

# Transportation Conformity

## A Basic Guide for State & Local Officials

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A Basic Guide for  
State & Local  
Officials

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## Contents

Executive Summary.....	1
Purpose of this Guide .....	4
Introduction .....	4
Transportation Conformity and Actions Subject to Conformity .....	4
Description of a Conformity Determination .....	6
Responsibility for Making a Conformity Determination.....	6
Frequency Requirements for Transportation Conformity .....	8
Key Elements of a Metropolitan Transportation Plan/TIP Conformity Determination .....	8
Project-Level Conformity and Hot-Spot Analysis .....	10
Conformity Lapse and Lapse Grace Period .....	12
Options for MPOs to Reduce Emissions .....	12
Appendix A: Health Effects of Pollutants .....	13
Appendix B: Options to Reduce Emissions from On-Road Motor Vehicles .....	14
Appendix C: Resource Agencies and Other Helpful Contacts .....	16
Glossary.....	17





**This document has been prepared for State and local officials who are involved in decision making on transportation investments.**

## Executive Summary

### State's air quality implementation plan (SIP)

The concept of transportation conformity was introduced in the Clean Air Act (CAA) of 1977, which included a provision to ensure that transportation investments conform to a State implementation plan (SIP) for meeting the Federal air quality standards. Conformity requirements were made substantially more rigorous in the CAA Amendments of 1990. The transportation conformity regulations<sup>1</sup> that detail implementation of the CAA requirements were first issued in November 1993, and have been amended several times. The regulations establish the criteria and procedures for transportation agencies to demonstrate that air pollutant emissions from metropolitan transportation plans, transportation improvement programs and projects are consistent with ("conform to") the State's air quality goals in the SIP. This document has been prepared for State and local officials who are involved in decision making on transportation investments.

### What is Transportation Conformity?

Transportation conformity is required under CAA Section 176(c) to ensure that Federally-supported transportation activities are consistent with ("conform to") the purpose of a State's SIP. Transportation conformity establishes the framework for improving air quality to protect public health and the environment. Conformity to the purpose of the SIP means Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) funding and approvals are given to highway and transit activities that will not cause new air quality violations, worsen existing air quality violations, or delay timely attainment of the relevant air quality standard, or any interim milestone.

### Where Does Transportation Conformity Apply?

Conformity requirements apply in areas that either do not meet or previously have not met national ambient air quality standards (NAAQS) for ozone (O<sub>3</sub>), carbon monoxide (CO), particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), or nitrogen dioxide (NO<sub>2</sub>). These areas are known as "nonattainment areas" and "maintenance areas," respectively.

### What Actions Are Subject to Conformity?

In areas that are nonattainment or maintenance for one or more of the pollutants mentioned above, conformity applies to long-range metropolitan transportation plans, shorter-term metropolitan transportation improvement programs (TIPs), and transportation projects funded or approved by FHWA or FTA.

<sup>1</sup>Title 40 CFR Parts 51 and 93.

**The projected emissions must meet the requirements of the budget test and/or interim emissions test depending on the area.**

## **Transportation Conformity**

**A Basic Guide for State & Local Officials**

### **What is a Conformity Determination?**

A conformity determination demonstrates that implementation of the metropolitan transportation plan, TIP, or project will not cause any new violations of the air quality standard, increase the frequency or severity of violations of the standard, or delay timely attainment of the standard or any interim milestone. For metropolitan transportation plan and TIP conformity, the determination shows that the total emissions from on-road travel on an area's transportation system are consistent with goals for air quality found in the SIP. Before a SIP is available, other tests of conformity are used. For project-level conformity, the determination shows that the project is consistent with the regional conformity determination and that potential localized emissions impacts are addressed.

### **Who is Responsible for Making a Conformity Determination?**

Conformity determinations are made by FHWA/FTA. Metropolitan planning organization (MPO) policy boards make initial conformity determinations for metropolitan transportation plans and TIPs in metropolitan areas, while State Departments of Transportation (DOTs) usually do so in areas without MPOs and typically conduct the analyses associated with project-level conformity. A formal interagency consultation process is required for developing SIPs, metropolitan transportation plans, TIPs, and making conformity determinations, and includes the Environmental Protection Agency (EPA), FHWA, FTA, and State and local transportation and air quality agencies.

### **How Frequently are Conformity Determinations Required?**

Conformity determinations must be made at least every four years, but may occur more often if metropolitan transportation plans or TIPs are updated more frequently or amended with non-exempt projects. Also, conformity determinations must be made within 24 months after SIP motor vehicle emissions budgets (MVEB) are found adequate or approved, whichever is first. Project-level conformity must be determined prior to the first time a non-exempt Federal project is adopted, accepted, approved, or funded. In addition, conformity determinations must be made within 12 months of an area being designated by EPA as nonattainment for ozone, carbon monoxide, particulate matter, or nitrogen dioxide.

### **How is the Public Involved?**

A conformity analysis is made available to the public as part of the MPO metropolitan transportation planning process. MPOs are required to make metropolitan transportation plans, TIPs, and conformity determinations available to the public, to accept and respond to public comment, and to provide adequate notice of relevant public meetings. Project sponsors must also provide an opportunity for public involvement during the project development process where otherwise required by law.

### **How is Metropolitan Transportation Plan/TIP Conformity Determined?**

Regional emissions are estimated based on projected travel on existing and planned highway and public transportation facilities consistent with an area's metropolitan transportation plan and TIP. Projected emissions must be based on the latest available information and the latest EPA-approved emissions estimation model. The projected emissions must meet the requirements of the budget test and/or interim emissions test depending on the area. Also, the MPO is required to demonstrate that Transportation Control Measures (TCMs) in approved SIPs are implemented in a timely fashion. In addition, interagency consultation is required on the conformity determination.

### **What is a State Implementation Plan (SIP)?**

A SIP is the State air quality plan for meeting the National Ambient Air Quality Standards ("NAAQS" or "air quality standards".) It is a compilation of legally enforceable rules and regulations prepared by a State or local air quality agency and submitted by the State's governor to EPA for approval. A SIP is designed to achieve better air quality by attaining, making progress toward attaining, or maintaining the NAAQS.

The SIP assigns emissions reductions for each pollutant or precursor for each source type (on-road motor vehicles, non-road equipment and vehicles, stationary, and area sources).

### **What are Motor Vehicle Emissions Budgets?**

A motor vehicle emissions budget (MVEB) is that portion of the total allowable emissions in the SIP that is allocated to on-road mobile sources, such as cars, trucks, and buses. It is the level of on-road emissions that the area can have and still meet the SIP's goals. Budgets are established in the applicable SIP as part of the air quality planning process by State air quality or environmental agencies, and approved by EPA.



Transportation agencies participate in this process in accordance with required interagency consultation procedures.

For transportation conformity, projected emissions from highway and public transportation use must be less than or equal to the budgets. In other words, the budget acts as a ceiling on emissions from the on-road transportation sector.

#### **What are Transportation Control Measures (TCMs)?**

TCMs are specific projects or programs designed to reduce emissions from transportation sources that are included in the approved SIP. Examples include programs for improving public transportation, developing high occupancy vehicle (HOV) lanes, and ordinances to promote non-motorized vehicle travel.

#### **What is Project-Level Conformity?**

All Federally-funded or approved highway and public transportation projects subject to conformity are required to meet project-level conformity requirements. To demonstrate project-level conformity, a project must come from a conforming metropolitan transportation plan and TIP; its design concept and scope must not have changed significantly from that in the metropolitan transportation plan and TIP; the analysis must have used the latest planning assumptions and latest emissions model; and in PM areas, there must be a demonstration of compliance with any control measures in the SIP. In carbon monoxide and particulate matter nonattainment and maintenance areas, additional analysis may be necessary to determine if a project has localized air quality impacts. This localized air analysis is referred to as a "hot-spot" analysis.

#### **What Happens if an MPO Cannot Make a Conformity Determination?**

When a conformity determination is not made according to schedule, areas have a one-year grace period to make the determination before there is a conformity lapse. During a lapse, only certain types of projects can proceed: (1) projects that are exempt from conformity; (2) TCMs in approved SIPs; and (3) projects or project phases that are already authorized. Also, during a lapse no new non-exempt projects can be amended into the metropolitan transportation plan/TIP and the use of Federal-aid funds is restricted. The one-year conformity lapse grace period does not apply to new nonattainment areas that must make a determination on their metropolitan transportation plans and TIPs within 12 months of final designation.

#### **What Options Do States and MPOs Have to Reduce Emissions?**

A variety of projects and programs can be implemented to reduce emissions. Options include traditional investments like public transportation, HOV lanes, and signal timing, as well as technology-based measures such as retrofitting, repowering, replacing heavy-duty diesel trucks or implementing idling reduction programs.

**All Federally-funded or approved highway and public transportation projects subject to conformity are required to meet project-level conformity requirements.**

This Guide was prepared to help State and local officials understand transportation conformity and how conformity requirements relate to transportation investments in their communities.

## Transportation Conformity

A Basic Guide for State & Local Officials

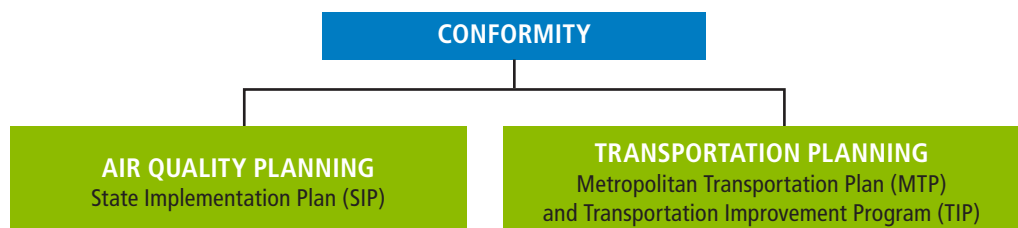
## Purpose of this Guide

This Guide was prepared to help State and local officials understand transportation conformity and how conformity requirements relate to transportation investments in their communities. Specifically, the implications of conformity on metropolitan transportation plans, transportation improvement programs (TIPs), and transportation projects are discussed. The Guide provides overview information on the major elements of the conformity process and provides answers to basic questions.<sup>2</sup> Several exhibits are included in the Guide to illustrate key elements of the conformity process. Appendices are also included that discuss the health effects of pollutants, options to reduce on-road mobile source emissions, and resource agency contacts.

## Introduction

The air quality provisions of the Clean Air Act (CAA) and the metropolitan transportation planning provisions of Title 23 and Title 49 of the United States Code<sup>3</sup> require a planning process that integrates air quality and metropolitan transportation planning such that transportation investments support clean air goals. This process is known as transportation conformity and is carried out in accordance with 40 CFR Parts 51 and 93<sup>4</sup>. Exhibit 1 illustrates how conformity plays a central role as the link between transportation and air quality planning.

### EXHIBIT 1 Conformity Links Air Quality and Transportation Planning



## Transportation Conformity and Actions Subject to Conformity

Transportation conformity is a process required by the CAA Section 176(c), which establishes the framework for improving air quality to protect public health and the environment. The goal of transportation conformity is to ensure that FHWA and FTA funding and approvals are given to highway and public transportation activities that are consistent with air quality goals.

The CAA requires that metropolitan transportation plans, TIPs, and Federal projects conform to the purpose of the SIP. Conformity to a SIP means that such activities will not cause or contribute to any new violations of the NAAQS; increase the frequency or severity of NAAQS violations; or delay timely attainment of the NAAQS or any required interim milestone. Conformity requirements apply in areas that either do not meet or previously have not met air quality standards for ozone, carbon monoxide, particulate matter, or nitrogen dioxide. These areas are known as “nonattainment areas” or “maintenance areas,” respectively. For a complete list of nonattainment and maintenance areas for these and other pollutants see 40 CFR Part 81 or <https://www.epa.gov/green-book>.

### Pollutants that Come from On-Road Vehicles (e.g., Cars, Trucks, Buses)

Transportation sources contribute to four of the six criteria pollutants for which EPA has established standards to protect public health and/or safety. The pollutants are: ozone (O<sub>3</sub>), carbon monoxide (CO), particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), and nitrogen dioxide (NO<sub>2</sub>). Appendix A provides basic facts about health impacts of these pollutants. Exhibit 2 shows the proportion of PM<sub>10</sub>, PM<sub>2.5</sub>, nitrogen oxides (NO<sub>x</sub>), volatile organic compounds (VOCs), and CO emissions from the various sources of pollution. Exhibit 3 shows the on-road percentage of total emissions by pollutant in 2011.

<sup>2</sup>Many additional documents and training materials are available at [www.fhwa.dot.gov/environment/air\\_quality/conformity/](http://www.fhwa.dot.gov/environment/air_quality/conformity/) and <https://www.epa.gov/state-and-local-transportation> that address the technical requirements of transportation conformity.

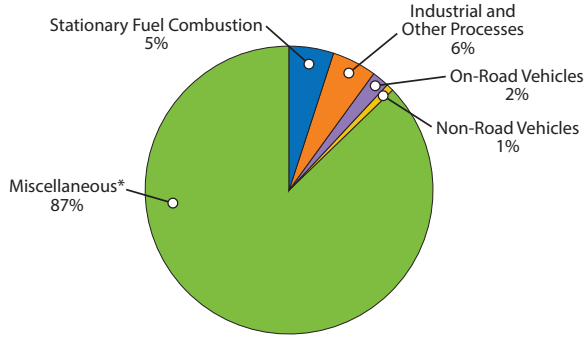
<sup>3</sup>Title 23 and Title 49 of the United States Code (U.S.C.) codify the transportation laws including the Fixing America's Surface Transportation Act (FAST Act). These include transportation planning provisions that govern the programs of the FHWA and the FTA.

<sup>4</sup>The transportation conformity rule is available at [https://www.fhwa.dot.gov/environment/air\\_quality/conformity/laws\\_and\\_regs/](https://www.fhwa.dot.gov/environment/air_quality/conformity/laws_and_regs/).



**EXHIBIT 2**

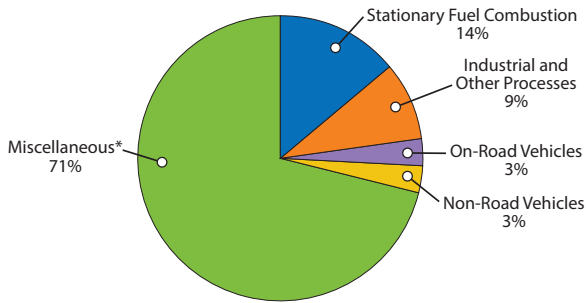
**Proportion of PM<sub>10</sub>, PM<sub>2.5</sub>, Nitrogen Oxides (NO<sub>x</sub>), Volatile Organic Compounds (VOCs), and CO Emissions from the Various Sources of Pollution**



**PM<sub>10</sub> Emissions 2013**

Source: U.S. Environmental Protection Agency, Clearinghouse for Inventories and Emissions Factors (CHIEF), Current Emission Trends Summaries

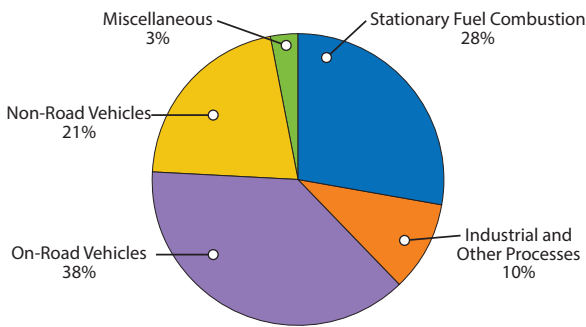
\*Miscellaneous sources include prescribed fires and wildfires, dust from paved and unpaved roads, road construction, and agriculture operations.



**PM<sub>2.5</sub> Emissions 2013**

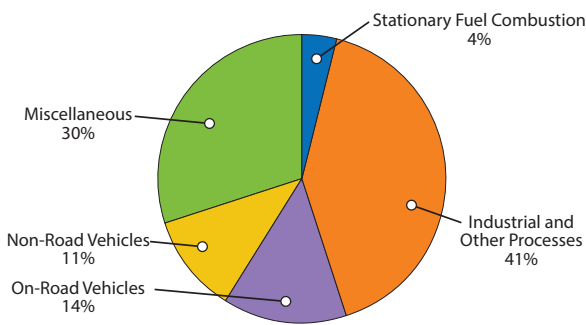
Source: U.S. Environmental Protection Agency, Clearinghouse for Inventories and Emissions Factors (CHIEF), Current Emission Trends Summaries

\*Miscellaneous sources include prescribed fires and wildfires, dust from paved and unpaved roads, road construction, and agriculture operations.



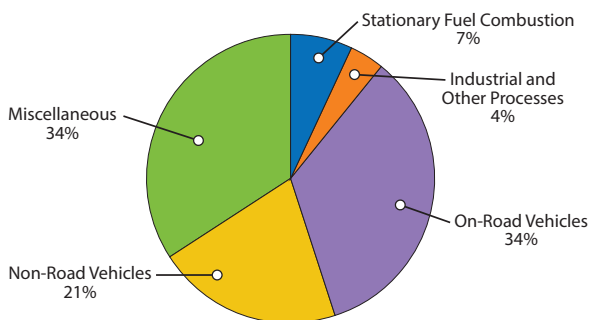
**NO<sub>x</sub> Emissions 2013**

Source: U.S. Environmental Protection Agency, Clearinghouse for Inventories and Emissions Factors (CHIEF), Current Emission Trends Summaries



**VOC Emissions 2013**

Source: U.S. Environmental Protection Agency, Clearinghouse for Inventories and Emissions Factors (CHIEF), Current Emission Trends Summaries

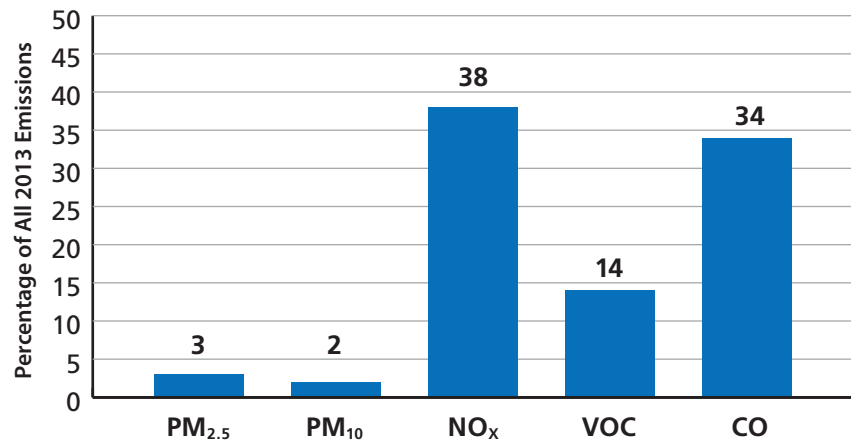


**CO Emissions 2013**

Source: U.S. Environmental Protection Agency, Clearinghouse for Inventories and Emissions Factors (CHIEF), Current Emission Trends Summaries

### EXHIBIT 3

#### Emissions from On-Road Mobile Sources as Percentage of All Sources for Each Pollutant in 2013



U.S. Environmental Protection Agency, Clearinghouse for Inventories and Emissions Factors (CHIEF), Current Emission Trends Summaries

### Description of a Conformity Determination

For metropolitan transportation plan and TIP conformity, the determination shows that the total emissions from on-road travel on an area's transportation system are consistent with goals for air quality found in the SIP. Before a SIP is available, other tests of conformity are used. For project-level conformity, a project must come from a conforming metropolitan transportation plan and TIP, its design concept and scope must not have changed significantly from that in the metropolitan transportation plan and TIP, and it addresses potential localized emissions impacts.

A conformity determination demonstrates that implementation of the metropolitan transportation plan, TIP, or project will not cause any new violations of the air quality standard, increase the frequency or severity of violations of the standard, or delay timely attainment of the standard or any interim milestone.

### Responsibility for Making a Conformity Determination

The policy board of an MPO must formally make an initial conformity determination on its metropolitan transportation plans and TIPs prior to submitting them to FHWA/FTA for an independent review and conformity determination. The conformity process is done in accordance with the required interagency consultation process described in Exhibit 4. For individual projects including those in rural areas, the State DOT or project sponsor usually prepares the conformity analysis. FHWA or FTA must make a project-level conformity determination prior to project approval and/or funding. Exhibit 4 shows the typical roles and responsibilities of the various agencies.

## Transportation Conformity

A Basic Guide for  
State & Local  
Officials

**EXHIBIT 4**

**Roles and Responsibilities of Federal, State, and Local Transportation and Air Quality Agencies in Transportation Conformity and SIP Development Process**

(Specific States and metropolitan areas may have negotiated different assignments of responsibility tailored to local conditions.)

AGENCIES	ROLES AND RESPONSIBILITIES	WHEN
MPO	<ul style="list-style-type: none"> <li>• Conduct analysis on metropolitan transportation plan/TIP</li> <li>• Incorporate latest emissions factors, planning assumptions, and emissions models</li> <li>• Circulate draft metropolitan transportation plan/TIP for interagency and public comment based on public involvement procedures adopted by the MPO</li> <li>• Ensure public involvement procedures are followed</li> <li>• Ensure timely implementation of TCMs</li> <li>• Respond to significant comments on TIP/metropolitan transportation plan conformity documents</li> <li>• Determine conformity on metropolitan transportation plan/TIP</li> <li>• Consult with agencies throughout the conformity determination process</li> <li>• Consult on the development of the SIP and MVEB</li> <li>• May elect to shorten conformity horizon after consultation with air agency and public comment</li> <li>• Participate in the TCM substitution process</li> <li>• Concur on TCM substitutions</li> </ul>	<ul style="list-style-type: none"> <li>• At least every 4 years or when a metropolitan transportation plan/ TIP is updated or amended with non-exempt projects</li> <li>• 24 months after certain SIP actions</li> <li>• 12 months after new nonattainment designations become effective</li> <li>• As needed</li> </ul>
State/Local Transportation Agency	<ul style="list-style-type: none"> <li>• Consult with agencies throughout the conformity determination process</li> <li>• Conduct regional conformity analysis on projects not in metropolitan areas, based on interagency consultation</li> <li>• In CO and PM nonattainment and maintenance areas, conduct “hot-spot” analysis, if necessary as part of a project-level conformity determination</li> <li>• Provide for public involvement/respond to significant comments</li> <li>• Ensure timely implementation of TCMs</li> <li>• Review and approve regional and hot-spot analysis</li> <li>• Consult on the development of the SIP and MVEB</li> <li>• Participate in the TCM substitution process</li> <li>• Concur on TCM substitutions in isolated rural areas</li> </ul>	<ul style="list-style-type: none"> <li>• As needed</li> </ul>
State/Local Air Quality/ Environmental Agency	<ul style="list-style-type: none"> <li>• Prepare SIP for each relevant pollutant</li> <li>• Ensure interagency involvement during SIP development (including the State DOT and MPO(s))</li> <li>• Hold public hearings prior to SIP adoption</li> <li>• Ensure SIPs are complete and control measures are enforceable under the 1990 CAA, prior to board approval action</li> <li>• Ensure latest emissions factors and planning assumptions are used for SIP development</li> <li>• Review and approve SIP, forward to EPA for Federal approval</li> <li>• Participate in the interagency consultation process for metropolitan transportation plan/TIP/ project development and conformity determinations</li> <li>• Consult on shortened conformity horizon</li> <li>• Participate in the TCM substitution process and submit substitute TCM to EPA</li> <li>• Concur on TCM substitutions</li> </ul>	<ul style="list-style-type: none"> <li>• As needed</li> </ul>
State Legislature	<ul style="list-style-type: none"> <li>• Adopt State legislation to develop and enforce applicable CAA provisions</li> <li>• Ensure funding available for implementation of programs and projects</li> </ul>	<ul style="list-style-type: none"> <li>• As needed</li> </ul>
FHWA/FTA	<ul style="list-style-type: none"> <li>• Make conformity determinations on metropolitan transportation plans/TIPs updates/amendments and projects</li> <li>• Participate in the interagency consultation process for metropolitan transportation plan/TIP development and conformity determinations</li> <li>• Ensure timely implementation of TCMs</li> <li>• Ensure MPOs allow for adequate public involvement</li> <li>• Ensure that all other conformity and metropolitan transportation planning requirements are met</li> <li>• Develop technical guidance on traffic demand and forecasting, and Federal aid program guidance</li> <li>• Consult on the development of the SIP and MVEB</li> </ul>	<ul style="list-style-type: none"> <li>• At least every 4 years or when a metropolitan transportation plan/ TIP is updated or amended with non-exempt projects</li> <li>• 24 months after certain SIP actions</li> <li>• 12 months after new nonattainment designations become effective</li> <li>• As needed</li> </ul>
EPA	<ul style="list-style-type: none"> <li>• Develop conformity rules, regulations, and guidance documents</li> <li>• Consult on the development of the SIP and MVEB</li> <li>• Review submitted budgets for adequacy and implement adequacy process</li> <li>• Provide technical guidance on TCMs and SIP development</li> <li>• Review and comment on draft and submitted control strategy and maintenance SIPs</li> <li>• Review, comment, and approve SIPs</li> <li>• Participate in the interagency consultation process for metropolitan transportation plan/TIP/ project development and conformity determinations</li> <li>• Review and comment on proposed conformity determinations</li> <li>• Designate approved emissions models for use in SIP development and conformity determinations</li> <li>• Designate “guideline” dispersion models for project-level emissions analysis</li> <li>• Participate in the TCM substitution process and codify substitute TCM into SIPs</li> <li>• Concur on TCM substitutions</li> </ul>	<ul style="list-style-type: none"> <li>• As needed</li> </ul>

The conformity rule requires that Federal, State, and local transportation and air quality agencies establish formal procedures to ensure interagency coordination on critical issues.

## Transportation Conformity

A Basic Guide for State & Local Officials

### Frequency Requirements for Transportation Conformity

Conformity determinations must be made at least every four years, but may occur more often if metropolitan transportation plans or TIPs are updated more frequently or amended with non-exempt projects. In addition, certain SIP actions relating to MVEBs may also require an updated conformity determination within 24 months. Also, conformity must be demonstrated within 12 months of EPA's designation of an area as nonattainment for any transportation-related criteria pollutant. Project-level conformity must be determined prior to the first time a non-exempt Federal project is adopted, accepted, approved, or funded.

### Key Elements of a Metropolitan Transportation Plan/TIP Conformity Determination

**One way to understand transportation conformity is to know the key requirements and how they interact. The major components of a conformity determination include:**

- Interagency Consultation
- Public Involvement
- Latest Planning Assumptions and Emissions Model
- Regional Emissions Analysis
  - Motor Vehicle Emissions Budget
- Timely Implementation of Transportation Control Measures
- Fiscal Constraint

#### Interagency Consultation

**Experience has shown that ongoing coordination and communication between Federal, State, and local transportation and air quality agencies is vital to a smoothly running conformity process. In addition, a clear understanding of roles and responsibilities of participating agencies is essential.**

The conformity rule requires that Federal, State, and local transportation and air quality agencies establish formal procedures to ensure interagency coordination on critical issues. Typical participants in interagency consultation include FHWA, FTA, EPA, State DOTs, MPOs and other local transportation agencies, and State and regional air quality agencies. In addition, public transportation operators are often active participants in interagency consultation. Interagency consultation is a forum for discussing key assumptions to be used in conformity analyses, strategies to reduce mobile source emissions, specific impacts of major projects, issues associated with travel demand and emissions modeling, and the development of MVEBs. The specific process that will be followed in each area must be adopted as part of the SIP and must be used to develop metropolitan transportation plans, TIPs, and the SIP. These adopted interagency consultation procedures are included in the "conformity SIP."

#### Public Involvement

**Good public involvement processes are proactive, easily accessible to the public, and keep the public informed on an ongoing basis.**

MPOs are required to make metropolitan transportation plans, TIPs, and conformity determinations available for public review. MPOs must also respond to public comment and provide adequate notice of relevant meetings. Project sponsors must also provide an opportunity for public involvement during the project development process where otherwise required by law. The public involvement requirements for transportation planning must be met; there are no additional public involvement requirements for conformity.

#### Latest Planning Assumptions and Emissions Model

**Conformity determinations must be based on the latest planning assumptions and the latest EPA-approved emissions estimation model at the time the conformity analysis begins. This requirement ensures that the latest planning, travel, vehicle age and fleet mix, demographic, and economic assumptions are reflected in conformity determinations.**

The latest planning assumptions available at the time the conformity analysis begins include population, employment, travel needs, vehicle fleet composition (proportions of types of vehicles), land use, and economic development. The conformity rule requires that when metropolitan transportation plans and TIPs are developed or updated, the assumptions used to forecast future conditions must be based on the latest available information. Current motor vehicle fleet information is essential to good planning and forecasting and is one of the key planning assumptions in conformity. Likewise, the latest EPA-approved emissions estimation model must be used that reflects the latest science and policies regarding motor vehicle emissions and the emissions benefits of cleaner engine and fuel standards.

## Regional Emissions Analysis

**Regional emissions analysis is the key analytical component of a conformity determination. The analysis supports the demonstration that transportation investments are consistent with air quality goals.**

Estimating regional emissions from on-road mobile sources traveling on the planned transportation system is essential to a conformity determination. The conformity rule requires that future emissions estimates include the entire horizon of the metropolitan transportation plan (at least 20 years) for the region. Note that MPOs have the option to shorten the time horizon for the conformity demonstration if certain requirements are met. The regional emissions that are forecast through models are compared to the MVEB (“budget”) from the SIP that sets a limit on emissions from on-road sources. This budget cannot be exceeded in order for an area to make a conformity determination. In the absence of an approved or adequate budget, areas must pass interim tests that basically compare emissions associated with the proposed transportation network (“build” scenario) with emissions from either a “no-build” scenario or baseline year, or both. The regional emissions analysis is based on motor vehicle travel across the entire current and planned transportation system and reflects the investments detailed in the metropolitan transportation plan and TIP.

## Motor Vehicle Emissions Budget

The SIP accounts for emissions of each pollutant for each source type. There are four types of sources: on-road mobile, non-road mobile, stationary (e.g., refineries), and area (e.g., dry cleaners). The State air quality agency is responsible for the development of the entire SIP. The air quality agency identifies how pollution from all sources will be reduced sufficiently to achieve the purpose of the SIP. Required emissions reductions are calculated, and control measures are adopted to achieve needed reductions.

An MVEB is that portion of the total allowable emissions in the SIP that is allocated to on-road mobile sources, such as cars, trucks, and buses. It is the level of on-road emissions that the area can have and still meet the SIP’s goals. Budgets are established in the applicable SIP as part of the air quality planning process by State air quality or environmental agencies, and approved by EPA. Transportation agencies participate in this process in accordance with required interagency consultation procedures.

For transportation conformity, projected emissions from highway and public transportation use must be less than or equal to the budgets. In other words, the budget acts as a ceiling on emissions from the on-road mobile sector.

## Timely Implementation of Transportation Control Measures (TCMs)

**When an EPA-approved SIP includes TCMs, each time a conformity determination is made, the MPO must demonstrate that these measures are being implemented on schedule as called for in the SIP.**

TCMs are measures included in an approved SIP to help reduce emissions from on-road mobile sources. Section 93.101 of the conformity regulations contains a definition of TCMs for conformity purposes. Some of these measures are specifically listed in the CAA<sup>5</sup>, and transportation and air quality agencies often consider whether such measures are beneficial and needed to meet air quality requirements. TCMs are designed to reduce emissions from motor vehicles by reducing vehicle use, changing traffic flow, or changing congestion conditions. Examples include high-occupancy vehicle (HOV) lanes, improving public transportation, and vanpooling programs. If an EPA-approved SIP includes any of these measures, the MPO must show, as part of the conformity determination, that the measures are being implemented on schedule and given priority for Federal funding. Not all areas have these measures in their approved SIPs; nevertheless, these types of measures are often routinely implemented through the metropolitan transportation plan and TIP (e.g., public transportation services, telecommuting programs). If not included in an approved SIP, such measures are not TCMs for the purpose of conformity, and the MPO does not have to demonstrate their timely implementation.

If an MPO finds that a TCM has become delayed, the MPO may decide to replace the delayed TCM with a new TCM through a process called TCM substitution<sup>6</sup> in order to meet its timely implementation requirement. Through this process, an MPO does not need to go through a full SIP revision in order to substitute the delayed TCM for a new TCM.

<sup>5</sup> CAA Section 108(f)(1)(A)

**Estimating regional emissions from on-road mobile sources traveling on the planned transportation system is essential to a conformity determination.**

Project-level conformity determinations are required for Federal highway and transit projects in nonattainment and maintenance areas.

## Transportation Conformity

A Basic Guide for State & Local Officials



### Fiscal Constraint

**Metropolitan transportation plans and TIPS in nonattainment or maintenance areas must be shown to meet the FHWA/FTA fiscal constraint requirements.**

The FHWA/FTA transportation planning regulations<sup>6</sup> require that metropolitan transportation plans and TIPS be based upon reasonable estimates about future revenues. In addition, in the first two years of the TIP, projects must be limited to those for which funds are known to be available or committed. This is known as fiscal constraint. The conformity rule requires that the fiscal constraint requirements of the planning regulations be met prior to determining conformity on a metropolitan transportation plan or TIP.

### Project-Level Conformity and Hot-Spot Analysis

Project-level conformity determinations are required for Federal highway and transit projects in nonattainment and maintenance areas. The project must come from a conforming metropolitan transportation plan and TIP. Additionally, as part of these project-level determinations, in carbon monoxide and particulate matter nonattainment and maintenance areas, localized analysis requirements apply for certain Federally-funded or approved projects. This analysis is called “hot-spot” analysis.

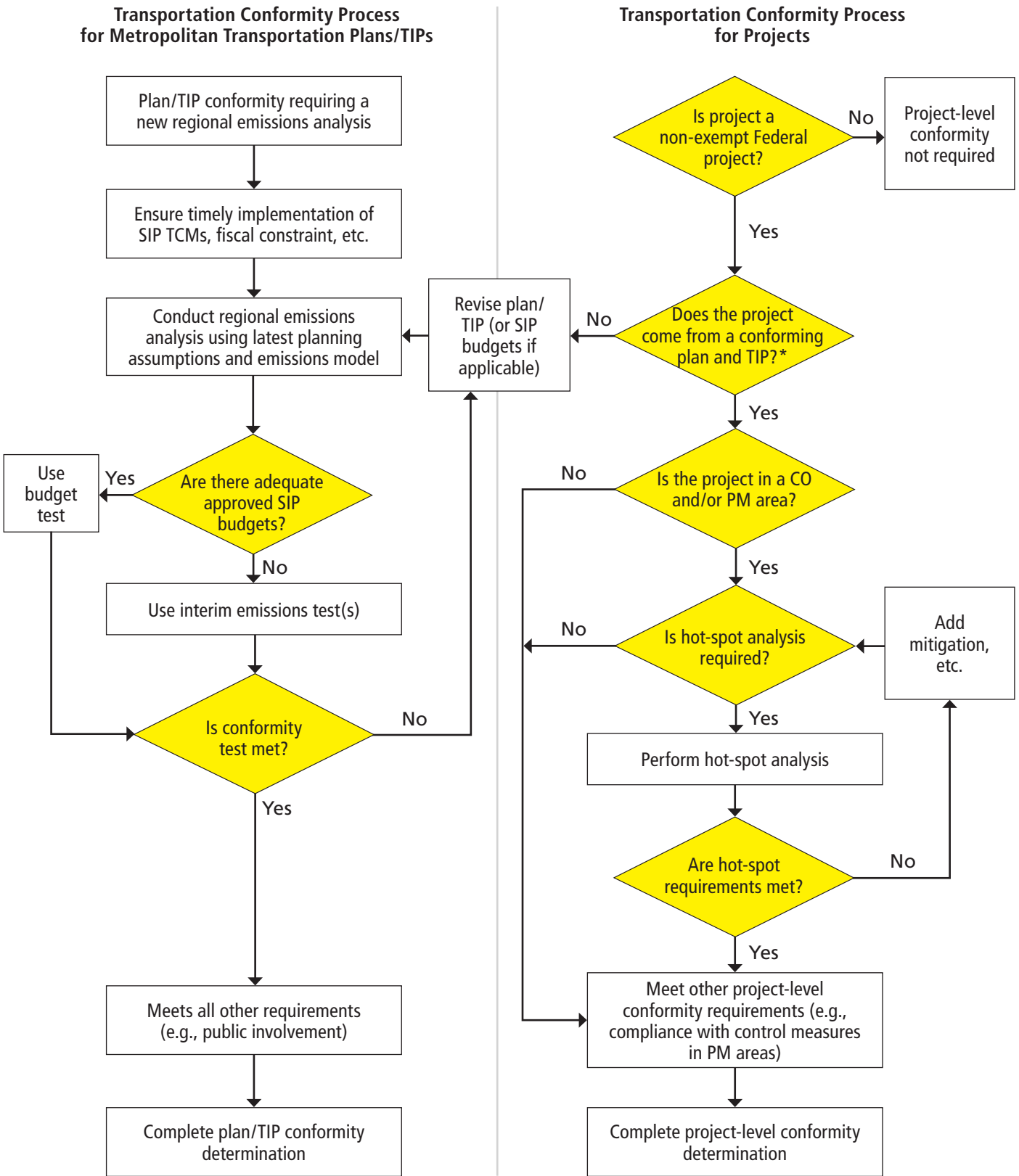
Exhibit 5 shows a simplified version of the transportation conformity process for metropolitan transportation plans/TIPS and projects.

<sup>6</sup>Guidance for Implementing the Clean Air Act Section 176(c)(8) Transportation Control Measure Substitution and Addition Provision - EPA-420-B-09-002, January 2009

<sup>7</sup>23 CFR Part 450

**EXHIBIT 5**

**Transportation Conformity Process for Metropolitan Transportation Plans/TIPs and Projects**



 Denotes key interagency consultation points

\*Does not apply to donut or isolated rural areas

**If a conformity determination is not made according to the required frequency requirements, areas have a one-year grace period after the missed deadline before a conformity lapse applies.**

## **Transportation Conformity**

**A Basic Guide for State & Local Officials**



### **Conformity Lapse and Lapse Grace Period**

If a conformity determination is not made according to the required frequency requirements, areas have a one-year grace period after the missed deadline before a conformity lapse applies. (This one-year grace period does not apply to newly designated nonattainment areas.) During the 12-month grace period, only transportation projects in the most recent conforming metropolitan transportation plan and TIP can be funded or approved. Once an area is in a conformity lapse, the use of Federal transportation funds is restricted to certain kinds of projects and no new non-exempt projects can be amended into the metropolitan transportation plan/TIP. These include “exempt projects” such as safety projects and certain mass transit projects, TCMs from an approved SIP, and project phases that were authorized by FHWA/FTA prior to the lapse. The FHWA and FTA do not reduce the amount of funding a State receives if there is a lapse; however, use of Federal funds is restricted during the lapse.

#### **Options to Resolve a Conformity Lapse**

Often, a lapse may occur due to a missed deadline such as an expired metropolitan transportation plan, TIP, or conformity determination. In this case, the lapse may be resolved by completing the necessary steps to fulfill transportation or air quality planning requirements. There are two options to resolving a conformity lapse if emissions estimates exceed the MVEB: change the projects in the metropolitan transportation plan or TIP (either the mix or timing of projects), and/or revise the MVEB. In order to revise an MVEB, a SIP revision is required. Also, in order to revise a budget, the State air quality agency may need to identify additional control measures from on-road or other sources of pollution in order to increase the budget for on-road emissions.

#### **Options for MPOs to Reduce Emissions**

The MPO can adopt projects in the metropolitan transportation plan and TIP that help to reduce emissions. Examples include: HOV lanes, public transportation investments, signal timing, bicycle lanes, and coordinating land use planning with transportation planning. Other projects that can be implemented including retrofitting, repowering, or scrapping old trucks; supporting idling reduction at truck stops; or encouraging accelerated use of cleaner fuels, especially low sulfur diesel fuel. Appendix B includes a more detailed discussion of options to reduce emissions from on-road motor vehicles.



## Appendix A: Health Effects of Pollutants

EPA has established standards<sup>8</sup> for four transportation-related pollutants:

- ground level ozone formed by volatile organic compounds (VOCs) and oxides of nitrogen (NO<sub>x</sub>);
- carbon monoxide (CO);
- particulate matter (less than 10 microns (PM<sub>10</sub>) and less than 2.5 microns (PM<sub>2.5</sub>); and,
- nitrogen dioxide (NO<sub>2</sub>).

The standards are based upon EPA's assessment of the health risks associated with each of the pollutants on at-risk populations. These assessments are based upon short- and long-term scientific studies by noted health professionals and medical research institutions. At-risk groups include children, the elderly, persons with respiratory illnesses, and even healthy people who exercise outdoors.

Air pollution often involves a complex set of chemical reactions, including combinations of pollutants and other factors such as weather and geography. Each pollutant plays a different role in the overall air quality in any given geographic area. Below is a brief overview of the key transportation-related pollutants.

**Ozone** Ozone often irritates the eyes, impairs the lungs, and aggravates respiratory problems. Ozone can cause chest pain, coughing, nausea, pulmonary congestion, and possible long-term lung damage. NO<sub>x</sub> and VOCs are precursors to ozone formation.

**Volatile Organic Compounds** VOCs come from vehicle exhaust, paint thinners, solvents, and other petroleum-based products. VOCs and nitrogen oxides react in the presence of sunlight to form ozone. A number of exhaust VOCs are toxic, with the potential to cause cancer.

**Nitrogen Oxides** Under the high pressure and temperature conditions in an engine, nitrogen and oxygen atoms in the air react to form various nitrogen oxides, collectively known as NO<sub>x</sub>. NO<sub>x</sub>, like hydrocarbons, is a precursor to the formation of ozone and also contributes to the formation of acid rain. NO<sub>x</sub> impacts the respiratory system, causing a high incidence of acute respiratory diseases. Pre-school children are especially at risk. NO<sub>x</sub> also degrades visibility due to its brownish color and the conversion to nitrate particles.

**Carbon Monoxide** Carbon monoxide is a product of incomplete combustion and occurs when carbon in the fuel is partially oxidized rather than fully oxidized to carbon dioxide (CO<sub>2</sub>). Carbon monoxide reduces the flow of oxygen in the bloodstream and is particularly dangerous to persons with heart disease. Exposure to carbon monoxide can impair visual perception, manual dexterity, learning ability, and performance of complex tasks.

**Particulate Matter** Particulate matter is tiny particles that can cause irritation and damage to the respiratory system, which can result in difficulty breathing, induce bronchitis, and aggravate existing respiratory disease. Exposure to particles may more dramatically impact individuals with chronic pulmonary or cardiovascular disease, people with influenza or asthma, and children and elderly persons. Particles may aggravate breathing difficulties, damage lung tissue, alter the body's defense against foreign materials, and can lead to premature mortality. There are two PM standards: PM<sub>10</sub> and PM<sub>2.5</sub>. PM<sub>10</sub> refers to particles with a diameter of 10 microns (µm) or less, and PM<sub>2.5</sub> refers to particles with a diameter of 2.5 µm or less. As a comparison, an average grain of table salt is 100 µm in diameter.

<sup>8</sup>National Ambient Air Quality Standards (NAAQS)

**While some control measures are not the responsibility of State and local transportation officials, it is beneficial for officials to be familiar with on-road motor vehicle control programs implemented by other public agencies, automobile manufacturers, and fuel suppliers.**

## **Transportation Conformity**

**A Basic Guide for State & Local Officials**

## **Appendix B: Options to Reduce Emissions from On-Road Motor Vehicles**

The CAA identifies actions (transportation control measures or TCMs) that may be taken to reduce emissions from mobile sources<sup>9</sup>. In addition, there are other measures such as vehicle controls, fuel-based standards, and inspection and maintenance programs that may also help areas reduce mobile source emissions. While some of the measures are not the responsibility of State and local transportation officials, it is beneficial for officials to be familiar with on-road motor vehicle control programs implemented by other public agencies (e.g., motor vehicle departments, environmental agencies), automobile manufacturers, and fuel suppliers. Having an understanding of the costs and benefits of all available options to achieve emissions reductions is useful to officials in advance of being asked to make decisions on specific strategies for implementation.

### **Transportation Control Measures**

Options to control and reduce emissions from motor vehicles comes under the category of TCMs. Implementation of these measures is typically within the purview of transportation agencies, and TCMs are usually funded with FHWA/FTA or State and local transportation funds. The emissions reduction potential of conventional TCMs, such as ridesharing and bicycling programs, is not likely to be as substantial as the technology-based transportation measures discussed above. Nevertheless, TCMs can be useful in reducing congestion and may be needed in some areas in order to demonstrate attainment of the NAAQS. TCMs such as expanded transit services can also provide and enhance travel options and increase travel choices.

The CAA requires that in ozone nonattainment areas classified as severe or extreme, the State must identify and adopt specific transportation control strategies and TCMs to offset any projected growth in emissions from growth in vehicle miles traveled (VMT). States and MPOs should consider the CAA list of TCMs (Section 108(f)(1)(A)) for strategies they might include in the SIP. These 16 TCMs (with the exception of programs to encourage the removal of pre-1980 vehicles) are eligible for Congestion Mitigation and Air Quality Improvement (CMAQ) Program funding. Below is the list of TCMs included in the CAA. There is overlap between some of the measures, and the descriptions listed illustrate types of projects that might be considered in nonattainment areas to reduce mobile source emissions or to increase overall vehicle occupancy.

### **CAA Section 108(f)(1)(A) Transportation Control Measures Include**

- (i) programs for improved public transit;
- (ii) restriction of certain roads or lanes to, or construction of such roads or lanes for use by, passenger buses or high-occupancy vehicles (HOVs);
- (iii) employer-based transportation management plans, including incentives;
- (iv) trip-reduction ordinances;
- (v) traffic flow improvement programs that achieve emissions reductions;
- (vi) fringe and transportation corridor parking facilities serving multiple-occupancy vehicle programs or transit service;
- (vii) programs to limit or restrict vehicle use in downtown areas or other areas of emissions concentration, particularly during periods of peak use;
- (viii) programs for the provision of all forms of high-occupancy, shared-ride services;
- (ix) programs to limit portions of road surfaces or certain sections of the metropolitan area to the use of non-motorized vehicles or pedestrian use, both as to time and place;
- (x) programs for secure bicycle storage facilities and other facilities, including bicycle lanes, for the convenience and protection of bicyclists, in both public and private areas;
- (xi) programs to control extended idling of vehicles;
- (xii) reducing emissions from extreme cold-start conditions;
- (xiii) employer-sponsored programs to permit flexible work schedules;
- (xiv) programs and ordinances to facilitate non-automobile travel, provision and utilization of mass transit, and to generally reduce the need for single-occupant vehicle travel, as part of transportation planning and development efforts of a locality, including programs and ordinances applicable to new shopping centers, special events, and other centers of vehicle activity;

<sup>9</sup>CAA Section 108(f)

- (xv) programs for new construction and major reconstruction of paths, tracks, or areas solely for use by pedestrian or other non-motorized means of transportation when economically feasible and in the public interest. For purposes of this clause, the Administrator shall also consult with the Secretary of the Interior;
- (xvi) programs to encourage removal of pre-1980 vehicles.

### **Market-Based Transportation Control Measures**

In addition to conventional TCMs, work is underway in nonattainment areas to reduce mobile source emissions using market-based TCMs such as road pricing, congestion pricing, VMT fees, and parking pricing. These mechanisms can be relatively cost-effective and can be designed to impact vehicles at either certain times of the day (e.g., peak-period pricing), or at all times. In addition, these measures in combination with traditional TCMs can address other public policy objectives such as congestion reduction and energy conservation.

In many areas, public acceptance of market-based TCMs has been slow due to practical and political considerations. For example, implementation of market-based measures may require State legislation (e.g., congestion pricing) or a voter referendum. Therefore, regardless of the potential merits and cost-effectiveness of these measures, the implementation of market-based TCMs is likely to occur gradually.

**In many areas, public acceptance of market-based TCMs has been slow due to practical and political considerations.**

## Appendix C: Resource Agencies and Other Helpful Contacts

### State Departments of Transportation

American Association of State Highway Transportation Officials (AASHTO)

<http://www.transportation.org/>

### Metropolitan Planning Organizations (MPOs) or Councils of Government

Association of Metropolitan Planning Organizations (AMPO)

<http://www.ampo.org/>

National Association of Regional Councils (NARC)

<http://www.narc.org/>

### Public Transportation Agencies

American Public Transportation Association

<http://www.apta.com/>

### State or Local Air Agencies

National Association of Clean Air Agencies (NACAA)

<http://www.4cleanair.org/>

### Federal Highway Administration (FHWA)

Office of Natural Environment

[http://www.fhwa.dot.gov/environment/air\\_quality/conformity/](http://www.fhwa.dot.gov/environment/air_quality/conformity/)

Field Offices

<http://www.fhwa.dot.gov/about/field.cfm>

Resource Center

<http://www.fhwa.dot.gov/resourcecenter/teams/airquality/index.cfm>

### Federal Transit Administration (FTA)

Regional Offices

<https://www.transit.dot.gov/about/regional-offices/regional-offices>

### Environmental Protection Agency (EPA)

EPA Office of Transportation and Air Quality (OTAQ)

<https://www.epa.gov/aboutepa/about-office-air-and-radiation-oar#otaq>

Regional Offices

<https://www.epa.gov/aboutepa#pane-4>

## Transportation Conformity

A Basic Guide for  
State & Local  
Officials

## Glossary

**Area Source** Small stationary and non-transportation pollution sources that are too small and/or numerous to be included as point sources but may collectively contribute significantly to air pollution (e.g., dry cleaners).

**Attainment Area** An area considered to have air quality that meets or exceeds the U.S. EPA national ambient air quality standards, which EPA establishes according to the requirements of the Clean Air Act. An area may be an attainment area for one pollutant and a nonattainment area for others. Nonattainment areas are areas designated by EPA as not meeting a standard for a pollutant.

**Carbon Monoxide (CO)** A colorless, odorless, tasteless gas formed in large part by incomplete combustion of fuel. Human activities (e.g., transportation or industrial processes) are largely the source for CO contamination in ambient air.

**Congestion Management and Air Quality Improvement (CMAQ) Program** A categorical funding program under the Federal-aid Highway Program. CMAQ directs funding to projects that contribute to meeting or maintaining national ambient air quality standards in nonattainment and maintenance areas. CMAQ funds generally may not be used for projects that result in the construction of new capacity available to SOVs (single-occupant vehicles).

**Emissions Inventory** A complete list of sources and amounts of pollutant emissions within a specific area and time interval.

**Environmental Protection Agency (EPA)** The Federal regulatory agency responsible for administering and enforcing Federal environmental laws including the Clean Air Act, the Clean Water Act, the Endangered Species Act, and others.

**Federal Highway Administration (FHWA)** An agency of the U.S. Department of Transportation that provides financial and technical support for constructing, improving, and preserving America's highway system.

**Federal Transit Administration (FTA)** An agency of the U.S. Department of Transportation that provides stewardship of combined formula and discretionary programs to support a variety of locally planned, constructed, and operated public transportation systems throughout the United States.

**High Occupancy Vehicles (HOVs)** Generally applied to vehicles carrying two or more people; freeways, expressways, and other large volume roads may have lanes designated for use by carpools, vanpools, and buses. The term HOV is also sometimes used to refer to high-occupancy vehicle lanes themselves.

**Highway** Term applies to roads, streets, and parkways, and also includes rights-of-way, bridges, railroad crossings, tunnels, drainage structures, signs, guardrails, and protective structures in connection with highways.

**Hydrocarbons (HC)** Colorless gaseous compounds originating from evaporation and the incomplete combustion of fossil fuels.

**Inspection and Maintenance Program (I/M)** An emissions testing and inspection program implemented to ensure that the catalytic or other emissions control devices on in-use vehicles are properly maintained over time.

**Land Use** Refers to the manner in which portions of land or the structures on them are used (i.e., commercial, residential, retail, industrial, etc.).

**Lapse** Means that the conformity determination for a metropolitan transportation plan or TIP has expired, and thus there is no currently conforming metropolitan transportation plan and TIP.

**Maintenance Area** Any geographic region of the United States previously designated nonattainment pursuant to the CAA Amendments of 1990 and subsequently re-designated to attainment subject to the requirement to develop a maintenance plan under Section 175A of the CAA, as amended.

## Transportation Conformity

A Basic Guide for  
State & Local  
Officials

**Metropolitan Planning Organization (MPO)** The policy board of an organization created and designated to carry out the metropolitan transportation planning process.

**Metropolitan Transportation Plan** The official multimodal metropolitan transportation plan addressing no less than a 20-year planning horizon that is developed, adopted, and updated by the MPO through the metropolitan transportation planning process.

**Metropolitan Transportation Plan/TIP Amendment** A revision to a metropolitan transportation plan or TIP that involves a major change to a project included in a metropolitan transportation plan or TIP including the addition or deletion of a project or a major change in project cost, project/project phase initiation dates, or a major change in design concept or design scope (e.g., changing project termini or the number of through traffic lanes). Changes to projects that are included only for illustrative purposes do not require an amendment. An amendment is a revision that requires public review and comment, re-demonstration of fiscal constraint, or a conformity determination (for those involving "non-exempt" projects in nonattainment and maintenance areas).

**Metropolitan Transportation Plan/TIP Update** Making current a metropolitan transportation plan or TIP through a comprehensive review. Updates require public review and comment, a 20-year horizon year for the metropolitan transportation plan, a four-year program period for TIPs, demonstration of fiscal constraint, and a conformity determination (in nonattainment and maintenance areas).

**Mobile Sources** Include motor vehicles, aircraft, seagoing vessels, and other transportation modes. The mobile source related pollutants are carbon monoxide, hydrocarbons or volatile organic compounds, nitrogen oxides, and particulate matter.

**Mode** A form of transportation such as an automobile, bus, or bicycle.

**Motor Vehicle Emissions Budget (MVEB)** That portion of the total allowable emissions defined in the submitted or approved control strategy implementation plan revision or maintenance plan for a certain date for the purpose of meeting reasonable further progress milestones or demonstrating attainment or maintenance of the NAAQS, for any criteria pollutant or its precursors, allocated to highway and transit vehicle use and emissions.

**National Ambient Air Quality Standards (NAAQS)** Those standards established pursuant to Section 109 of the CAA. Conformity applies in areas that are nonattainment or maintenance for one or more of the NAAQS of the transportation-related pollutants: ozone, carbon monoxide, nitrogen dioxide, and particulate matter.

**National Environmental Policy Act (NEPA)** The National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.). It is the major legislation that requires Federal actions to address potential environmental impacts.

**Nitrogen Oxides (NO<sub>x</sub>)** A group of highly reactive gases that contain nitrogen and oxygen in varying amounts. Many of the nitrogen oxides are colorless and odorless. NO<sub>x</sub> is formed when the oxygen and nitrogen in the air react with each other during combustion. The primary sources of nitrogen oxides are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuels.

**Nonattainment Area** Geographic region of the United States that the EPA has designated as not meeting the NAAQS.

**Oxygenated Gasoline** Gasoline enriched with oxygen-bearing liquids to reduce CO production by permitting more complete combustion.

**Ozone (O<sub>3</sub>)** A pollutant that is not directly emitted from transportation sources. It is a secondary pollutant formed when HC and NO<sub>x</sub> combine in the presence of sunlight. Ozone is associated with smog or haze conditions. Although the ozone in the upper atmosphere protects us from harmful ultraviolet rays, ground-level ozone produces an unhealthy environment in which to live. Ozone is created by human and natural sources.

**Particulate Matter (PM, PM<sub>2.5</sub>, PM<sub>10</sub>)** Any material that exists as solid or liquid in the atmosphere. Particulate matter may be in the form of fly ash, soot, dust, fog, fumes, etc. Particulate matter can be of such a small size that it cannot be filtered by the nose and lungs. PM<sub>10</sub> is particulate matter that is less than 10 microns in size. PM<sub>2.5</sub> is particulate matter that is less than 2.5 microns in size. A micron is one millionth of a meter.

**Parts Per Million (PPM)** A measure of air pollutant concentrations.

**Public Participation** The active and meaningful involvement of the public in the development of metropolitan transportation plans and programs.

**Public Transportation** Generally refers to passenger service provided to the general public along established routes with fixed or variable schedules at published fares. Related terms include: public transit, mass transit, urban transit, and paratransit.

**Reformulated Gasoline (RFG)** Gasoline specifically developed to reduce undesirable combustion products.

**State Implementation Plan (SIP)** The State air quality plan for meeting the National Ambient Air Quality Standards ("NAAQS" or "air quality standards"). It is a compilation of legally enforceable rules and regulations prepared by a State or local air quality agency and submitted by the State's governor to EPA for approval. A SIP is designed to achieve better air quality by attaining, making progress toward attaining, or maintaining the NAAQS.

**Stationary Source** Relatively large, fixed sources of emissions (e.g., chemical process industries, petroleum refining and petrochemical operations, or wood processing).

**Telecommuting** The substitution, either partially or completely, of transportation to a conventional office through the use of computer and telecommunications technologies (e.g., telephones, personal computers, modems, facsimile machines, electronic mail).

**Transportation Conformity** Process to assess the compliance of any metropolitan transportation plan, program, or project with air quality implementation plans. The conformity process is defined by the Clean Air Act and regulated by the conformity rule.

**Transportation Control Measures (TCMs)** Any measure that is specifically identified and committed to in the applicable implementation plan, including a substitute or additional TCM that is incorporated into the applicable SIP through the process established in the CAA Section 176(c)(8), that is either one of the types listed in Section 108 of the CAA, or any other measure for the purpose of reducing emissions or concentrations of air pollutants from transportation sources by reducing vehicle use or changing traffic flow or congestion conditions. Notwithstanding the first sentence of this definition, vehicle technology-based, fuel-based, and maintenance-based measures that control the emissions from vehicles under fixed traffic conditions are not TCMs for the purposes of transportation conformity.

**Transportation Improvement Program (TIP)** A prioritized listing/program of transportation projects covering a period of four years that is developed and formally adopted by an MPO as part of the metropolitan transportation planning process, consistent with the metropolitan transportation plan, and required for projects to be eligible for funding under Title 23 USC and Title 49 USC Chapter 53.

**Vehicle Miles Traveled (VMT)** The sum of distances traveled by all motor vehicles in a specified region.

**Volatile Organic Compounds (VOCs)** VOCs come from vehicle exhaust, paint thinners, solvents, and other petroleum-based products. A number of exhaust VOCs are toxic, with the potential to cause cancer.



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