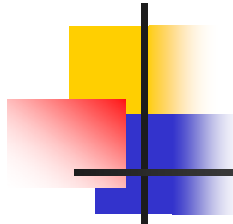


# Air Quality Conformity for California



---

Arnold Sherwood



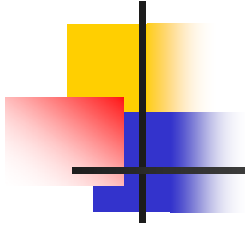
# Bio

---

Arnold Sherwood was responsible for air quality conformity for over 25 years at SCAG. As Director of the Forecasting & Modeling Department, he was responsible for the FTIP, transportation modeling, demographic & economic forecasting among other duties.

Since retiring from SCAG, he has taught courses in air quality conformity for the Institute of Transportation Studies at U.C. Berkley, consulted for SCAG and other agencies, and assisted Caltrans & transportation planning agencies throughout California on RTP and conformity issues.

He is a graduate of Princeton University and holds a M.S. and Ph.D. in Physics from U.C. San Diego and an M.S. in Urban Planning from the University of Arizona.



# Introductions and Course Overview

## **SECTION 1**



# Course Objectives

---

- To develop a clear understanding of the need for the transportation conformity requirements, and the contributions that transportation sources make to air pollution.
- To learn how to make a conformity determination in California's urban and rural nonattainment and maintenance areas.



# Course Objectives

---

- To learn what agencies are involved in conformity, their roles, and how to conduct an effective interagency consultation process.
- To learn how to identify and analyze strategies that can help reduce emissions.
- To learn the consequences of not having a conforming plan and TIP in place, and what to do to correct the problem.



# Course Objectives

---

- Introductions and Course Overview
- Overview of Transportation Conformity
- Overview of Air Quality
- Transportation Planning Requirements
- State Implementation Plans (SIPs)
- Transportation Conformity Requirements
- Regional Emissions Analysis



# Course Objectives

---

- Latest Planning Assumptions & Emissions Model
- Modeling Nuts and Bolts
- Interagency Consultation
- Transportation Control Measures
- Project Level Requirements
- Consequences of a Non-conforming Plan or TIP
- Rural Area Requirements
- Course Evaluation and Wrap-Up



# Why Are You Here?

---

- Participant introductions
  - What is your name?
  - Where are you from?
  - For what agency do you work?
  - On a scale of 1 to 5, with 5 being an expert, rate yourself on your knowledge of the conformity process
  - Your objectives in taking this course





# Transportation Conformity

Connects air quality and transportation planning:

**The SIP**

(State Air  
Quality  
Plan)

*conformity*

Transportation  
Plan, and  
Transportation  
Improvement  
Program (TIP)

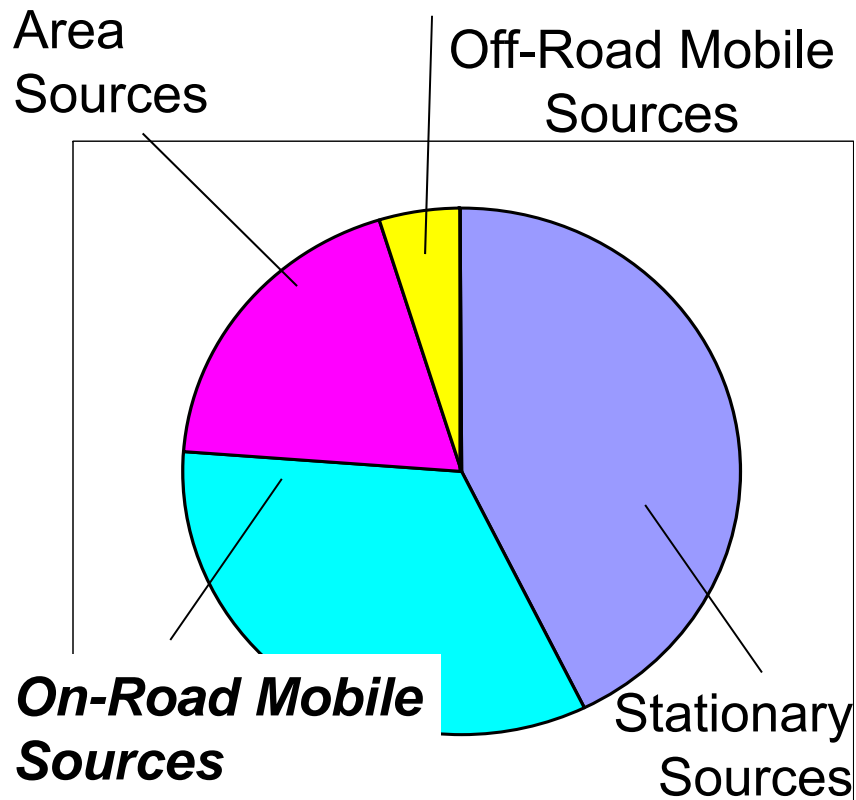


# Overview: What is Conformity?

---

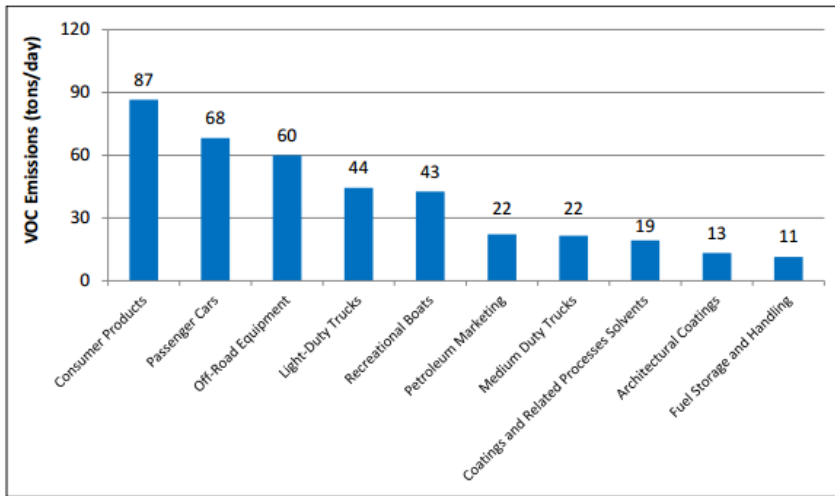
- Established by the Clean Air Act
- Requires evaluation of emissions from transportation plans, programs, and projects BEFORE any element may be implemented
- Applies in geographic areas where transportation-related pollutants:
  - Violate national air quality standards
  - Have violated national air quality standards in the past

# Conformity: What Emissions Sources Does It Address?



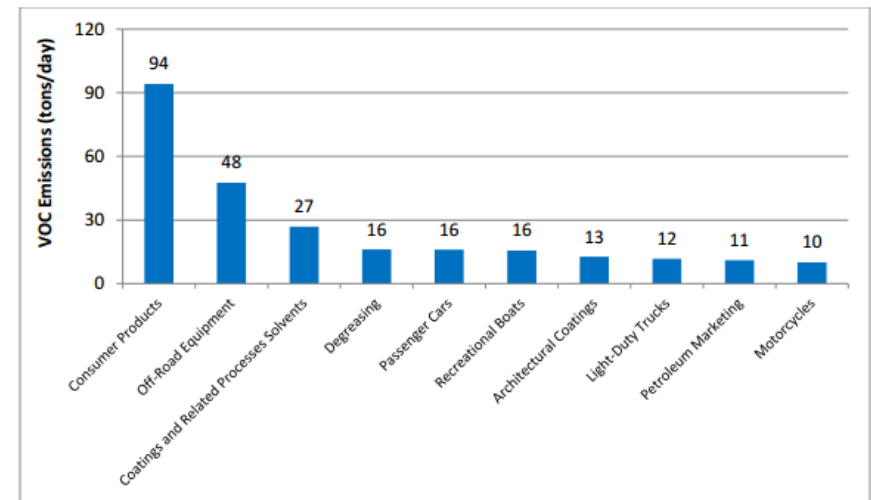
- ◆ Transportation conformity addresses emissions from on-road mobile sources.
- ◆ On-road mobile sources are emissions created by cars, trucks, buses, etc...
- ◆ Transportation conformity covers just one piece of the emissions pie...

# Top 10 Emitter Categories



**FIGURE 3-7**

TOP TEN EMITTER CATEGORIES FOR VOC IN 2012 (SUMMER PLANNING)



**FIGURE 3-12**

TOP TEN EMITTER CATEGORIES FOR VOC IN 2031 (SUMMER PLANNING)

# Top 10 Emitter Categories for NOx

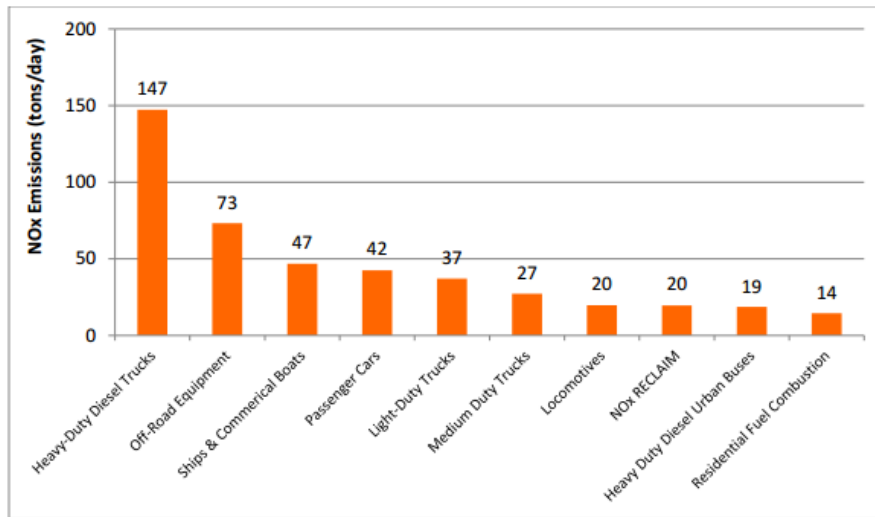


FIGURE 3-13

TOP TEN EMITTER CATEGORIES FOR NOx IN 2012 (SUMMER PLANNING)

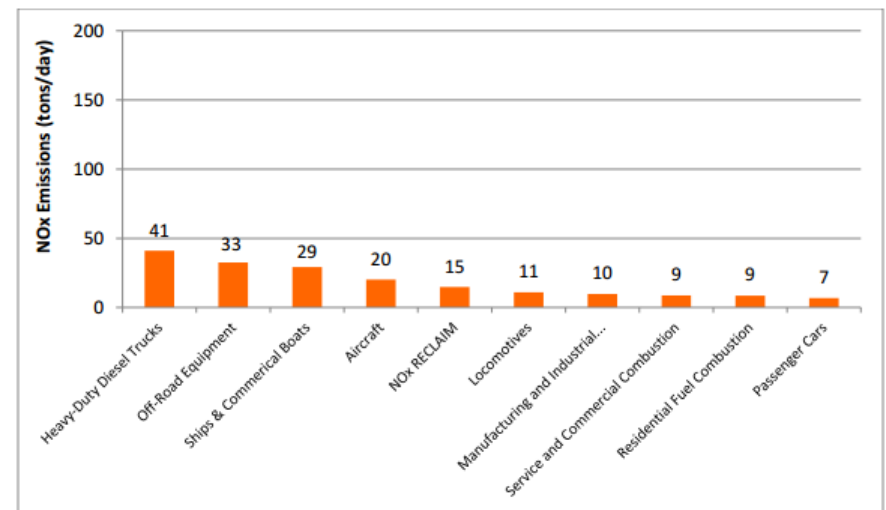


FIGURE 3-18

TOP TEN EMITTER CATEGORIES FOR NOx IN 2031 (SUMMER PLANNING)

# Top 10 Emitter Categories for Directly Emitted PM2.5

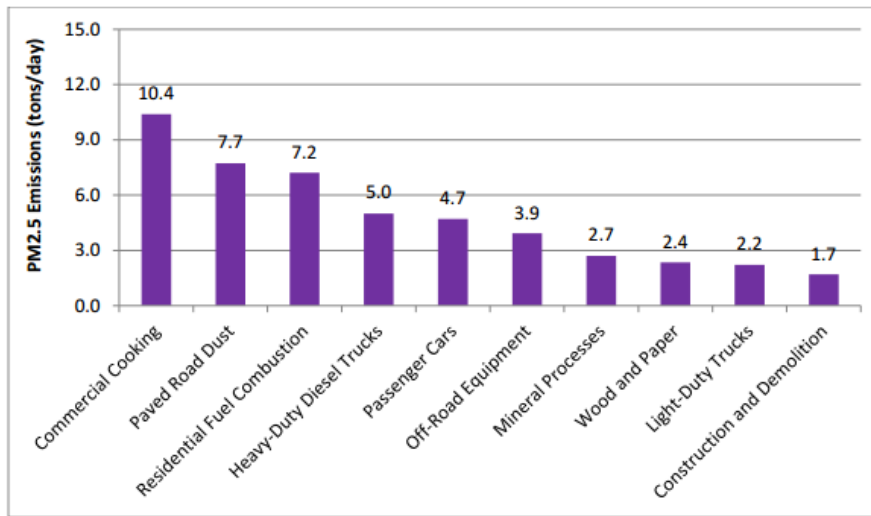


FIGURE 3-25

TOP TEN EMITTER CATEGORIES FOR DIRECTLY EMITTED PM2.5 IN 2012 (ANNUAL AVERAGE)

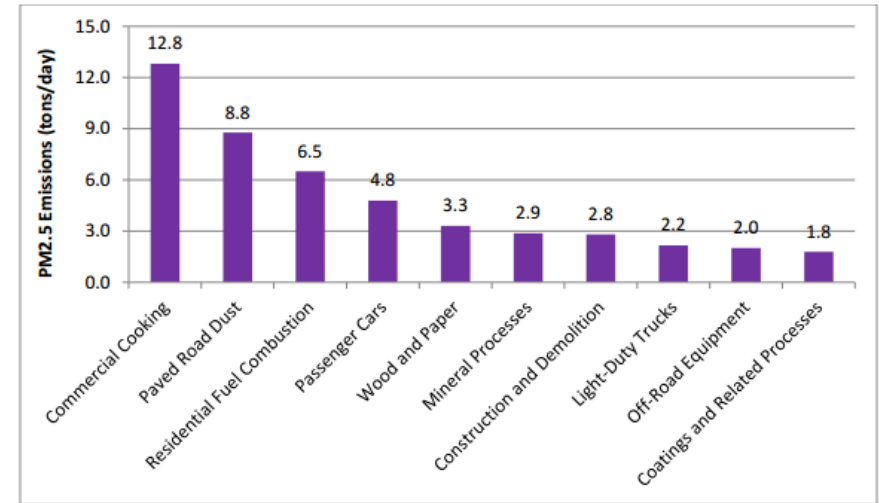


FIGURE 3-30

TOP TEN EMITTER CATEGORIES FOR DIRECTLY EMITTED PM2.5 IN 2031 (ANNUAL AVERAGE)



# Who Is Responsible for Conformity?

---

- There are numerous agencies involved in the conformity process, including:
  - Metropolitan Planning Organizations (MPOs)
  - State DOTs
  - State and Regional Air Quality Agencies and Districts
  - US DOT (FTA/FHWA)
  - US EPA

**Roles & Responsibilities of Federal, State, and Local Agencies\***

\* This Exhibit outlines general requirements and typical roles and responsibilities of the various involved agencies. Specific States and metropolitan areas may have negotiated different assignments of responsibility tailored to local conditions.

Players/Decision Makers	Action Required	When
<b>MPO</b>	<ul style="list-style-type: none"> <li>• conduct analysis on regional plan/TIP and projects</li> <li>• incorporate latest emissions factors, planning assumptions, and emissions models</li> <li>• circulate draft plan/TIP for interagency and public comment</li> <li>• ensure public involvement procedures are followed</li> <li>• ensure timely implementation of TCMs</li> <li>• respond to significant comments on TIP/plan conformity documents</li> <li>• review and approve conformity determination on plan/TIP/projects in CO and PM nonattainment areas, conduct "hot-spot" analysis as part of the NEPA process</li> <li>• consult with agencies throughout the conformity determination process</li> </ul>	<ul style="list-style-type: none"> <li>■ at least every 4 years, when a new plan, TIP or amendments to a plan/ TIP are proposed, or as needed based on SIP submittal</li> </ul>
<b>State Transportation Agency</b>	<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 areas, conduct "hot-spot" analysis as part of the NEPA process</li> <li>• provide for public involvement/respond to significant comments</li> <li>• ensure timely implementation of TCMs</li> <li>• review and approve staff regional and hot-spot analysis</li> </ul>	<ul style="list-style-type: none"> <li>• as needed</li> </ul>
<b>State Air Quality/ Environmental Agency</b>	<ul style="list-style-type: none"> <li>• prepare SIP for each relevant pollutant</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>• interagency involvement during SIP development</li> <li>• review and approve staff recommendation, forward to EPA for Federal approval</li> </ul>	<ul style="list-style-type: none"> <li>• as needed</li> </ul>



**Roles & Responsibilities of Federal, State, and Local Agencies\* (Continued)**

\* This Exhibit outlines general requirements and typical roles and responsibilities of the various involved agencies. Specific States and metropolitan areas may have negotiated different assignments of responsibility tailored to local conditions.

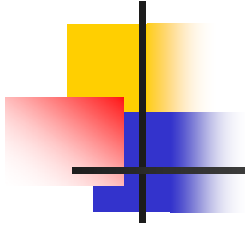
<b>Players/Decision Makers</b>	<b>Action Required</b>	<b>When</b>
<b>State Legislature</b>	<ul style="list-style-type: none"> <li>•adopt State legislation to develop and enforce applicable CAA provisions</li> <li>•ensure funding available for implementation of programs</li> </ul>	<ul style="list-style-type: none"> <li>•as needed</li> </ul>
<b>USDOT-FHWA/FTA</b>	<ul style="list-style-type: none"> <li>•make joint conformity determinations on MPO plans/TIPs amendments and projects</li> <li>•provide input as part of the interagency consultation process for plan/TIP/SIP development</li> <li>•ensure timely implementation of TCMs</li> <li>•ensure adequate public involvement as part of the metropolitan planning process</li> <li>•ensure that all other conformity and transportation planning requirements are met</li> <li>•involvement as part of interagency consultation meetings for MPO plan/TIP development</li> <li>•develop technical guidance on traffic demand and forecasting, and Federal aid program guidance</li> </ul>	<ul style="list-style-type: none"> <li>•at least every 4 years for each conformity determination or as needed</li> <li>•for each plan/TIP or plan/TIP amendment conformity determination</li> <li>•as needed</li> </ul>
<b>US EPA</b>	<ul style="list-style-type: none"> <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>•interagency consultation involvement during SIP and plan/TIP development</li> <li>•review and comment on proposed conformity determinations</li> <li>•designates approved emissions models for use in SIP development and conformity determinations</li> <li>•designates "guideline" dispersion models for project level emissions analysis</li> </ul>	<ul style="list-style-type: none"> <li>•as needed</li> </ul>



# Conformity Websites

---

- **[www.epa.gov/otaq/transp.htm](http://www.epa.gov/otaq/transp.htm)**
  - Includes information from EPA's Office of Transportation and Air Quality
- **[www.fhwa.dot.gov/environment](http://www.fhwa.dot.gov/environment)**
  - Includes other information on FHWA programs including guidance, CMAQ, TCMs, public education
- **[www.arb.gov](http://www.arb.gov)**
  - Includes California-specific information



# Overview of Air Quality

## **SECTION 2**



# Air Quality - Overview

---

- The Clean Air Act (CAA) sets the framework and goals for improving air quality to protect public health
- Title I of the CAA sets forth provisions for the attainment and maintenance of...

## *National Ambient Air Quality Standards (NAAQS)*

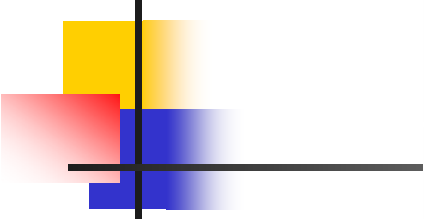
- NAAQS are set for “criteria” pollutants - those that adversely affect human health and safety
- NAAQS are set at levels to ensure adequate protection of the public



# NAAQS

---

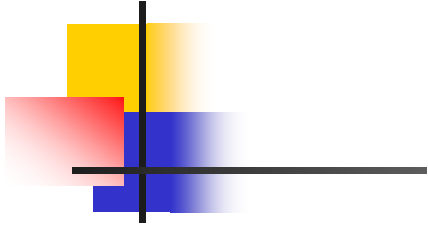
- NAAQS exist for the following pollutants:
  - Ozone ( $O_3$ )
  - Sulfur Dioxide ( $SO_2$ )
  - Nitrogen Dioxide ( $NO_2$ )
  - Carbon Monoxide (CO)
  - Lead (PB)
  - Particulate Matter (PM)
    - PM-10
    - PM-2.5



## Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards <sup>1</sup>		National Standards <sup>2</sup>			
		Concentration <sup>3</sup>	Method <sup>4</sup>	Primary <sup>3,5</sup>	Secondary <sup>3,6</sup>	Method <sup>7</sup>	
Ozone (O <sub>3</sub> ) <sup>8</sup>	1 Hour	0.09 ppm (180 µg/m <sup>3</sup> )	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry	
	8 Hour	0.070 ppm (137 µg/m <sup>3</sup> )		0.070 ppm (137 µg/m <sup>3</sup> )			
Respirable Particulate Matter (PM <sub>10</sub> ) <sup>9</sup>	24 Hour	50 µg/m <sup>3</sup>	Gravimetric or Beta Attenuation	150 µg/m <sup>3</sup>	Same as Primary Standard	Inertial Separation and Gravimetric Analysis	
	Annual Arithmetic Mean	20 µg/m <sup>3</sup>		—			
Fine Particulate Matter (PM <sub>2.5</sub> ) <sup>9</sup>	24 Hour	—	—	35 µg/m <sup>3</sup>	Same as Primary Standard	Inertial Separation and Gravimetric Analysis	
	Annual Arithmetic Mean	12 µg/m <sup>3</sup>	Gravimetric or Beta Attenuation	12.0 µg/m <sup>3</sup>			15 µg/m <sup>3</sup>
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m <sup>3</sup> )	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m <sup>3</sup> )	—	Non-Dispersive Infrared Photometry (NDIR)	
	8 Hour	9.0 ppm (10 mg/m <sup>3</sup> )		9 ppm (10 mg/m <sup>3</sup> )			
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m <sup>3</sup> )		—			
Nitrogen Dioxide (NO <sub>2</sub> ) <sup>10</sup>	1 Hour	0.18 ppm (339 µg/m <sup>3</sup> )	Gas Phase Chemiluminescence	100 ppb (188 µg/m <sup>3</sup> )	Same as Primary Standard	Gas Phase Chemiluminescence	
	Annual Arithmetic Mean	0.030 ppm (57 µg/m <sup>3</sup> )		0.053 ppm (100 µg/m <sup>3</sup> )			
Sulfur Dioxide (SO <sub>2</sub> ) <sup>11</sup>	1 Hour	0.25 ppm (655 µg/m <sup>3</sup> )	Ultraviolet Fluorescence	75 ppb (196 µg/m <sup>3</sup> )	—	Ultraviolet Fluorescence; Spectrophotometry (Pararosaniline Method)	
	3 Hour	—		—			0.5 ppm (1300 µg/m <sup>3</sup> )
	24 Hour	0.04 ppm (105 µg/m <sup>3</sup> )		0.14 ppm (for certain areas) <sup>11</sup>			—
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas) <sup>11</sup>			—
Lead <sup>12,13</sup>	30 Day Average	1.5 µg/m <sup>3</sup>	Atomic Absorption	—	Same as Primary Standard	High Volume Sampler and Atomic Absorption	
	Calendar Quarter	—		1.5 µg/m <sup>3</sup> (for certain areas) <sup>12</sup>			
	Rolling 3-Month Average	—		0.15 µg/m <sup>3</sup>			
Visibility Reducing Particles <sup>14</sup>	8 Hour	See footnote 14	Beta Attenuation and Transmittance through Filter Tape	<b>No National Standards</b>			
Sulfates	24 Hour	25 µg/m <sup>3</sup>	Ion Chromatography				
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m <sup>3</sup> )	Ultraviolet Fluorescence				
Vinyl Chloride <sup>12</sup>	24 Hour	0.01 ppm (26 µg/m <sup>3</sup> )	Gas Chromatography				

See footnotes on next page ...



1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
2. National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above  $150 \mu\text{g}/\text{m}^3$  is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of  $25^\circ\text{C}$  and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of  $25^\circ\text{C}$  and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. Any equivalent measurement method which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.
5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
7. Reference method as described by the U.S. EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the U.S. EPA.
8. On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.
9. On December 14, 2012, the national annual PM2.5 primary standard was lowered from  $15 \mu\text{g}/\text{m}^3$  to  $12.0 \mu\text{g}/\text{m}^3$ . The existing national 24-hour PM2.5 standards (primary and secondary) were retained at  $35 \mu\text{g}/\text{m}^3$ , as was the annual secondary standard of  $15 \mu\text{g}/\text{m}^3$ . The existing 24-hour PM10 standards (primary and secondary) of  $150 \mu\text{g}/\text{m}^3$  also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.
10. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.
11. On June 2, 2010, a new 1-hour  $\text{SO}_2$  standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971  $\text{SO}_2$  national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.  
  
Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.
12. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
13. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard ( $1.5 \mu\text{g}/\text{m}^3$  as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
14. In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

**TABLE 2-3**

**National Ambient Air Quality Standards (NAAQS) Attainment Status - South Coast Air Basin**

<b>Criteria Pollutant</b>	<b>Averaging Time</b>	<b>Designation<sup>a</sup></b>	<b>Attainment Date<sup>b</sup></b>
<b>Ozone (O<sub>3</sub>)</b>	(1979) 1-Hour (0.12 ppm) <sup>c</sup>	Nonattainment ("extreme")	2/26/2023 (revised deadline)
	(2015) 8-Hour (0.070 ppm) <sup>d</sup>	Pending – Expect Nonattainment ("extreme")	Pending (beyond 2032)
	(2008) 8-Hour (0.075 ppm) <sup>d</sup>	Nonattainment ("extreme")	7/20/2032
	(1997) 8-Hour (0.08 ppm) <sup>d</sup>	Nonattainment ("extreme")	6/15/2024
<b>PM<sub>2.5</sub><sup>e</sup></b>	(2006) 24-Hour (35 µg/m <sup>3</sup> )	Nonattainment ("serious")	12/31/2019
	(2012) Annual (12.0 µg/m <sup>3</sup> )	Nonattainment ("moderate")	12/31/2021
	(1997) Annual (15.0 µg/m <sup>3</sup> )	Attainment (final determination pending)	4/5/2015 (attained 2013)
<b>PM<sub>10</sub><sup>f</sup></b>	(1987) 24-hour (150 µg/m <sup>3</sup> )	Attainment (Maintenance)	7/26/2013 (attained)
<b>Lead (Pb)<sup>g</sup></b>	(2008) 3-Months Rolling (0.15 µg/m <sup>3</sup> )	Nonattainment (Partial) (Attainment determination to be requested)	12/31/2015
<b>CO</b>	(1971) 1-Hour (35 ppm)	Attainment (Maintenance)	6/11/2007 (attained)
	(1971) 8-Hour (9 ppm)	Attainment (Maintenance)	6/11/2007 (attained)
<b>NO<sub>2</sub><sup>h</sup></b>	(2010) 1-Hour (100 ppb)	Unclassifiable/Attainment	N/A (attained)
	(1971) Annual (0.053 ppm)	Attainment (Maintenance)	9/22/1998 (attained)
<b>SO<sub>2</sub><sup>i</sup></b>	(2010) 1-Hour (75 ppb)	Designations Pending (expect Unclassifiable/Attainment)	N/A (attained)
	(1971) 24-Hour (0.14 ppm) (1971) Annual (0.03 ppm)	Unclassifiable/Attainment	3/19/1979 (attained)

- a) U.S. EPA often only declares Nonattainment areas; everywhere else is listed as Unclassifiable/Attainment or Unclassifiable
- b) A design value below the NAAQS for data through the full year or smog season prior to the attainment date is typically required for an attainment demonstration
- c) The 1979 1-hour ozone NAAQS (0.12 ppm) was revoked, effective 6/15/05 ; however, the Basin has not attained this standard and therefore has some continuing obligations with respect to the revoked standard; original attainment date was 11/15/2010; the revised attainment date is 2/6/23
- d) The 2008 8-hour ozone NAAQS (0.075 ppm) was revised to 0.070 ppm, effective 12/28/15 with classifications and implementation goals to be finalized by 10/1/17; the 1997 8-hour ozone NAAQS (0.08 ppm) was revoked in the 2008 ozone NAAQS implementation rule, effective 4/6/15; there are continuing obligations under the revoked 1997 and revised 2008 ozone NAAQS until they are attained
- e) The attainment deadline for the 2006 24-hour PM<sub>2.5</sub> NAAQS was 12/31/15 for the former "moderate" classification; U.S.EPA approved reclassification to "serious," effective 2/12/16 with an attainment deadline of 12/31/2019; the 2012 (proposal year) annual PM<sub>2.5</sub> NAAQS was revised on 1/15/13, effective 3/18/13, from 15 to 12 µg/m<sup>3</sup>; new annual designations were final 1/15/15, effective 4/15/15; on July 25, 2016 U.S. EPA finalized a determination that the Basin attained the 1997 annual (15.0 µg/m<sup>3</sup>) and 24-hour PM<sub>2.5</sub> (65 µg/m<sup>3</sup>) NAAQS, effective August 24, 2016
- f) The annual PM<sub>10</sub> NAAQS was revoked, effective 12/18/06; the 24-hour PM<sub>10</sub> NAAQS deadline was 12/31/2006; the Basin's Attainment Re-designation Request and PM<sub>10</sub> Maintenance Plan was approved by U.S. EPA on 6/26/13, effective 7/26/13
- g) Partial Nonattainment designation – Los Angeles County portion of the Basin only for near-source monitors; expect to remain in attainment based on current monitoring data; attainment re-designation request pending
- h) New 1-hour NO<sub>2</sub> NAAQS became effective 8/2/10, with attainment designations 1/20/12; annual NO<sub>2</sub> NAAQS retained
- i) The 1971 annual and 24-hour SO<sub>2</sub> NAAQS were revoked, effective 8/23/10; however, these 1971 standards will remain in effect until one year after U.S. EPA promulgates area designations for the 2010 SO<sub>2</sub> 1-hour NAAQS; final area designations expected by 12/31/20 due to new source-specific monitoring requirements; Basin expected to be in attainment due to ongoing clean data





# Ozone NAAQS Timelines

Key Dates for Existing and Future Nonattainment Areas

	2008 NAAQS	2015 NAAQS
Emission statement rule, emission inventory, and Moderate area/OTR RACT SIPs	July 2014	Late 2019
Marginal area attainment date	July 2015	Late 2020
Attainment plans and demonstrations for initial Moderate areas	July 2015	Late 2020
Attainment plans and demonstrations for initial Serious and above areas	July 2016	Late 2021
Moderate area SIPs for 11 reclassified Marginal areas	Early 2017 (TBD)	--
Moderate area attainment date	July 2018	Late 2023
2008 NAAQS revoked	2018-2019 (TBD)	--



# Ozone NAAQS Timelines

Anticipated Schedule for 2015 Ozone NAAQS Implementation  
Rules/Guidance/Tools

Action	After NAAQS Promulgation	Planned Dates
Final 2015 Ozone NAAQS revision, monitoring rules, exceptional event demonstration schedule, and PSD permit grandfathering provision	Upon promulgation	October 2015
Propose Exceptional Events Rule revision and guidance on wildfire-related ozone demonstrations	1 month	November 2015
Area designations guidance (including Rural Transport Areas)	4 months	February 2016
Final update to PSD permit modeling guideline (Appendix W; proposed July 2015); MERPs and SIL guidance	8 months	June 2016
Final Exceptional Events Rule revision and guidance on wildfire-related ozone demonstrations	10 months	August 2016
States submit area designation recommendations	12 months	October 2016
Interstate ozone transport contribution assessment provided to States	12 months	October 2016
Propose nonattainment area rules/guidance (including area classifications, SIP due dates, nonattainment NSR provisions)	12 months	October 2016
Final designations, classifications, and nonattainment area SIP rules/guidance	24 months	October 2017

Update to transportation conformity guidance	25 months	November 2017
States submit Infrastructure and Transport SIPs	36 months	Late 2018
States submit attainment plans	5-6 years	2020-2021
Nonattainment Area Attainment Dates (Marginal - Extreme)	5-22 years	2020-2037



# Anticipated PM NAAQS Implementation Milestones as of March 2016

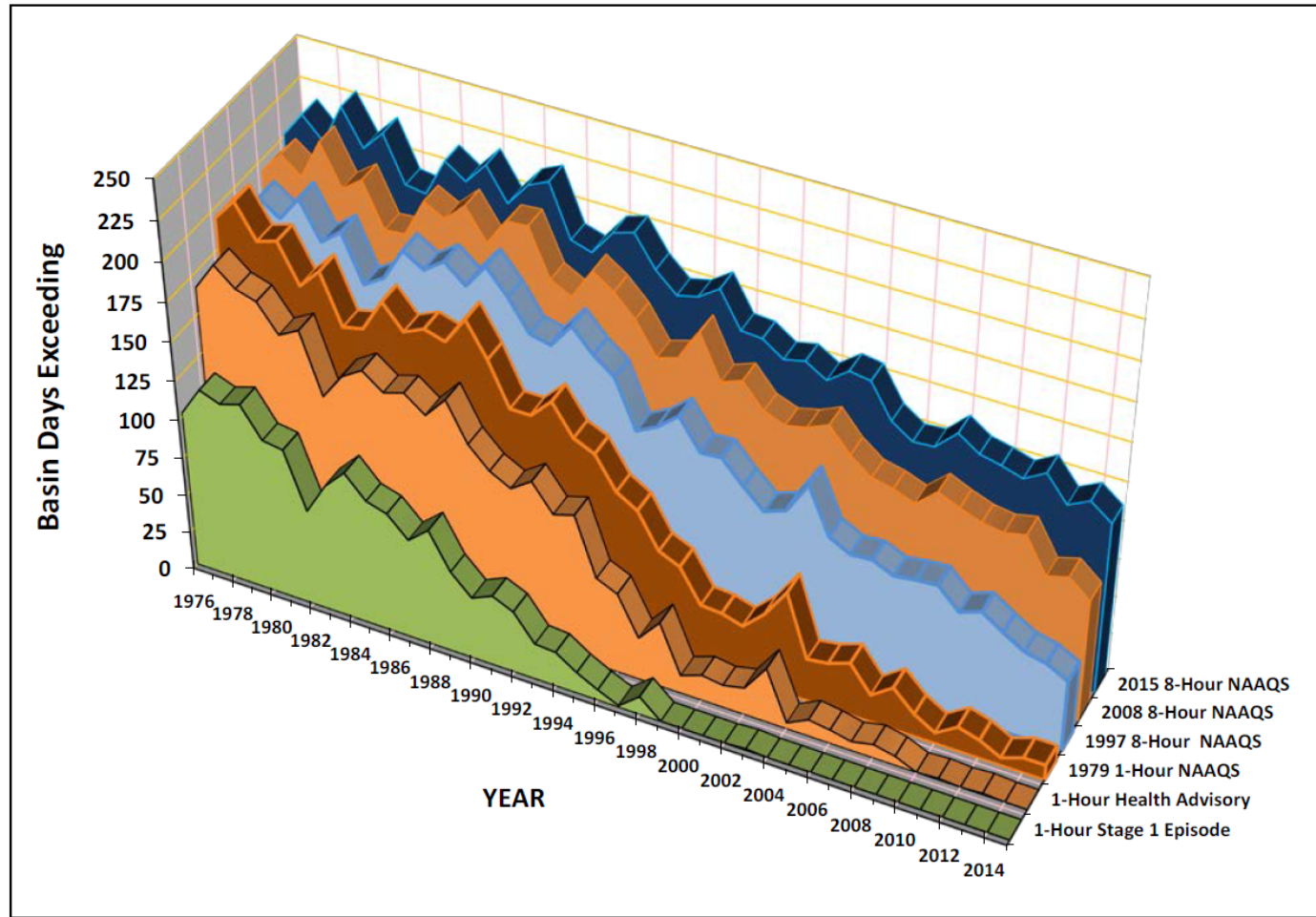
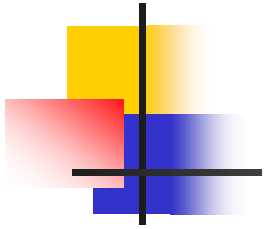
Milestone	2006 PM <sub>2.5</sub> NAAQS	2012 PM <sub>2.5</sub> NAAQS
Standard Effective	October 2006	December 2012
Designations Effective	December 2009	April 2015
Infrastructure SIPs Due	October 2009	December 2015
Attainment Plans (Nonattainment SIPs) Due	December 2014	October 2016 (Moderate areas)
Attainment Date	December 2015 (Moderate) December 2019 (Serious)	December 2021 (Moderate) December 2025 (Serious)



# NAAQS and Attainment

---

- When an area violates a NAAQS standard it is designated as a “Nonattainment Area”
  - Attainment / Nonattainment designations are made individually for each NAAQS pollutant
  - Once designated, plans must be created to bring the area back into attainment
  - When an area achieves attainment of the NAAQS
    - Area is redesignated as a “Maintenance Area”
    - Maintenance areas are required to have a plan to stay in attainment for 20 years



**FIGURE 2-3**

TREND OF NUMBER OF BASIN DAYS EXCEEDING CURRENT AND FORMER OZONE NAAQS AND 1-HOUR OZONE EPISODE LEVELS (HEALTH ADVISORY AND STAGE-1), 1976 THROUGH 2015



# Clean Air Act Requirements

---

This Plan complies with applicable federal CAA includes a series of requirements to be included in State Implementation Plans for nonattainment areas. The following required elements have been included and/or analyzed in the 2016 AQMP and corresponding appendices.

- Emission Inventory
- Reasonably Available Control Measures (RACM)
- Best Available Control Measures (BACM)
- Control Strategy and Needed Other Measures
- Attainment Demonstration
- Impracticability Demonstration (for “moderate” annual PM<sub>2.5</sub> area)
- Reasonable Further Progress (RFP) and Milestones
- Contingency Measures
- General Conformity
- Transportation Conformity
- Vehicle Miles Traveled (VMT) Offset Demonstration
- PM Precursors
- New Source Review (NSR)
- Emissions Statements



# Categorizing Sources

---

- EPA classifies emissions sources into three categories:
  - Point (e.g., electric utilities, refineries, etc.)
  - Area (e.g., dry cleaners, paints, solvents, etc.)
  - Mobile (e.g., cars, trucks, trains, etc.)
- Mobile sources are further categorized into
  - On-Road (Cars, trucks, buses, motorcycles)
  - Off-Road (Planes, trains, ships, construction equipment)



# Linkage between Air Quality and Transportation Planning

---

- 1990 CAA amendments added specificity to the relationship between air quality planning and transportation planning
- ***Reason:*** Controlling mobile sources is critically important to meeting the NAAQS
- Transportation conformity is intended to help the SIP achieve its goal which is to attain the NAAQS





## NAAQS - Ozone

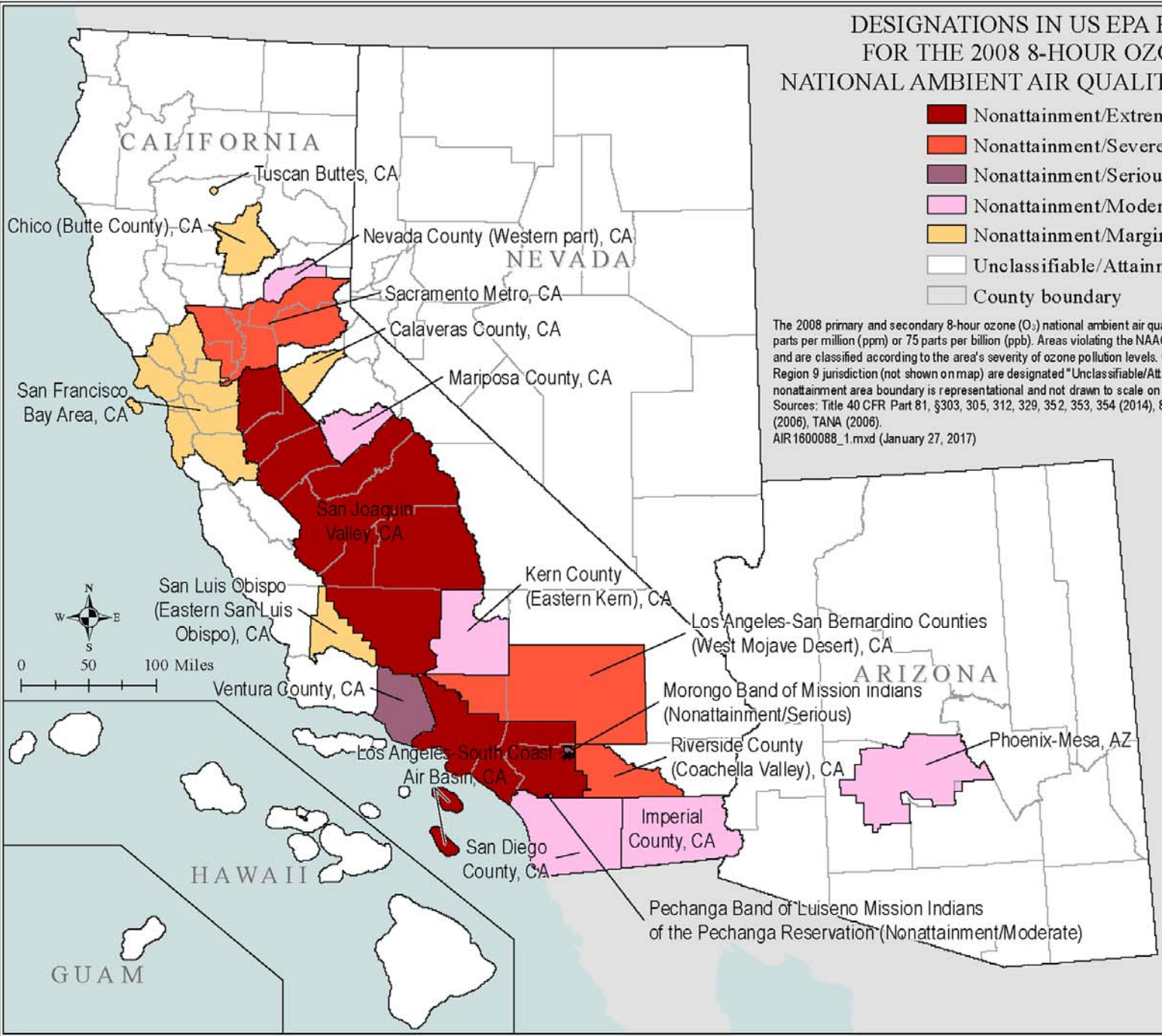
---

- Standards for ozone are unique because ozone is the result of chemical reactions in the atmosphere
  - As a result, ozone precursors are regulated
    - Volatile organic compounds (VOCs)
    - Nitrogen oxides (NO<sub>x</sub>)

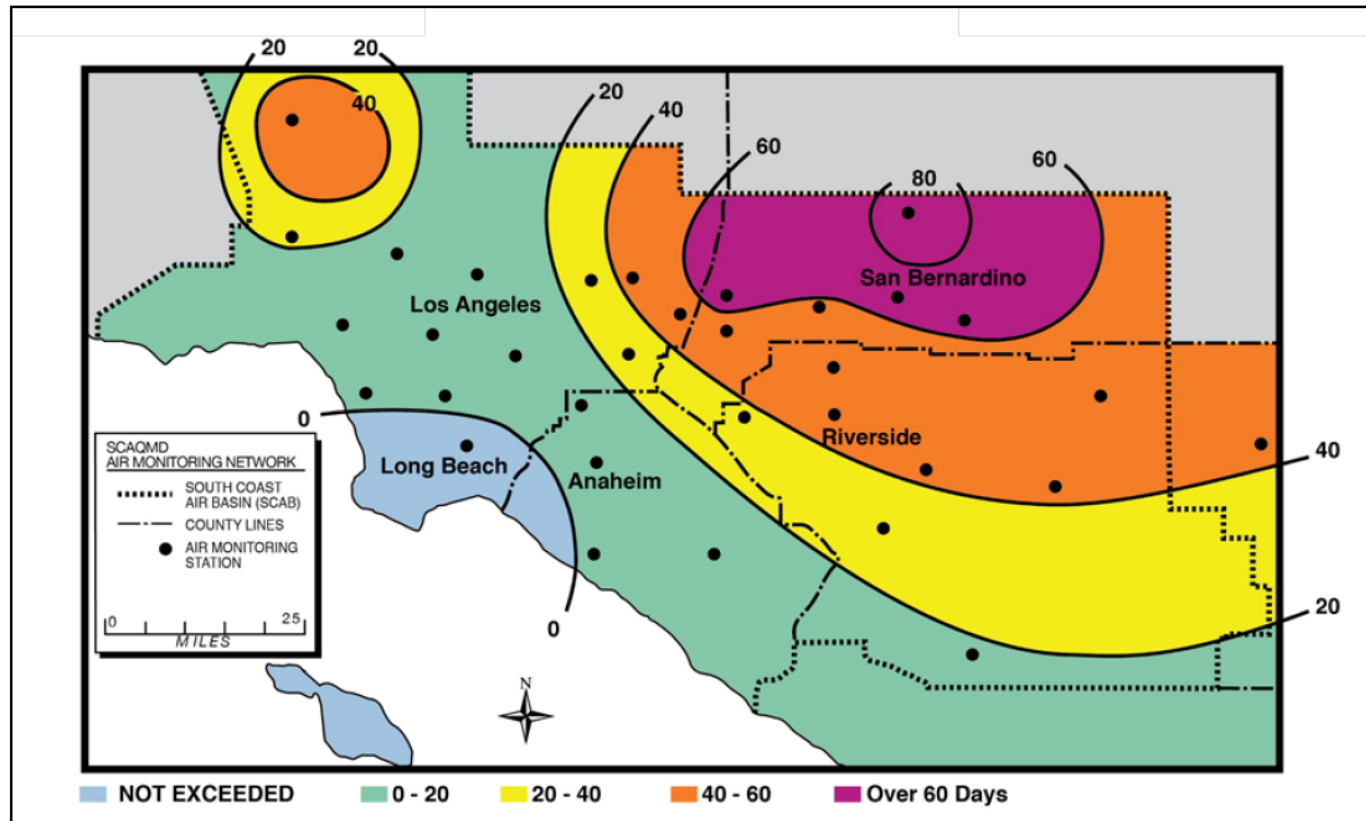
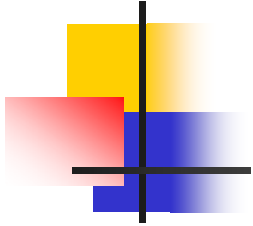
DESIGNATIONS IN US EPA REGION 9  
FOR THE 2008 8-HOUR OZONE (O<sub>3</sub>)  
NATIONAL AMBIENT AIR QUALITY STANDARDS

- Nonattainment/Extreme
- Nonattainment/Severe-15
- Nonattainment/Serious
- Nonattainment/Moderate
- Nonattainment/Marginal
- Unclassifiable/Attainment
- County boundary

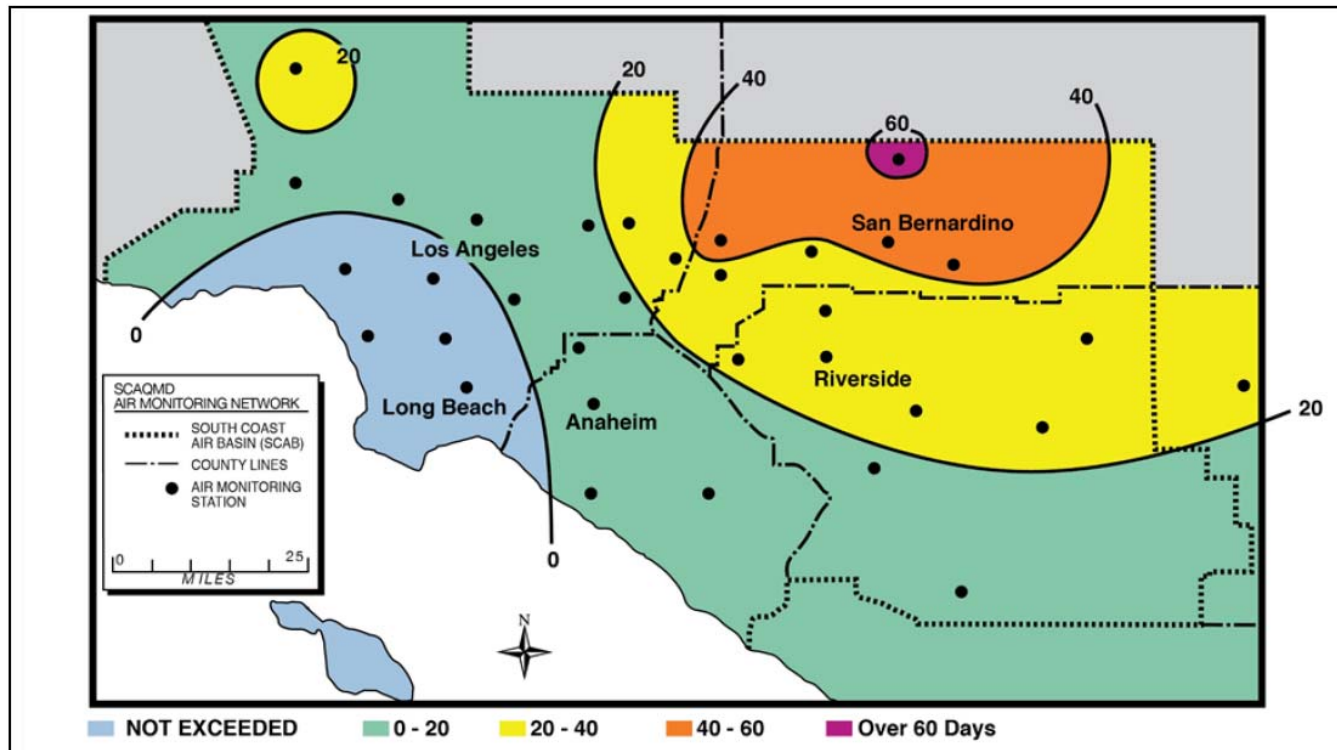
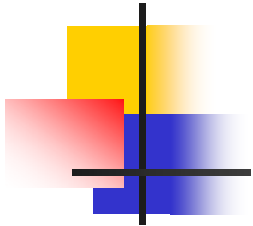
The 2008 primary and secondary 8-hour ozone (O<sub>3</sub>) national ambient air quality standard (NAAQS) is 0.075 parts per million (ppm) or 75 parts per billion (ppb). Areas violating the NAAQS are designated "Nonattainment", and are classified according to the area's severity of ozone pollution levels. Other Pacific territories under EPA Region 9 jurisdiction (not shown on map) are designated "Unclassifiable/Attainment." The *Tuscan Buttes, CA* nonattainment area boundary is representational and not drawn to scale on this map.  
Sources: Title 40 CFR Part 81, §303, 305, 312, 329, 352, 353, 354 (2014), 81 FR 26697 (May 4, 2016), ESRI (2006), TANA (2006).  
AIR1600088\_1.mxd (January 27, 2017)



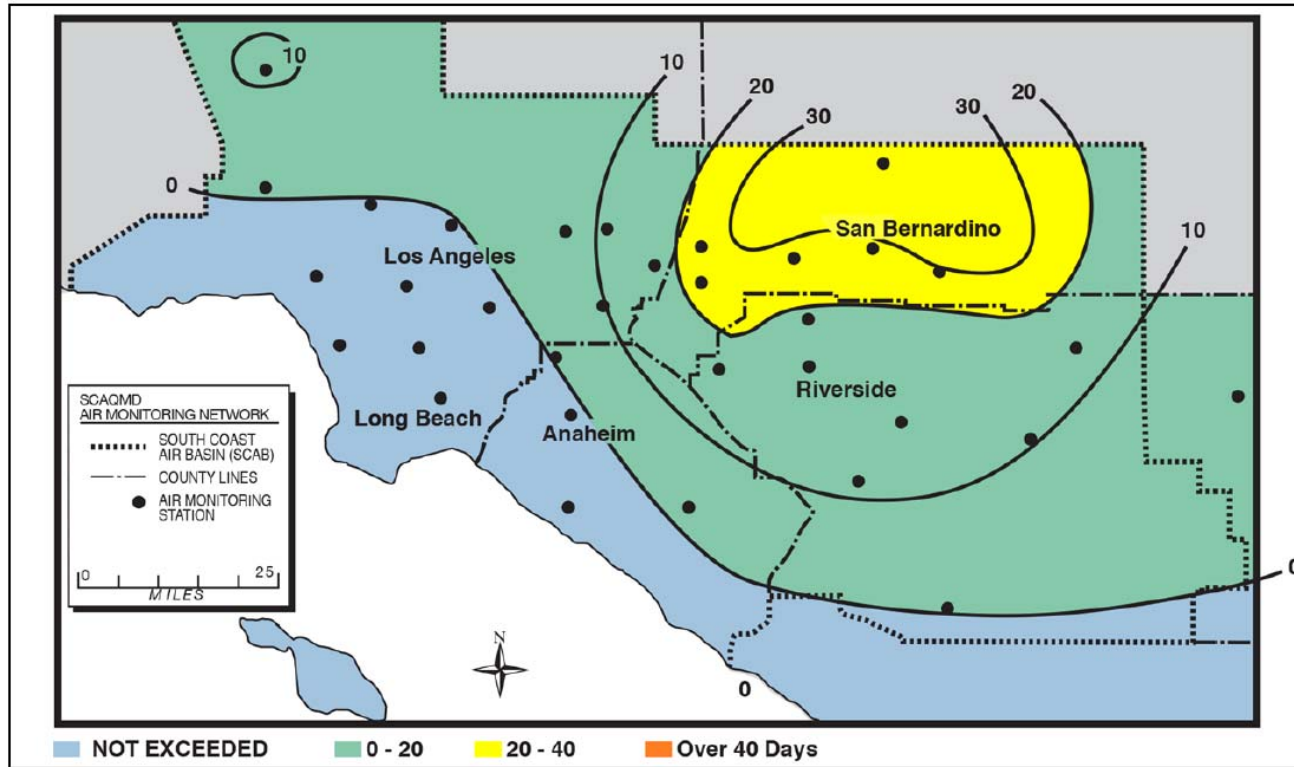
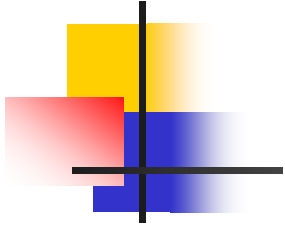
0 50 100 Miles



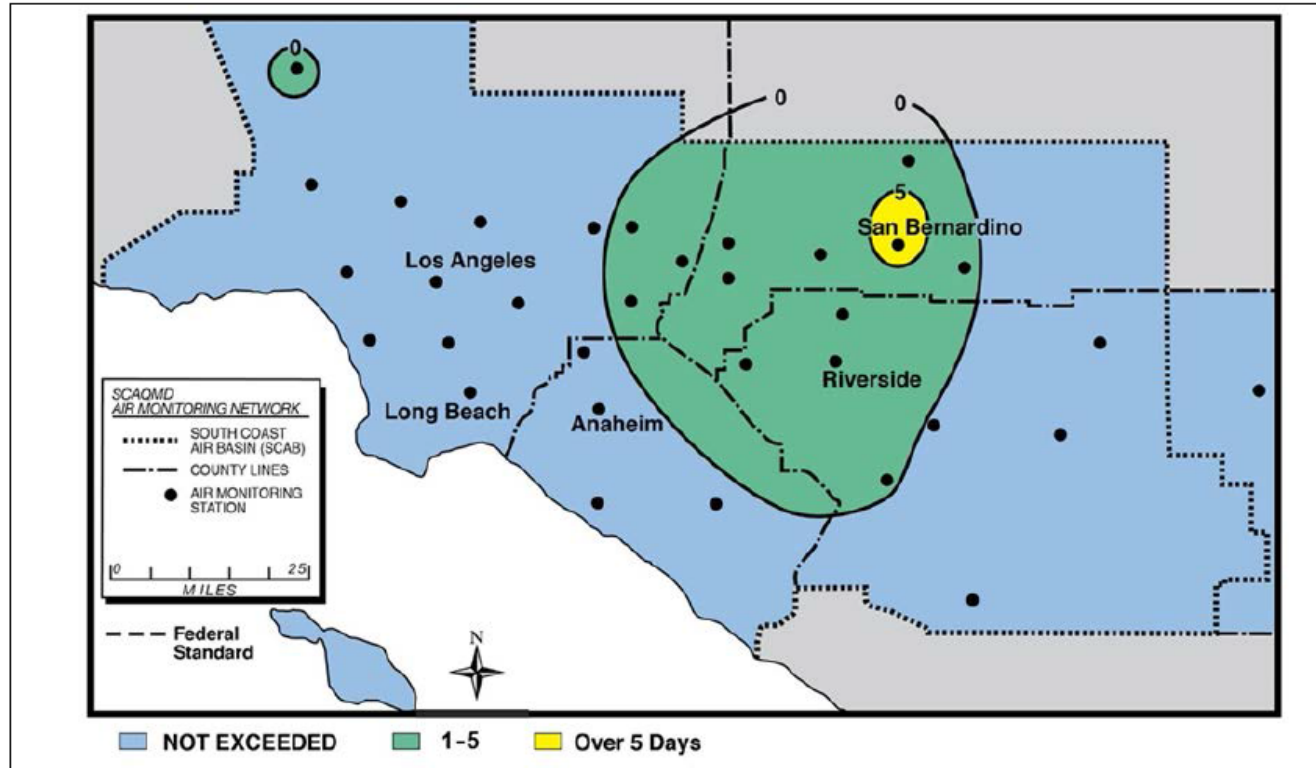
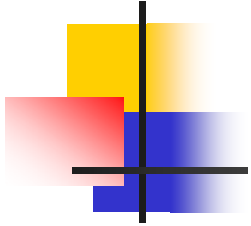
**FIGURE 2-4**  
NUMBER OF DAYS IN 2015 EXCEEDING THE 2015 8-HOUR OZONE FEDERAL STANDARD  
(8-HOUR AVERAGE OZONE > 0.070 PPM)



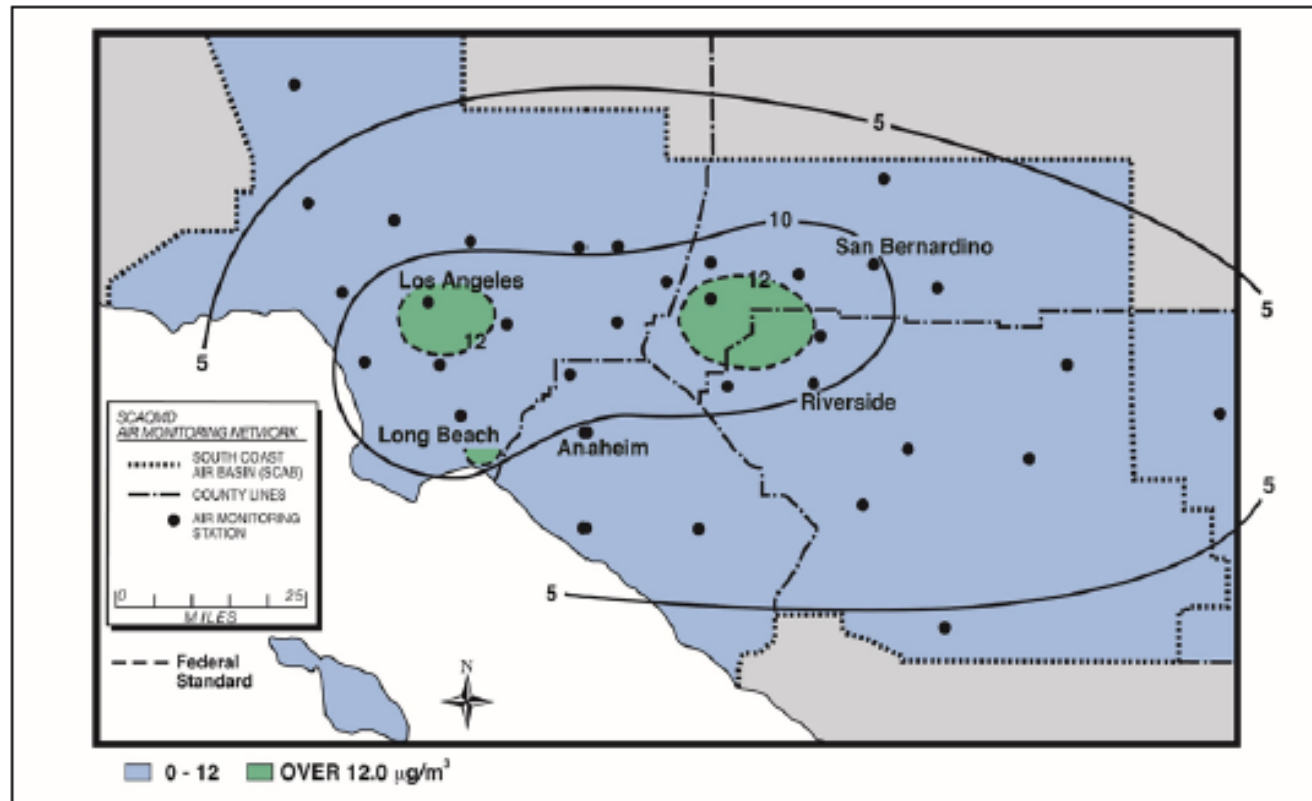
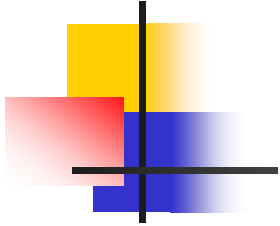
**FIGURE 2-5**  
NUMBER OF DAYS IN 2015 EXCEEDING THE REVISED 2008 8-HOUR OZONE FEDERAL STANDARD  
(8-HOUR AVERAGE OZONE > 0.075 PPM)



**FIGURE 2-6**  
NUMBER OF DAYS IN 2015 EXCEEDING THE REVOKED 1997 8-HOUR OZONE FEDERAL STANDARD  
(8-HOUR AVERAGE OZONE > 0.08 PPM)



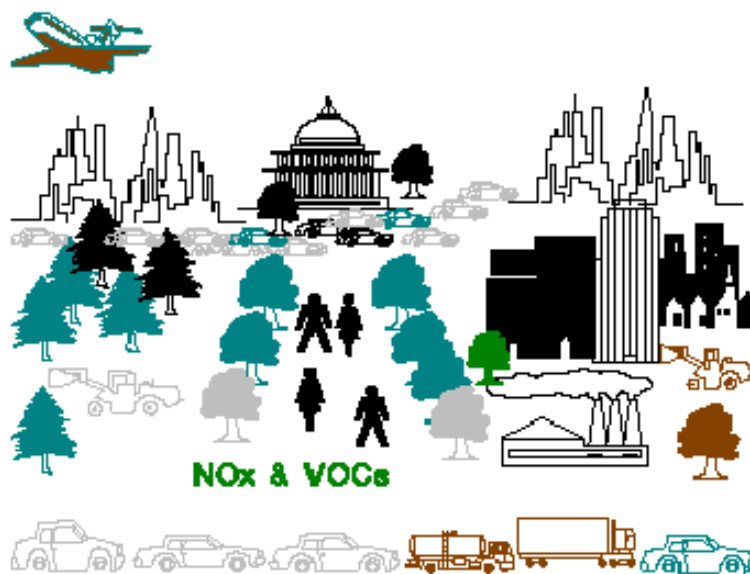
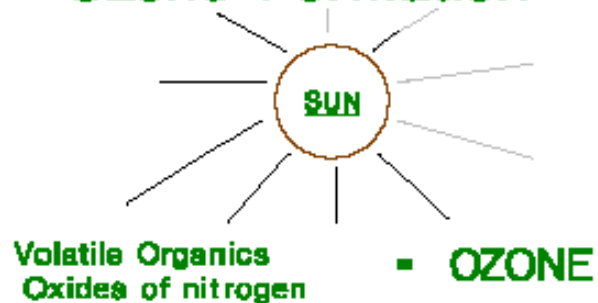
**FIGURE 2-7**  
NUMBER OF DAYS IN 2015 EXCEEDING THE REVOKED 1979 1-HOUR FEDERAL OZONE STANDARD  
(1-HOUR AVERAGE OZONE > 0.12 PPM; GREEN SHADED AREA INDICATES AREAS WITH EXCEEDANCES)



**FIGURE 2-8**  
**2015 PM<sub>2.5</sub>: ANNUAL AVERAGE CONCENTRATION COMPARED TO THE CURRENT FEDERAL STANDARD**  
*(ANNUAL PM<sub>2.5</sub> NAAQS = 12  $\mu\text{g}/\text{m}^3$ , ANNUAL ARITHMETIC MEAN)*

# How Ozone is Formed

## Ozone Formation







# NAAQS - Ozone and Smog

---

- Ground level ozone is the major ingredient of smog
  - Smog refers to the brown haze seen over some major metropolitan areas
  - Due to the nature of the chemical reaction, ozone is often a seasonal problem (summertime)



# Air Pollution and Health

---

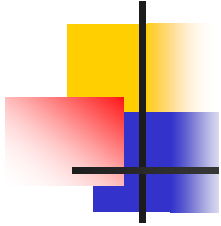
- Health Impacts are Clear:
  - Meuse Valley, Belgium- 1930, killed more than 60 people and sickened over 600
  - Donora, PA- October, 1948, killed 20 people and sickened over 7,000
  - Great December SMOG -1952, resulted in over 4,000 deaths



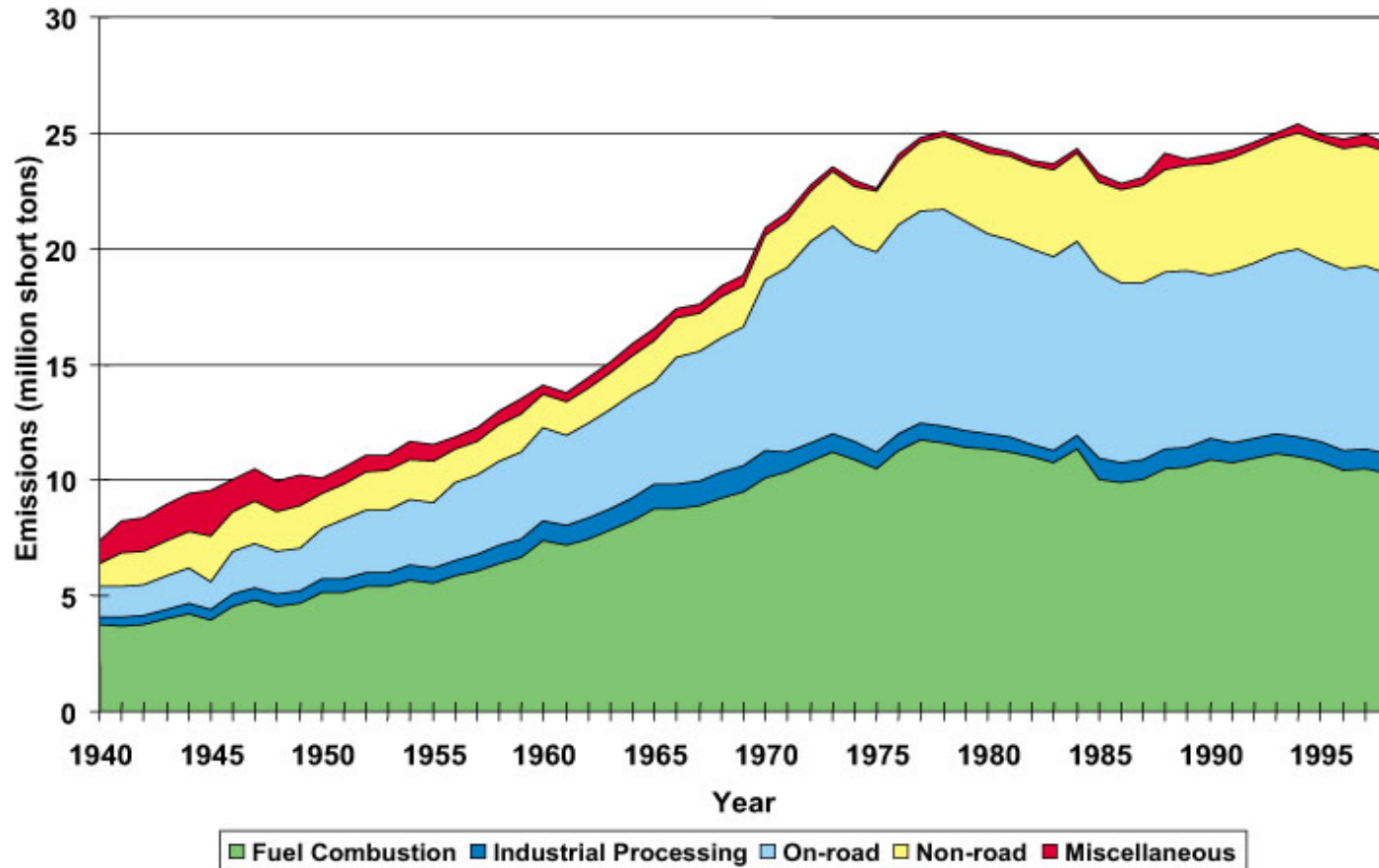
# Emissions Trends

---

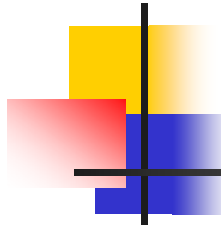
- Although transportation accounts for a significant portion of emissions, it is also where the most improvement has taken place since 1970
- Emissions (in tons) from mobile sources have declined in every category except NO<sub>x</sub> since 1970



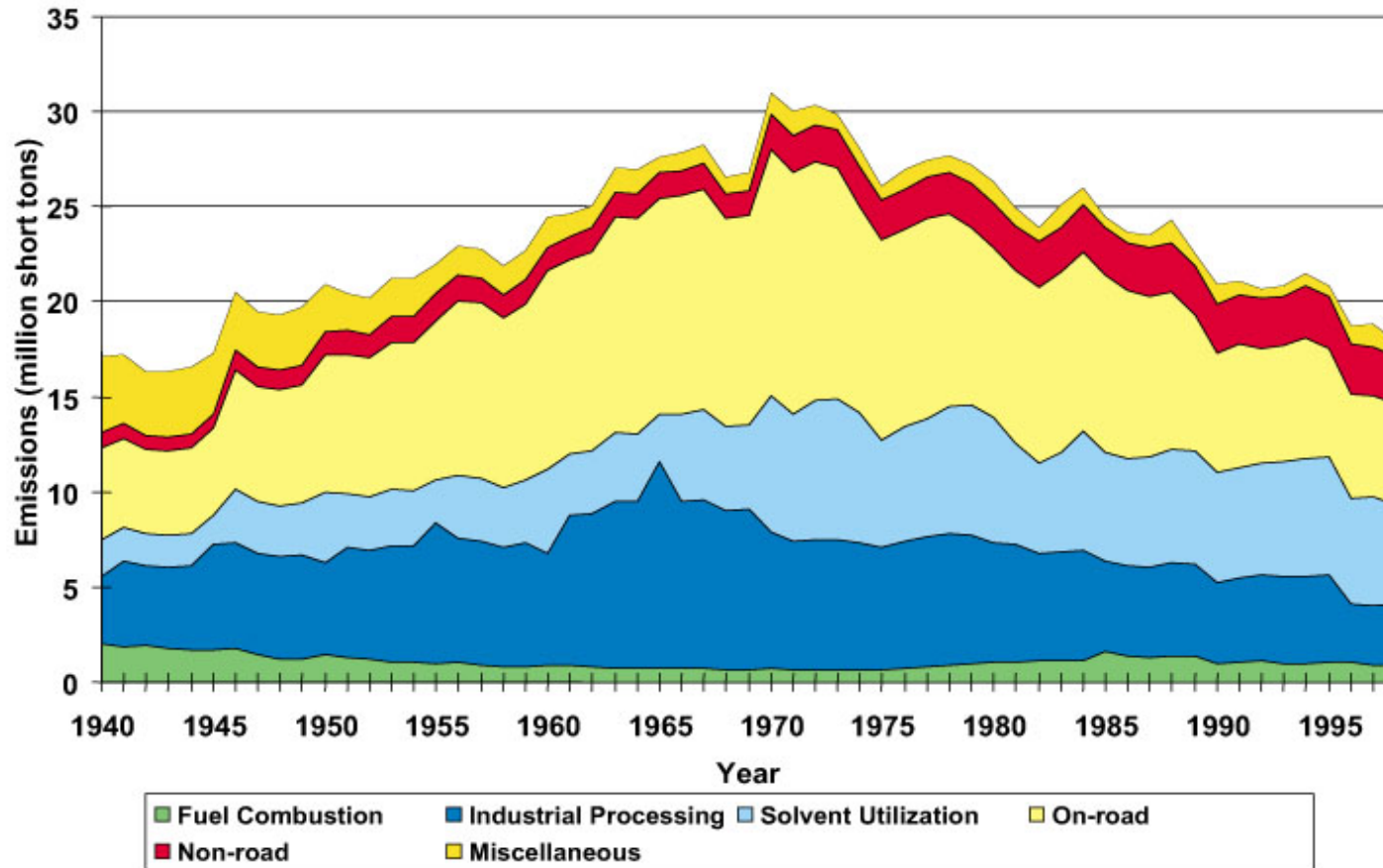
### Trend in NITROGEN OXIDE Emissions, 1940 to 1998



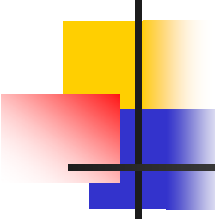
Note: Some fluctuations in the years before 1970 are the result of different methodologies



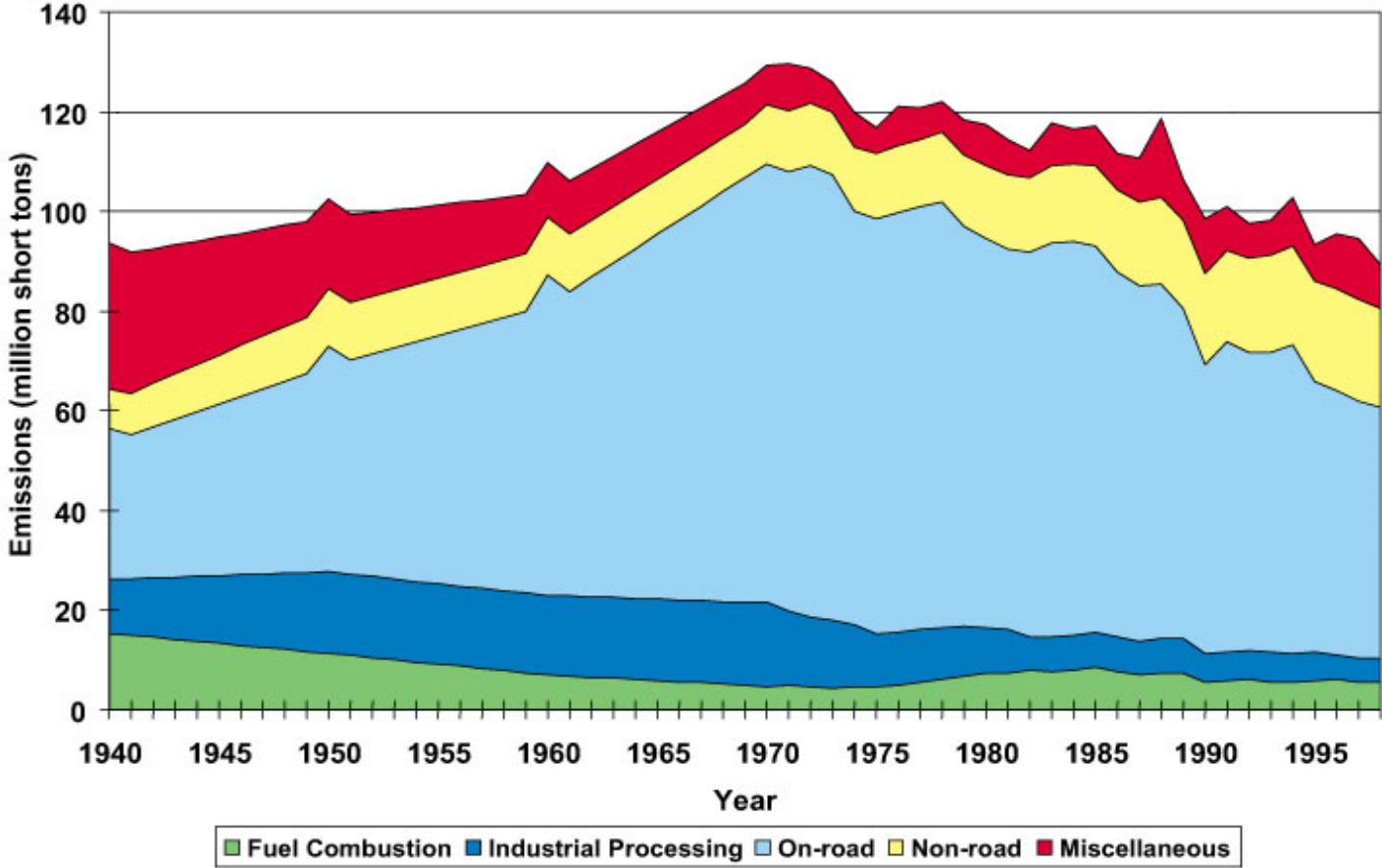
### Trend in VOLATILE ORGANIC COMPOUND Emissions, 1940 to 1998



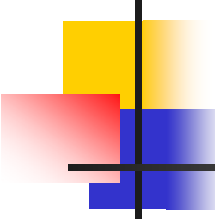
Note: some fluctuations in the years before 1970 are the result of different methodologies



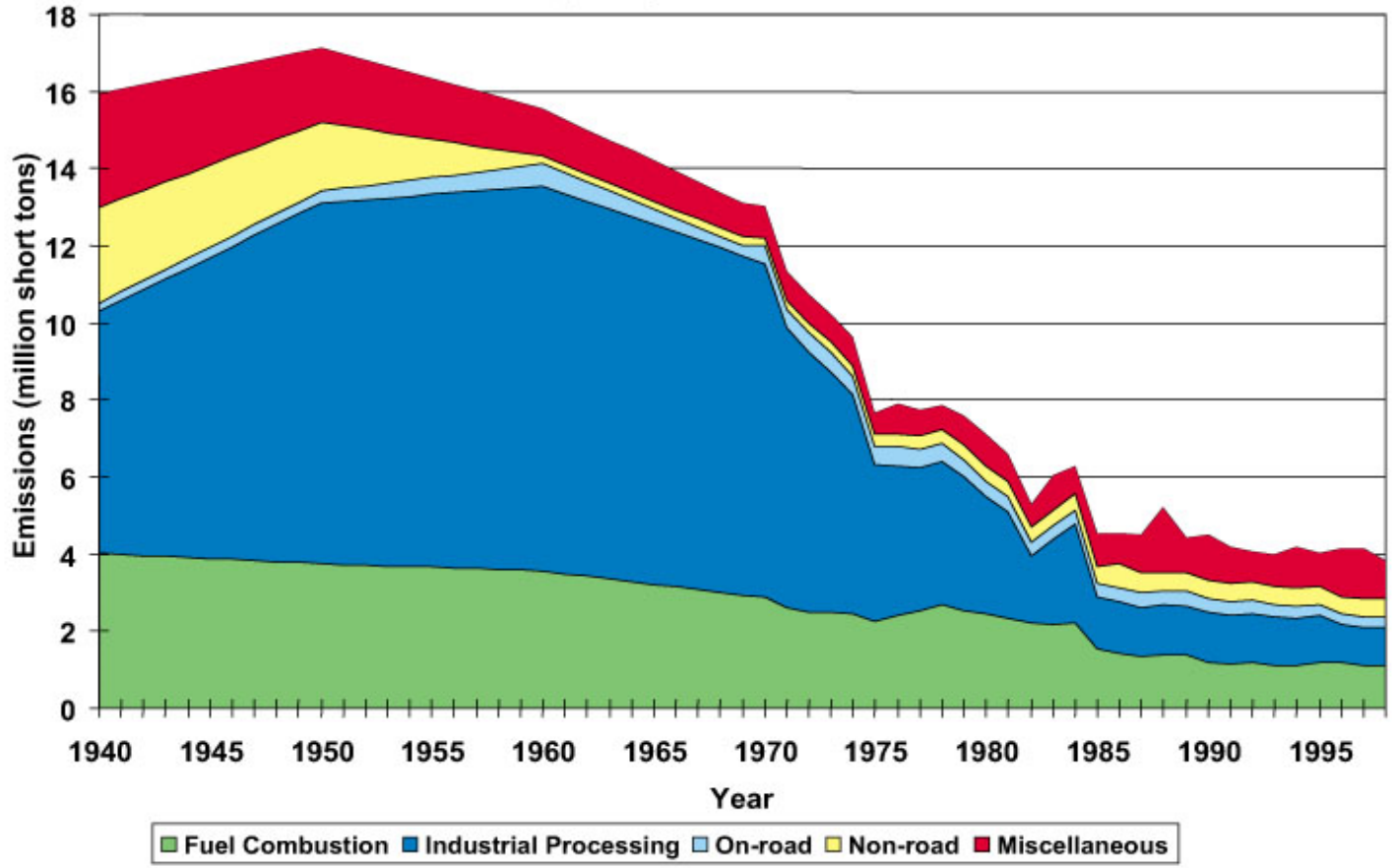
### Trend in CARBON MONOXIDE Emissions, 1940 to 1998



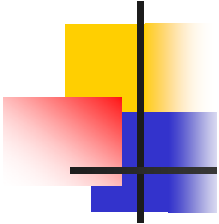
Note: Some fluctuations in the years before 1970 are the result of different methodologies



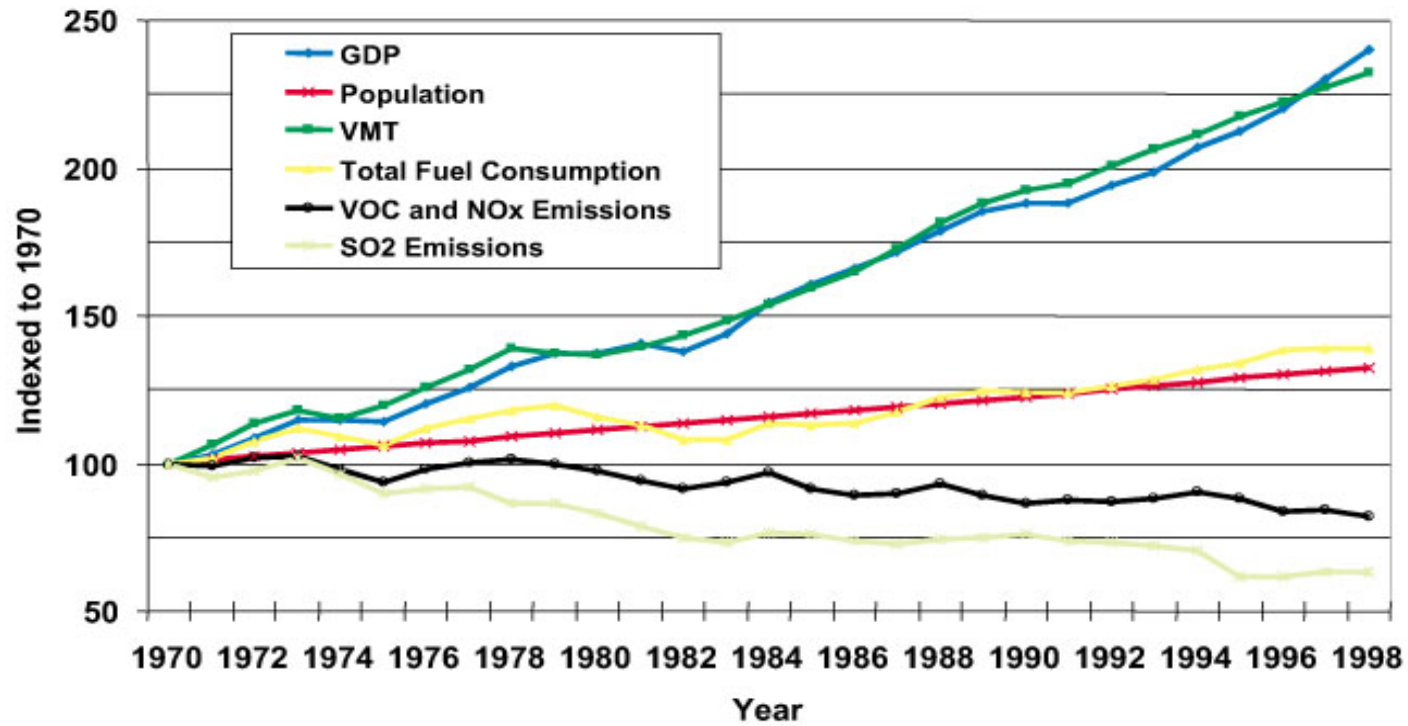
### Trend in PARTICULATE MATTER (PM<sub>10</sub>) Emissions Excluding Fugitive Dust Sources, 1940 to 1998



Note: Some fluctuations in the years before 1970 are the result of different methodologies



**Trend in Gross Domestic Product, Population, Vehicle Miles Traveled, Total Fuel Consumption, combined VOLATILE ORGANIC COMPOUND and NITROGEN OXIDES Emissions, and SULFUR DIOXIDE Emissions, 1970 to 1998**







# Travel Trends

---

- Although emissions have decreased dramatically vehicle miles traveled (VMT) have increased:
  - Size of the fleet has increased
  - Car use has increased
- Emission reductions have been strongly influenced by technological changes such as reformulated gasoline, more efficient engines, on-board diagnostic systems, and catalytic converters



# Future Trends

---

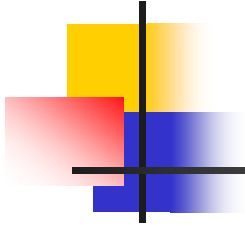
- Emissions in the future may decline at a much slower rate due to:
  - Fewer new technologies
  - Increasing VMT
- Emission declines will be helped by:
  - Tier II vehicle standards
  - Heavy-duty engine standards
  - Low sulfur diesel fuel rules



# Summary

---

- 1990 CAA amendments have placed greater emphasis on transportation sources and the connections between air quality planning and transportation planning
- Substantial progress has been made in reducing emissions, including on-road vehicles
- Reductions may become more difficult as population and travel increase
- *Finally...*  
Conformity helps an area achieve its air quality goals



# Transportation Planning Requirements

## **SECTION 3**



# Lesson Overview

---

- Overview of planning requirements
- Transportation plans
- Transportation improvement programs
- Public involvement requirements
- Roles and responsibilities

# Transportation Planning





# Participants in Transportation Planning

---

- Metropolitan Planning Organizations (MPOs)
  - Urban areas greater than 50,000 population
  - Typically encompasses multiple jurisdictions
- State Agencies
  - Serve as the integrator / coordinator of MPO efforts
  - Often serve as the planning entity for non-MPO areas
  - Develop the statewide plan
- Other transportation/transit agencies
- The public



# Planning Products

---

- Transportation Plan (Plan, LRP, RTP)
  - Long-term plan for major transportation investments
  - At least a 20-year horizon/Updated every 4 years
  - Developed for metropolitan / regional and state levels
- Transportation Improvement Program (TIP)
  - Short-term program of available dollars with projects
  - Minimum 4-year horizon/Updated every 4 years
  - Developed for metropolitan / regional level
- State Transportation Improvement Program (STIP)
  - 20 year horizon/Updated every 4 years





# Applicability of Conformity Requirements

---

- Conformity applies to:
  - Metropolitan plans
  - TIPS
  - Projects
- There is no requirement to determine conformity on a statewide plan or STIP
- Applies in Ozone, CO, PM, and NO<sub>2</sub> non-attainment and maintenance areas



# Transportation Plans – Overview

---

- Plans outline an integrated strategy for long term (at least 20 years) transportation investments
- Plans must:
  - Include all major surface transportation investments, including all federally funded projects
  - Discuss projected future transportation demand
  - Consider the 8 broad planning factors
  - Demonstrate a fiscally constrained financial plan



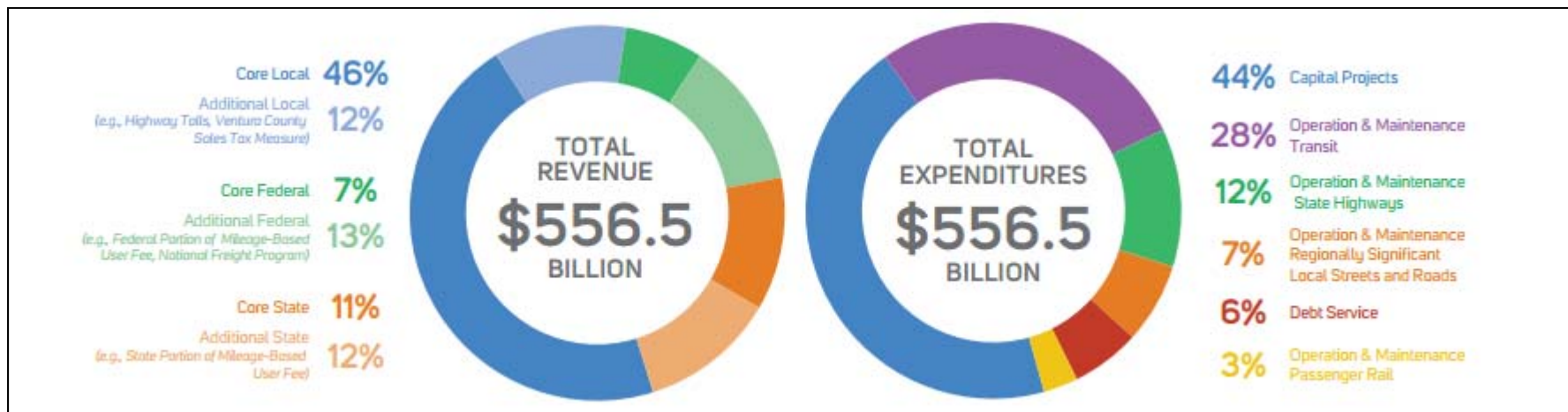
# Key Elements – Transportation Plans

---

- Strategies
  - Balanced short and long-term strategies lead to an integrated intermodal system
- Facilities
  - Facilities are planned to function within an integrated metropolitan system
- Financial elements
  - Resources that may be “reasonably expected” to be available are identified

# Fiscal Constraint on the Plan

**Example:** Southern California Association of Governments  
Regional Checkbook -2016 RTP (nominal dollars)





# Updating Transportation Plans

---

- Plans must be updated:
  - Every 4 years in non-attainment / maintenance areas
  - Every 5 years in attainment areas
- Plans can be amended in the interim, but...

Conformity requirements apply to all amendments
- A conformity determination must be made when updating a plan in a non-attainment / maintenance area!



# Transportation Improvement Program (TIP)

---

- TIPs serve as a priority list of projects for MPOs
- TIPs must:
  - Include a description of projects
  - Ensure consistency with the transportation plan
  - Demonstrate fiscal constraint
- TIPs must be updated every 4 years



# TIP Details

---

- Project details must be sufficient to allow for conformity determinations
  - Must include all regionally significant projects
  - Must include the identification and prioritization of all transportation control measures (TCMs) in approved SIPs



# Fiscal Constraint on the TIP

---

- TIPs must:
  - Show funding from federal, state and local sources
  - Show the projects / project phases to be funded
- In non-attainment and maintenance areas:  
All projects must have adequate resources available and committed in the first 2 years of the TIP





# Relationship Between the TIP and the Plan

---

- Conformity determination is required on the plan and the TIP
  - TIP must be consistent with plan
  - If the TIP is an exact subset of plan, a separate regional emissions analysis is not required
  - If the TIP is amended, other than minor amendments, a new conformity determination that includes emissions analysis is required



# Relationship Between the TIP and the STIP

---

- All TIPs are incorporated into the STIP  
(Statewide Transportation Improvement Program)
  - STIP is developed by the state transportation agency
  - STIP is reviewed and approved by DOT (FTA/FHWA) for obligating Federal transportation funds
- Planning studies that use capital funds such as CMAQ, STP, etc. must be included in the STIP
- STIP is not subject to conformity requirements
- If STIP schedule slips, TIPs are affected



# Unified Planning Work Program (UPWP)

---

- UPWP is developed by individual MPOs to guide planning activities each year
- Activities planned / funded through the UPWP include:
  - Data collection
  - Model development and enhancements
  - Development of the transportation plan / TIP
- UPWP update is required annually



# Public Involvement Requirements

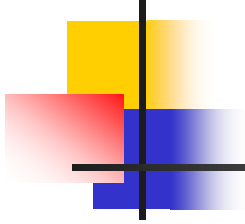
- Public involvement requirements for plans and TIPs:
  - Involve the public in transportation planning
  - Provide opportunity for public comment
- Conformity requires public involvement
  - Relies upon transportation planning requirements
  - Public should be involved in the development process
- MPOs and states are required to periodically review their public involvement efforts



# Summary

---

- Transportation planning is a continuous process
- Conformity applies to transportation plans / TIPs
  - In nonattainment and maintenance areas, plans must be updated every 4 years
  - TIPs must be updated every 4 years
- Conformity also applies to certain categories of projects
- Public involvement and coordination with other agencies is important in the conformity process



# State Implementation Plans (SIPs)

## **SECTION 4**



# Lesson Overview

---

- Overview of SIPs
- Relationship of SIPs to transportation plans and TIPs
- Types of SIPs
- SIP sanctions and time clocks
- Roles and responsibilities in developing SIPs



# State Implementation Plan (SIP) - Description

---

- The SIP is an air quality plan that shows how an area will meet the NAAQS
- SIPs are...
  - Required by the CAA for nonattainment or maintenance areas of one or more NAAQS
  - Prepared by the state and approved by EPA
- SIPs provide for the implementation and enforcement of emission control measures from all source categories





# Key SIP Requirements

---

- Key SIP provisions in the CAA dictate that control measures must be:
  - Enforceable
  - Quantifiable
  - Permanent
  - Surplus
- Legal Authority must be in place to implement SIPs



# Elements of a SIP – Inventory

---

- Inventories are detailed accounting of all emissions and emissions sources
  - Helps define the emissions problem
  - Used as the basis for:
    - Establishing emissions reductions targets to enable the area to attain the NAAQS
    - Setting caps on emissions



## Elements of a SIP – Inventory (Continued)

---

- An on-road emission inventory includes:
  - Number and types of vehicles in the region
  - Age of vehicles
  - Rate of fleet turnover
  - Seasonal temperatures
  - Vehicle miles traveled (VMT)
  - Transportation Network



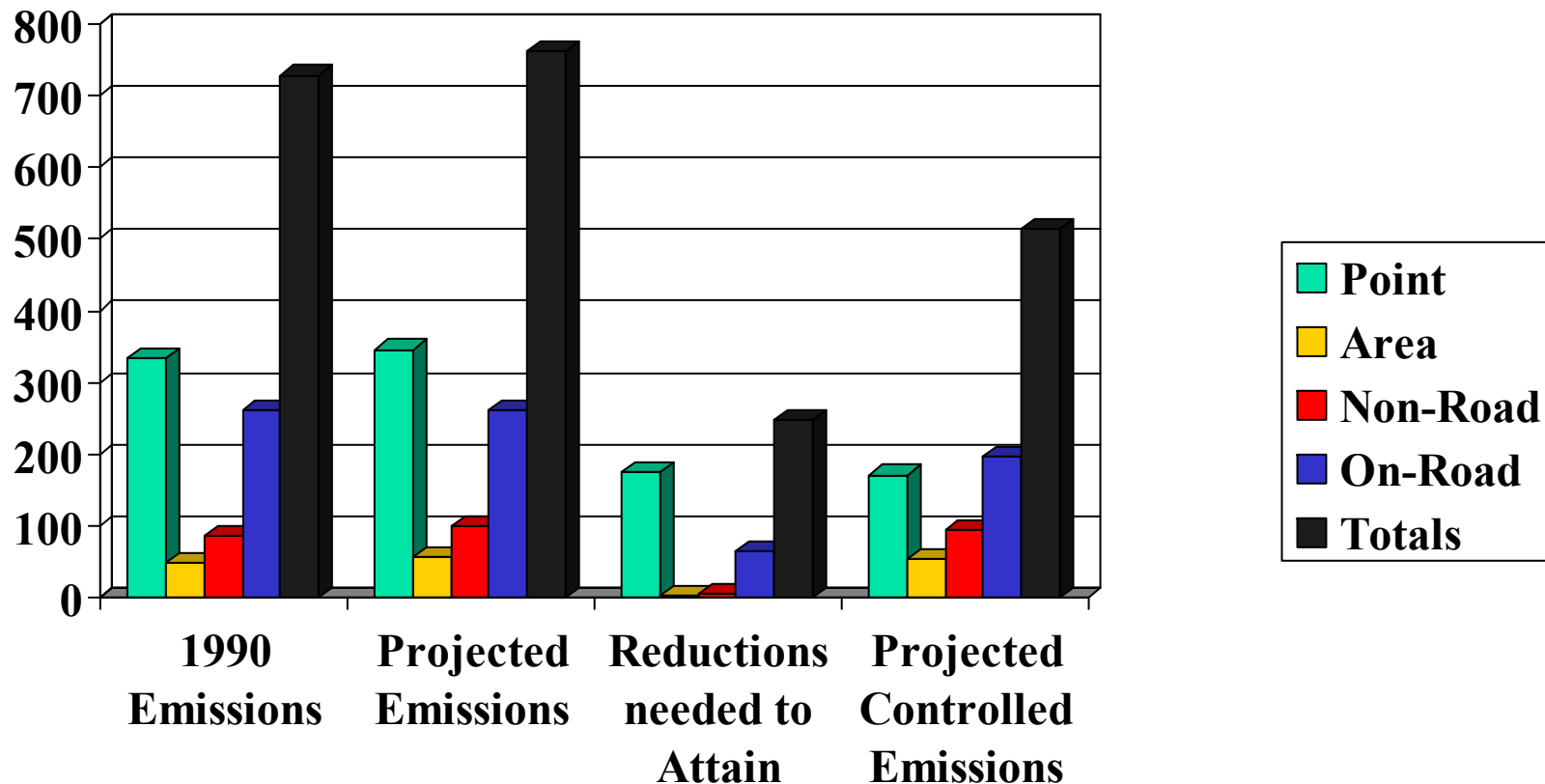
## Elements of a SIP – Inventory (Continued)

---

- A base year inventory is projected to a future year (e.g., attainment year).
- Level of emissions reductions needed to attain NAAQS are determined
- Strategies to reduce emissions over time are identified and a controlled inventory established

# Sample of NO<sub>x</sub> Emissions Inventory 2002 Controlled Emissions

(Washington DC-MD-VA Nonattainment Area)





# Elements of a SIP – Emissions Budgets

---

- Emissions inventory used to establish an emissions “budget” for on-road sources for each pollutant
  - Not all non-attainment / maintenance areas are required to have budgets
- Motor vehicle emissions budgets serve as a regulatory limit for on-road mobile source emissions
- SIP control measures / strategies are identified to reduce emissions so that the emissions budget is not exceeded



# Elements of a SIP – Emissions Budgets

---

- Conformity is demonstrated using the motor vehicle emissions budgets
- Conformity is the link between the SIP and the transportation plan/TIP
  - Projected emissions from the transportation plan and TIP must be at or below the SIP budgets
  - Planning assumptions used to develop SIP budgets must be the latest available information  
(e.g., vehicle types, VMT, population, etc.)



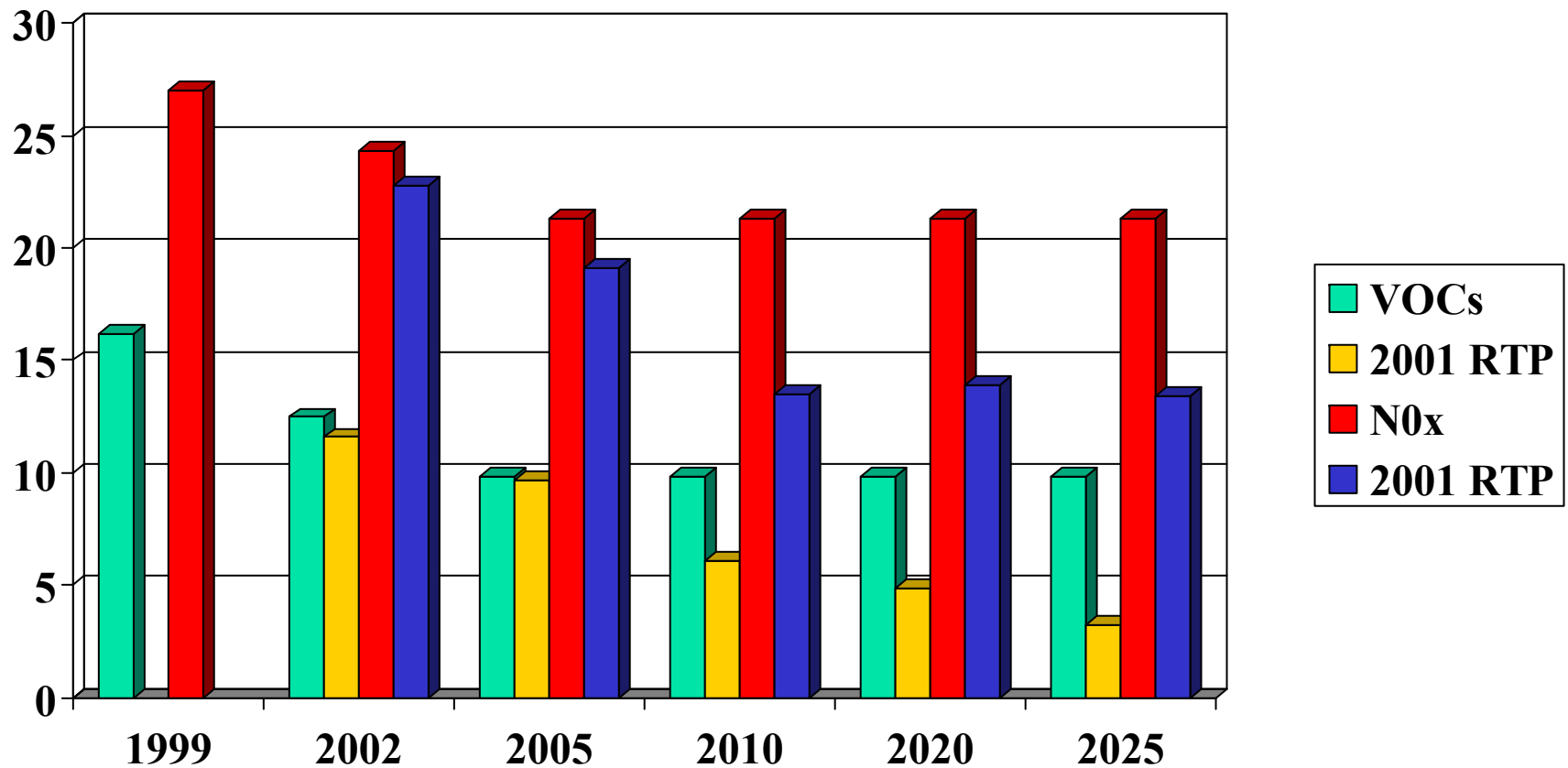
## EXAMPLE: Motor Vehicle Emissions for CO

---

- 1999 Attainment
  - SIP will include the following data:
    - 1990 Base Year = 200 tpd
    - 1999 Uncontrolled Emissions = 250 tpd
    - 1999 Target level = 180 tpd
    - Reductions required = 70 tpd (250 tpd – 180 tpd)
    - Total reductions possible = 75 tpd
    - Controlled Emissions Inventory = 175 tpd  
(250 tpd – 75 tpd)
- Result = SIP COMPLIANCE with a 5 tpd surplus



# Example of Emissions Budget Ventura County/South Coast Air Basin





# SIPs and Transportation Conformity

---

- There are different types of SIPs that contain budgets for conformity
  - Control Strategy SIPs
    - Reasonable Further Progress SIPs
    - Attainment SIPs
  - Maintenance Plans
- Requirements depend on pollutant, classification and attainment dates



# Rate of Progress SIPs (Reasonable Further Progress)

---

- Rate of Progress (ROP) SIPs are used only for serious, severe and extreme ozone areas
- Types of Rate of Progress (ROP) SIPs
  - 15% ROP SIP for first 6 years
  - 9% ROP SIP for every 3 years thereafter



# Attainment SIPs

---

- Certain areas that are designated non-attainment for a given pollutant are required to demonstrate attainment using emissions modeling
- Demonstration includes specific reductions needed to attain the NAAQS by attainment dates
- Attainment dates are generally determined by the pollutant and an area's classification



# Maintenance Plans

---

- Maintenance plans are developed once an area qualifies for redesignation as a maintenance area
  - Approved plan is required for redesignation
  - Plan assures that an area will maintain the standards for 20 years after an attainment designation
- Maintenance plans are developed for 10-year periods
  - When 8-years have elapsed in the first 10-year period the second 10-year plan must be submitted
  - Contains, at a minimum, motor vehicle emissions budgets for the last year of the 10-year plan period



## Karina O'Connor, EPA Region #9

---

Karina O'Connor has been working on transportation and air quality planning with EPA Region 9 for over 20 years. She is the Region 9 lead for Regional and Project Level Transportation Conformity and works with agencies in California and Nevada on various environmental projects and policies.

She also reviews hot spot and NEPA documents for transportation projects and coordinates overall air quality issues between the Nevada agencies and EPA.

Ms. O'Connor, PE, obtained her MS in Civil Engineering from Stanford University and her BS in Civil Engineering from Purdue University.



# Sanctions

---

- CAA provides for sanctions in the event of SIP failure
- Types of SIP failures:
  - Failure to submit a SIP
  - Incompleteness
  - SIP disapproval (with or without a protective finding)
- Two types of sanctions:
  - 2-to-1 emission offsets for stationary sources
  - Federal funds withheld for certain transportation projects



# Sanctions

---

- Stationary source sanctions are imposed 18 months after SIP failure
- Highway sanctions are imposed 6 months later at which time conformity would “lapse”
- Federal Implementation Plan (FIP) requirements may be imposed 24 months after a SIP failure
  - EPA develops the Federal Implementation Plan
  - Functions in lieu of an acceptable SIP





# Interagency Consultation

---

- Interrelationship between the SIP and transportation planning processes requires close coordination
  - Coordination is carried out through the interagency consultation process
  - Participants include state air agency, state DOT, MPOs, regional air districts (where applicable), cities and counties, FHWA, FTA, and EPA

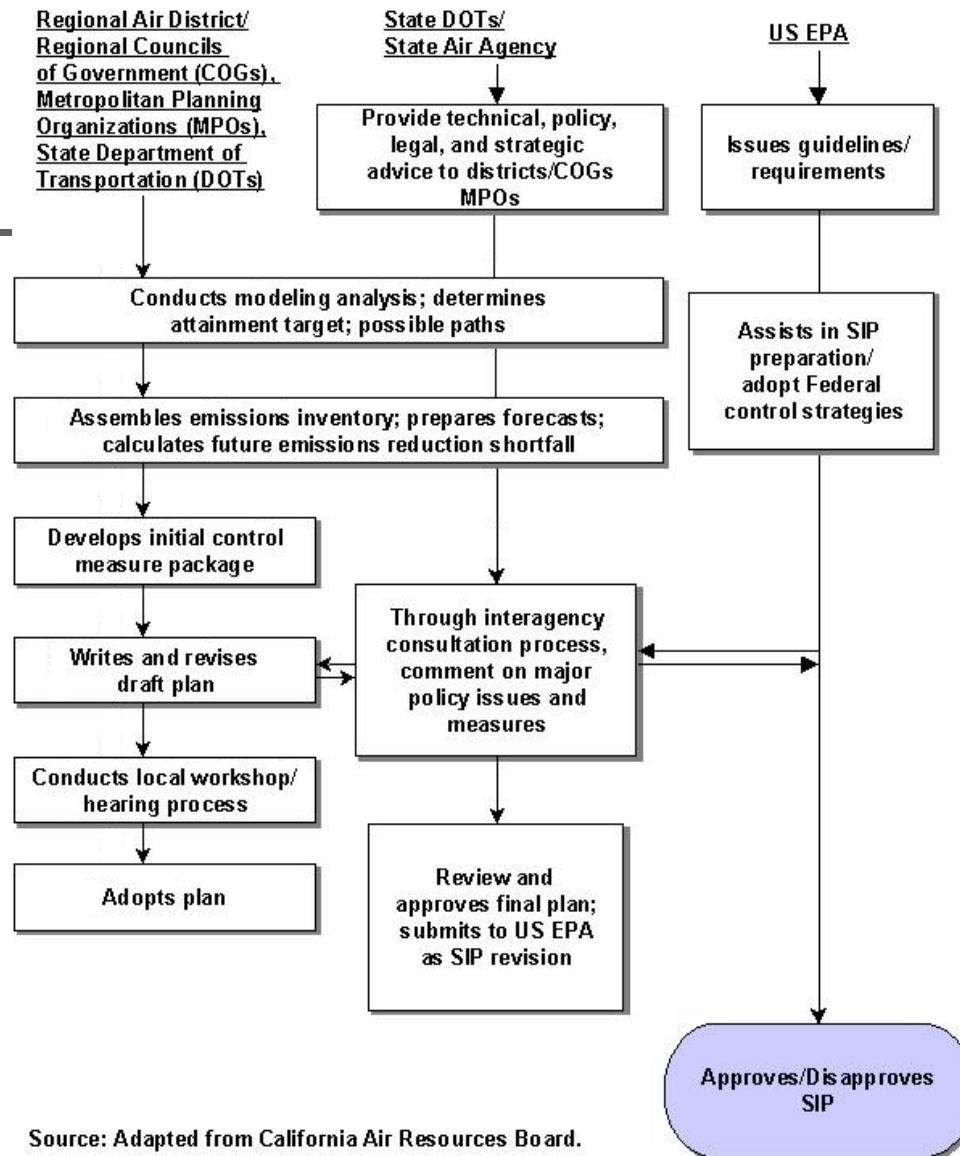


# Reasonably Available Control Measures

---

- RACMs are reasonably available control measures (e.g. TCMs) that may help an area reach attainment sooner
- RACMs must be considered for inclusion in the SIP
  - Are such measures available?
  - Are they included in the SIP? If not, why not?
- Criteria for assessing RACMs
  - Consideration of evaluated emissions benefits
  - Consideration of benefits from all feasible mobile and stationary sources combined
  - Consideration of benefits from a combined set of measures
  - Do measures advance attainment by a year or more?

## Exhibit 8 Example of Roles and Responsibilities in SIP Development



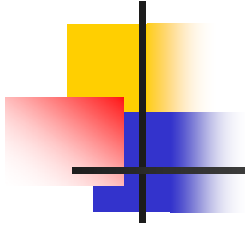
Source: Adapted from California Air Resources Board. (Please note: many States do not have local or regional air districts or agencies. The State air agency will likely have a greater role in SIP preparation in these States.)



# Summary

---

- A SIP is an air quality plan that shows how to meet the NAAQS
- Conformity is the link between SIPs, transportation plans and TIPs
- There are several different types of SIPs with different requirements
- Inventories are the basis upon which motor vehicle emission budgets are developed
- Sanctions can be imposed for SIP failures



# Transportation Conformity Requirements

## **SECTION 5**



# Lesson Overview

---

- Conformity overview
- Applicability of conformity requirements
- Frequency of conformity determinations



# Conformity Overview

---

- Transportation conformity is a process where...  
Transportation planning agencies demonstrate that plans, programs, and projects are consistent with the transportation-related elements of a SIP
  - Demonstrated by the MPO and DOT (FHWA/FTA)
  - Ensures that Federal funding and approval are given to activities that are consistent with air quality goals



# Clean Air Act Requirement

---

- The Clean Air Act requires that transportation plans, programs and projects do not:
  - Create new violations of the NAAQS
  - Increase the frequency or severity of NAAQS violations
  - Delay timely attainment of the NAAQS





# Applicability

---

- All nonattainment / maintenance areas for:
  - Ozone (O<sub>3</sub>)
  - Carbon monoxide (CO)
  - Nitrogen dioxide (NO<sub>2</sub>)
  - Particulate matter less than 10 micrometers (PM-10)
  - Particulate matter less than 2.5 micrometers (PM-2.5)
- Applies to emissions from precursor pollutants
  - NO<sub>x</sub> in NO<sub>2</sub> and PM<sub>2.5</sub> areas
  - VOCs and NO<sub>x</sub> in Ozone areas
  - VOCs, NO<sub>x</sub>, and PM-10 in PM-10 areas
    - If transportation-related precursor emissions significantly contribute to PM-10, or
    - If the SIP has budgets for such emissions



## New Nonattainment Areas

---

- A one year grace period is allowed for newly designated nonattainment areas
- After one year:
  - Conforming plan and TIP must be in place
  - Area is subject to conformity frequency requirements



# New 8-hour ozone standard

---

- Final revised 2008 8-hour ozone NAAQS signed Mar. 12, 2008
- Same pollutant as current 8-hour ozone standard
  - Readings are over an 8-hour period
  - The 3-year average of the 4th highest ozone readings must be  $\leq 0.075$  ppm instead of  $\leq .08$
  - Truncated, not rounded, so .0759 is attainment (instead of .0849)



## 2008 8-hour ozone standard

---

- Final area designations for the new 8-hour ozone standard: Mar. 12, 2010 (based on 2006-2008 data)
- Effective date of designation: June 15, 2010
- New 8-hour conformity applies: June 15, 2011
- New SIPs required by June 15, 2013

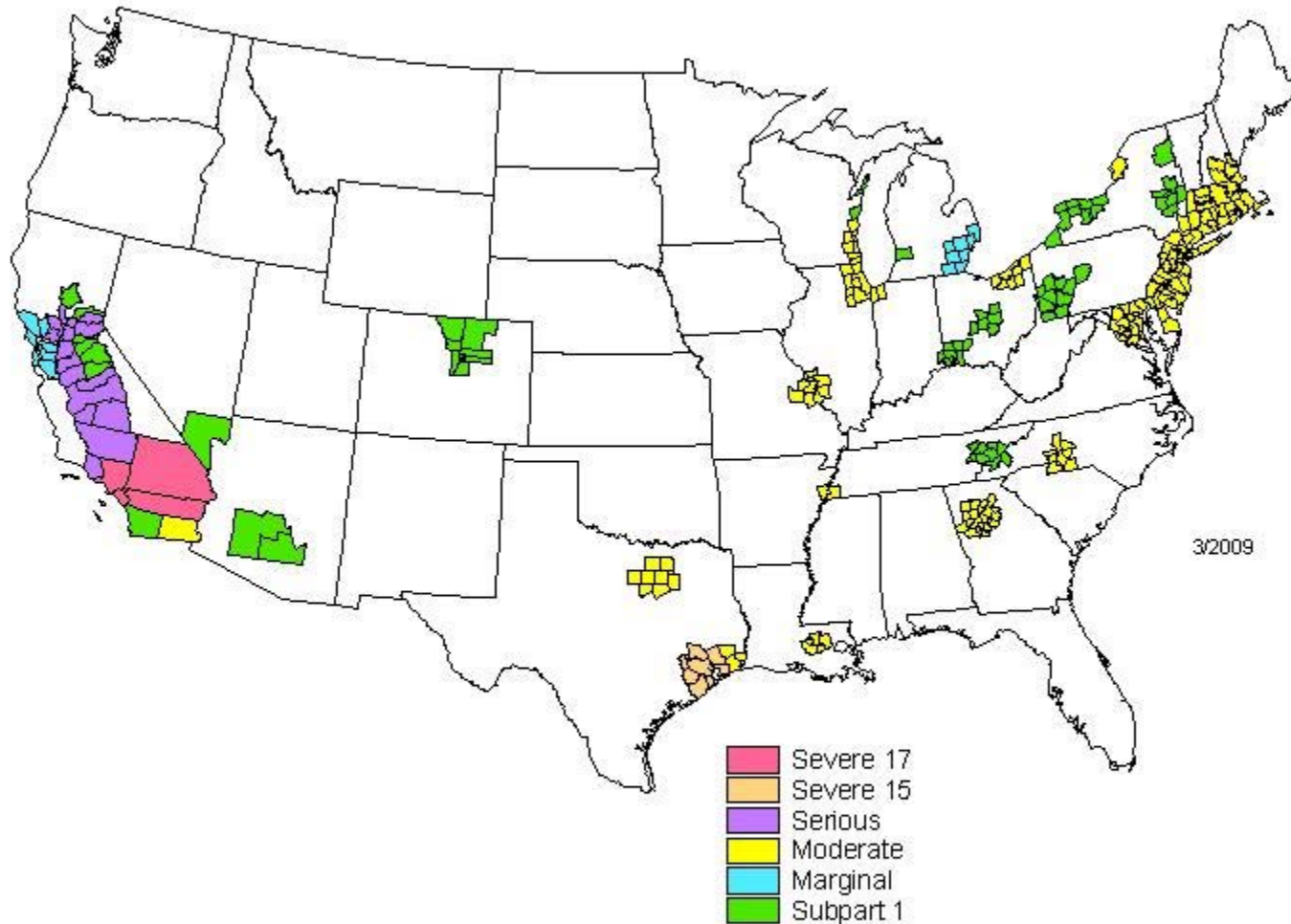


# 2008 8-Hour Ozone Classifications

---

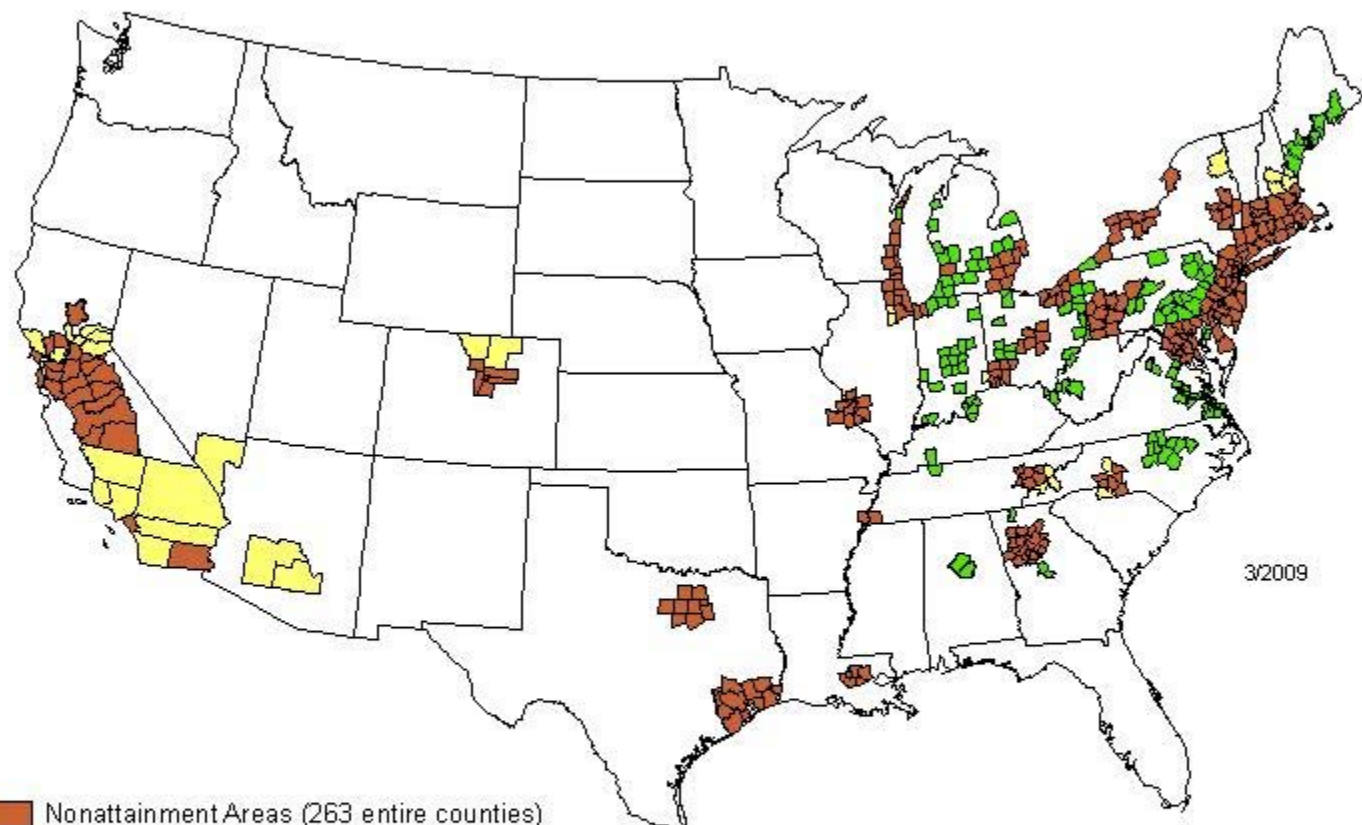
<b>Classification</b>	<b>Attainment Date</b> (years for designation)
Marginal	3 years (2015)
Moderate	6 years (2018)
Serious	9 years (2021)
Severe	15 years (2027)
Extreme	20 years (2032)

## Counties Designated Nonattainment for 8-hour Ozone






Classification colors are shown for whole counties and denote the highest area classification that the county is in

Nonattainment and Maintenance Areas in the U.S.  
8-hour Ozone Standard



3/2009

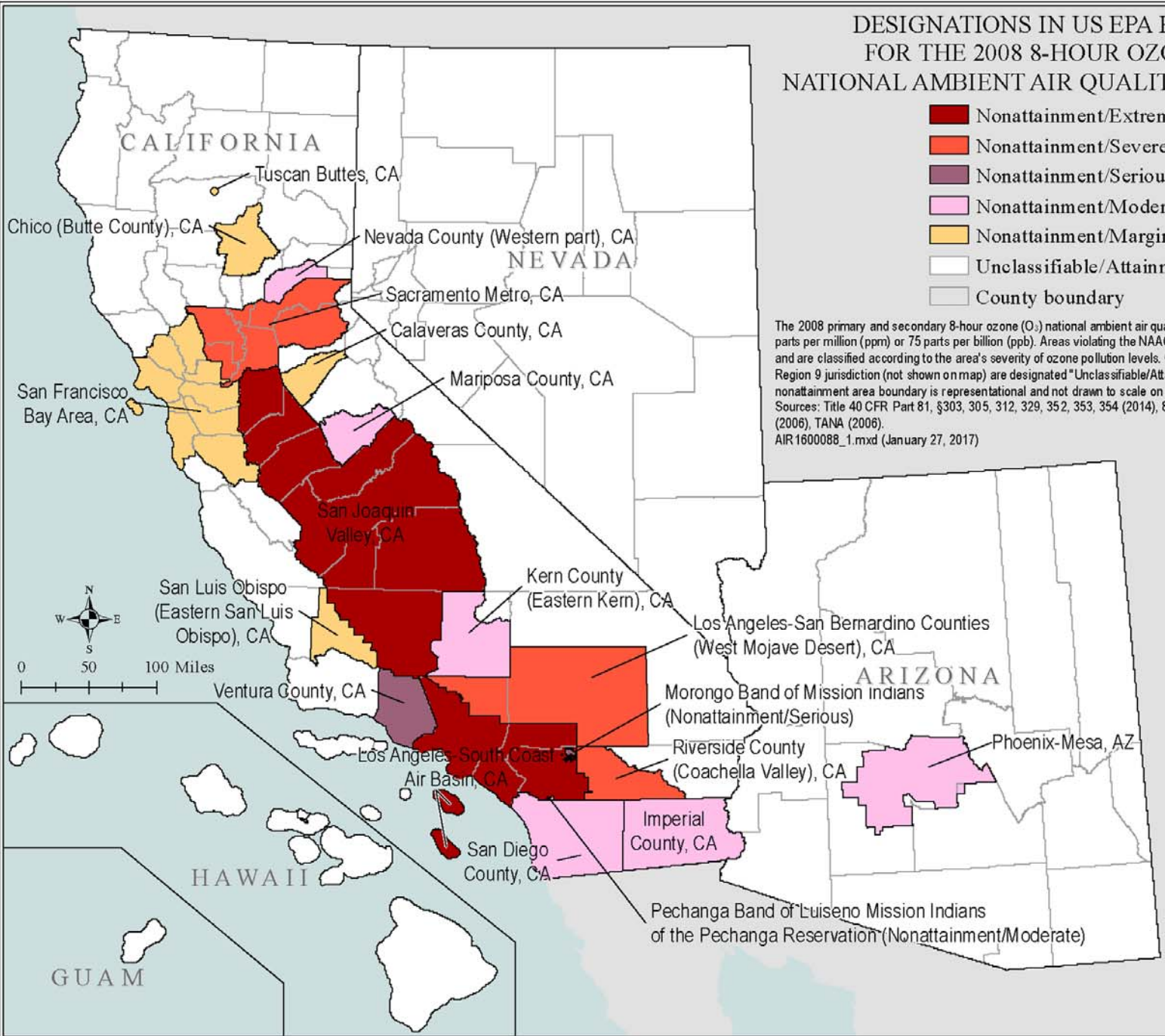
-  Nonattainment Areas (263 entire counties)
-  Nonattainment Areas (30 partial counties)
-  Maintenance Areas (141 entire or partial counties)

Partial counties, those with part of the county designated nonattainment and part attainment, are shown as full counties on this map.

# DESIGNATIONS IN US EPA REGION 9 FOR THE 2008 8-HOUR OZONE (O<sub>3</sub>) NATIONAL AMBIENT AIR QUALITY STANDARDS

- Nonattainment/Extreme
- Nonattainment/Severe-15
- Nonattainment/Serious
- Nonattainment/Moderate
- Nonattainment/Marginal
- Unclassifiable/Attainment
- County boundary

The 2008 primary and secondary 8-hour ozone (O<sub>3</sub>) national ambient air quality standard (NAAQS) is 0.075 parts per million (ppm) or 75 parts per billion (ppb). Areas violating the NAAQS are designated "Nonattainment", and are classified according to the area's severity of ozone pollution levels. Other Pacific territories under EPA Region 9 jurisdiction (not shown on map) are designated "Unclassifiable/Attainment". The *Tuscan Buttes, CA* nonattainment area boundary is representational and not drawn to scale on this map.  
 Sources: Title 40 CFR Part 81, §303, 305, 312, 329, 352, 353, 354 (2014), 81 FR 26697 (May 4, 2016), ESRI (2006), TANA (2006).  
 AIR1600088\_1.mxd (January 27, 2017)





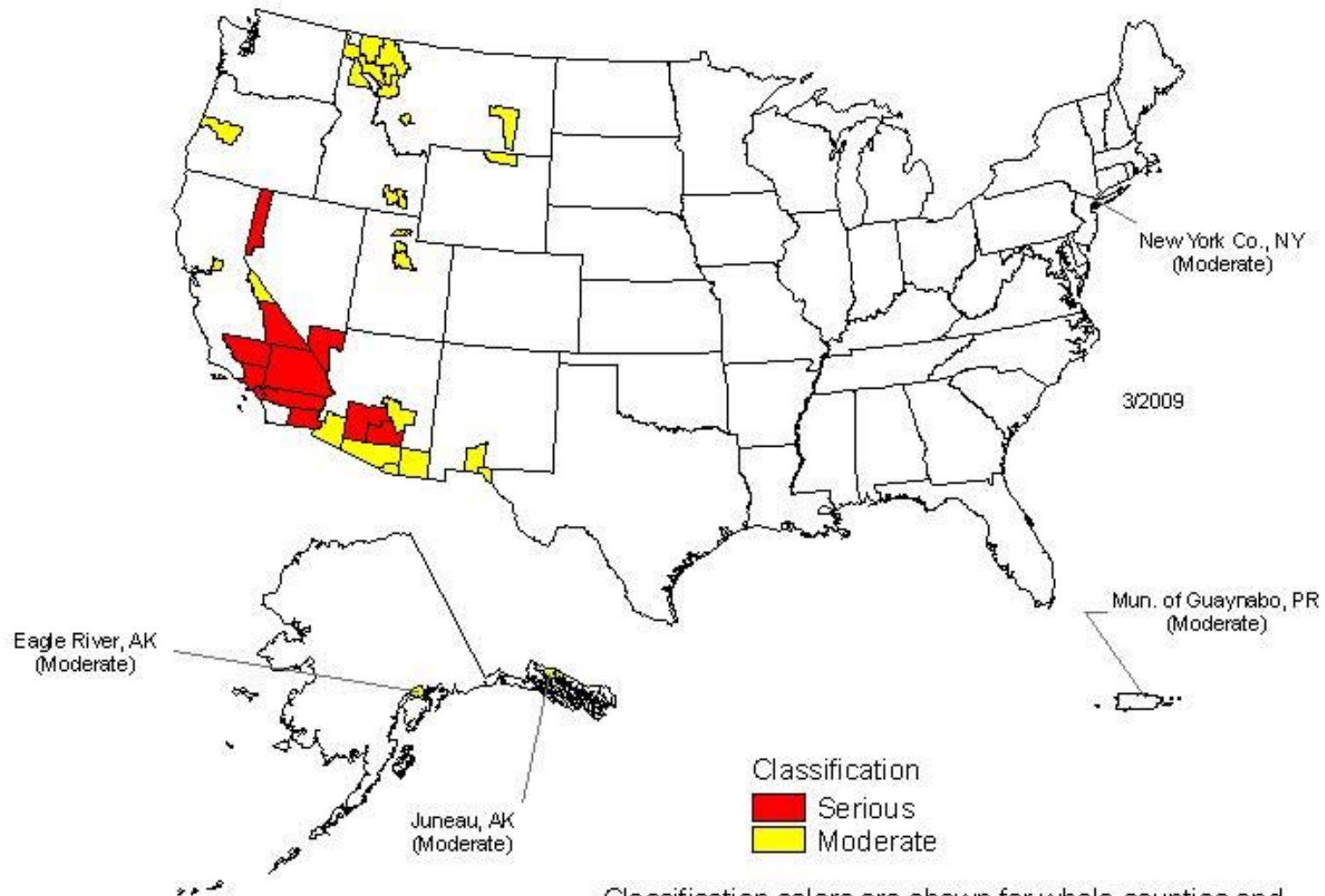


# The 1-hour ozone standard

---

- Was revoked June 15, 2005
  - Conformity for the 1-hour standard no longer applies
  - 1-hour SIP commitments still in effect (e.g. TCMs)
- Coordinated with date conformity for the 8-hour standard applies
  - To ensure conformity not required for both ozone standards at same time

## Counties Designated Nonattainment for PM-10



Classification colors are shown for whole counties and denote the highest area classification that the county is in

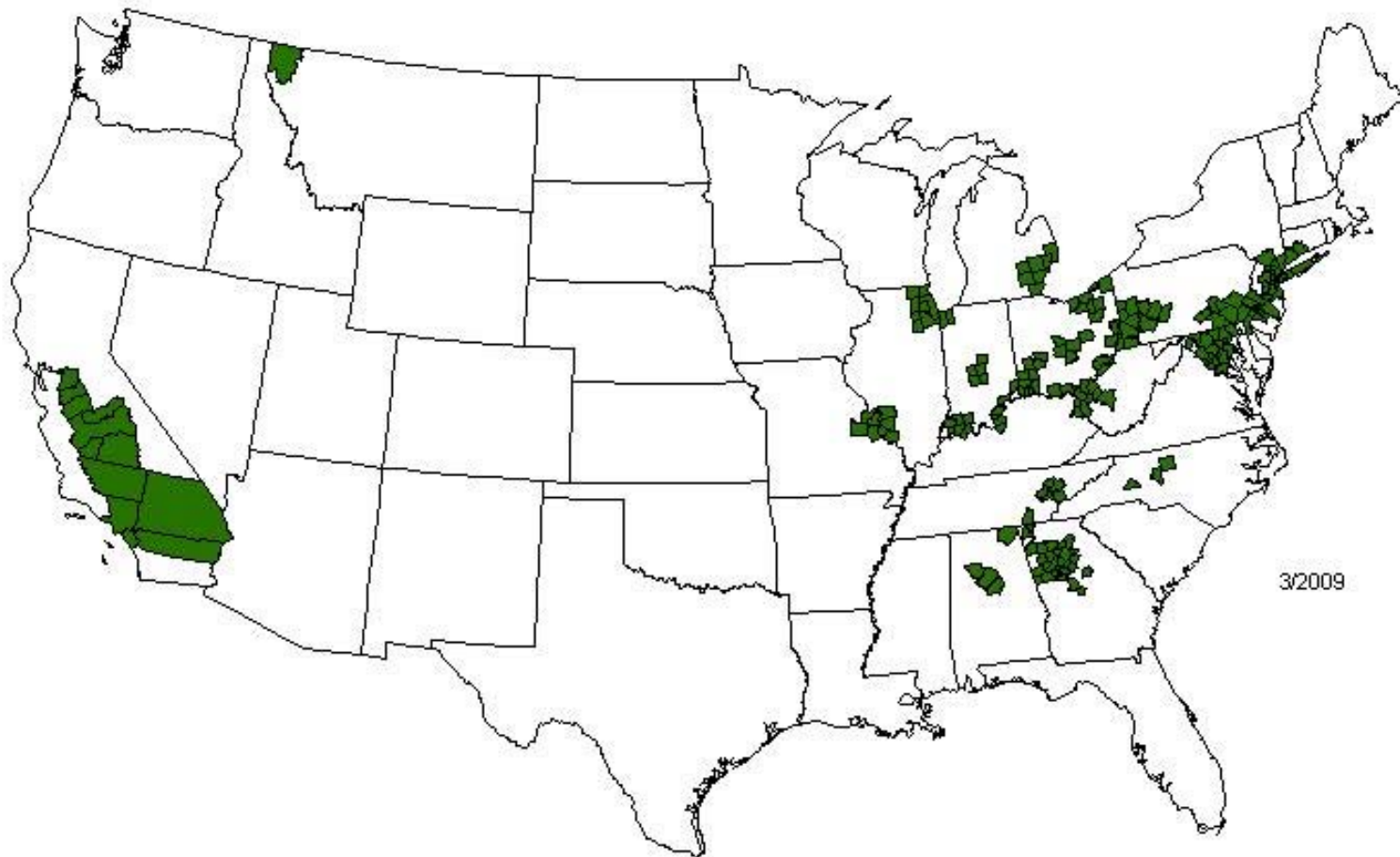


# New PM<sub>2.5</sub> standards

---

- PM<sub>2.5</sub> is a different pollutant than PM<sub>10</sub>, not just a different standard
- New PM<sub>2.5</sub> standards:
  - annual standard: 15 µg/m<sup>3</sup> (no change)
  - 24 hour standard: 35 µg/m<sup>3</sup> (replaces 65)
- EPA designated areas Dec. 18, 2006
  - Effective date April 5, 2009 (to allow use of 2006-2008 data)
  - Conformity applies 1 year after effective date: April 5, 2010
- New SIPs required by April 5, 2012

## Counties Designated Nonattainment for PM-2.5



Partial Counties are shown as whole counties





# When is Conformity Required?

---

- Conformity must be determined:
  - At least every 4 -years in non-attainment and maintenance areas
  - Prior to approval / acceptance of a transportation plan, a TIP, and plan / TIP amendments
  - Prior to approval of federal projects
    - Federal projects involving FHWA/FTA approval / funding
    - Projects must be included in a conforming plan and TIP
  - Within 24 months after certain SIP actions



# Four Year Clock

---

- When does the four year clock start?
  - When FHWA/FTA makes a conformity determination
  - Not when an MPO submits a plan to FHWA/FTA
- The 4-year plan update clock and the 4-year conformity clock are aligned and run on the same schedule
- Existing conformity determination will lapse if:
  - More than four years pass after the last transportation conformity determination, and
  - There is no new conformity determination
- Lapse occurs 12 months after determination expires



---

# When is Conformity Required for Projects?

---

- A project level conformity determination is required for all federal projects before approval
- Redetermination required for federal projects that have not advanced in four years
- Redetermination required if a project's design concept and scope have changed significantly





# Exceptions

---

- A conformity determination is not required for:
  - Projects exempt for safety
  - Projects exempt because of de minimis impacts
  - Traffic signal synchronization projects, etc.
- Project level conformity determinations are not required for non-federal projects



# How Often is Conformity Required?

---

- Conformity must be redetermined within 24 months of the date that:
  - EPA makes an adequacy finding on the motor vehicle emissions budget in an initial SIP submission
  - EPA approves a SIP that creates or revises a budget
  - EPA approves a SIP that effectively adds, deletes, or changes any TCMs
  - EPA promulgates a Federal Implementation Plan which creates or revises a budget and/or effectively adds, deletes, or changes any TCMs

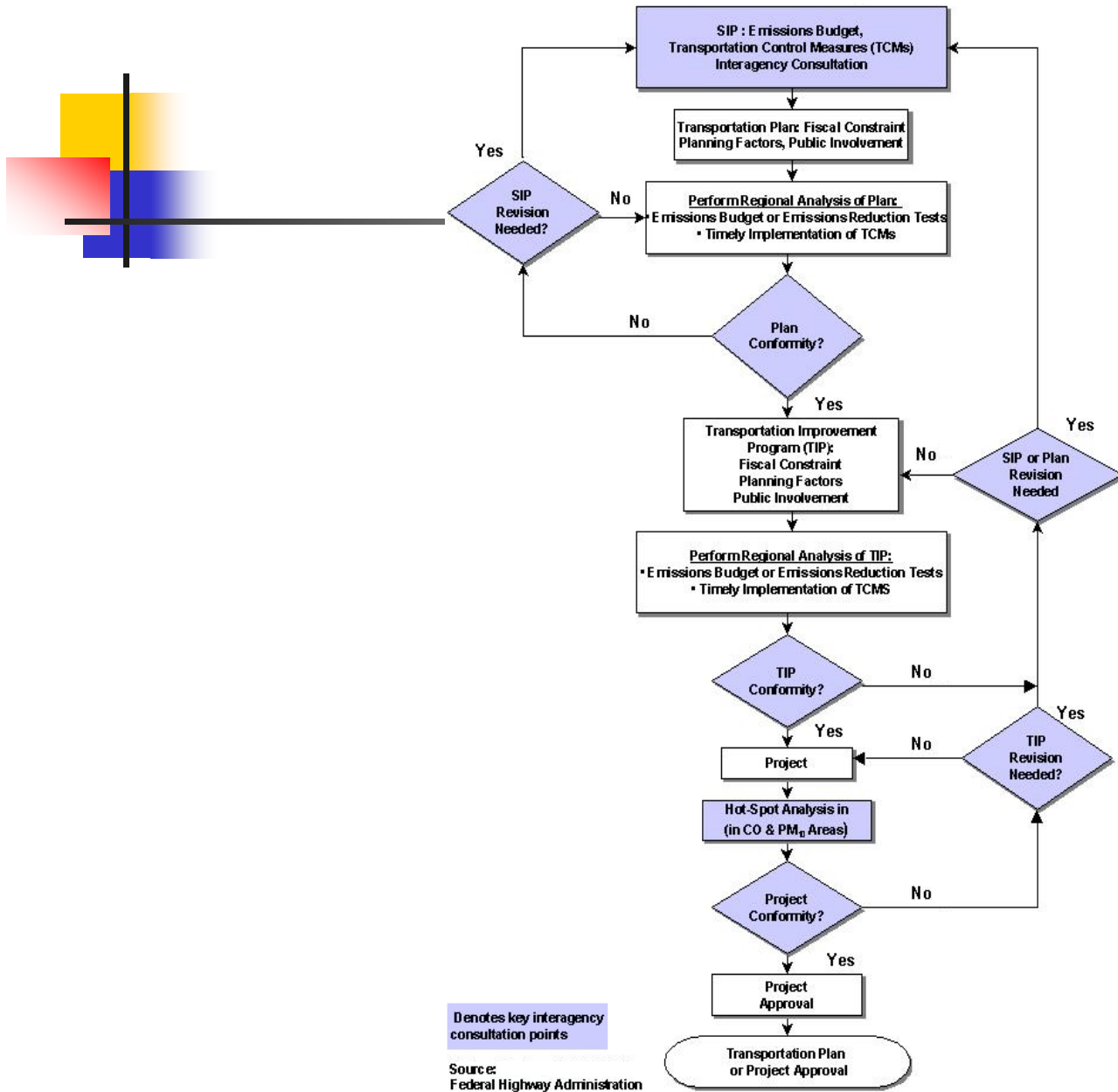


# Conformity Frequency Requirements: Rationale

---

- Frequency requirements make the conformity process meaningful by:
  - Appropriately reflecting the current transportation system
  - Incorporating new information  
(e.g., planning assumptions and modeling)
  - Utilizing new budgets consistent with attainment goals
- Conformity determinations must be made on the existing adequate and approved budget

# Transportation Conformity Process



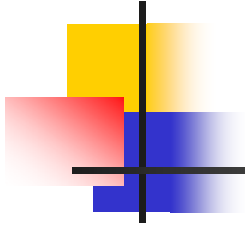


---

# Summary

---

- Conformity requirements apply in nonattainment and maintenance areas
- Qualifying plans, TIPs, and projects are subject to conformity requirements
- Conformity of the plan and TIP must be determined at least every four years
- Attention to time frames for updates is essential to avoid a conformity lapse



# Major Components of Transportation Conformity Determinations

## **SECTION 6**



# Lesson Overview

---

- Section A – Regional Emissions Analysis
  - Budget Test
  - Emissions Reduction Tests
- Section B – Assumptions and Data
  - Latest Planning Assumptions
  - Latest Emissions Model
- Section C – Interagency Consultation
- Section D – Transportation Control Measures
- Section E – Project-level Requirements

# Section A

# Regional Emissions Analysis

---





# Purpose

---

- A regional emissions analysis:
  - Assesses regional transportation-related emissions from existing sources
  - Determines the emissions impacts of proposed transportation projects
  - Demonstrates that emissions from implementing the transportation plan and TIP are consistent with the motor vehicle emissions budget



# Analysis Requirements

---

- Emissions must be estimated for all NAAQS pollutants from the existing and planned transportation system in nonattainment and maintenance areas
- Regional emissions analysis must include:
  - Emissions from regionally significant projects
    - Regionally significant projects have specific analysis requirements that must be followed
  - Emissions from all other projects
    - Non-regionally significant projects do not have specific analysis requirements and are estimated using reasonable professional practice

---



# Conformity Tests - Overview

---

- Conformity is determined by applying the applicable testing technique(s) to the regional emissions analysis
  - Budget test
  - Emissions reduction test(s)
    - Build / No-build test
    - Less than baseyear test
    - No greater than baseyear test
- Analysis must cover the transportation plan horizon



# Baseline Year for the Baseline Year Test

<b>If you are determining conformity for the...</b>	<b>Then your baseline year is...</b>
2012 PM <sub>2.5</sub> NAAQS • Annual NAAQS of 12.0 $\mu\text{g}/\text{m}^3$	2014
2008 Ozone NAAQS • 8-hour NAAQS 0.075 ppm	2011
2006 PM <sub>2.5</sub> NAAQS • 24-hour NAAQS of 35 $\mu\text{g}/\text{m}^3$	2008
1997 PM <sub>2.5</sub> NAAQS • Annual NAAQS of 35 $\mu\text{g}/\text{m}^3$ • 24-hour NAAQS of 35 $\mu\text{g}/\text{m}^3$	2002
1997 8-hour ozone NAAQS • 0.08 ppm, avg. over an 8-hour period	2002
PM <sub>10</sub> NAAQS • 24-hour NAAQS of 150 $\mu\text{g}/\text{m}^3$	1990



# Horizon Year Analysis

---

- Normally 20 years
- SAFETY-LU allows analysis to latter of:
  - 10 years in the future
  - Last year for which a SIP budget exists
  - Year after a regionally significant project included in TIP is completed
- MPO, which makes final decision, must initiate a process through interagency consultation for period less than 20 years
- Must show analysis for years emission budget is exceeded beyond required years, for information only



# Conformity Test Requirements

---

- The SIP budget status determines which conformity test must be applied, if:
  - SIP is approved / emissions budget is found adequate
    - Budget test
  - SIP has been submitted but not approved
    - Budget test for an existing, adequate budget
    - Emissions reduction test(s) for an inadequate budget
  - SIP has not been submitted
    - Emission reduction test(s) if no existing, adequate budget



# What is an Adequate Budget?

---

- EPA must determine that an emissions budget is adequate prior to use for conformity determinations
  - Meeting adequacy criteria is required for SIP approval
  - An adequacy finding is separate from a completeness finding on a SIP
  - A positive adequacy finding does not guarantee approval of a SIP



# Adequacy Criteria

---

- Endorsement of the governor
- Public hearing
- Interagency consultation and full documentation
- All EPA concerns must be addressed
- Control measures must achieve the air quality goal (RFP, attainment, maintenance)





## Adequacy Criteria (Continued)

---

- Emissions budget(s) must be clearly identified and precisely quantified in the SIP
- Emissions budget must be consistent with the emissions inventory / control measures
- All revisions to previously submitted SIPs must be satisfactorily explained



# Adequacy Process

---

- Approximately 90-day process
- State submits SIP to EPA
- EPA announces receipt of SIP on website  
30-day public comment period started
- EPA makes an adequacy / inadequacy finding
- Finding is effective 15 days after FRN (in most cases)



# The Budget Test

---

- Budget test:
  - Demonstrates that the plan / TIP will not exceed the established emissions budget(s)
  - Emissions from the planned transportation system must be less than or equal to the budget



# Which SIPs Establish Budgets?

---

- SIPs that contain motor vehicle emissions budgets:
  - Control strategy SIPs
  - Maintenance plans
- Budgets are established for:
  - Milestone years (e.g., rate of progress plans)
  - Attainment year (e.g., attainment demonstration)
  - The last year of the first 10-year maintenance plan



# Budget Test: Which Years?

---

- For a conformity determination, a budget test must be completed for:
  - The attainment year, if in the timeframe of the plan
  - Any years where a budget is established in the SIP
  - The horizon year of the transportation plan
  - An intermediate year so that analysis years are no more than 10 years apart
- If a maintenance plan only has a budget for last year of the plan a qualitative finding must be included



# Emission Reduction Tests

---

- When no adequate or approved SIP budgets:
  - Moderate & above Ozone and CO areas must use:
    - Build less than no-build test AND
    - Less than baseyear test
  - PM-10, PM2.5, NO<sub>2</sub>, CO and other Ozone areas must use:
    - Build less than or equal to no-build test OR
    - Less than or equal to baseyear test



# Emission Reduction Tests: What Years?

---

- Emissions from the planned transportation system must be estimated for:
  - A year no more than 5 years in the future from the date of the determination
  - The horizon year of the transportation plan
  - Intermediate years so that analysis years are no more than 10 years apart



# Build/No-Build Test

---

- No-Build includes:
  - All in-place regionally significant highway and transit projects
  - Ongoing TDM or TSM activities
  - Completion of all regionally significant projects, regardless of funding source which are currently:
    - Under construction
    - Undergoing right-of-way acquisition
    - Have completed NEPA
    - Come from first year of previous conforming TIP
- Build includes:
  - Everything in No-Build
  - Completion of all regionally significant projects and TCMs in the Plan/TIP which will be operational in the analysis year
  - All new TDM or TSM activities not in previous conforming Plan/TIP
  - Completion of all regionally significant projects not in Plan/TIP



## Projects & Activities Included in the Regional Emissions Analysis

Year	"Baseline" (No-build) Scenario	"Action" (Build) Scenario
Base Year (2000)	<b>1</b> All in-place regionally significant highway and transit facilities, services and activities	
Milestone Year (e.g., 2003)	<p><b>1 +</b></p> <p><b>2</b> All current additional in-place regionally significant highway and transit facilities, services and activities+</p> <p>All ongoing TDM or TSM activities +</p> <p>All regionally significant projects, regardless of funding sources, which are (1) currently under construction, or (2) undergoing right-of-way acquisition (except for hardship acquisition and protective buying), or (3) have completed the NEPA process, will be opened by 2003 +</p> <p>Projects which are included in the first year of the previously conforming transportation plan/TIP, and which will be opened by 2000+</p> <p>Original design concept and scope of a project not from a conforming transportation plan/TIP but is a modification of a project currently in the plan/TIP</p>	<p><b>1 + 2 +</b></p> <p><b>3</b> Other regionally significant projects, including TCMs, in the plan which will be opened by 2000+</p> <p>The incremental effects<sup>7</sup> of any non-Federal TDM/TSM activities not included in the applicable SIP which have been modified since the last conformity determination to be more stringent or effective +</p> <p>All expected regionally significant highway and transit projects which are not from a conforming transportation plan/TIP open by 2003+</p> <p>All expected regionally significant non-Federal highway and transit projects completed by 2003+</p> <p>The new design concept and scope of a project not from a conforming transportation plan/TIP but is a modification of a project currently in the plan/TIP</p>
Attainment Year (e.g., 2005)	<p><b>1 + 2 +</b></p> <p><b>4</b> Additional projects from the last three categories of <b>2</b> above which will be open after 2000 and by 2005</p>	<p><b>1 + 2 + 3 + 4 +</b></p> <p><b>5</b> All other regionally significant projects as in <b>3</b> above which will be open after 2000 and by 2005</p>
Intermediate Year (e.g., 2012)	<p><b>1 + 2 +</b></p> <p><b>4</b> Additional projects from the last three categories of <b>2</b> above which will be open after 2005 and by 2012</p>	<p><b>1 + 2 + 3 + 4 +</b></p> <p><b>5</b> All other regionally significant projects as in <b>3</b> above which will be open after 2005 and by 2012</p>
Last Year of Transportation Plan (e.g., 2020)	<p><b>1 + 2 +</b></p> <p><b>4</b> Additional projects from the last three categories of <b>2</b> above which will be open after 2012 and by 2020</p>	<p><b>1 + 2 + 3 + 4 +</b></p> <p><b>5</b> All other regionally significant projects as in <b>3</b> above which will be open after 2012 and by 2020</p>



# When is Regional Analysis Not Required?

---

- Areas can rely on the previous regional emissions analysis for TIP / plan conformity determination if:
  - No regionally significant projects are added or deleted
  - Projects are consistent with the plan
  - The previous 20-year analysis is less than 3 years old
  - No additional years are being added to the plan



# General: Regional Emissions Analyses

---

- No adequate or approved SIP budgets:
  - interim emissions test(s) – baseline year and build/no-build tests)
- Adequate or approved SIP budgets:
  - budget test
- Final rule updates interim emissions tests and provide flexibility



# General Changes to Build/No-Build Test

---

- Test changed to build  $\leq$  no-build test for all areas except higher classifications of ozone and CO
  - the build $\leq$ no-build test is waived altogether for these areas for analysis years when projects and planning assumptions are exactly the same in the build and no-build scenarios
  - provides flexibility to areas with fewer Clean Air Act (CAA) requirements
  - helps these areas when build and no-build scenarios are exactly the same
    - these areas still need to make conformity determinations and look at all analysis years
- Test remains build < no-build for ozone and CO areas of higher classifications

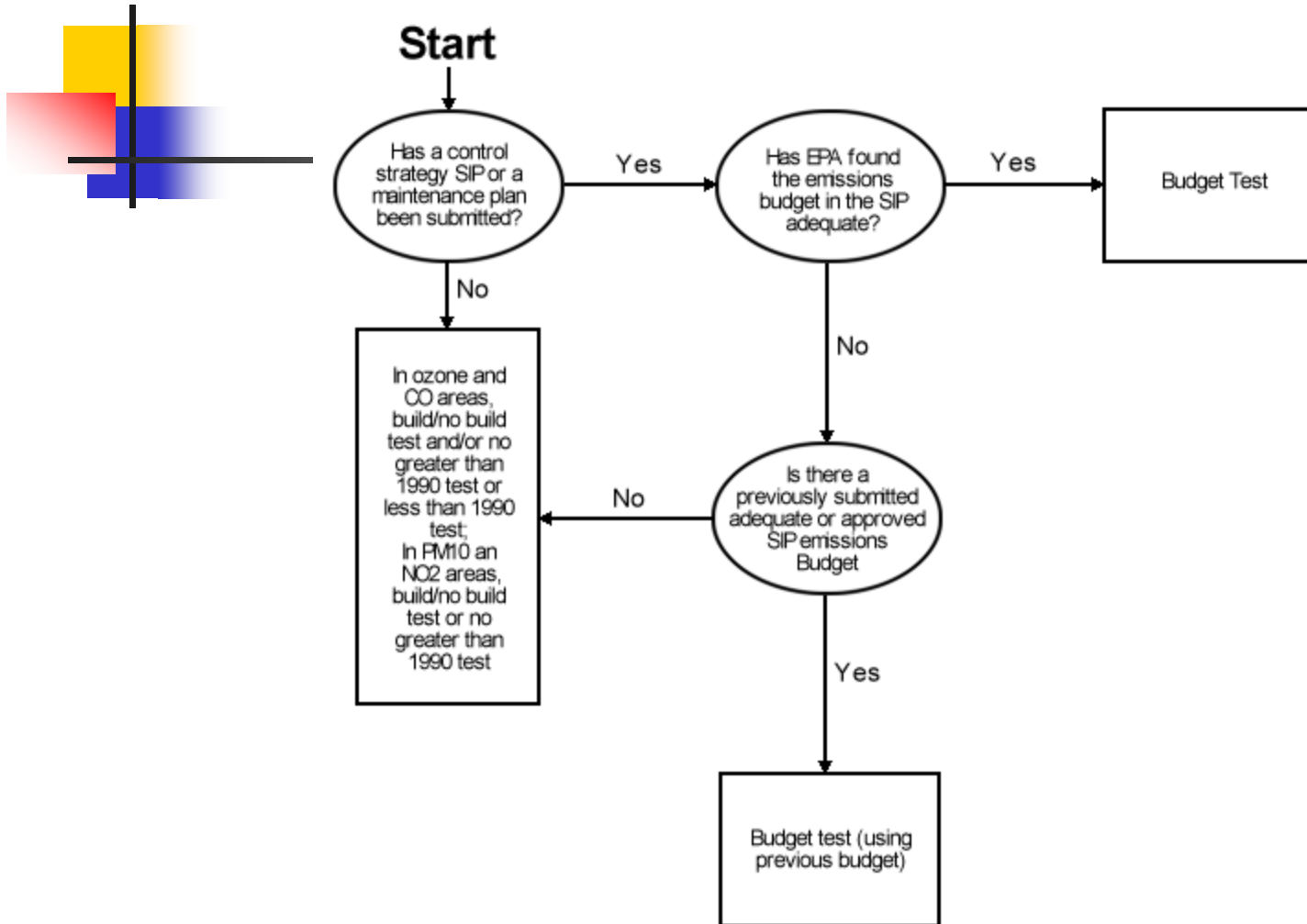


# Timely Implementation of TCMs

---

- Timely implementation requirement applies for a TCM in the approved SIP, including SIPs for all pollutants and standards
- TCMs in a 1-hour SIP still apply even after the 1-hour standard is revoked
  - They must still be implemented in a timely manner
  - They must still be accounted for in conformity determinations

## Exhibit 23 Which Regional Emissions Tests Apply?



# 2008 8-Hour Ozone (Summer Planning Emissions [Tons/Day])

TABLE 36 2008 8-Hour Ozone (Summer Planning Emissions [Tons/Day]) (EMFAC 2014)

Pollutant	Nonattainment Area	2017	2020	2023	2031	2040	
ROG	Budget	SCAB	119	108	99	99	99
	RTP	Morongo	0.5	0.4	0.3	0.2	0.2
		Pechanga	0.1	0.1	0.1	0.0	0.0
		SCAB excluding Morongo and Pechanga	102.0	79.3	67.3	49.2	37.1
		Sum	102.6	79.8	67.7	49.4	37.3
		SCAB	103	80	68	50	38
	Budget - RTP	16	28	31	49	61	
NO <sub>x</sub>	Budget	SCAB	224	185	140	140	140
	RTP	Morongo	2.3	1.8	1.1	0.7	0.6
		Pechanga	0.9	0.7	0.5	0.3	0.2
		SCAB excluding Morongo and Pechanga	180.4	137.6	86.4	64.0	59.0
		Sum	183.5	140.1	88.0	65.0	59.8
		SCAB	184	141	88	65	60
	Budget - RTP	40	44	52	75	80	

# Annual Emissions (Tons/Day)

TABLE 37 1997, 2006 and 2012 PM<sub>2.5</sub> Standards (Annual Emissions [Tons/Day]) (EMFAC 2014)

Pollutant		2019	2021	2030	2040
ROG	RTP	82.5	71.8	49.1	35.4
Baseline Adjustments *		-7.16	N/A	-1.79	-0.48
Total Emissions		76	72	48	35
Emission Budget		132	132	132	132
Budget – Emissions		56	60	84	97
NO <sub>x</sub>	RTP	166.5	135.1	70.8	62.9
Baseline Adjustments *		-1.88	N/A	-0.03	0.00
Total Emissions		165	136	71	63
Emission Budget		290	290	290	290
Budget – Emissions		125	154	219	227
PM <sub>2.5</sub>	RTP	10.8	10.2	10.0	9.8
Re-entrained Road Dust Paved		7.6	7.7	8.2	8.5
Re-entrained Road Dust Unpaved *		0.6	0.6	0.6	0.6
Road Construction Dust *		0.3	0.5	0.8	0.5
NO <sub>x</sub> to PM <sub>2.5</sub> Trading		-12.5	-15.4	-21.9	-22.7
Sum		6.9	3.6	-2.3	-3.3
Total Emissions **		7	4	-3	-4
Emission Budget		35	35	35	35
Budget – Emissions		28	31	38	39

\* The detailed PM<sub>2.5</sub> emission budgets were provided by ARB on March 8, 2012.

\*\* The Plan PM<sub>2.5</sub> emissions for years after 2014 are calculated with the NO<sub>x</sub> to PM<sub>2.5</sub> (10 to 1) trading mechanism as approved by EPA on November 9, 2011.

TABLE 38 PM<sub>10</sub> (Annual Emissions [Tons/Day]) (EMFAC 2014)

Pollutant		2020	2030	2040
ROG	RTP	76.3	49.1	35.4
Smog Check Reductions *		-3.8	-2.8	-2.8
Sum		72.5	46.3	32.6
Total Emissions		73	47	33
Emission Budget		110	81	81
Budget – Emissions		37	34	48
NO <sub>x</sub>	RTP	150.1	70.8	62.9
Smog Check Reductions *		-1.7	0.0	0.0
Sum		148.4	70.8	62.9
Total Emissions		149	71	63
Emission Budget		180	116	116
Budget – Emissions		31	45	53
PM <sub>10</sub>	RTP	24.0	23.9	24.0
Re-entrained Road Dust Paved		50.8	54.8	55.5
Re-entrained Road Dust Unpaved **		5.8	5.8	5.8
Road Construction Dust		3.7	5.4	3.4
Sum		84.3	89.9	89.7
Total Emissions		85	90	90
Emission Budget		164	175	175
Budget – Emissions		79	85	85

\* Provided by ARB. \* Provided by SCAQMD.



# Winter, Summer, and Annual Emissions (Tons/Day)

## South Coast Air Basin: Continued

TABLE 39 CO (Winter Emissions [Tons/Day]) (EMFAC 2014)

Pollutant		2020	2030	2040
CO	RTP	572.0	317.3	237.2
Total Emissions		572	318	238
Emission Budgets		2,137	2,137	2,137
Budget – Emissions		1,565	1,819	1,899

TABLE 40 NO<sub>2</sub> (Winter Emissions [Tons/Day]) (EMFAC 2014)

Pollutant		2020	2030	2040
NO <sub>2</sub>	RTP	147.3	69.5	61.8
Total Emissions		148	70	62
Emission Budgets		680	680	680
Budget – Emissions		532	610	618

## Western Mojave Desert Air Basin – Antelope Valley Portion of Los Angeles County and San Bernardino County Portion of MDAB

TABLE 41 2008 8-Hour Ozone (Summer Planning Emissions [Tons/Day]) (EMFAC 2014)

Pollutant		2020	2026	2031	2040
ROG	RTP	7.9	6.0	5.2	4.3
Total Emissions		8	6	6	5
Emission Budget		22	22	22	22
Budget – Emissions		14	16	16	17
NO <sub>x</sub>	RTP	17.3	9.7	8.9	10.1
Total Emissions		18	10	9	11
Emission Budget		77	77	77	77
Budget – Emissions		59	67	68	66

## Mojave Desert Air Basin – San Bernardino County Portion Excluding Searles Valley

TABLE 42 PM<sub>10</sub> (Annual Emissions [Tons/Day]) (EMFAC 2014)

Pollutant		2021	2031	2040
PM <sub>10</sub> No-Build	Re-entrained Road Dust	8.1	10.0	11.6
	Motor Vehicle	1.8	2.2	2.6
	Total Emissions	9.9	12.2	14.2
PM <sub>10</sub> Build	Re-entrained Road Dust	7.7	9.2	10.3
	Paving Unpaved Roads	-0.6	-0.4	-0.3
	Motor Vehicle	1.8	2.1	2.6
Total Emissions		8.9	10.9	12.6
No Build – Build		1.0	1.3	1.7

## Mojave Desert Air Basin – Searles Valley Portion

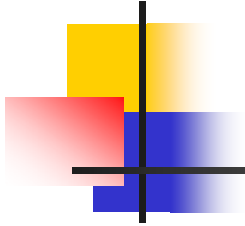
TABLE 43 PM<sub>10</sub> (Annual Emissions [Tons/Day]) (EMFAC 2014)

Pollutant		2021	2031	2040
PM <sub>10</sub>	No Build	0.0	0.0	0.0
	Build	0.0	0.0	0.0
No Build – Build		0.0	0.0	0.0

## Salton Sea Air Basin – Coachella Valley Portion

TABLE 44 2008 8-Hour Ozone (Summer Planning Emissions [Tons/Day]) (EMFAC 2014)

Pollutant		2021	2026	2031	2040
ROG	RTP	3.5	2.9	2.6	2.3
Total Emissions		4	3	3	3
Emission Budget		7	7	7	7
Budget – Emissions		3	4	4	4
NO <sub>x</sub>	RTP	7.4	4.1	3.8	4.0
Total Emissions		8	5	4	5
Emission Budget		26	26	26	26
Budget – Emissions		18	21	22	21



### Salton Sea Air Basin – Coachella Valley Portion

TABLE 45 PM<sub>10</sub> (Annual Emissions [Tons/Day]) (EMFAC 2014)

Pollutant		2021	2031	2040
PM <sub>10</sub>	RTP	0.91	1.04	1.17
Re-entrained Road Dust Paved		2.08	2.44	2.69
Re-entrained Road Dust Unpaved *		1.71	1.70	1.70
Road Construction Dust *		0.32	0.37	0.27
Sum		5.02	5.55	5.83
Total Emissions		5.1	5.6	5.9
Emission Budget		10.9	10.9	10.9
Budget – Emissions		5.8	5.3	5.0

\* Provided by SCAQMD.

### Salton Sea Air Basin – Imperial County Portion

TABLE 46 2008 8-Hour Ozone (Summer Planning Emissions [Tons/Day]) (EMFAC 2014)

Pollutant		2017	2021	2031	2040
ROG	RTP	3.1	2.6	2.0	1.8
Total Emissions		4	3	3	2
Emission Budget		7	7	7	7
Budget – Emissions		3	4	4	5
NO <sub>x</sub>	RTP	6.5	4.9	3.1	3.4
Total Emissions		7	5	4	4
Emission Budget		17	17	17	17
Budget – Emissions		10	12	13	13

### Salton Sea Air Basin – Imperial County Portion

TABLE 47 2006 and 2012 PM<sub>2.5</sub> Standards (Annual Emissions [Tons/Day]) (EMFAC 2014)

Pollutant		2021	2031	2040
NO <sub>x</sub>	No-Build	2.4	1.6	1.6
	Build	2.4	1.5	1.6
No Build – Build		0.0	0.1	0.0
PM <sub>2.5</sub> No-Build	Re-entrained Road Dust	0.11	0.12	0.14
	Motor Vehicle	0.10	0.11	0.13
	Sum	0.21	0.23	0.27
	Total Emissions	0.3	0.3	0.3
PM <sub>2.5</sub> Build	Re-entrained Road Dust	0.06	0.07	0.08
	Motor Vehicle	0.10	0.11	0.12
	Sum	0.16	0.18	0.20
	Total Emissions	0.2	0.2	0.2
No Build – Build		0.1	0.1	0.1

TABLE 48 PM<sub>10</sub> (Annual Emissions [Tons/Day]) (EMFAC 2014)

Pollutant		2021	2031	2040
PM <sub>10</sub> No-Build	Re-entrained Road Dust	0.93	1.07	1.19
	Motor Vehicle	0.42	0.50	0.59
	Sum	1.35	1.57	1.78
	Total Emissions	1.4	1.6	1.8
PM <sub>10</sub> Build	Re-entrained Road Dust	0.58	0.71	0.82
	Motor Vehicle	0.42	0.49	0.58
	Sum	1.00	1.20	1.40
	Total Emissions	1.0	1.2	1.4
No Build – Build		0.4	0.4	0.4



# Summary

---

- Know the status of your motor vehicle emissions budget
  - Has the SIP been submitted to EPA?
  - Has EPA found the budget adequate?
- If your budget is found inadequate
  - Is there a previously approved or adequate budget?
  - If not, which emissions reduction test(s) apply?

# Section B

## Assumptions and Data

---



# Latest Planning Assumptions / Latest Emissions Model

---

- Conformity determinations must be based on:
  - The latest planning assumptions, and
  - The latest EPA-approved emissions factor model
  - Latest means at the time conformity analysis begins
    - When begin to generate VMT and speed data to calculate emissions
    - Determine through interagency consultation
- Ensures that conformity determinations are based upon current and best available information
- Latest planning assumptions and emissions model may be different than what was used in the SIP



# Latest Planning Assumptions

---

- MPOs must use the most recent information available
- Assumptions should be updated every 5 years
  - Population
  - Employment
  - Vehicle registration
  - Fleet assumptions
  - Speed data, etc.
- Interagency consultation should be used to decide when updates are necessary



# Latest Emissions Model

---

- EPA must approve an emissions model before it can be officially used
- Latest EPA-approved emissions factor model may be different than the model used in the SIP
- Current Model: EMFAC 2011 in California
- Rule provides a 3 to 24 month grace period before a new model must be used



# Summary

---

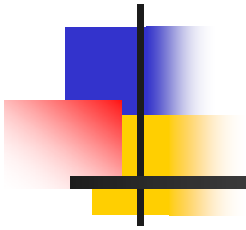
- Timing and coordination of data updates is essential to a smooth conformity process
- Be aware of:
  - Types of data
  - Sources of data
  - Time periods required to update data
- Ensure that the right participants are involved
- Ensure that agreements made during interagency consultation on data are well documented



Section C

Modeling Nuts and Bolts

---

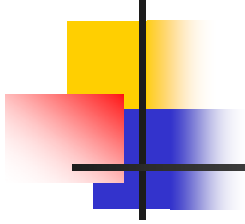




# Lesson Overview

---

- Section A - VMT Estimation
- Section B - Uses of VMT Estimates
- Section C - Travel Demand Modeling
- Section D - VMT Estimation for Other Areas
- Section E - Emissions Modeling-EMFAC



# **SUBSECTION A**

# **VMT ESTIMATION**



## What is VMT?

---

- VMT = Vehicle Miles Traveled  
(Distance traveled in miles)
- VMT and speeds are essential inputs to conduct a regional emissions analysis



# Relationship to Conformity

---

- VMT and speeds are the important variables for determining transportation conformity
- VMT changes are compared to estimates
- VMT estimates are used in each:
  - Emissions inventory
  - Emissions budget
  - Regional emissions analysis



# VMT Estimation

---

- Characteristics of VMT information:
  - Time of day
  - VMT by road classification
  - VMT by vehicle type
  - Other characteristics
    - Vehicles subject to I / M
    - Urban / rural areas, etc.



# What is the Requirement?

---

- All non-attainment and maintenance areas must estimate all VMT for the regional emissions analysis
- VMT is estimated based upon the existing system and any new projects
  - Some elements must be modeled
  - Other elements are estimated without modeling



# What Should be Included?

---

- VMT estimates for the regional emissions analysis...
  - Must include:
    - Regionally significant federal projects
    - Non-regionally significant federal projects
    - Regionally significant non-federal projects
  - Do not include:
    - Exempt federal projects
    - Non-regionally significant non-federal projects





# How to Estimate VMT?

---

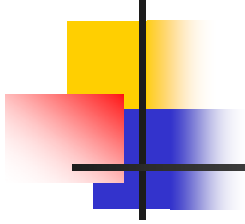
- Areas subject to modeling requirements
  - All regionally significant projects must be included
  - VMT from projects that can not be modeled must be estimated using reasonable professional practice
- Areas not subject to modeling requirements
  - Estimate VMT by HPMS and/or local counts
  - Decided through interagency consultation



# Methods of VMT Estimation

---

- Travel Demand Modeling
- Traffic count programs
- HPMS data (Highway Performance Monitoring System)
  - Interstate system
  - Arterials, collectors, and rural areas (more limited data)



# **SUBSECTION B**

## **USES OF VMT ESTIMATES**



# Uses of VMT Estimates

---

- SIPs and emissions inventories
- Forecasting future VMT
- Conformity



# SIPs and Emissions Inventories

---

- Emission inventories are required every 3 years until an area reaches attainment
  - Includes on-road mobile sources
  - Based upon VMT by vehicle class and facility type
  - VMT is often based on HPMS data
  - Inventory requirements for other sources rely on output of goods and services in various sectors arrayed by the associated SIC NAICS codes



# SIPs and Emissions Inventories

---

- SIPs use...
  - Trends in VMT growth over the base year, or
  - Travel demand models
- SIP VMT estimates come from travel demand models
- VMT estimates from a travel demand model must be compared to VMT data for the same year from HPMS

# Subsection C

## Travel Demand Modeling

---



## Section Overview

---

- Basics of the four-step model
- Tools available
- Keeping models up to date





# Travel Demand Modeling

---

- Key inputs:
  - Socio-economic projections
    - Employment
    - Population
    - Households
    - Auto ownership
  - Land-use
  - Highway and transit networks



# Travel Demand Modeling

---

- Key outputs:
  - Travel demand
    - Projections of average daily traffic (ADT)
    - Transit ridership
    - Trips generated by purpose and mode
    - Roadway speeds
    - Levels of roadway congestion
    - Vehicle Miles Traveled (VMT)



# Four-step Model Basics

---

- Steps of the model...
  - ***Trip Generation***  
How many trips will be made and for what purpose?
  - ***Trip Distribution***  
Where are the trips going?
  - ***Mode Split***  
What modes of travel will be used?
  - ***Assignment***  
What roads and transit lines will be used?

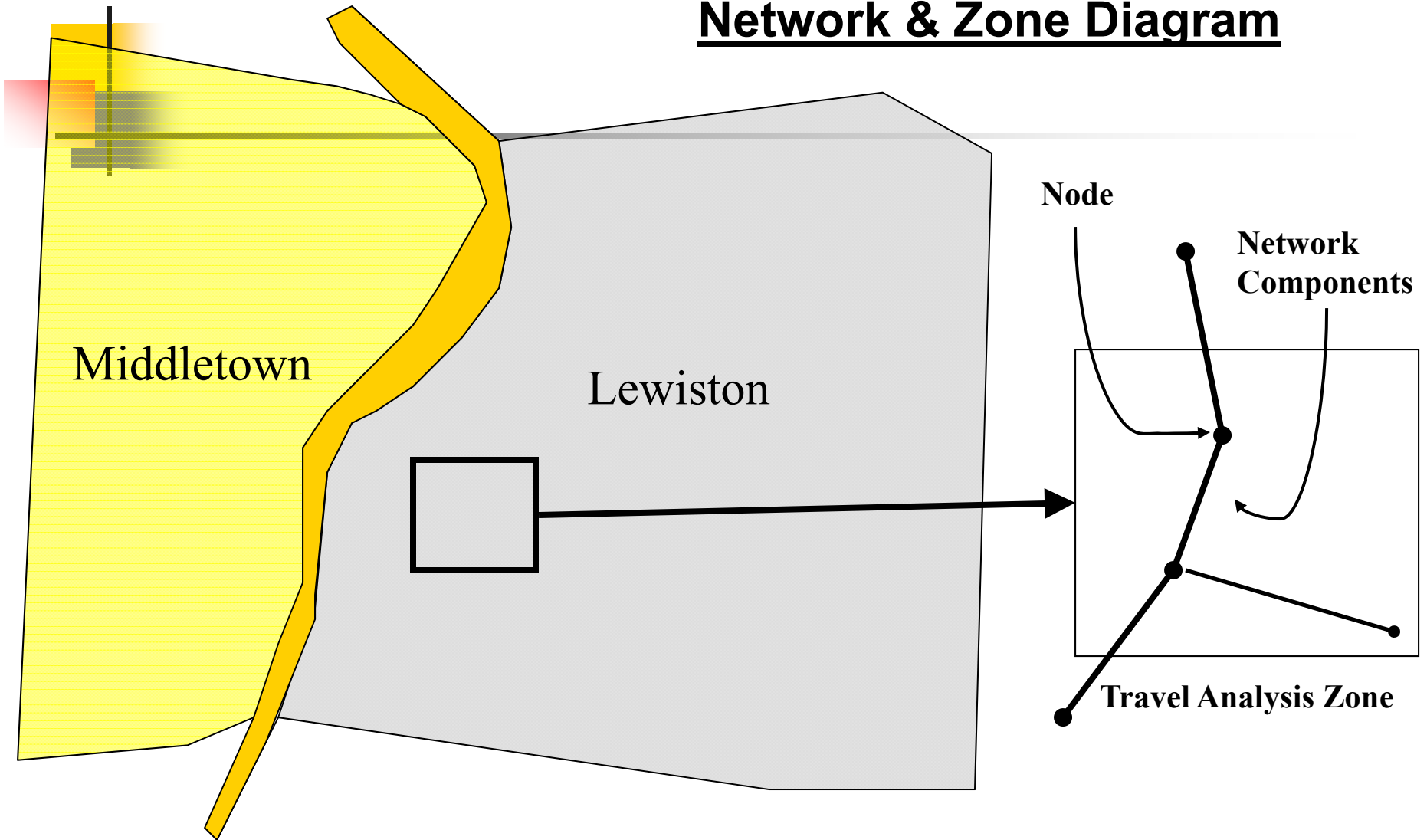


# Four-step Model Basics

---

- Zone and Network System:
  - Travel modeling requires that an urban area be represented by smaller areas of similar characteristics
    - Referred to as travel analysis zones (TAZ)
    - Some MPO models have over 1000 zones
  - Trips originate and terminate in a zone
  - TAZ characteristics are independent model variables (Population, employment, autos, households, etc.)

# Network & Zone Diagram





# Four-step Model Basics

---

- Zone and Network System
  - Highway and transit system are represented by a network for computer analysis
  - Networks consist of links and nodes
    - Each link has characteristics that represents highways and transit facilities
      - Number of lanes
      - Speed
      - Facility type
      - Capacity class
    - Nodes are where links meet or intersect



# Four-step Model Basics

---

- Trip Generation
  - Purposes:
    - Home-based work trips
    - Home-based shopping trips
    - Home-based other trips
    - Non-home based trips
    - School trips
    - Truck trips



# Four-step Model Basics

---

- Trip Generation
  - Trip generation uses average trip rates
    - Trip productions
      - Households produce trips
      - Based on characteristics such as family size, number of cars, etc.
    - Trip attractions
      - Destinations classify attractions
      - Based on employment in a zone
  - Trips are summarized by zone





# Four-step Model Basics

---

- Trip Distribution
  - Origin and destination (O/D) tables are very large
    - A 1200 zone model has 1,440,000 trip combinations
  - Separate O/D tables are developed for each trip purpose
    - Typically 4 to 6 trip purposes



# Four-step Model Basics

---

- Mode Split
  - Trips are split between different modes:
    - Transit
    - Carpool
    - Auto passenger
    - Automobile drivers
  - Mode split determines how persons are travelling
  - Transit improvements are assessed and evaluated based in part on how they change the mode share



# Four-step Model Basics

---

- Mode Split
  - Auto occupancy rates are calculated and converted to vehicle trips from person trips
  - Travel time for transit has two components:
    - In-vehicle time (on board a bus or subway car)
    - Out-of-vehicle time (represents convenience)
      - Waiting for a bus
      - Walking to the bus
      - Transfer time, etc.



# Four-step Model Basics

---

- Mode Split
  - Calibration compares estimated modal share to actual data that has been collected
    - Ridership surveys
    - Home interview surveys



# Four-step Model Basics

---

- Assignment
  - Trip assignment can be time consuming and data intensive
  - Process for highway trips:
    - Requires calculating the shortest path between an origin and the destination
    - Trips are added to each link in the minimum path and compared to the capacity of the link
      - If the link is congested and the travel time is lower, then other quicker paths are tried
      - Process is repeated several times until there is an equilibrium between travel demand and supply



# Four-step Model Basics

---

- Assignment
  - Process for transit trips:
    - Process is similar except...
      - Transit headways are adjusted instead of travel times
      - Transit headway is the time between transit vehicles
    - Increases in capacity may cause a shift in the equilibrium and paths chosen and can lead to additional trips



# Conformity Requirements for Travel Modeling

---

- Serious and above Ozone and CO non-attainment areas, if greater than 200,000 population:
  - Must use network-based travel models available
  - Must be supported by current and available documentation
- Where network-based models have been historically used, areas must continue with network-based modeling



# Conformity Requirements (Continued)

---

- Modeling procedures are discussed in the interagency consultation process, and:
  - Validated against observed counts
  - Model forecasts must be analyzed for reasonableness and compared to historical trends
  - Network-based model assumptions must be documented  
(Land use, population, employment, etc.)





# Conformity Requirements (Continued)

---

- Land development scenarios must be consistent with future transportation system alternatives
- Capacity-sensitive assignment methodology must be used
- Emissions estimates must be based on a methodology that differentiates between peak and off-peak link volumes and speeds



# Travel Modeling Issues

---

- Travel demand models:
  - Were not originally designed for emissions modeling
  - Driven by peak period demands
    - Emissions calculated over an entire day
  - Calibrated for the typical day
    - Pollutant is seasonal
  - Validated to traffic counts
    - Not validated to speeds
  - MPOs may not have adequate mode share model



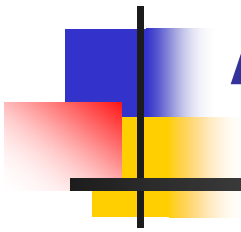
# Travel Modeling and SIP Budgets

---

- Latest planning assumptions
  - Travel data should be current
    - Vehicle fleet composition and average speeds
  - Travel demand inputs may be different than the assumptions used to develop the SIP
    - Socio-economic and land use inputs
  - Models used for transportation conformity determinations may be different than those models used to develop SIP

# Section D

## Estimating VMT for Other Areas





# Reasonable Professional Practice to Project VMT

---

- Areas not required to use network models may project VMT using any appropriate methods
  - Extrapolating historical VMT
  - Projecting VMT by considering population growth and trends in per capita VMT
  - Consider future economic activity, transit alternatives, and transportation system policies



# Reasonable Professional Practice to Project VMT

---

- Areas not required to use network models may project VMT using any appropriate methods
  - VMT must be calibrated to HPMS
  - VMT projection procedures are subject to modification in interagency consultation

# Section E

## Emissions Modeling – EMFAC

---



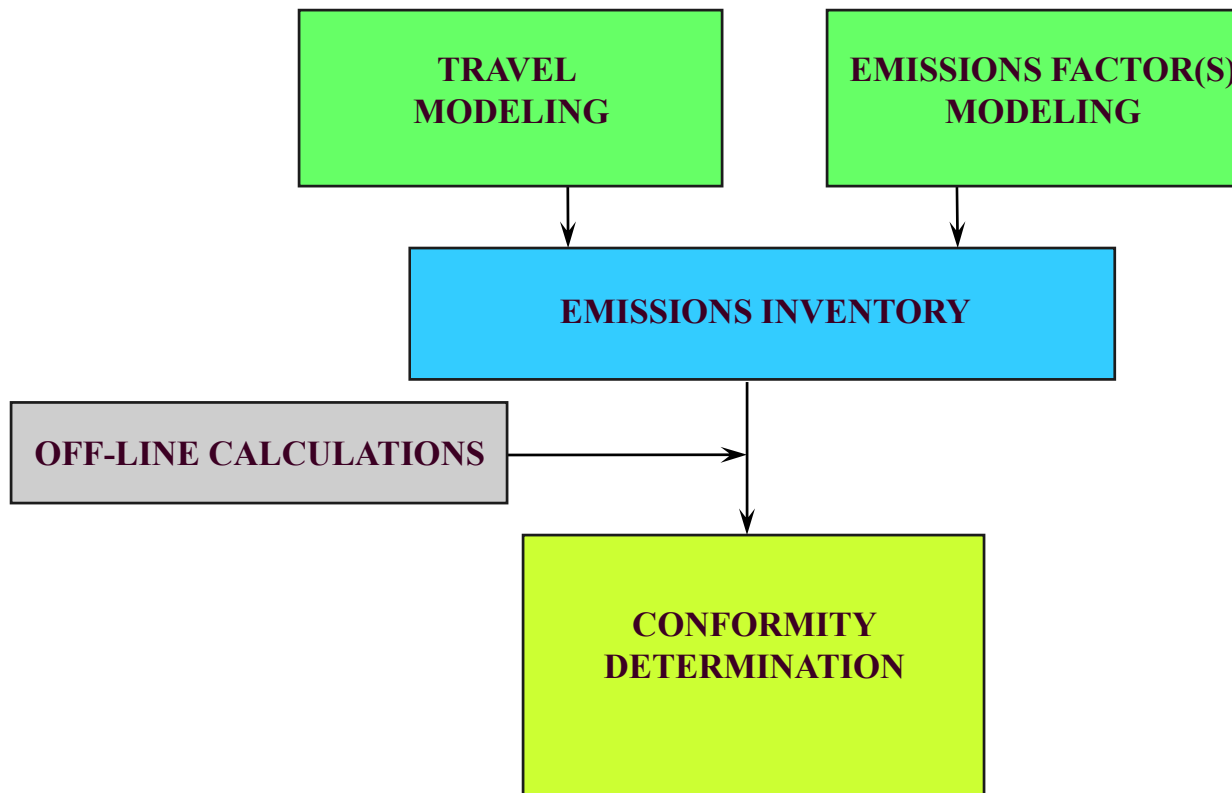
# EMFAC Overview

---

- Applicable throughout California subsequent to EPA approval
- Uses
  - SIP development
  - Control measure development
  - Transportation conformity
  - Air toxics assessment
  - Air quality models



# Overview of the Emissions Modeling Process



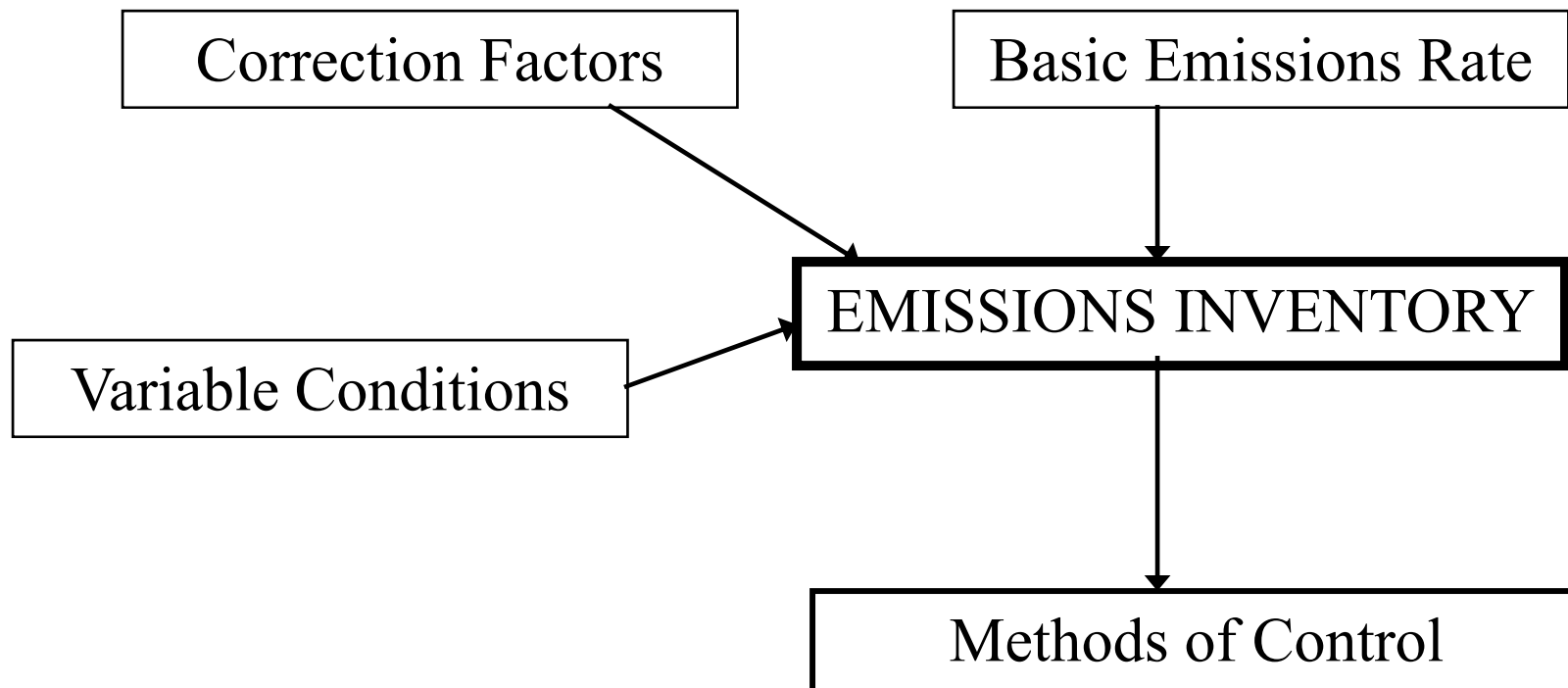


# What is EMFAC?

---

- EMFAC is a computer model used to predict emissions from on-road motor vehicles
- EMFAC does NOT calculate absolute emissions
  - Calculates emission factors for different vehicle types—cars, trucks, motorcycles, buses, etc.
  - Calculates emission factors by speed
- Combines with regional activity data (VMT) from the travel model to produce absolute emissions
- EMFAC allows users to input variables and assumptions

# Overview of EMFAC Emission Modeling





# Emissions Inventory Development

---

- Inputs
  - Emissions factor (gm/mi or gm/hr or gm/start)
  - Vehicle activity (starts/miles/speed/soaks)
  - Vehicle fleet (class/fuel/age/technology)
  - Emissions Coefficients  
(VOC/CO/NO<sub>x</sub>/PM/Pb/SO<sub>x</sub>/CO<sub>2</sub>/HC/SO<sub>2</sub>)



# Major Changes from EMFAC2000

---

- Revises passenger car mileage accrual rates
- Changes calculations of seasonal vapor pressure
- Updates 2003+ model evaporative technology
- Increases PM10 emissions rates for 2007+ models
- Revises idling time by heavy trucks
- Includes new speed, VMT, and vehicle registration data from local planning agencies
- Introduces a new “What If” scenario generation tool—can vary vehicle pop., VMT, fleet age, temperature, speed distribution, etc.

# Section D

# Interagency Consultation

---



# Section Overview

---

- Overview of interagency consultation
- Interagency consultation procedures
- Key elements of interagency consultation agreements
- Importance of a continuous consultation process
- National EPA / DOT (FTA/FHWA) MOU
- Best practices and examples



# Interagency Consultation - Overview

---

- A collaborative process between organizations on key elements of transportation and air quality planning
  - Required in all nonattainment and maintenance areas
  - Formally integrated into a SIP and legally enforceable by a state court
  - Conducted for development or modification of plans, TIPs, SIPs, and conformity determinations
  - Important for determining what years will be analyzed in the regional emissions analysis





# Interagency Consultation Process

---

- Ensures all agencies:
  - Meet regularly
  - Share information
  - Collaboratively to make decisions
    - Key issues
    - Assumptions



# Roles and Responsibilities

---

- Regulations require the participation of all relevant agencies in interagency consultation
  - Not all agencies are required to participate in every activity covered by interagency consultation
- Typical key participants include:
  - MPO(s)
  - State transportation agency
  - State air quality / environmental agency
  - US DOT (FHWA/FTA)
  - US EPA

**Roles & Responsibilities of Federal, State, and Local Agencies\***

\* This Exhibit outlines general requirements and typical roles and responsibilities of the various involved agencies. Specific States and metropolitan areas may have negotiated different assignments of responsibility tailored to local conditions.

<b>Players/Decision Makers</b>	<b>Action Required</b>	<b>When</b>
<b>MPO</b>	<ul style="list-style-type: none"> <li>• conduct analysis on regional plan/TIP and projects</li> <li>• incorporate latest emissions factors, planning assumptions, and emissions models</li> <li>• circulate draft plan/TIP for interagency and public comment</li> <li>• ensure public involvement procedures are followed</li> <li>• ensure timely implementation of TCMs</li> <li>• respond to significant comments on TIP/plan conformity documents</li> <li>• review and approve conformity determination on plan/TIP/projects in CO and PM nonattainment areas, conduct "hot-spot" analysis as part of the NEPA process</li> <li>• consult with agencies throughout the conformity determination process</li> </ul>	<ul style="list-style-type: none"> <li>▪ at least every 4 years, when a new plan, TIP or amendments to a plan/ TIP are proposed, or as needed based on SIP submittal</li> </ul>
<b>State Transportation Agency</b>	<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 areas, conduct "hot-spot" analysis as part of the NEPA process</li> <li>• provide for public involvement/respond to significant comments</li> <li>• ensure timely implementation of TCMs</li> <li>• review and approve staff regional and hot-spot analysis</li> </ul>	<ul style="list-style-type: none"> <li>• as needed</li> </ul>
<b>State Air Quality/ Environmental Agency</b>	<ul style="list-style-type: none"> <li>• prepare SIP for each relevant pollutant</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>• interagency involvement during SIP development</li> <li>• review and approve staff recommendation, forward to EPA for Federal approval</li> </ul>	<ul style="list-style-type: none"> <li>• as needed</li> </ul>

**Roles & Responsibilities of Federal, State, and Local Agencies\* (Continued)**

\* This Exhibit outlines general requirements and typical roles and responsibilities of the various involved agencies. Specific States and metropolitan areas may have negotiated different assignments of responsibility tailored to local conditions.

<b>Players/Decision Makers</b>	<b>Action Required</b>	<b>When</b>
<b>State Legislature</b>	<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</li> </ul>	<ul style="list-style-type: none"> <li>•as needed</li> </ul>
<b>USDOT-FHWA/FTA</b>	<ul style="list-style-type: none"> <li>•make joint conformity determinations on MPO plans/TIPs amendments and projects</li> <li>•provide input as part of the interagency consultation process for plan/TIP/SIP development</li> <li>•ensure timely implementation of TCMs</li> <li>•ensure adequate public involvement as part of the metropolitan planning process</li> <li>•ensure that all other conformity and transportation planning requirements are met</li> <li>•involvement as part of interagency consultation meetings for MPO plan/TIP development</li> <li>•develop technical guidance on traffic demand and forecasting, and Federal aid program guidance</li> </ul>	<ul style="list-style-type: none"> <li>•at least every 4 years for each conformity determination or as needed</li> <li>•for each plan/TIP or plan/TIP amendment conformity determination</li> <li>•as needed</li> </ul>
<b>US EPA</b>	<ul style="list-style-type: none"> <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>•interagency consultation involvement during SIP and plan/TIP development</li> <li>•review and comment on proposed conformity determinations</li> <li>•designates approved emissions models for use in SIP development and conformity determinations</li> <li>•designates "guideline" dispersion models for project level emissions analysis</li> </ul>	<ul style="list-style-type: none"> <li>•as needed</li> </ul>



# Key Elements: Interagency Consultation

---

- Each consultation process must include:
  - Roles and responsibilities
  - Frequency and process standards for convening consultation meetings



# Key Elements: Interagency Consultation (Continued)

---

- Each consultation process must include:
  - Evaluation and choice of a model and assumptions for regional emissions analysis
  - Development of transportation control measures (TCMs) for inclusion in the SIP
  - Whether TCM implementation obstacles are being overcome & are being given funding priority



# Key Elements: Interagency Consultation (Continued)

---

- Each consultation process must include provisions for making determinations regarding:
  - Minor arterials or other projects that should be considered regionally significant projects
  - Projects otherwise exempt that should be treated as non-exempt projects
  - Projects that might require PM-10 or PM-2.5 hot spot analysis



# Conflict Resolution

---

- While differences are usually resolved without conflict, specific resolution provisions are required
  - Included in interagency consultation procedures
  - Specifies time clocks for resolution of conflict
- If a state air agency does not agree with the state DOT or MPO conformity determination
  - Governor is the arbiter of disputes, and must receive appeal 14 days after DOT/MPO response to comments





# Consultation Procedures

---

- Formally included in the SIP (Conformity SIPs)
- Required within:
  - 12 months of nonattainment designation(s)
  - 12 months of rule amendment(s)
- SIP must be enforceable in a state court
  - State rulemaking
  - A memorandum of understanding
  - Environmental board resolutions (in some cases)
  - Air agency administrative orders (in some cases)



# Best Practices

---

- The consultation process works best when:
  - The process is continuous with periodic meetings
  - Key decisions are made early in the process
  - Discussions and determinations are well documented
    - Agreements
    - Assumptions
    - Meeting agendas and notes



# Benefits of a Well Executed Process

---

- Provides the latest planning information to decision makers from various agencies
- Provides a forum for effective state and local planning / decision making
- Identifies key issues early in the process



# Summary

---

- The importance of interagency consultation can not be over emphasized
- Interagency consultation provides opportunities to raise issues early and minimize disruption to the conformity process
- State and local agencies should initiate interagency consultation as soon as possible after a nonattainment designation

# Section E

## Transportation Control Measures (TCMs)



---



## Section Overview

---

- Overview of TCMs
- Incorporating TCMs into a SIP
- Timely implementation of TCMs in SIPs



# What is a TCM?

---

- Conformity rule defines TCMs as:
  - Emissions control measures listed in Clean Air Act
  - Any measure focused on reducing vehicle use or traffic / congestion
- Conformity rule excludes vehicle or fuel technologies (e.g., I & M, RFG) from the definition of TCMs

**Exhibit 14**  
**Transportation Control Measures**  
CAA §108(f)(1)(A), 42 U.S.C. §7408(f)(1)

- 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 (HOV);
- 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;
- 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; and
- xvi. programs to encourage removal of pre-1980 vehicles.\*

\*Note: Excluded from CMAQ Funding under TEA-21





# EPA Criteria for TCMs in SIPs

---

- A complete description and an estimation of the emissions reduction benefit(s) of each TCM
- Adoption by a jurisdiction with legal authority to implement the TCM
- Evidence that funding is available for implementation
- All necessary approvals for implementation



# EPA Criteria for TCMs in SIPs (Continued)

---

- An adopted schedule to plan, implement, and fully enforce the TCM
- A description of the monitoring program to assess the effectiveness of the TCM
- Governor's approval of the SIP
- Public hearing (Part of the SIP approval process)



# TCM Basics

---

- TCMs can be included as a SIP control measure or contingency measure
- Timely implementation of TCMs in SIPs must be shown as part of conformity determination
- CMAQ funding is available for TCMs



# Timely Implementation of TCMs

---

- Implementation of TCMs in plans and TIPs must match the schedule in SIP
- If TCMs fall off schedule, areas must show:
  - Past obstacles have been identified and remedied
  - State & local agencies with funding authority are giving implementation of TCMs priority
- If TCMs fall off schedule and area no longer wants to implement the TCM:
  - A SIP revision is no longer required to substitute a TCM (before needed an EPA-approved SIP substitute or substitution process)



# TCM Substitution

---

- TCM substitute needs to:
  - Achieve equivalent or greater emission reductions
  - Schedule consistent with original TCM (if date has passed, as soon as practicable, but no later than SIP credit date)
  - Adequate funding, authority, and personnel
  - Collaborative process in development (CAA interagency consultation) and opportunity for public comment
  - Concurrence by MPO, state air agency, and EPA administrator with the equivalency of the substitute



# TCM Substitution (Continued)

---

- Adoption of the substitute TCM
  - Concurrence by the MPO, state air agency, and EPA administrator constitutes adoption of the substitute
  - Upon adoption, the substitute becomes part of the SIP and is federally enforceable
  - Within 90 days, substitute TCM is codified into the SIP



# Control Measures in the Plan / TIP

---

- For conformity, TCMs are control measures in an approved SIP
- Control measures can be implemented in Plan/TIP without being in the SIP
  - Transit
  - TDM measures
  - Bicycle and pedestrian-oriented projects
- Credit should be taken in regional emissions analysis
  - Off-model analysis may be required to estimate the effectiveness of control measures



# San Francisco TCM Case

---

- Background:
  - San Francisco SIP contained a TCM calling for implementation of transit policies designed to increase ridership 15% over 5 years
  - The goal was never met even though extensive investments were made in transit
  - MPO did NOT take credit for any reductions





# San Francisco TCM Case (Continued)

---

- Court Decision:
  - Court ruled that failure to achieve the 15% goal was a SIP violation
  - MPO faced \$25,000 per day penalties
  - In corollary rulings the court decided that TCMs remain in effect until removed from a SIP -TCMs apply even if no credit is taken!
  - Court decision was reversed on appeal



# San Francisco TCM Case (Continued)

---

- Lessons Learned:
  - States and MPOs should be careful when adopting express targets if results are dependent on outside factors such as consumer demand
  - When adopting express targets, all TCM obligations should be defined and qualified



# Other Transportation Measures

---

- Other measures can be used to reduce emissions
  - Enhanced inspection & maintenance programs
  - Reformulated gasoline
- These are not TCMs for the purpose of conformity
- Legal requirement to implement if in the SIP
- Shortfall in projected emissions reductions can cause conformity issues

# TCM Examples in 2017 FTIP

TABLE 49 LOS ANGELES COUNTY TCMS Subject To Timely Implementation: Continued

Lead Agency	Project ID	Project Description	Original Completion Date	2015 FTIP Completion Date	2016 RTP/SCS Completion Date	2016 RTP/SCS Project Status
LOS ANGELES COUNTY	LAF7703	EXPERIENCELA 3.0-MOBILITY IN THE CLOUD : DEVELOPS AND IMPLEMENTS CLOUD COMPUTING BASED SOFTWARE TECHNOLOGY TO PROVIDE TRANSIT USERS LOCATION SPECIFIC INFORMATION VIA PERSONAL MOBILE DEVICES AND INTERACTIVE KIOSKS AT KEY TRANSPORTATION FACILITIES.	6/30/2019	6/30/2019	6/30/2019	ON SCHEDULE. NO CHANGE IN COMPLETION DATE FROM 2015 FTIP TCM REPORT.  PROJECT TO BE DELIVERED BY COUNTY ARTS COMMISSION-CONSULTANT SERVICES ARE PROCURED.
LOS ANGELES COUNTY MTA	LA0C8164	EXPOSITION BLVD RIGHT-OF-WAY BIKE PATH-WESTSIDE EXTENSION. DESIGN AND CONSTRUCTION OF 2.5 MILES OF CLASS 1 BIKEWAY, LIGHTING, LANDSCAPING & INTERSECTION IMPROVEMENTS. (PPNO# 3184)	2009	7/31/2018	7/31/2018	ON SCHEDULE. NO CHANGE IN COMPLETION DATE FROM 2015 FTIP TCM REPORT.  THE BIKE PATH IS AN ONGOING DESIGN AND BUILD PROJECT. THE CONSTRUCTION IS BEING PERFORMED IN CONJUNCTION WITH THE EXPOSITION LIGHT RAIL TRANSIT - PHASE 2 PROJECT.
LOS ANGELES COUNTY MTA	LA0C8114	LA CNTY RIDESHARE SERVICES; PROVIDE COMMUTE INFO, EMPLOYER ASSISTANCE AND INCENTIVE PROGRAMS THROUGH CORE & EMPLOYER RIDESHARE SERVICES & MTA INCENTIVE PROGRAMS. PPNO 9003	2009	12/30/2016	12/30/2016	ON SCHEDULE. NO CHANGE IN COMPLETION DATE FROM 2015 FTIP TCM REPORT.  THE REGIONAL RIDESHARE PROJECT IS BEING IMPLEMENTED IN A TIMELY MANNER AND IS ON SCHEDULE. ALL FUNDS ARE BEING SPENT IN ACCORDANCE WITH PROP C 25% GUIDELINES.
LOS ANGELES COUNTY MTA	LA0D198	CRENSHAW/LAX TRANSIT CORRIDOR - THE CRENSHAW/LAX TRANSIT CORRIDOR PROJECT IS AN 8.5-MILE LIGHT RAIL TRANSIT (LRT) LINE EXTENDING FROM THE INTERSECTION OF CRENSHAW AND EXPOSITION BOULEVARDS ALLOWING FOR TRANSFER TO THE EXPOSITION LIGHT RAIL TRANSIT LINE TO A CONNECTION WITH THE METRO GREEN LINE AT THE AVIATION/LAX STATION	12/31/2018	4/30/2021	4/30/2021	ON SCHEDULE. NO CHANGE IN COMPLETION DATE FROM 2015 FTIP TCM REPORT.  RIGHT OF WAY IS 81% COMPLETE. CONSTRUCTION IS UNDERWAY WITH FIVE MAJOR CONTRACTS AWARDED: C0988 DESIGN BUILD, C0990 ADVANCED UTILITY RELOCATION, C0991 SOUTHWESTERN YARD & STORAGE FACILITY, C0992 CONCRETE TIES AND ASSEMBLY ITEMS
LOS ANGELES COUNTY MTA	LA0F021	EXPOSITION LIGHT RAIL TRANSIT SYSTEM PHASE II - FROM CULVER CITY TO SANTA MONICA	12/31/2017	12/31/2017	12/31/2017	ON SCHEDULE. NO CHANGE IN COMPLETION DATE FROM 2015 FTIP TCM REPORT.  THE DESIGN PHASE IS APPROXIMATELY 99.9% COMPLETE. THE CONSTRUCTION PHASE IS APPROXIMATELY 82.3% COMPLETE.



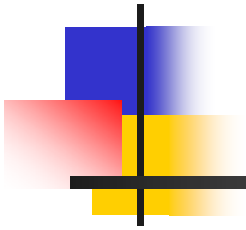
# Summary

---

- TCMs in SIPs that are not implemented as scheduled can delay a conformity determination
- SIP descriptions of TCMs should be complete and include what, when, and where
- The emissions impacts of TCMs must be quantified and credit taken as appropriate
  - For TCMs in a SIP, the emissions budget should reflect credit for the emissions reductions
  - For TCMs in a plan/TIP, credit is taken for the emissions reductions in the regional emissions analysis

# Section F

## Project Level Requirements





# Section Overview

---

- Geographic Variations & Project Level Conformity
- Overview of project level analysis
  - Projects from conforming plans and TIPs
  - Projects not from conforming plans and TIPs
  - Project level analysis and TCMs
  - Project level analysis and NEPA
- Hot spot analysis
  - Quantitative analysis
  - Qualitative analysis
- Interagency consultation



# Project Level Requirements

---

- For Projects from a plan and TIP:
  - A currently conforming plan and TIP must be in place
  - The project must be from a conforming plan and TIP
  - CO, PM-10 and PM-2.5 hot spot analysis, if applicable
  - PM-10 and/or PM-2.5 control measures, if applicable





# Projects from Conforming Plans and TIPs

---

- Projects are considered to be from currently conforming plans / TIPs if the design concept and scope:
  - Has not changed from what was originally included in the regional emissions analysis
  - Was adequate to determine the contribution of a project to regional emissions in the plan and TIP
- Project level conformity determinations are made as part of the NEPA process for projects that require approval or funding from the US DOT



# Project Level Requirements

---

- Projects not from a conforming plan and TIP:
  - Similar to projects in the plan and TIP
    - A currently conforming plan and TIP must be in place
    - CO, PM-10 and PM-2.5 hot spot analysis, if applicable
    - PM-10 and/or PM-2.5 control measures, if applicable
  - AND
    - Must not interfere with TCMs in SIP
    - Included in the regional emissions analysis



# Projects & NEPA

---

- NEPA does not greatly affect the conformity process:
  - Project details assumed in the modeling process do not preclude the consideration of other options as a result of the NEPA process
  - If the NEPA process significantly changes a project, the project must meet certain conformity rule criteria prior to NEPA process completion



# Hot Spot Analysis - Overview

---

- Project level determinations must also analyze localized concentrations of CO, PM-10 and PM-2.5 in non-attainment and maintenance areas for CO, PM-10 and PM-2.5
  - Typically referred to as “hot spots”
  - Performance metric varies
    - CO non-attainment areas  
Metric: Project must improve air quality
    - PM non-attainment and CO / PM maintenance areas  
Metric: Project must not make air quality worse



# Hot Spot Analysis - Determinations

---

- Conformity determinations for hot spots are made using different methods as applicable
  - CO Hot Spots
    - Some require quantitative analysis
    - Some require qualitative analysis or air quality analysis
  - PM Hot Spots
    - Currently limited to qualitative analysis
    - EPA issued guidance for PM-2.5 & PM-10 qualitative analyses in March 2006



# Hot Spot Analysis - Determinations (Continued)

---

- Analysis must be based on emissions from the project and background emissions
  - Analysis must include entire project after major design features have been identified
  - Emissions from any construction activities are not considered in hot spot analysis
- Assumptions must be consistent with the assumptions used in the regional emissions analysis
- Mitigation controls may be included if written commitments to implement exists



# Hot Spot Analysis - CO

---

- A quantitative hot spot analysis using specific models and data is required for some projects
  - At locations identified in the SIP
  - Affecting intersections that are or will be at level of service D, E, or F
  - Affecting any of the three busiest intersections or intersections with the worst levels of service in the non-attainment or maintenance area
- A qualitative finding is required for all other projects



# Hot Spot Analysis - PM

---

- Examples of Projects of Air Quality Concern
  - Project on a new highway with > 125,000 ADT & with diesel truck traffic  $\geq$  8% of ADT
  - Expansion of a highway with significant increase in diesel trucks affecting intersections with level of service D, E, or F
  - New exit ramps and other highway improvements that connect to a major freight, bus, or intermodal terminal
  - A major new bus or intermodal terminal
- A qualitative finding is required using either:
  - Comparison to another location with similar characteristics
  - Air quality studies for the proposed project location





# Hot Spot Analysis – PM (cont.)

---

- Examples of Projects That are Not of Air Quality Concern
  - New or expanded highway projects that primarily serves gasoline vehicles including congested intersections
  - Intersection channelization or interchange projects involving turn lanes or physically separated lanes
  - Intersection channelization, signalization, or reconfiguration projects and traffic circles designed to improve traffic flow and that do not increase idling
  - A new or expanded bus terminal serving non-diesel or hybrid-electric vehicles
  - A 50% arrival increase at a small terminal (e.g., a facility with 10 buses in the peak hour)



# Interagency Consultation

---

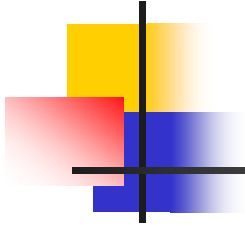
- The consultation process for hot spots is the forum for:
  - Determining projects to be analyzed
  - Agreeing on approaches to analysis
  - Documenting all analyses



# Summary

---

- Project level requirements include:
  - A currently conforming plan and TIP in place
  - CO and PM hot spot analysis, if applicable
  - Compliance with PM control measures, if applicable
  - Projects not from a plan and TIP must not interfere with TCM implementation and must be included in the regional emissions analysis test(s)
- Project level conformity determinations are part of the NEPA process
- Hot Spot Analysis may be required for CO and PM-10 (Quantitative or Qualitative requirements apply)



# Consequences of SIP and Conformity Failures

## **SECTION 7**



# Lesson Overview

---

- Conformity lapse
- Conformity freeze
- SIP issues



## Definition of a Conformity Lapse

---

- "...Lapse means that the conformity determination for a transportation plan or TIP has expired, and thus there is no currently conforming transportation plan / TIP"



# Consequences of a Conformity Lapse

---

- Only certain types of projects can proceed during a conformity lapse
- During conformity lapse, no new plans, TIPs, or projects can be approved until:
  - The plan and TIP are changed; or
  - The SIP is changed



# What Causes a Conformity Lapse?

---

- A conformity lapse may be caused by:
  - Failure to meet the 4-year frequency requirement for conformity redetermination
  - Failure to redetermine conformity within 24 months when required by SIP changes or a FIP
  - SIP failures
  - Failure to meet the planning regulations





# Projects and Funding During a Lapse

---

- Only some types of transportation projects may proceed for purposes of funding and implementation:
  - Exempt projects
  - TCMs in approved SIPs



## Projects and Funding During a Lapse (Continued)

---

- Previously approved federal projects or project phases
  - Projects from the previously conforming plan / TIP, which have received funding commitments
  - Project agreement (PS&E authorization) approval
  - Full Funding Grant Agreements (FFGA)
- Non-regionally significant non-federal projects



# Projects and Funding During a Lapse (Continued)

---

- Regionally significant non-federal projects
  - Only if the project was approved by the non-federal entity before the lapse
- Traffic synchronization projects
  - Projects must be included in subsequent regional conformity analysis of the transportation plan / TIP



# Example of Lapse

---

- Atlanta, GA -
  - Missed 18 month timeframe for initial SIP submissions
  - Main issues:
    - Fiscal constraint
    - Use of planning assumptions
    - Land use commitments
  - State formed a regional transportation planning authority to resolve issues and end the lapse



# Interim Plan and TIP

---

- If a lapse is expected to be lengthy, an MPO can prepare an Interim Plan and TIP in order to proceed with additional projects
- State and local agencies should determine:
  - If the lapse may last longer than six months
  - If resources are better spent on redetermining conformity by correcting deficiencies
  - Note:-per SAFETY-LU, lapse occurs 12 months after failure to redetermine conformity



# SIP Disapprovals

---

- EPA can issue partial, limited, or full disapprovals
- EPA disapprovals may be issued with or without a protective finding
- Some SIP disapprovals can have problematic conformity consequences (i.e., lapse)
  - 15%, ROP SIPs
  - Attainment SIPs
  - NOT maintenance plans



# What is a Protective Finding?

---

- A finding by EPA that the SIP identifies enough control measures to achieve 15% ROP or attainment
  - State provides an enforceable, written commitment to adopt additional control measures
  - SIP must still be revised and approved
- If a SIP is disapproved with a protective finding:
  - Lapse may still occur
  - Lapse begins when highway sanctions are imposed
  - Effective 2-years after the date of the EPA disapproval
  - Emission budgets in the SIP can still be used for conformity



# SIP Disapproval without a Protective Finding

---

- A SIP disapproval without a protective finding results in a freeze on the effective date of EPA's final disapproval
- A freeze precludes any new plan or TIP conformity findings from being made until:
  - The state submits a new SIP
  - EPA finds the motor vehicle emissions budgets adequate for conformity purposes





# Conformity Freeze

---

- During a freeze all new transportation plans / TIPs or projects are affected
  - Only projects that are included in the first three years of the transportation plan / TIP may go forward
  - No new projects (or project phases) not in the first three years of the plan / TIP may be found to conform
  - No new plans, TIPs, or plan / TIP amendments may be found to conform
- Exempt projects can proceed at any time



# Conformity Freeze (Continued)

---

- If any one phase of a project is included in the first three years of the currently conforming plan / TIP
  - Subsequent phases may proceed following disapproval
  - All phases of the project must have been included in the plan/TIP conformity analysis
  - All other applicable project-level conformity criteria must have been satisfied



## Conformity Freeze (Continued)

---

- The freeze will turn into a lapse in conjunction with the imposition of highway sanctions
- Normally occurs two years after the effective date of EPA's SIP disapproval without a protective finding
- A lapse could also occur if the current plan or TIP expires during the freeze since no new plans / TIPs can be adopted



# Example of Conformity Freeze

---

- New Jersey -
  - Failure to implement control measures in SIP, specifically the enhanced Inspection & Maintenance program
  - EPA disapproved the SIP without a protective finding for failure to implement
  - Resulting in a lengthy conformity freeze
  - State revised the SIP, including alternative control strategies to end the freeze
  - Subsequent phases may proceed following disapproval
  - All phases of the project must have been included in the plan / TIP conformity analysis and all other applicable project-level conformity criteria must have been satisfied



# Conformity Consequences of Other SIP Failures

---

- For failure to submit a SIP and for a SIP that has been found incomplete:
  - Lapse occurs when highway sanctions are applied
  - Occurs 2 years after effective date of EPA's action
- Applies to 15%, ROP and attainment SIPs, not maintenance plans



# What are Out-year Budgets?

---

- Budgets established outside the timeframe of the SIP
- Areas with attainment or maintenance SIPs can create out-year budgets
- To establish out-year budgets, the projections on which the budgets are based must be consistent with the purpose of the SIP (attainment or maintenance) when considering emissions from all other sources



## Example: Out-year Budgets

---

- Albuquerque, NM -
  - Maintenance area for carbon monoxide
  - Original maintenance plan approved in 1996 which established a budget for 2006
  - Issue: Area could not meet conformity requirements in the years beyond 2006



# Example: Out-year Budgets (Continued)

---

- Remedy:
  - Area reviewed emissions inventory / air monitoring data
  - Determined that increasing budget in the out-years would not create a violation
  - Revised SIP to establish new 2006 budget and out-year budget for 2010, allowing area to pass conformity
- Interagency consultation was critical





# SIP Issues

---

- Implementing control measures
  - Mobile and non-mobile source control measures must be implemented
  - Failure to implement can result in sanctions
- Options if conformity difficulties arise:
  - Implement or amend SIP for failed control measure
  - Explore alternative control strategies and amend SIP



# SIP Issues

---

- Updating emissions inventories
  - Updated inventories do not require updating motor vehicle emissions budgets
  - Budgets may be based on old inventories and not reflect the latest fleet mix, speeds, etc.
  - However, SIPs may be revised using updated data
- Options if conformity difficulties arise:
  - Utilize safety margin or revise SIP
  - Implement additional control measures
  - Alter plan / TIP



# SIP Issues

---

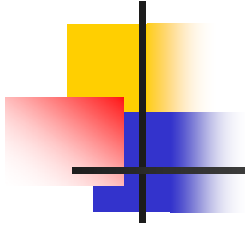
- Inconsistent data / assumptions
  - Different assumptions in SIPs and Plan / TIP can cause inconsistency in population, travel data, vehicle mix, etc.
  - Problems and failure to submit could result in
    - Sanctions clocks
    - Conformity lapse if highway sanctions are imposed
- Options if conformity difficulties arise:
  - Utilize safety margin or revise SIP
  - Implement additional control measures
  - Alter plan / TIP



# Summary

---

- Conformity lapse occurs if conformity determination not made on time
  - Only certain projects may proceed
- Conformity freeze results from SIP disapproval without a protective finding
  - Immediate conformity freeze on effective date of disapproval
  - Only projects in first 4 years of plan/TIP can proceed
- Certain SIP failures can result in a conformity lapse
  - Generally two years after EPA's action
  - Only certain projects may proceed
- Failure in SIP implementation can impact conformity and may result in sanctions



# Rural Area Requirements

## **SECTION 8**



## Lesson Overview

---

- Definition of an Isolated Rural Area
- Treatment of regionally significant projects
- Demonstration of conformity in rural non-attainment and maintenance areas
- Demonstration of conformity in areas after the time period in a control strategy SIP or maintenance plan



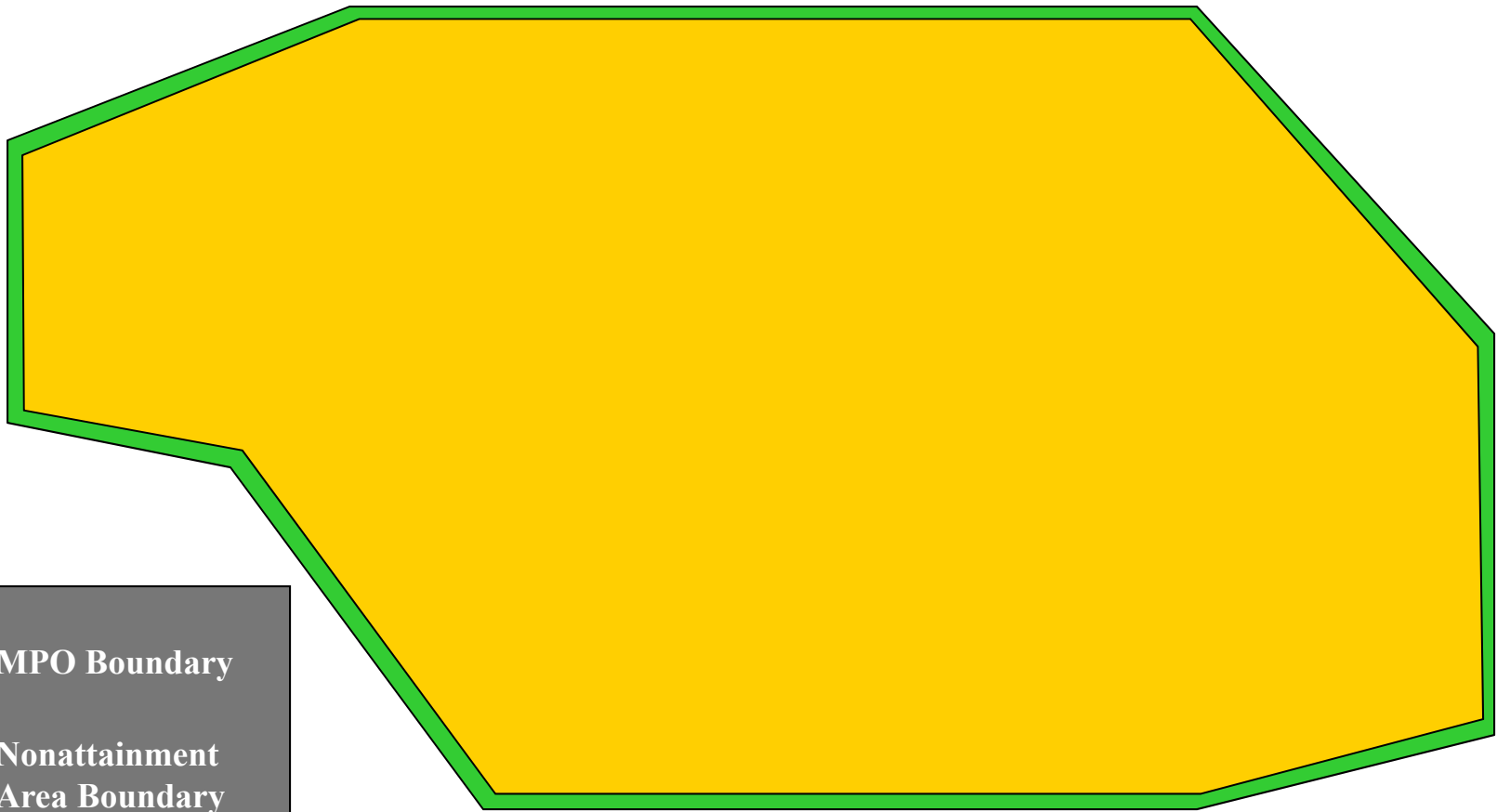
# Types of Areas




---

- Metropolitan Areas
  - Areas with an MPO, a population of at least 50,000, and have a plan / TIP
- Donut Areas
  - Areas outside a metropolitan planning boundary but inside a non-attainment/maintenance area boundary
- Isolated Rural Areas
  - Non-attainment or maintenance areas (or portions of) without an MPO and whose projects aren't part of any MPO's regional emissions analysis



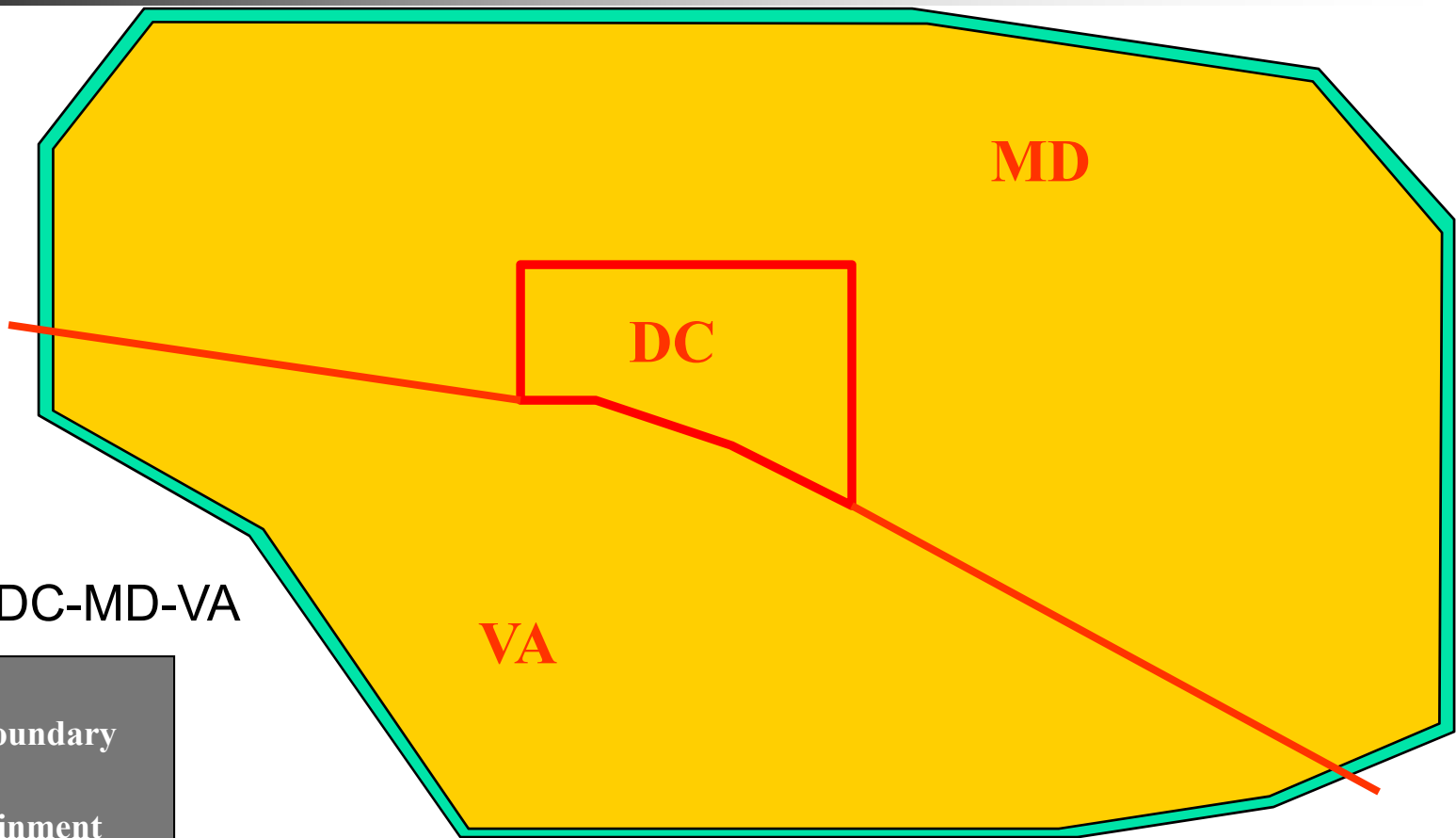
# Typical Alignment



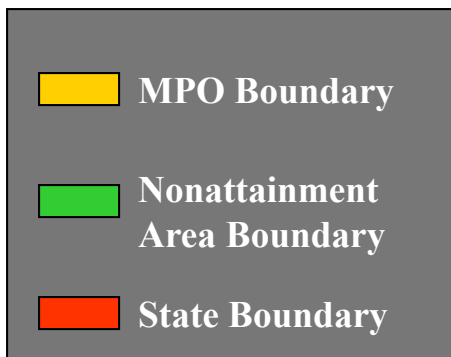
-  MPO Boundary
-  Nonattainment Area Boundary
-  State Boundary



# Multiple Jurisdictions

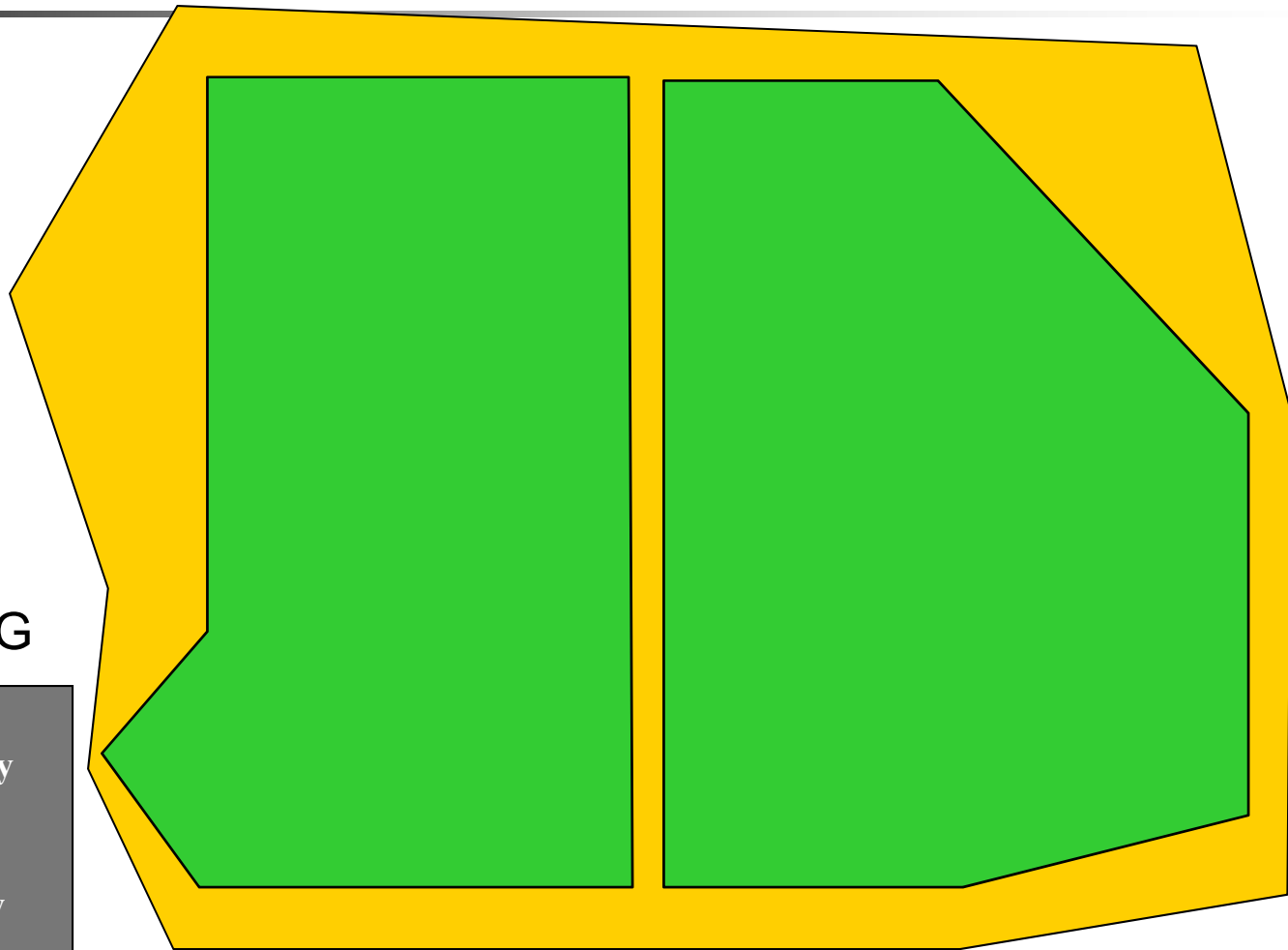
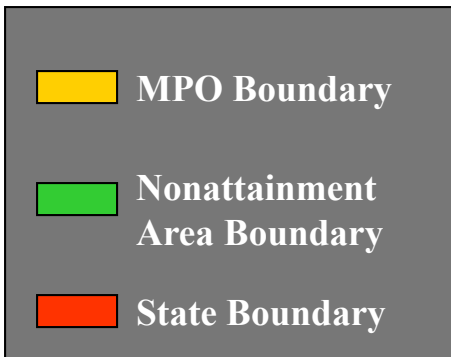


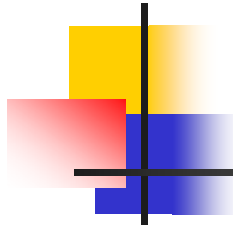
Example: DC-MD-VA



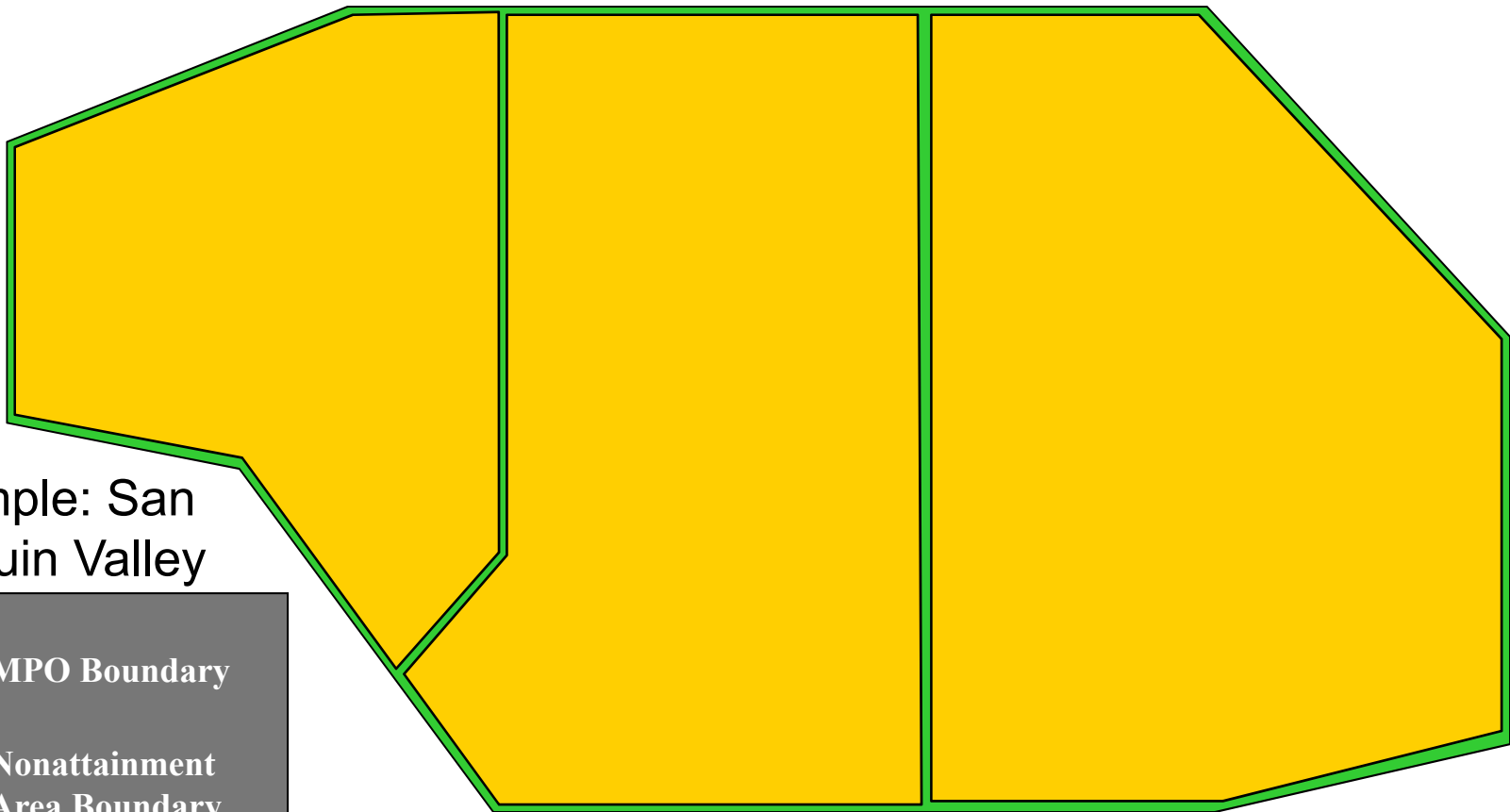
# Multiple Nonattainment Areas

Example: SCAG

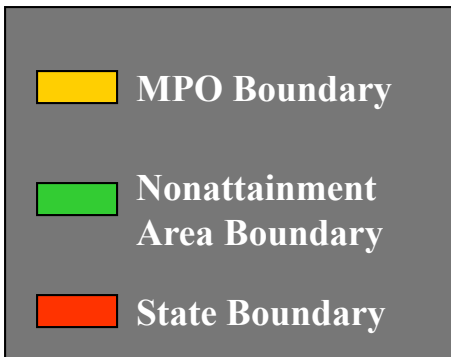




# Multiple MPOs



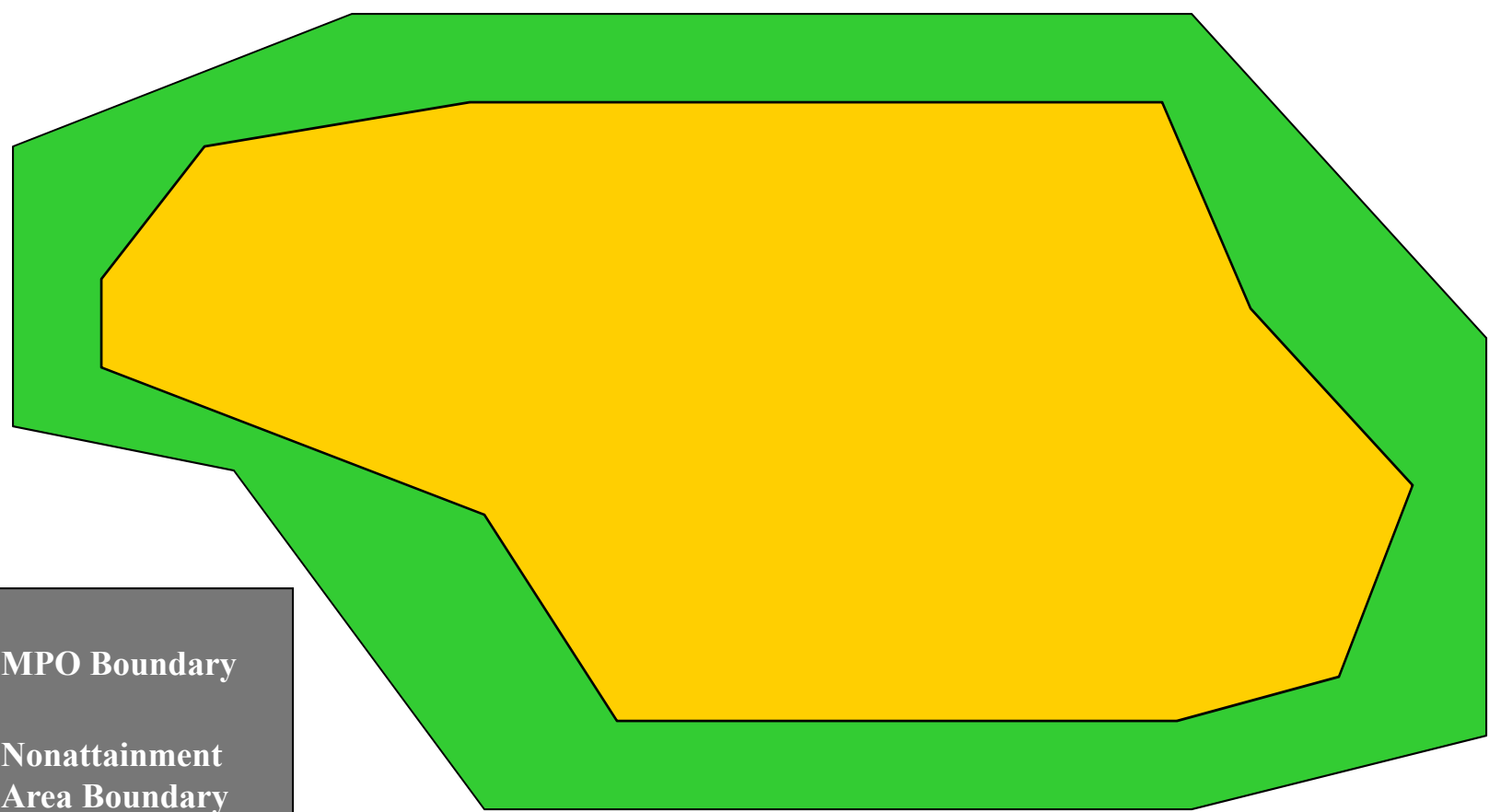
Example: San Joaquin Valley








# Donut Area

---



-  MPO Boundary
-  Nonattainment Area Boundary
-  State Boundary



# Isolated Rural Area

---



 MPO Boundary

 Nonattainment  
Area Boundary

 State Boundary



# Definition of an Isolated Rural Area

---

- Rural area with a population of less than 50,000
- Does not have a metropolitan plan or TIP
- Regionally significant projects are not part of the regional emissions analysis of an MPO's plan or TIP
- Rural area projects are incorporated into the STIP prior to Federal action



# Test Requirements for Isolated Rural Areas

---

- 40 CFR 93.110 Latest planning assumptions
- 40 CFR 93.111 Latest emissions model
- 40 CFR 93.112 Interagency consultation
- 40 CFR 93.113 Timely implementation of TCMs
- 40 CFR 93.116 Hot spots
- 40 CFR 93.117 PM-10 control measures
- 40 CFR 93.118 Budget Test
- 40 CFR 93.119 Emissions Reduction Tests



# Metropolitan vs. Isolated Rural Areas

---

## Metropolitan Areas

- MPO prepares the conformity determination
- Current transportation plan
- Current TIP

## Rural Areas

- State DOT prepares the conformity determination
- Current plan or TIP – FHWA/FTA projects are included in STIP
  - Projects are consistent with the statewide plan and included in the STIP





# Regional Emissions Analysis

---

## Metropolitan Areas

- Analysis must include:
  - Regionally significant projects in the plan / TIP
  - Any other regionally significant projects
- Plan covers at least 20-years

## Rural Areas

- Analysis must include:
  - Projects funded or approved by FHWA/FTA
  - All other regionally significant projects expected in the area
- Projects are grouped and analyzed together
- Plan covers
  - Statewide transportation plan timeframe
  - At least 20 years



# Frequency Requirements for Rural Areas

---

- Rural areas need to make conformity determinations only when a new project is federally funded or approved
- Conformity determinations are only required as needed (no frequency requirement)



# Tests for Years Beyond SIP Timeframes

---

- Isolated Rural Areas have a choice of how long the regional emissions analysis will be (just as MPO areas do)
  - 10 years in the future
  - Attainment year
  - Year after regionally significant project completed
  - Subject to interagency consultation/public comment



# Tests for Years Beyond SIP Timeframes (Cont.)

---

- Isolated Rural Areas have a choice of how to determine conformity in the years beyond those covered by the SIP
  - Budget test
  - Emissions reduction test or test(s) depending on the area classification
  - Air quality modeling used in an attainment demonstration or maintenance plan



# Summary

---

- Rural areas have flexibility in determining timeframe of analysis
- Rural areas have flexibility in determining conformity in the years beyond the SIP timeframe
  - Budget test
  - Emissions reduction test(s)
  - Air quality modeling
- Most rural areas work closely with the state to conduct modeling for emissions analysis