5} SIP development By 12/23/11: PSRC and SRTC for conformity determinations After 12/23/11: Every MPO/RTPO subject to conformity for transportation plans.	Mobile 6.2 can be used until 12/23/11 for conformity determinations of all “maintenance” and “nonattainment areas”. MPO’s can use Mobile 6.2 for PM _{2.5} conformity determinations but must develop new SIPs using MOVES. “Limited maintenance” areas (YVCOG, SWRTC, and TRPC) do not require modeling.	PSRC <u>may</u> use MOVES to demonstrate PM _{2.5} conformity over the next 11 months but <u>must</u> use MOVES to develop new SIP. EPA will allow grace period until 12/23/11 before model is required for regional conformity (except PM _{2.5}) and project level conformity.

I. 24-hour standard for PM_{2.5}

The Wapato Hills PM_{2.5} nonattainment area was officially designated on December 14, 2009, (Figure 1). The Wapato Hills area includes the City of Tacoma and some of surrounding Pierce County. The Puget Sound Clean Air Agency (PSCAA) and the Washington Department of Ecology (ECY) have three years from this date to submit a State Implementation Plan (SIP) that outlines how the area will achieve and maintain the new standard. Prior to SIP development, transportation conformity must be demonstrated by December 14, 2010. In the absence of an “emissions inventory” that establishes the percent of motor vehicle emissions relative to all area emissions, PSRC must demonstrate conformity using, either a “build/no-build test” or the “build/baseline” test. These interim tests compare vehicle emissions with and without planned projects that will affect traffic in and around the nonattainment area.

Prepared by:
 WSDOT Air, Noise, and Energy Office
 WSDOT Transportation Planning Office

Next Steps in 2010:

- PSRC must demonstrate conformity for PM_{2.5} using one of the interim tests by December 14, 2010.
- PSRC will review the current TIP and long-range plan to identify which projects could be impacted by the conformity requirements within the nonattainment boundary.
- PSCAA and ECY will determine if mobile source emissions are “significant,” or greater than 10% of total area emissions.
 - If transportation is “significant,” conformity for transportation is required. Transportation conformity regulations require the development of a State Implementation Plan (SIP) to show how the area can meet and maintain air quality standards in the future. States are allowed three years to develop and submit a SIP.
 - If analysis demonstrates that transportation is not a significant contributor to PM_{2.5} emissions in the area, no additional action will be required.
- PSRC cannot wait for PSCAA/ECY to determine whether transportation is a significant contributor to area emissions because of the time needed to update the air quality model for the new 2006 PM_{2.5} standard. Therefore, interagency consultation between PSCAA, WSDOT, ECY, EPA, FHWA, FTA, and PSRC is occurring regularly to ensure that a conformity determination is made by the December 14, 2010, deadline.
- PSCAA and ECY will begin development of a State Implementation Plan (SIP) for PM_{2.5} in 2010, to be complete by December 2012.

Beyond 2010:

Clean Air Act regulations require EPA to review all National Air Quality Standards (NAAQS) every 5 years. This means changes to the current (2006) PM_{2.5} NAAQS may be proposed as early as July 2010. If more stringent standards are proposed in the future, it could result in additional “nonattainment” designations in 2012.

Additional Notes:

- Significance finding: Ultimately, technical analysis will determine if mobile sources in the nonattainment area are significant (exceed 10% of overall emissions) and transportation conformity is required. Preliminary data from PSCAA suggests that transportation emissions are a significant contributor, but technical analysis to confirm will take most/all of the one year grace period allowed. However, conformity must be demonstrated by December 2010 so PSRC cannot wait for PSCAA. Therefore, PSRC is assuming that mobile source emissions are significant and working to demonstrate conformity by the December 14, 2010, deadline.

- **Interim Transportation Conformity Tests:** While SIP emissions budgets are being developed, EPA allows conformity to be established using one of two interim tests: a build-no-greater-than-no-build test (build/no-build)¹ or a build/baseline year test². PSRC is still deciding which interim test to use. The current challenge is related to the baseline year needed for the build/baseline year test. The 2009 Interim Conformity Guidance for PM_{2.5} requires the use of 2002 as the baseline year if an MPO wants to begin work before the final guidance is issued. However, EPA is considering either 2005 or 2008 as the base line year for the final PM_{2.5} conformity rule. Since PSRC's current model base year uses 2006, EPA, Region 10 is researching whether 2006 can be used.

II. 1-hour standard for NO₂

The effective date for the new NO₂ standards won't occur until the announcement is posted in the Federal Register, which is expected to occur very soon. However, the new rule was signed by the EPA administrator on January 21, 2010, and conformity determinations will still be required one year from that date. While the previous annual standard targeted NO₂ emissions as a precursor to O₃ formation, the proposed 1-hour standard is based on new evidence suggesting that NO₂ alone may cause health effects. In addition to more stringent standards, new requirements for near-road emissions monitoring within 50 meters of the roadway increases the likelihood of new exceedances from mobile sources. Implementing the proposed monitoring requirements will be a new financial burden for the Washington State Department of Ecology (ECY), who need to purchase and maintain the new monitoring equipment.

Next Steps for WSDOT in 2010:

No action is needed until Ecology begins to install a monitoring network. WSDOT expects areas in Washington to be classified as "unclassifiable" when conformity determinations are made in January 2011. WSDOT will work with ECY and PSCAA to establish the new monitoring locations once ECY has a better understanding of the schedule for purchasing and installing the new monitors.

Beyond 2010:

ECY must install a new near road NO₂ monitoring network by 2013. Once the monitoring network is in place, at least three years of data showing exceedances of the standard are needed to make a nonattainment conformity determination. If that area slips into nonattainment, significant interagency consultation will be needed with EPA, ECY,

¹ The build/no build test requires running the emissions model twice; first, running a "no build" scenario, with no new projects, to determine baseline emissions; and second, using a "build" scenario with the new projects. If the "build" scenario emissions output is no greater than the "no build" scenario emissions output, conformity is determined. However, if the "build" scenario emissions exceed the baseline, "no-build" scenario emissions, the plan and/or program (MTP and TIP) is not in conformity and cannot proceed with the new projects included.

²The "build/baseline year" test models and compares a specified "baseline year" travel demand model based emissions output with a "build" scenario emissions output. If the "build" scenario emissions exceed the "baseline year" emissions, conformity cannot be determined and new projects cannot move forward.

Prepared by:

WSDOT Air, Noise, and Energy Office
WSDOT Transportation Planning Office

and local air quality agencies to identify control measures to achieve compliance.

Currently, there is only one NO₂ monitor in Washington State, on the Swinomish Reservation, near Anacortes. This monitor has reported ambient NO₂ levels in excess of the new standard. While it is unlikely that these results will effect transportation, EPA is studying the area to better understand what sources are contributing to the NO₂ readings and whether these results can/should be used to make a conformity determination.

III. 8-hour standard for O₃ (Smog)

Mobile sources are thought to be a “significant” contributor to O₃ even though ground-level ozone is not emitted directly from vehicles, but from nitrogen oxides (NO_x), volatile organic compounds (VOCs), carbon monoxide (CO) and methane (CH₄) “cooking” in the sun. On January 6, 2010, EPA issued a Notice of Proposed Rulemaking (NPRM) proposing more stringent National Ambient Air Quality Standards (NAAQS) for primary and secondary ground-level ozone. The current primary standard of 0.075 ppm (parts per million), adopted in 2009, was less stringent than the 0.060-0.070 ppm range recommended by EPA’s scientific advisory panel. This 2009 primary standard triggered a legal challenge by environmental and health advocates and the newly proposed primary standards are in accordance with the original scientific panel’s recommendations.

There is also a proposal to update the secondary O₃ standard. EPA is proposing a seasonal secondary standard, designed to protect sensitive vegetation and ecosystems, including forests, parks, wildlife refuges and wilderness areas. The previous secondary standard was identical to the current primary standard. EPA is proposing to set the level of the secondary standard within the range of 7-15 ppm-hours. Because the method for calculating the new secondary standard (W126) is new, the potential effects to WSDOT are presently unclear.

The final value of the primary standard will determine which counties could fall into nonattainment. EPA has released the following monitoring data from 2006 – 2008.

- King County: 0.077 ppm
- Pierce County: 0.070 ppm
- Spokane County: 0.064 ppm
- Clark County: 0.062 ppm
- Thurston County: 0.061 ppm

Next Steps for WSDOT in 2010:

WSDOT is coordinating comments on the NPRM before the March 7, 2010, deadline. Coordination will include, at a minimum: WSDOT ESO & TPO; EPA; Ecology; local clean air agencies; and affected MPOs (PSRC, SRTC, RTC, & TRPC).

Beyond 2010:

EPA is proposing an accelerated schedule for designating nonattainment areas for the “primary” ozone standard. For areas in violation of the new standard, the following schedule may apply.

- **January 2011:** States make recommendations for any areas to be designated nonattainment.
- **July 2011:** EPA makes final area designations.
- **August 2011:** Designations become effective.
- **December 2013:** State Implementation Plans (SIP) outlining how states will maintain conformity due to EPA.

Implications for WSDOT in 2010:

SIP planning is expected to begin in 2011 immediately following official nonattainment designations. SIP development and conformity demonstration will be significantly more complicated than in the past. It will take a multi-pronged strategy to address all the emissions precursors to bring the region into attainment with the standards.

IV. New Air Quality Model: EPA MOVES 2010

EPA released the latest version of the Motor Vehicle Emission Simulator (MOVES) model, MOVES2010, to the public on December 23, 2009. EPA will publish a Federal Register notice of availability in the near future (date uncertain) to approve MOVES2010 for meeting official state implementation plan (SIP) and transportation conformity requirements. Upon publication in the Federal Register, MOVES2010 will become EPA’s only approved motor vehicle emissions factor model for estimating volatile organic compounds (VOC), nitrogen oxides (NO_x), carbon monoxide (CO), direct particulate matter (PM₁₀ and PM_{2.5}) and other pollutants and precursors from cars, trucks, motorcycles, and buses by state and local agencies outside of California. EPA intends to include in the notice a two-year grace period for using MOVES2010 for transportation conformity purposes.

NOTE: Based on EPA guidance, the MOVES2010 model will be used to develop the PM_{2.5} SIP emissions budget for the Tacoma/Wapato Hills nonattainment area.

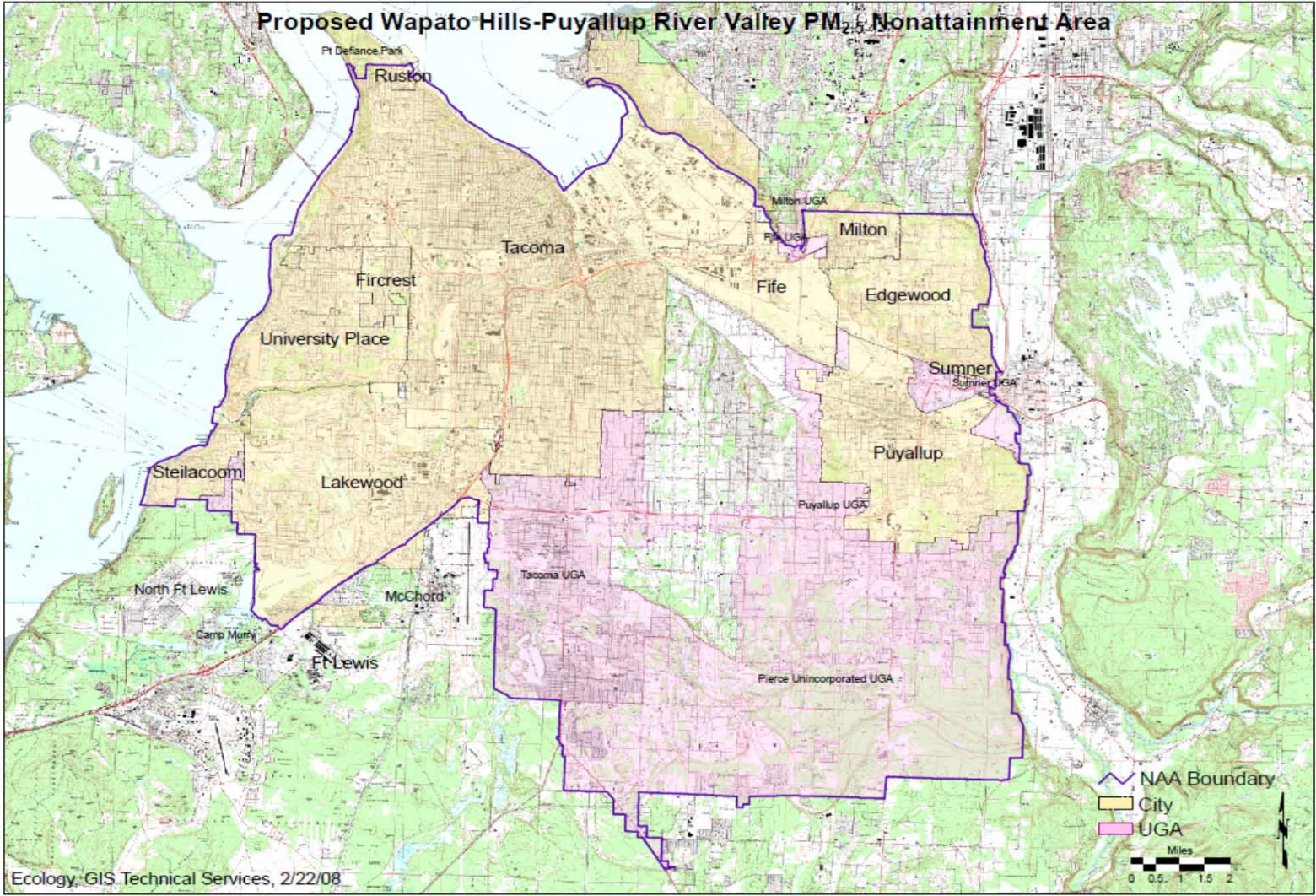
For more information – questions:

Timothy V. Sexton, Manager
WSDOT Air Quality, Noise, Energy Policy
Phone: (206) 440-4549
E-mail: sextont@wsdot.wa.gov

Clifford L. Hall, Regional Coordinator
WSDOT Transportation Planning Office
Phone: (360) 705-7993
E-mail: hallcli@wsdot.wa.gov

Prepared by:
WSDOT Air, Noise, and Energy Office
WSDOT Transportation Planning Office

Figure 1



Prepared by:
WSDOT Air, Noise, and Energy Office
WSDOT Transportation Planning Office