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425.01 Air Quality Background

The Washington State Department of Transportation (WSDOT) evaluates the effect of projects on air emissions for the following pollutants:

- Carbon monoxide (CO)
- Course particulate matter (PM₁₀)
- Fine particulate matter (PM_{2.5})
- Mobile source air toxics (MSATs)
- Fugitive dust

Analysis for CO, PM₁₀, and PM_{2.5} is done at both the project and region level. Currently, MSATs and fugitive dust are only discussed or analyzed at the project level.

Generally, air quality analysis determines if air pollutant concentrations with our projects will exceed [National Ambient Air Quality Standards](#) (NAAQS) set by the U.S. Environmental Protection Agency (EPA) to protect human health and welfare. Concentrations can increase, as long as the result does not exceed the standard. Mitigation is evaluated for projects that do any of the following:

- Cause or contribute to any new violation of the NAAQS.
- Increase the frequency or severity of existing violation of air quality standards.
- Delay timely attainment of air quality standards.

There are no NAAQS for MSATs, so this analysis evaluates relative differences between project alternatives. Temporary construction emissions are not quantitatively analyzed for most projects. Instead, commitments for incorporating construction best management practices to reduce fugitive dust emissions are documented.

For guidance on greenhouse gas emissions, please see [Chapter 440](#) and related guidance on the WSDOT [Energy](#) web page.

425.02 Documentation and Modeling Requirements

Air quality analysis is required for all (1) nonexempt projects within nonattainment or maintenance areas, (2) projects requiring an EIS, and (3) projects that meet the requirements for MSAT analysis.

For each alternative, studies should describe the affected environment, current conformity status, latest planning assumptions (same for project and region level), analysis methodology and results, potential operational and construction impacts, recommended mitigation, and the results of interagency coordination. The [Air Quality Analysis Checklist](#) lists all the required information for document approval by WSDOT.

As of December 20, 2012, the EPA MOVES emissions model, combined with either CAL3QHC/-R or AERMOD dispersion models, is required for all project-level analyses. The analysis must use the most current model versions available at the time the environmental document is finalized.

Reminder, per [40 CFR 93.104\(d\)](#), projects must be implemented (e.g., completion of environmental documents, acquisition of right of way) within three years of the project level conformity determination or a new conformity finding is required.

(1) Exempt Projects

Exempt projects are listed in federal and state regulations ([40 CFR 93.126](#) and [WAC 173-420-110](#)). These are mostly projects that maintain existing transportation facilities, improve mass transit, or are considered to have a neutral impact on air quality. Some projects, like park and ride lots, may reduce regional air emissions but increase emissions locally, which is why they are exempt from regional but not project level conformity analysis.

The exempt list includes the category “hazard elimination program” for projects that are normally air quality neutral, like removing rock fallen from the road or replacing guardrails. However, not all projects with hazard elimination program funds are automatically exempt from conformity analysis. For example, if installation of a new traffic signal or re-striping to add new lanes is funded by the program, then conformity analysis is still required.

The metropolitan planning organization (MPO), in consultation with partner agencies, may also determine that a project on the exempt list has the potential for adverse emissions impacts and requires analysis.

(2) Region-Level Analysis

Region-level analysis is required by National and State Environmental Policy Acts (NEPA and SEPA, respectively) and Transportation Conformity Regulations, for all transportation projects that have a federal nexus or are regionally significant within CO and PM_(2.5, 10) nonattainment or maintenance areas. Regional conformity analysis is conducted by the MPO for their long-range plan and four-year transportation improvement program (TIP) (see [Chapter 200](#)). If design concept or scope changes in a way that could affect region-level emissions, the conformity determination must be updated.

Projects DO NOT conform if any of the following occur:

- Project not in a conforming program.
- Total project not included in the regional analysis and conforming TIP (may still demonstrate conformity through hotspot modeling).
- Project design and scope are significantly different from the conforming TIP.

When a project is within or affecting a nonattainment or maintenance area for CO or $PM_{(2.5, 10)}$, the project sponsor should use one of the following statements to describe the relationship of the project to the air emissions inventory in the State Implementation Plan (SIP):

- The project is in an area where the SIP does not contain transportation control measures so conformity procedures in 23 CFR 770 do not apply to this project.
- The project is in an area with transportation control measures outlined in a SIP that was approved by EPA on date. FHWA determined that the transportation plan and the TIP conform to the SIP. Since the project is included in the TIP (project #), per 23 CFR 770, it also conforms to the SIP.
- When neither statement precisely fits the situation, they can be modified. Also, if the project itself is a SIP Transportation Control Measure (TCM), this should be highlighted to emphasize the project's air quality benefits.

For an EIS on projects not in a nonattainment or maintenance area, the project is exempt from regional conformity. However, the air quality study must still include a discussion on the relationship of the project to regional emissions for NEPA.

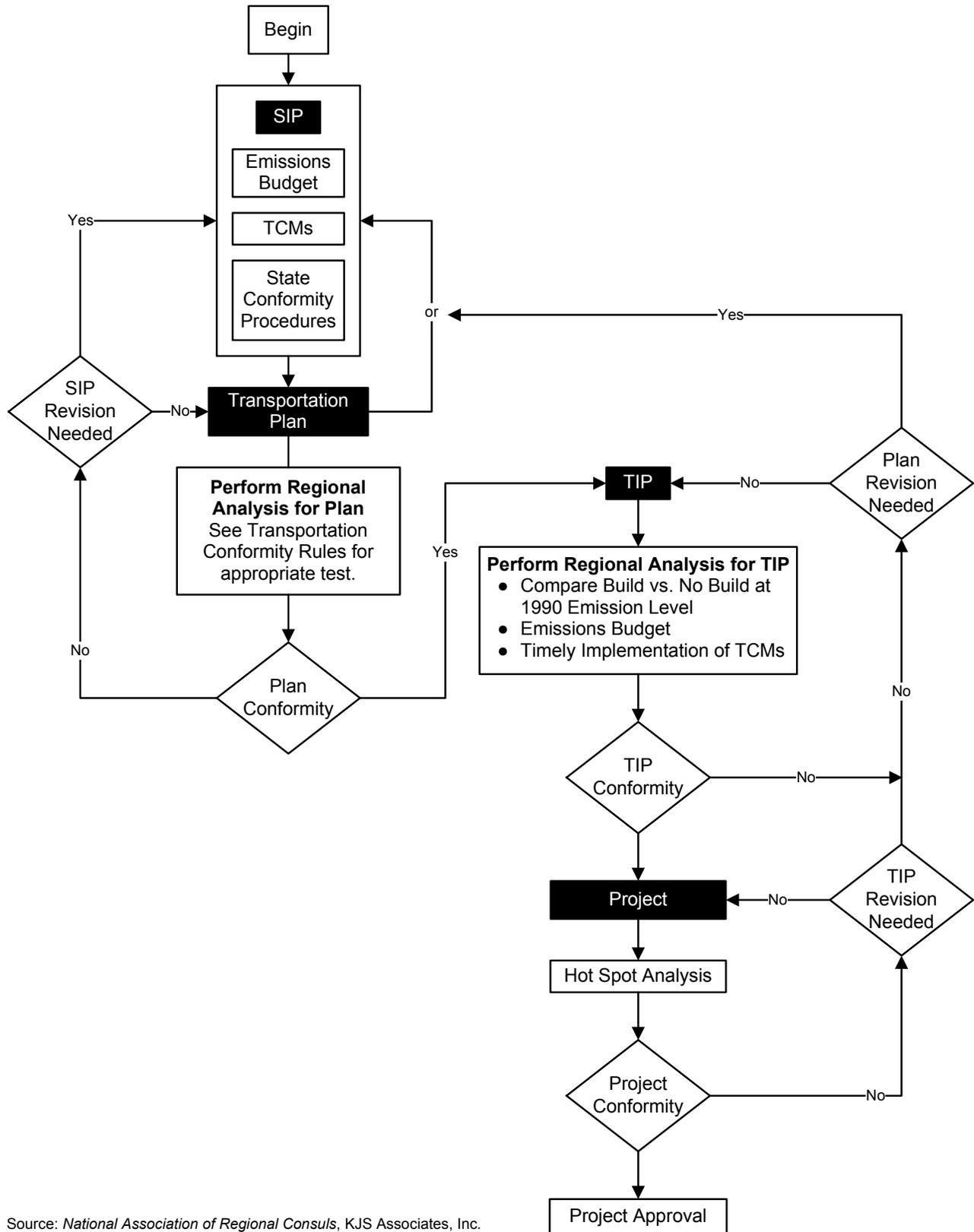
Projects that do not meet the above criteria are normally exempt from region-level analysis and documentation. See [WAC 173-420-120](#) for projects exempt from regional analysis.

(3) Project-Level Analysis

NEPA, SEPA, and *Transportation Conformity Regulations* require project-level quantitative, or “hotspot,” analysis for nonexempt projects within CO or $PM_{(2.5, 10)}$ nonattainment or maintenance areas. Exempt projects are listed in [40 CFR 93.126](#) and [40 CFR 93.128](#).

For project-level analysis, all project alternatives must be analyzed for the existing year, estimated year of completion, and design year (end year of current transportation plan). Reporting should summarize methodologies and assumptions used, provide total pollutant concentrations (project contribution plus background) at receptors for each alternative, and compare results to applicable state and national standards. A table of the results is the preferred way to display this information.

[Figure 425-1](#) summarizes the air quality analysis process.



Source: National Association of Regional Consuls, KJS Associates, Inc.

Conformity Process From Planning to Project-Level Analysis
Figure 425-1

Carbon Monoxide (CO) – *Transportation Conformity Regulations* require analysis of all intersections affected by the project within nonattainment or maintenance areas that are Level of Service (LOS) D, E, or F in the Existing or Design Year. “Affected intersections” have at least a 10 percent increase in volumes or a degradation of LOS to D or worse with the project. Choosing the top three intersections by volume and LOS is no longer an option.

When the total predicted one-hour CO concentrations (standard is 35 ppm) are less than the eight-hour CO standard (9 ppm), no separate eight-hour analysis is necessary. If the preferred alternative would result in violations of either CO standard, reasonable mitigation measures should be developed through coordination with interagency consultation partners. The air quality analysis should discuss proposed mitigation measures and include documentation of the coordination.

For quantitative CO analysis, FHWA has released a Carbon Monoxide Categorical Hotspot Finding (CMCF) that satisfies project-level conformity requirements for eligible projects.

Quantitative CO analysis may not be required where concentrations (project plus background) are known to be well below the one- and eight-hour NAAQS. This decision must be based on (1) analysis from similar projects, (2) general analyses for various classes of projects, or (3) approved “look-up” table evaluations or “categorical findings.” Where applicable, a brief statement on the basis for the decision is sufficient.

Particulate Matter (PM) – Quantitative PM_(2.5, 10) analysis is required for projects of air quality concern (POAQC). POAQs add capacity or re-align roads with more than 125,000 AADT and 8 percent trucks, more than 10,000 truck AADT (8 percent of 125,000), or that contribute to substantial increases or concentrations of diesel exhaust emissions (such as bus terminals and transfer points, designated truck routes, and freight intermodal terminals).

PM₁₀ area hotspot analysis must include both direct (exhaust, tire wear, and brake wear) and re-entrained road dust using EPA [AP-42 method](#), unless a local method is specified in the SIP. PM_{2.5} analysis does not need to include re-entrained dust.

For nonexempt projects, the interagency consultation agencies must concur that a project is not of air quality concern. If a nonexempt project is not a POAQC nor listed in [40 CFR 93.123\(b\)\(1\)](#), but does meet applicable criteria in 40 CFR 93.109, then a PM_{2.5} project-level conformity determination is required. However, these project types will not require a hotspot analysis. Instead, documentation should clarify that EPA has determined that projects not listed in [40 CFR 93.123\(b\)\(1\)](#) meet the Clean Air Act’s requirements without a hotspot analysis.

Mobile Source Air Toxics (MSATs) – WSDOT uses the same requirements as the current FHWA [interim guidance on MSATs](#) (2012) that bases the level of analysis on the type of project and project facility. Quantitative MSAT emissions analysis is required for projects on facilities with average annual daily traffic (AADT) greater than 140,000 vehicles or where there is potential for the project to substantially increase (10 percent) the number of diesel vehicles using a roadway. Qualitative MSAT evaluations may be required for projects on lower volume facilities.

Temporary Construction Emissions – For most projects, analysis of construction emissions includes a qualitative discussion of best management practices for reducing fugitive dust and a summary of any agreements between the project sponsor and local clean air agency. For some larger projects or those lasting more than five years at one location, a quantitative emissions analysis of construction activities may be recommended. Consult [the Air Quality and Energy Policy Specialist](#) for more details.

Requirements on handling and disposing of asbestos are covered in the Hazardous Materials Chapter. (See [Chapter 447](#).)

Fugitive Dust – Particulate matter is small particles suspended in the air by wind or human activity. For projects involving earthwork, construction plans and specifications should be evaluated to identify possible dust producing activities and appropriate Best Management Practices (BMPs). BMPs are required for all WSDOT projects.

BMPs generally prevent or reduce fugitive dust emissions. The four most common methods are outlined in the [Guide to Handling Fugitive Dust From Construction Projects](#) by the Associated General Contractors (AGC) of Washington and are not mutually exclusive.

- Limit creation or presence of dust-sized particles. Cover exposed surfaces, use dust suppressants, install erosion control, minimize surface disruptions, pave dirt access roads, reschedule “dusty” work on windy days, reduce vehicle speeds, minimize spills.
- Reduce wind speed at ground level.
- Bind dust particles together. Apply flocculating agents, spray water.
- Remove and capture fugitive dust from the source. Filter fabric around catch basin, Street Sweepers, wheel wash, vehicle scrape.

Although water can be one of the main control agents for dust, it is important to plan ahead for water shortages and consider the use of other measures.

425.03 Air Quality Permits and Approvals

Regional clean air agencies may require air quality permits for the following activities:

- Land clearing burns.
- Demolition of structures containing asbestos.
- Asphalt batching, mixing concrete, crushing rock, or other temporary sources (new source construction).

Specific permit requirements are listed on the WSDOT [Environmental Permitting](#) web page.

425.04 Multi-Modal and Non-Road Air Quality Requirements

Air quality analysis for rail projects, ferry routes, and air flights requires a different type of conformity analysis (general conformity). Requirements for roadways to/from ferry and aviation facilities are similar to highway projects. Consult [the Air Quality and Energy Policy Specialist](#) for more details.

425.05 Air Quality Statutes, Regulations, and Guidance

U.S. Environmental Protection Agency (EPA), Washington State Department of Ecology (Ecology), and regional clean air agencies regulate ambient air quality in Washington. Permits and approvals required pursuant to these statutes are listed in [Section 425.03](#).

(1) Federal

- National Environmental Policy Act (NEPA) [42 USC 4321](#) and federal implementing regulations [23 CFR 771](#) (FHWA) and [40 CFR 1500.1-1500.8](#) (CEQ).
- Clean Air Act (CAA) [42 USC 7401-7431](#) et seq.
- [Clean Air Act Amendments](#) (CAAA) of 1990.
- [40 CFR 93](#) Federal conformity regulations, including exempt projects in [40 CFR 93.126](#).
- [23 CFR 450](#) FHWA regulations for statewide and metropolitan transportation planning and programming are defined in Planning Assistance and Standards.
- FHWA [Technical Advisory T 6640.8A](#) for NEPA documents.

(2) State

- State Environmental Policy Act (SEPA) and state implementing regulations [WAC 197-11](#) and [WAC 468-12](#).
- Clean Air Washington Act (CAWA) – [RCW 70.94](#).
- [WAC 173-420](#) state conformity regulations, including exempt projects in [WAC 173-420-110](#) and [WAC 173-420-120](#).
- [WAC 173-400-040](#) state fugitive dust regulations.
- [Guidebook for Conformity: Air Quality Analysis Assistance for Nonattainment Areas](#) (1995).

(3) Regional

- Memorandum of Agreement on [Fugitive Dust From Construction Projects](#) (1999) between WSDOT and the Puget Sound Clean Air Agency (PSCAA).

425.06 Abbreviations and Acronyms

AADT	Average Annual Daily Traffic
BMP	Best Management Practices
CAA	Clean Air Act (Federal)
CAAA	Clean Air Act Amendments
CAWA	Clean Air Washington Act
CMAQ	Congestion Mitigation and Air Quality Improvement Program
CO	Carbon Monoxide
EMIT	Easy Mobile Inventory Tool
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
LOS	Level of Service
MPO	Metropolitan Planning Organization
MSAT	Mobile Source Air Toxic
MTIP	Metropolitan Transportation Improvement Program
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO _x	Nitrogen Oxides
O ₃	Ozone
PM ₁₀	Course particulate matter, smaller than 10 micrometers in diameter
PM _{2.5}	Fine particulate matter, smaller than 2.5 micrometers in diameter
POAQC	Project of air quality concern
ppm	Parts per million
RTIP	Regional Transportation Improvement Program
RTPO	Regional Transportation Planning Organization
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SEPA	State Environmental Policy Act (for Washington)
SIP	State Implementation Plan
SO ₂	Sulfur Dioxide
TCM	Transportation Control Measure
TIP	Transportation Improvement Program

425.07 Glossary

Air Quality Analysis – An evaluation of various air pollutants at the project level based on specific project location and type. This evaluation should include discussion of construction phase emissions such as fugitive dust, odors, and asbestos if applicable. This evaluation may include discussion of other air related concerns identified in project development.

Average Annual Daily Traffic (AADT) – The estimated average daily number of vehicles passing a point or on a road segment over the period of one year.

Carbon Monoxide (CO) – A by-product of the burning of fuels in motor vehicle engines. Though this gas has no color or odor, it can be dangerous to human health. Motor vehicles are the main source of carbon monoxide, which is generally a wintertime problem during still, cold conditions.

Conformity – Projects are in conformity when they do not (1) cause or contribute to any new violation of any standards in any area, (2) increase the frequency or severity of any existing violation of any standard in any area, or (3) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

Criteria Pollutants – Carbon monoxide, sulfur dioxide, particulate matter, ground level ozone, lead, and nitrogen dioxide.

Exempt Projects – Listed in federal and state regulations ([40 CFR 93.126](#) and [WAC 173-420-110](#)), these are mostly projects outside nonattainment/maintenance areas that maintain existing transportation facilities or are considered to have a neutral impact on air quality. See also [WAC 173-420-120](#) for projects exempt from regional analysis.

Fugitive Dust – Particulate matter that is suspended in the air by wind or human activities and does not come out of an exhaust stack.

Hot Spot Analysis – Estimate of future localized CO and PM_(10, 2.5) pollutant concentrations and a comparison of those concentrations to the National Ambient Air Quality Standards. Uses an air quality dispersion model to analyze the effects of emissions on air quality near the project on a scale smaller than the entire nonattainment or maintenance area (e.g., roadway intersections or transit terminal). (See [40 CFR 93.101](#) and [40 CFR 93.116](#).)

Maintenance Area (Air Quality) – Area previously in nonattainment now in compliance with NAAQS.

Metropolitan Transportation Improvement Program (MTIP) – A fiscally constrained prioritized listing/program of transportation projects covering a period of four years and formally adopted by an MPO in accordance with [23 CFR 450](#), as required for all regionally significant projects and projects requesting federal funding.

Mobile Source – Any nonstationary source of air pollution such as cars, trucks, motorcycles, buses, airplanes, and locomotives.

Mobile Source Air Toxic (MSAT) – Any one of six priority volatile gases or small particulate compounds coming from the tailpipe of a vehicle. The six compounds are (1) formaldehyde; (2) 1, 3 butadiene; (3) acrolein; (4) naphthalene; (5) benzene; and (6) diesel emissions.

Nonattainment Area – An area that does not meet one or more of the NAAQS for the criteria pollutants designated in the Clean Air Act.

Ozone (O₃) – Ground level ozone forms in the atmosphere as a result of complex sunlight activated chemical transformations between nitrogen oxides (NO_x) and hydrocarbons (i.e., O₃ precursors).

Particulate Matter (PM₁₀ and PM_{2.5}) – Naturally occurring and artificial particles with a diameter of less than 10 microns or 2.5 microns, respectively. Sources of particulate matter include sea salt, pollen, smoke from forest fires and wood stoves, road dust, industrial emissions, and agricultural dust. These particles are small enough to be drawn deep into the respiratory system where they can contribute to infection and reduced resistance to disease.

Projects of Air Quality Concern (POAQC) – Add capacity or re-align roads with more than 125,000 AADT and 8 percent trucks, more than 10,000 truck AADT (8 percent of 125,000), or that contribute to substantial increases or concentrations of diesel exhaust emissions (such as bus terminals and transfer points, designated truck routes, and freight intermodal terminals).

Regionally Significant Project – A nonexempt transportation project that serves regional transportation needs, major activity centers in the region, major planned developments, or transportation terminals and most terminals themselves. Such projects are normally included in the modeling of a metropolitan area's transportation network, including, at a minimum, all principal arterial highways and all fixed guide way transit facilities that offer an alternative to regional highway travel ([40 CFR 93.101](#)).

Regional Transportation Improvement Program (RTIP) – A fiscally constrained prioritized listing/program of transportation projects for a period of six years that is formally adopted by a Regional Transportation Planning Organization in accordance with [RCW 47.80](#), as required for all regionally significant projects and projects requesting federal funding.

State Implementation Plan (SIP) – Framework for complying with federal law ([40 CFR Part 51](#)) requiring that the state take action to quickly reduce air pollution in a nonattainment area and provide controls to keep the area clean for 20 years. WSDOT projects must conform to the SIP before the FHWA and the EPA can approve construction.

Transportation Improvement Program (TIP) – A staged, multiyear intermodal program of transportation projects covering a metropolitan planning area consistent with the state and metropolitan transportation plan and developed pursuant to [23 CFR 450](#). The entire program must conform to the NAAQS before any federal funding can be used for nonexempt projects.