

Air Quality Conformity

This appendix documents that the Regional Transportation Plan conforms with requirements of the State Implementation Plan for particulate matter 10 microns in size or less (PM10), and with the Thurston County PM10 Maintenance Plan. The federal Clean Air Act, the Washington Clean Air Act, and the federal Transportation Equity Act for the 21st Century require this finding of conformity. Additionally, this appendix provides background on air quality conformity and issues specific to the region, the consultation process used to develop and validate conformity findings, and results of the technical conformity analysis.

Air Quality Conformity

The federal Clean Air Act and Washington State's Clean Air Act identify the air quality performance standards that regions must meet. These standards govern air pollution caused by mobile sources – like motor vehicles and other transportation modes – as well as by stationary sources, like manufacturing plants or home fireplaces. Transportation conformity ensures transportation investments do not contribute to a worsening of air quality in a region or preclude its ability to improve unhealthy air quality. Federal 40 CFR Part 93 and state WAC 173-420 identify governing rules.

State and federal guidelines establish the standards for healthy air quality. A region that meets these standards is considered to be an attainment area. Nonattainment areas do not meet these standards, and have unhealthy levels of air pollutants. A region may be an attainment area for one pollutant and a nonattainment area for another pollutant. A region may be redesignated from nonattainment to maintenance area if it successfully demonstrates an ability to address its air quality problems for a period of time. This redesignation status applies to the Thurston region.

The Thurston region is an attainment area for Carbon Monoxide (CO) and Ozone (O3). Part of the Thurston region is a maintenance area for Particulate Matter (PM10). PM10 refers to airborne particulate matter that is less than 10 microns in size, making it too small to be filtered by the nose and lungs. Components of mobile source particulates include vehicle tailpipe emissions, road dust, tire wear and brake wear. These result in tiny airborne particles that pose hazards to people with asthma or other respiratory problems, as well as the very young and the very old who have vulnerable respiratory systems. Significantly, it is also a by-product of wood burning.

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Background for the Thurston Region

In the late 1980s, the Environmental Protection Agency (EPA) designated the Lacey-Olympia-Tumwater urban area as a non-attainment area for PM₁₀. PM₁₀ is particulate matter less than 10 microns in aerodynamic diameter. Air samples indicated that wood smoke generated the vast majority of the pollution. The Olympic Region Clean Air Agency (then, the Olympic Area Pollution Control Authority) was authorized to develop and implement strategies that would reduce the PM₁₀ problem. Most effective of the measures identified by the Clean Air Agency were restrictions on outdoor burning and the kinds of wood-burning stoves that people can use in the urban area. Because the problem was so heavily attributable to wood burning, no transportation conformity requirements were imposed and no transportation control measures were identified, even though the region was designated non-attainment.

Figure H-1 illustrates the Clean Air Authority's success in mitigating the PM₁₀ problem. Particulate levels have steadily decreased since the late 1980s, with current levels at roughly one third of that allowed under clean air policies. Mobile source emissions account for about 25 percent of the total, according to the Clean Air Agency.

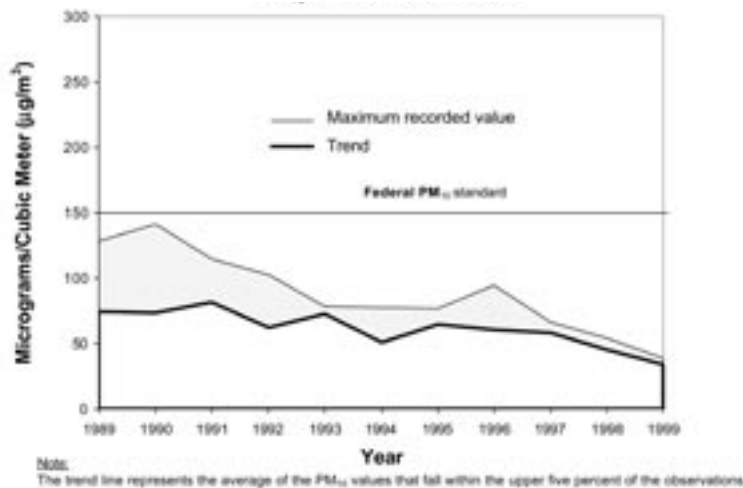
Because of its success in mitigating the particulate problem, in 1997 the Clean Air Agency sought a redesignation in conformity status from non-attainment to maintenance area. After careful consideration, EPA granted that request in November 2000.

That status redesignation triggered a change in TRPC's role and in

the region's transportation requirements, in particular in the newly designated maintenance area. The white area in Map H-1 identifies the official, federally-designated maintenance area.

The region had been successful in reducing particulate matter to low levels. With the resulting PM₁₀ levels so low, transportation sources now accounted for about a quarter of the total level that remained, or one-twelfth the allowable emissions. EPA's Transportation Conformity Regulations required that the maintenance area of the

**Figure H-1
Thurston County PM₁₀ Trends**



Thurston region would now have to comply with transportation conformity requirements, although again, the Thurston County PM10 Maintenance Plan identified no transportation control measures.

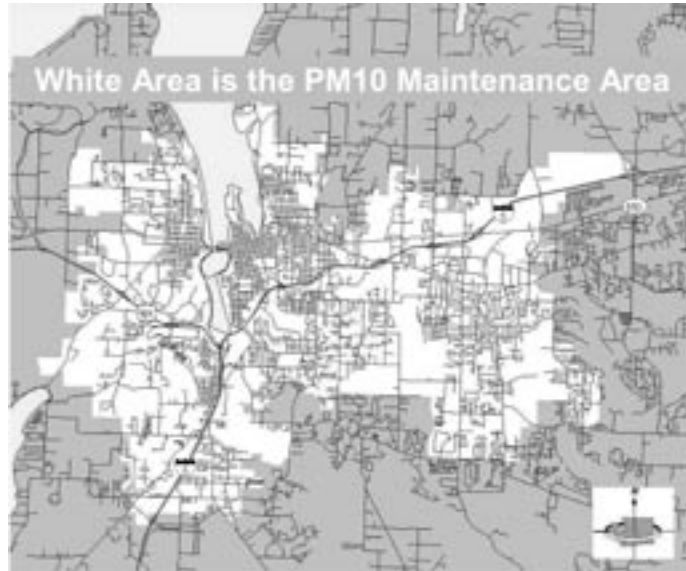
This “after the fact” conformity designation makes Thurston one of the very few regions in the nation to have been exempt from transportation conformity requirements when it had an air pollution problem but then had to comply with those requirements after air quality improved.

Transportation conformity requirements stipulate that TRPC must adopt a long-range transportation plan that successfully demonstrates that the projects it includes will not cause the region’s air quality to deteriorate. Specifically, projects in the plan must not:

- Cause or contribute to any new violation of the federal air quality standards for PM10.
This appendix demonstrates that the projects and programs identified in this plan will not cause or contribute to a new violation of the air quality standards for PM10.
- Increase the frequency or severity of any existing violation of the standards.
No violation of the air quality standards occurred since the late 1980s, therefore the projects and programs recommended in this plan cannot increase the frequency or severity of existing violations.
- Delay timely attainment of the standards.
The region has attained healthy air quality standards, therefore the projects and programs recommended in this plan cannot delay timely attainment of those standards.

Once this has been demonstrated in the long-range plan, those projects can then be included in the Regional Transportation Improvement Program (RTIP) with confidence that they will not cause a violation of clean air standards.

**Map H-1
Thurston Region PM10
Maintenance Area**



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When TRPC learned of the EPA determination and met with officials on the Air Quality Consultation Group in September 2002, the region was operating from its 2020 RTP. That Plan was not developed with this transportation conformity requirement in place, so did not demonstrate conformity. The region was placed into what is referred to as a “lapsed status” for conformity. This put restrictions on the region until a 2025 RTP that successfully demonstrated conformity was developed and adopted.

Requirements stipulate that unless a conforming long-range plan is in place, only certain kinds of projects can proceed. Those are project-types identified by both state and federal agencies as being exempt from air quality conformity requirements since they do not negatively affect PM10. The Federal Clean Air Act (40 CFR 93.126) and the State Clean Air Act (WAC 173-420-110) specifically identify those types of projects.

Air Quality Consultation

TRPC meets regularly with the state’s Air Quality Consultation Group. Comprised of representatives from the Environmental Protection Agency, the Washington State Department of Ecology, the Federal Transit Administration, the Federal Highway Administration, and the Washington State Department of Transportation, the Consultation Group provided direction on how to comply with requirements without jeopardizing project funding during TRPC’s unusual status.

Experts on the Consultation Group provided guidance in the development of an air quality conformity model used to demonstrate the region’s compliance with mandated requirements. The Group reviewed assumptions, methodologies, and process, and reviewed findings regarding any exempt projects before they could proceed.

The mandated air quality modeling procedures are contained in this appendix, as well as the data assumptions and results. They were included in the Draft Plan to ensure the widest possible distribution for public review.

Technical Procedure

The technical procedure for air quality conformity analysis involves estimation of PM10 emissions from mobile sources by integrating the regional travel demand model with EPA’s latest emission factors model MOBILE 6.2. Federal conformity rule identifies the criteria

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and procedures that guide the conformity process (40 CFR 93.109), and establishes a conformity criterion (§ 93.118(a)), which states that:

“This (Conformity) criterion is satisfied if it is demonstrated that emissions of pollutants or pollutant precursors...are less than or equal to the motor vehicle emissions budget(s) established in the applicable implementation plan...”

WAC 173-420-065 details the matching state equivalent conformity criterion. The latest state implementation plan (SIP) that addresses our region determined a mobile source emissions budget of 776.36 tons per year by 2010. Since the emission budget established in the SIP is for year 2010, emissions are calculated for that year in addition to 2005, which is base year for this plan, and 2030, which is the forecast year. To comply with § 93.118(b) which requires that intermediate years not be separated by more than 10 years to be consistent – meaning complying with the emissions budget – a conformity analysis for year 2020 was also performed.

Mobile source emissions consist of two components:

- Vehicle exhaust, tire wear, and brake wear – emissions that are directly attributable to the vehicles, and
- Road dust – emissions that depend on road surface material, vehicle load, and weather.

Exhaust, tire and brake wear emission factors are calculated using MOBILE 6.2. These emission factors, represented in grams per VMT, are combined with the VMT of the maintenance area (estimated using the travel demand model) resulting in auto emissions, represented in tons per year.

Road dust emissions are calculated following the same procedure used in establishing the emissions budget. In that procedure, the road dust emission factor used is 0.6321 grams/VMT for a dry day with less than 0.01 inches of rain. And in the original procedure it is assumed that Thurston County has 164 days with at least 0.01 inches of rainfall in a year. The road dust emission factor is multiplied by the number of dry days and the maintenance area VMT to obtain road dust emissions in tons per year.

Total PM10 mobile source emissions for the maintenance area are obtained by combining vehicle exhaust, tire and brake wear emissions with road dust emissions.

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Model Assumptions

Federal conformity rule § 93.110 mandates use of the latest planning assumptions. This requires using the latest population, employment and traffic estimates of the current and future year, and the latest transit operating policies and services. Since the adopted land use and employment are from the latest population and employment forecasts, the region complies with this requirement. All other transportation assumptions in the analysis employed the regional travel demand modeling assumptions.

Following the requirements in § 93.118, all regionally significant capacity projects identified in this plan for the entire region – not just the maintenance area – that can be modeled are included for estimating the congestion in 2030. Since implementation years are not established for projects, no basis exists to justify which regionally significant projects will be completed by 2010 and 2020. Therefore, VMT for these years are obtained by linearly interpolating between the base and future year.

TRPC performed the emission factors analysis with the most current vehicle registration distributions provided by the Washington State Department of Ecology. Default values supplied with the analysis tool are used for annual mileage accumulation rates and VMT fractions. Mileage accumulation rates represent the total annual travel accumulated per vehicle of a given age and individual vehicle category. VMT fractions allocate VMT to different vehicle categories. Other relevant data required for the analysis is obtained from “MOBILE 6\6.1\6.2 Input Parameters and Processing” prepared by the Air Quality Program of Washington State Department of Ecology. The last section of this appendix presents the MOBILE 6.2 input files used in the analysis.

Results and Conclusions

The conformity analysis must show that the estimated PM10 emissions in the maintenance area are less than the mobile source emissions budget of 776.36 tons per year established in the maintenance plan. The emissions depend on total number of vehicle miles traveled in the maintenance area, the mobile emission factors, and the road dust emissions factors. Tables H-1 and H-2 present total PM10 mobile emissions and emission factors, respectively.

**Table H-1
Maintenance Area VMT and Total PM10 Mobile Emissions**

	Maintenance Area Average Daily VMT (miles per day)	Total PM10 Mobile Emissions (tons per year)
2005	2,630,480	434.37
2010	2,929,098	465.43
2020	3,526,334	536.66
2030	4,123,570	624.73

**Table H-2
Auto and Road Dust Emission Factors**

	Auto Emission Factors (Grams/VMT)				Road Dust Emission Factors (Grams/VMT)
	Exhaust	Tire Wear	Brake Wear	Auto Total	
2005	0.0406	0.0095	0.0125	0.0627	0.6321
2010	0.0251	0.0095	0.0125	0.0472	0.6321
2020	0.0084	0.0096	0.0125	0.0305	0.6321
2030	0.0067	0.0096	0.0125	0.0288	0.6321

As shown in Table H-1, the PM10 mobile emissions for maintenance year and intermediate years are less than the emissions budget of 776.36 tons/year. Therefore, the transportation projects identified in this Plan do not degrade the region's air quality. The Plan complies with state and federal clean air requirements.

MOBILE 6.2 Input Files

The MOBILE 6.2 input files for 2005, 2010, 2020, and 2030 are presented below. The vehicle registration distribution values are not presented in this section due to space limitations. Contact the Thurston Regional Planning Council for the complete documentation.

Under current law, diesel fuel will be required to meet a reduced sulfur content limit of 15ppm on or before September 1, 2006. Therefore, following Department of Ecology's suggestions, a diesel sulfur content of 320ppm was used for 2010, and a diesel sulfur content of 15ppm was used for 2020 and later.

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2005 Mobile 6.2 Input File

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***** Header Section *****
MOBILE6 INPUT FILE

POLLUTANTS      :

PARTICULATES    : SO4 OCARBON ECARBON GASPM LEAD BRAKE TIRE
RUN DATA
***** Run Section *****
REG DIST        : examples\aq2030\reg20042.txt
FUEL PROGRAM     : 1
NO REFUELING     :
***** Scenario Section *****

SCENARIO RECORD : Thurston County: January 2005
CALENDAR YEAR   : 2005
EVALUATION MONTH : 1
MIN/MAX TEMP    : 31.6 44.4
ABSOLUTE HUMIDITY : 23.0
FUEL RVP        : 14.3
PARTICLE SIZE   : 10.0
DIESEL SULFUR   : 320
PARTICULATE EF  : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV
PMDDR1.CSV PMDDR2.CSV

END OF RUN

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2010 Mobile 6.2 Input File

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***** Header Section *****
MOBILE6 INPUT FILE

POLLUTANTS      :

PARTICULATES    : SO4 OCARBON ECARBON GASPM LEAD BRAKE TIRE
RUN DATA
***** Run Section *****
REG DIST        : examples\tip0608b\reg2006.txt
FUEL PROGRAM     : 1
NO REFUELING     :
***** Scenario Section *****

SCENARIO RECORD : Thurston County: January 2010
CALENDAR YEAR   : 2010
EVALUATION MONTH : 1
MIN/MAX TEMP    : 31.6 44.4
ABSOLUTE HUMIDITY : 23.0
FUEL RVP        : 14.3
PARTICLE SIZE   : 10.0
DIESEL SULFUR   : 320
PARTICULATE EF  : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV
PMDDR1.CSV PMDDR2.CSV

END OF RUN

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2020 Mobile 6.2 Input File

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***** Header Section *****
MOBILE6 INPUT FILE

POLLUTANTS      :

PARTICULATES    : SO4 OCARBON ECARBON GASPM LEAD BRAKE TIRE
RUN DATA
***** Run Section *****
REG DIST        : examples\tip0608b\reg2006.txt
FUEL PROGRAM    : 1
NO REFUELING    :
***** Scenario Section *****

SCENARIO RECORD : Thurston County: January 2020
CALENDAR YEAR   : 2020
EVALUATION MONTH : 1
MIN/MAX TEMP    : 31.6 44.4
ABSOLUTE HUMIDITY : 23.0
FUEL RVP        : 14.3
PARTICLE SIZE   : 10.0
DIESEL SULFUR  : 15
PARTICULATE EF  : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV
PMDDR1.CSV PMDDR2.CSV

END OF RUN
```

2030 Mobile 6.2 Input File

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***** Header Section *****
MOBILE6 INPUT FILE

POLLUTANTS      :

PARTICULATES    : SO4 OCARBON ECARBON GASPM LEAD BRAKE TIRE
RUN DATA
***** Run Section *****
REG DIST        : examples\aq2030\reg2006.txt
FUEL PROGRAM    : 1
NO REFUELING    :
***** Scenario Section *****

SCENARIO RECORD : Thurston County: January 2030
CALENDAR YEAR   : 2030
EVALUATION MONTH : 1
MIN/MAX TEMP    : 31.6 44.4
ABSOLUTE HUMIDITY : 23.0
FUEL RVP        : 14.3
PARTICLE SIZE   : 10.0
DIESEL SULFUR  : 15
PARTICULATE EF  : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV
PMDDR1.CSV PMDDR2.CSV

END OF RUN
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