




# Dayton Area Ozone Advance Program



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**CAAAC**  
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# What I Will Talk About

- Very brief background RAPCA
- Clean Air Act responsibilities
- National Ambient Air Quality Standards
- History of ozone and particulate matter standards and where these are headed
- Consequences of Nonattainment
- Sources of Emissions
- RAPCA Area Air Quality and Inventory
- Control Options



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# Background on RAPCA

- Regional Air Pollution Control Agency
- Six-county local agency—Dayton, Ohio
  - Agency roots from the 1950's under the City
  - Health Department authority—Direct grant from USEPA and annual contract with Ohio EPA
  - One of nine local agencies in Ohio
- History of nonattainment for ozone and particulate matter and currently borderline air quality for both



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# Background on RAPCA

- At one time Dayton was a Major Manufacturing Area
- 15 Foundries
- 5 General Motors Plants
- National Cash Register
- Dayton Press (McCalls/Readers' Digest)
- Three Paper Mills
- Two Large Electric Generating Stations, Downtown Steam Stations
- Two Large Municipal Incinerators



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# Clean Air Act Responsibilities

- Section 109 specifies EPA's responsibility for prescribing National Ambient Air Quality Standards "requisite to protect public health"
- Section 107 specifies the states responsibility for assuring air quality standards are achieved and maintained
- Section 110 (a) (2)(D) specifies interstate transport responsibilities



# CLEAN AIR ACT

## FINDINGS AND PURPOSES

### SEC. 101. (a) The Congress finds--

(3) that air pollution prevention (that is, the reduction or elimination, through any measures, of the amount of pollutants produced or created at the source) and air pollution control at its source is the primary responsibility of States and local governments; and

(4) that Federal financial assistance and leadership is essential for the development of cooperative Federal, State, regional, and local programs to prevent and control air pollution.



# National Ambient Air Quality Standards

- USEPA has promulgated NAAQS for ozone, particulate matter, SO<sub>2</sub>, NO<sub>2</sub>, CO, and Lead
- NAAQS are reviewed every five years and revised as appropriate
  - Most recent health studies
  - Better monitoring techniques
- Clean Air Science Advisory Committee reviews data and makes recommendations to the Administrator



# Revising Standards

- U.S. EPA has been busy revising standards:
  - 2006: 24-hr  $PM_{2.5}$
  - 2008: Lead
  - 2010:  $NO_2$ ,  $SO_2$
  - 2008-2011: Ozone
  - 2011: CO
- More to come:
  - 2012:  $PM_{2.5}$
  - 2013-2014: Ozone





# Ozone Air Quality Standard

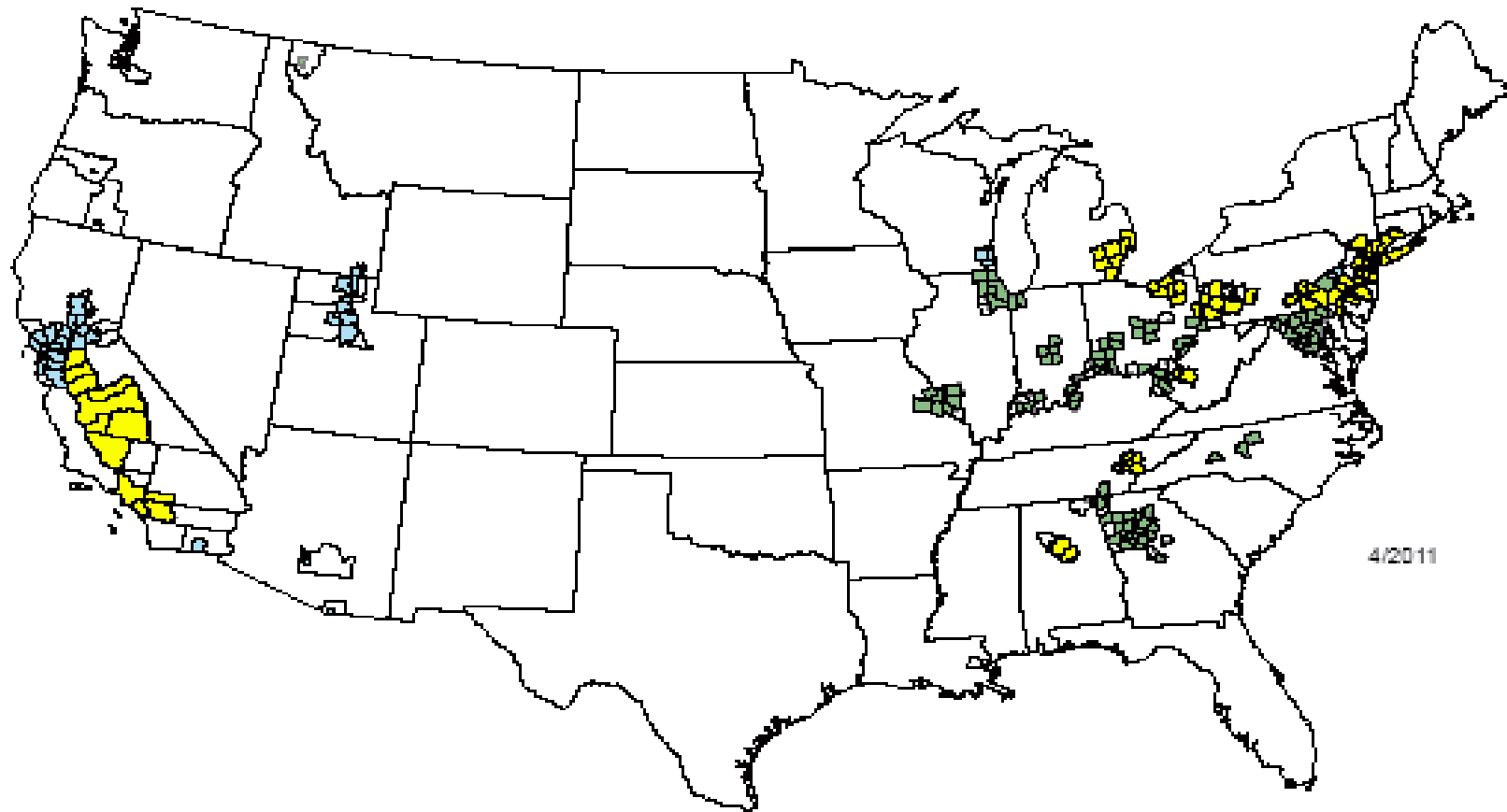
| <b>Timeline</b>                           | <b>Level (ppm)</b> | <b>Measurement</b>  |
|---|--------------------|---|
| Revision of New Standard probable in 2014 | 0.060 -0.070       | Average of fourth highest concentration measured over a three year period |
| New Standard                              | 0.075              |   |
| Old standard                              | 0.084              |   |
| Old, Old standard                         | 0.125              | Not to be exceeded more than four times in a three year period            |

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## PM<sub>2.5</sub> Air Quality Standard

- Annual standard – 15 ug/m<sup>3</sup>, averaged over a three year period
- 24-hour standard- 35 ug/m<sup>3</sup>
- Court ordered revision of standard. Annual standard could be lowered to 12-13 ug/m<sup>3</sup>

**Counties Designated Nonattainment  
for PM-2.5 (1997 Standard) and/or PM-2.5 (2006 Standard)**

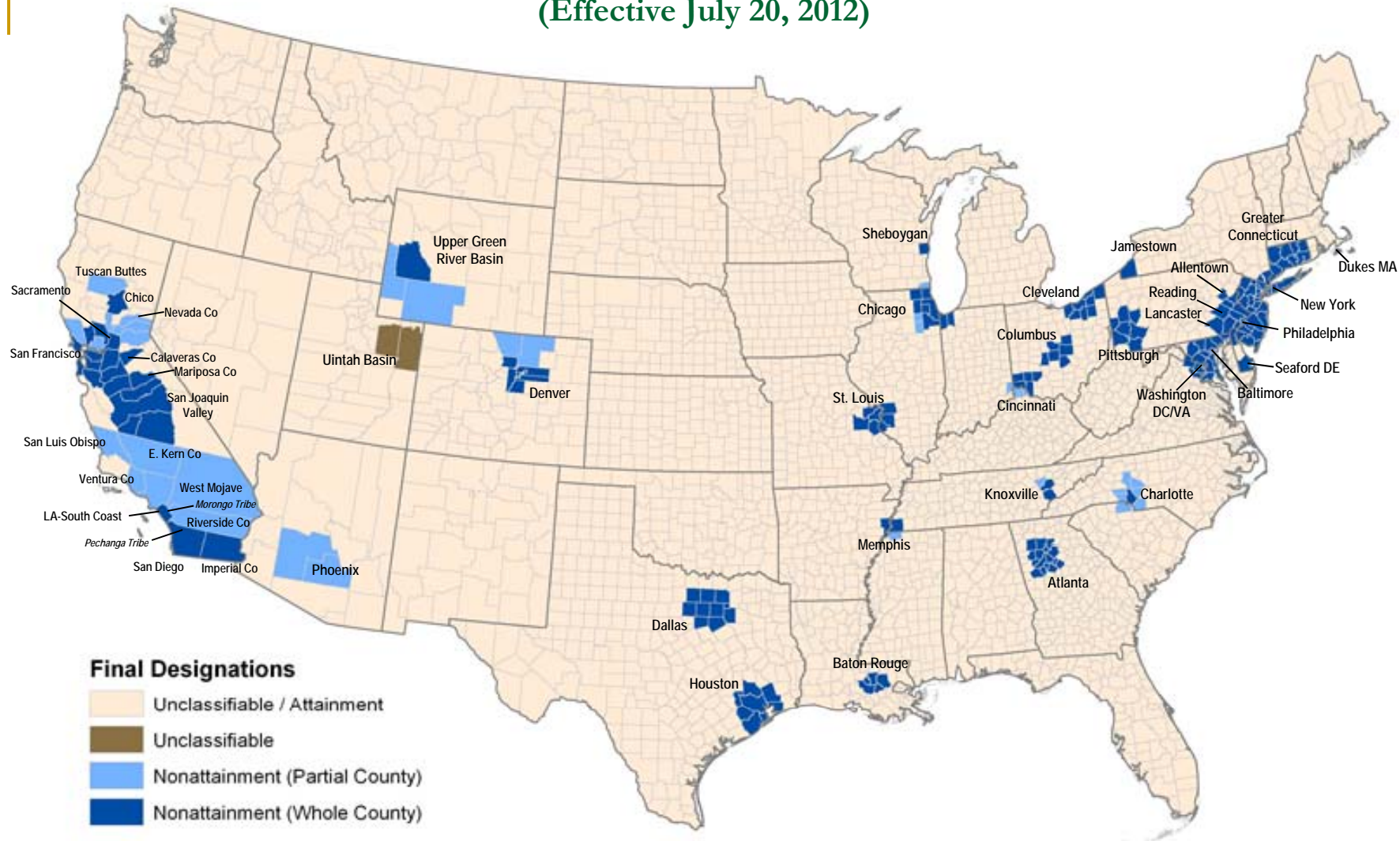


**Designated Nonattainment**

- 1997 PM-2.5
- Both 1997 and 2006 PM-2.5
- 2006 PM-2.5

Nonattainment areas are indicated by color. When only a portion of a county is shown in color, it indicates that only that part of the county is within a nonattainment area boundary.

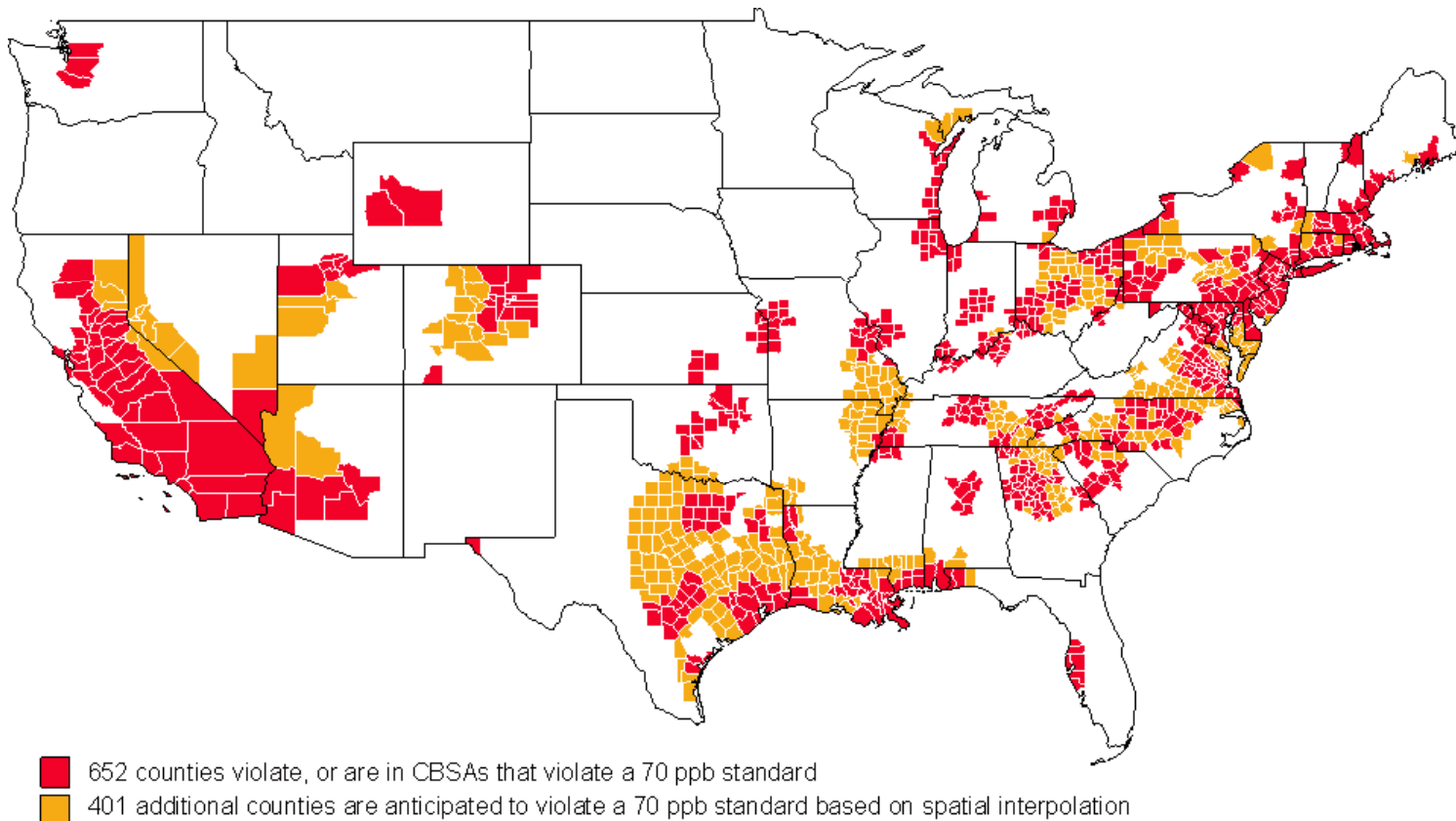
## Area Designations for 2008 Ozone NAAQS (Effective July 20, 2012)



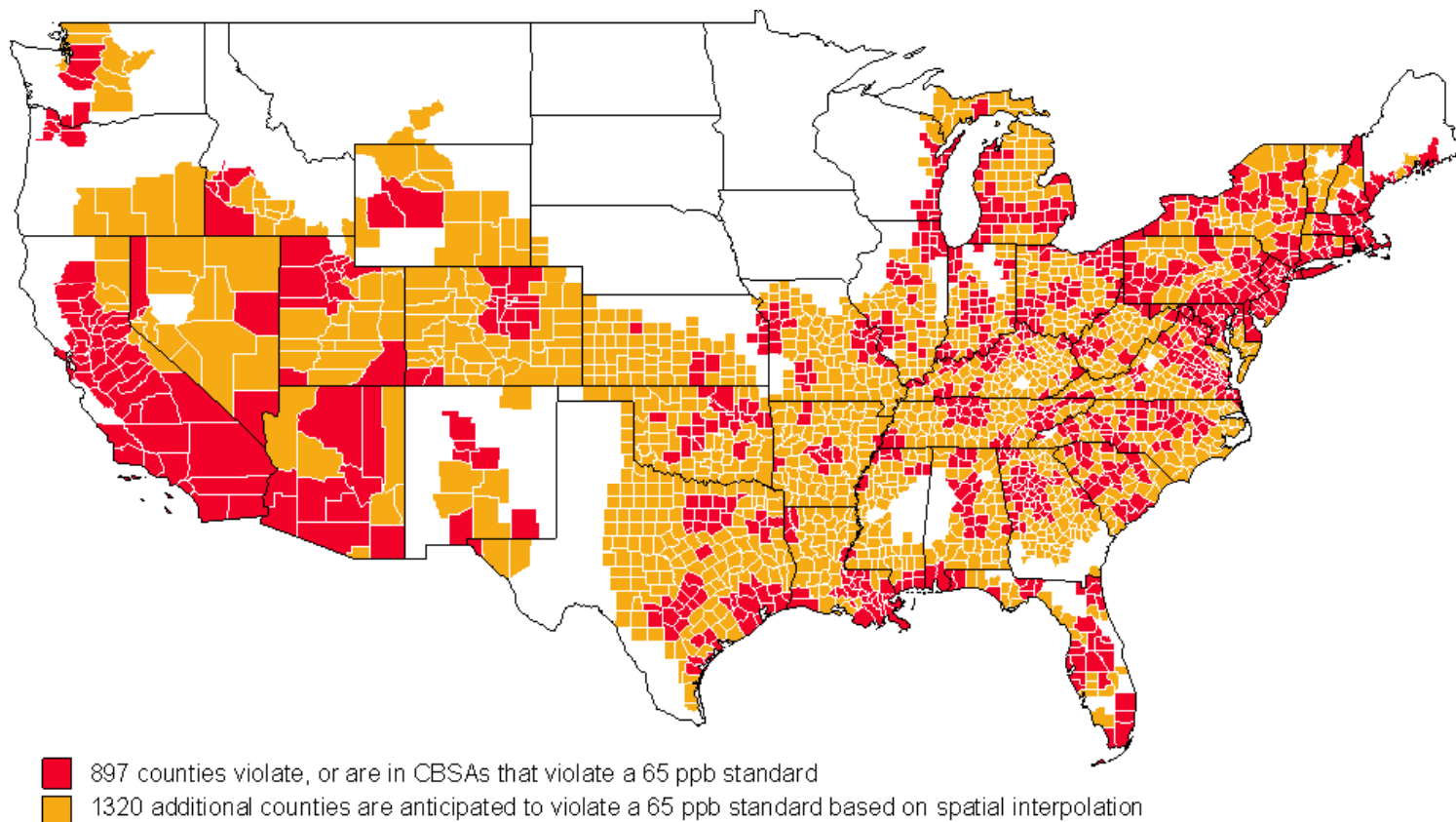
**Notes:**

EPA has not designated as nonattainment any areas outside the Continental US.

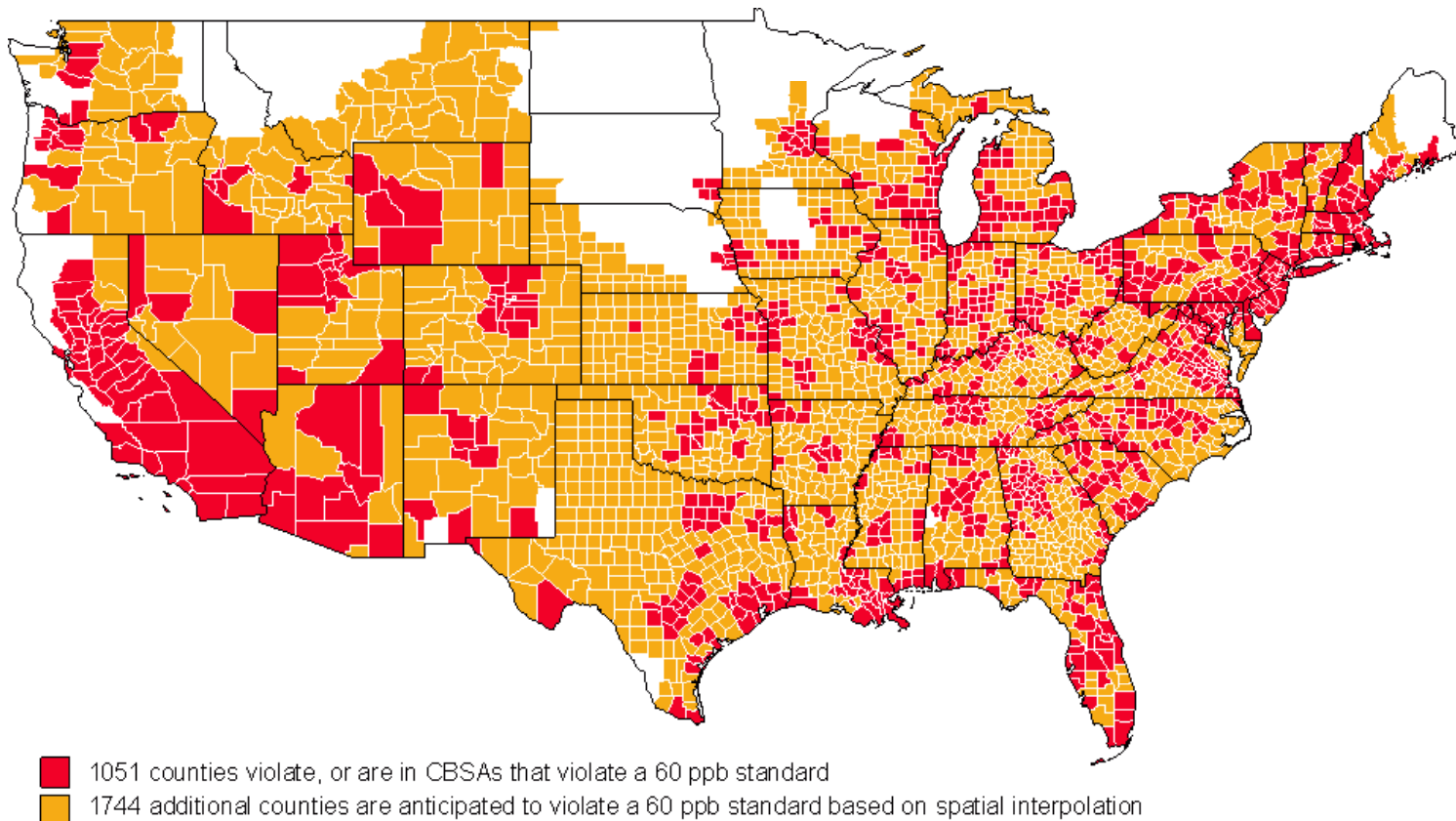
# Ozone Standard of 70 ppb based on 2008-2010 Data



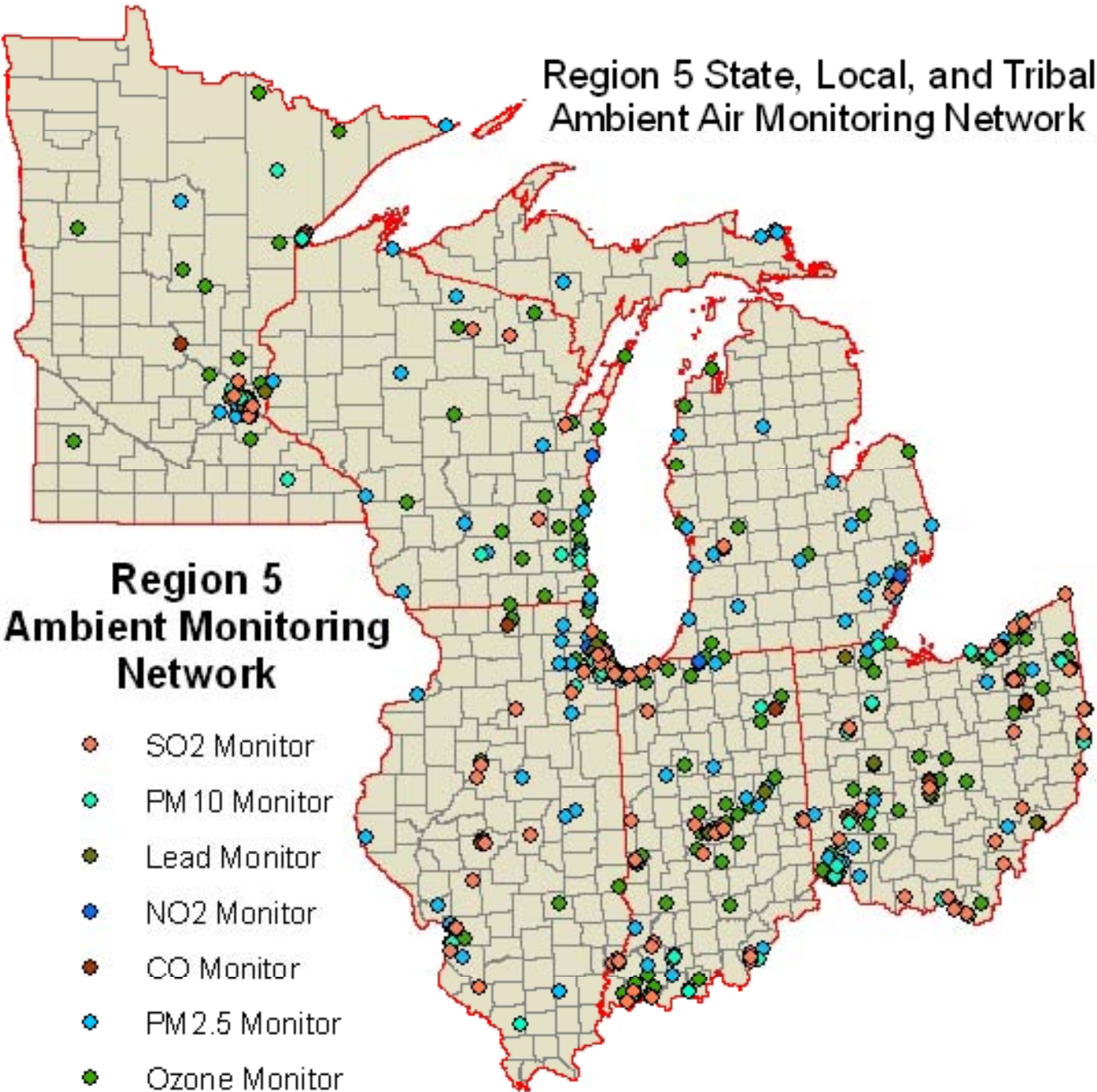
# Ozone Standard of 65 ppb based on 2008-2010 Data



# Ozone Standard of 60 ppb based on 2008-2010 Data



# Region 5 State, Local, and Tribal Ambient Air Monitoring Network



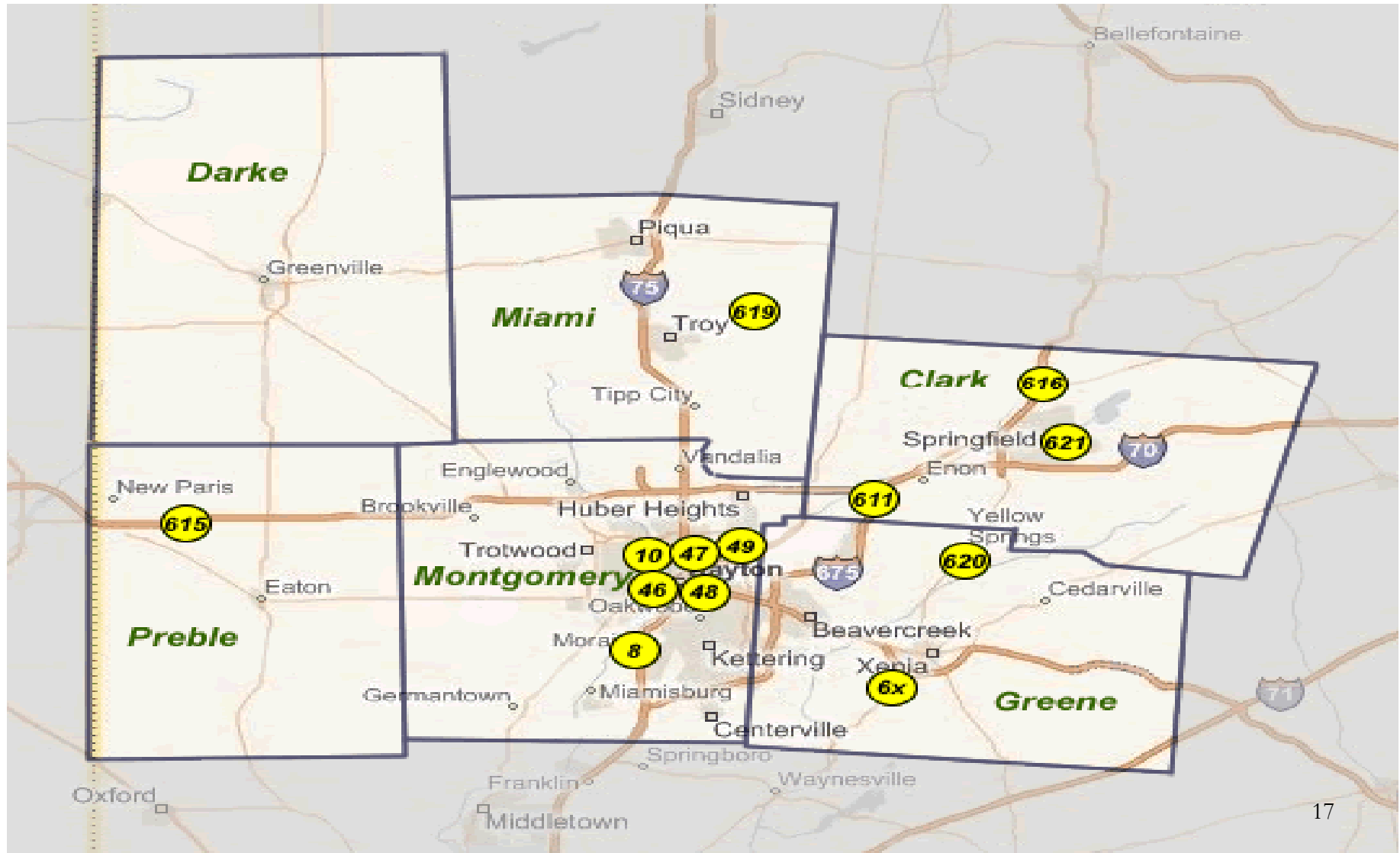
## Region 5 Ambient Monitoring Network

- SO2 Monitor
- PM10 Monitor
- Lead Monitor
- NO2 Monitor
- CO Monitor
- PM2.5 Monitor
- Ozone Monitor

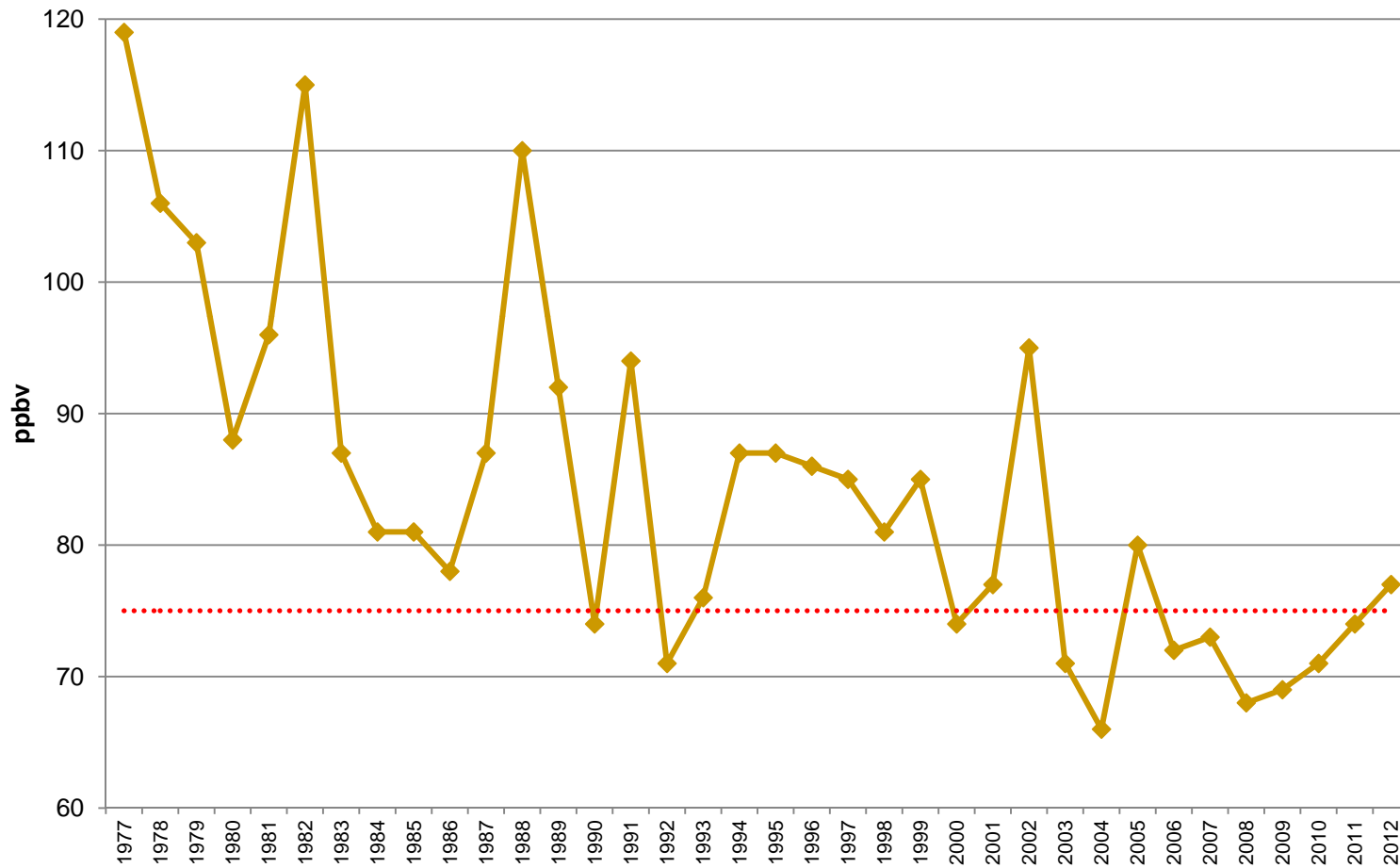


# RAPCA - Ambient Air Quality Monitoring Program

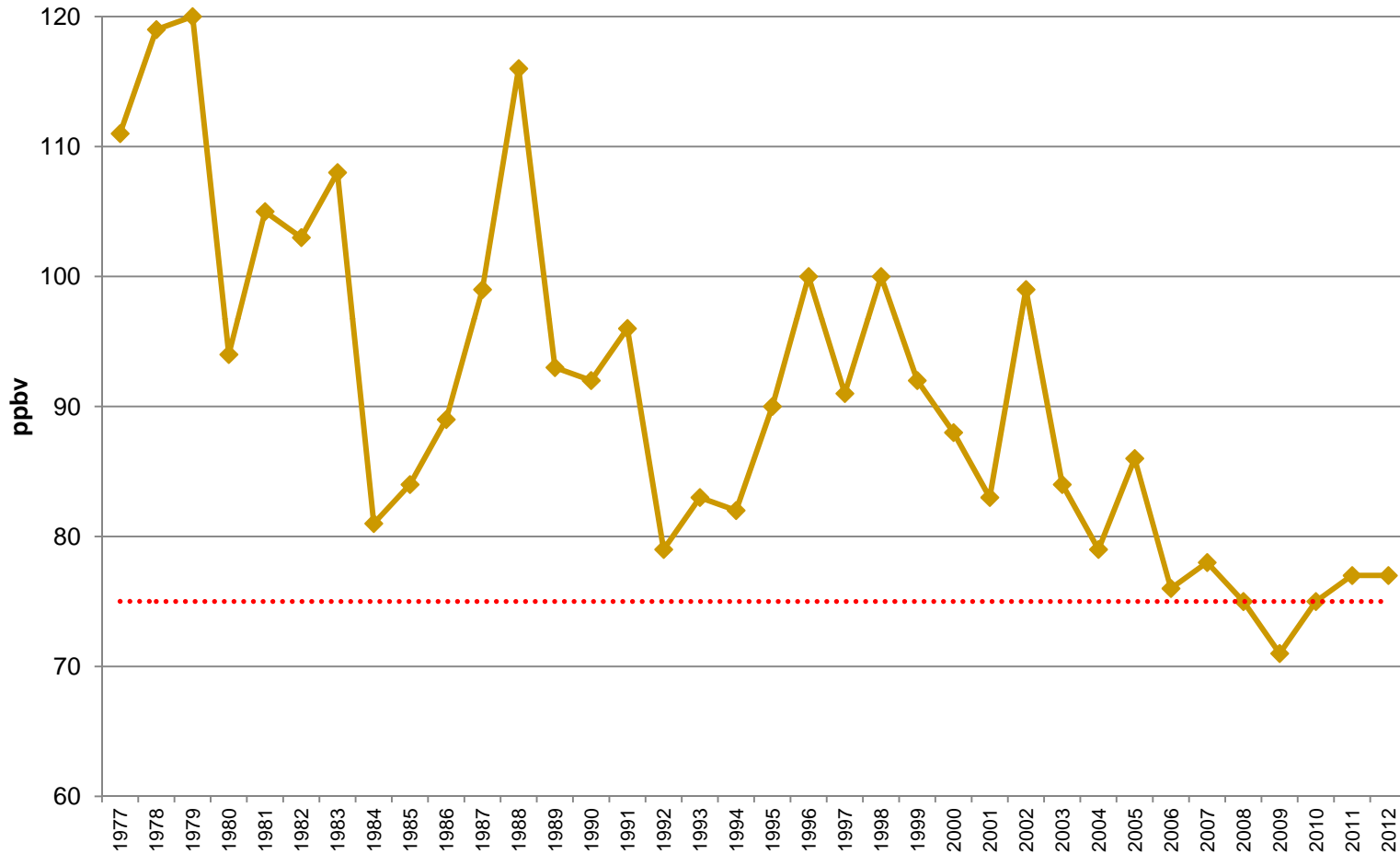
- 15 ambient air quality monitors at 12 locations:



# Preble County, Ohio 4<sup>th</sup> max 8 hr Ozone



# Clark County, Ohio 4<sup>th</sup> max 8 hr Ozone

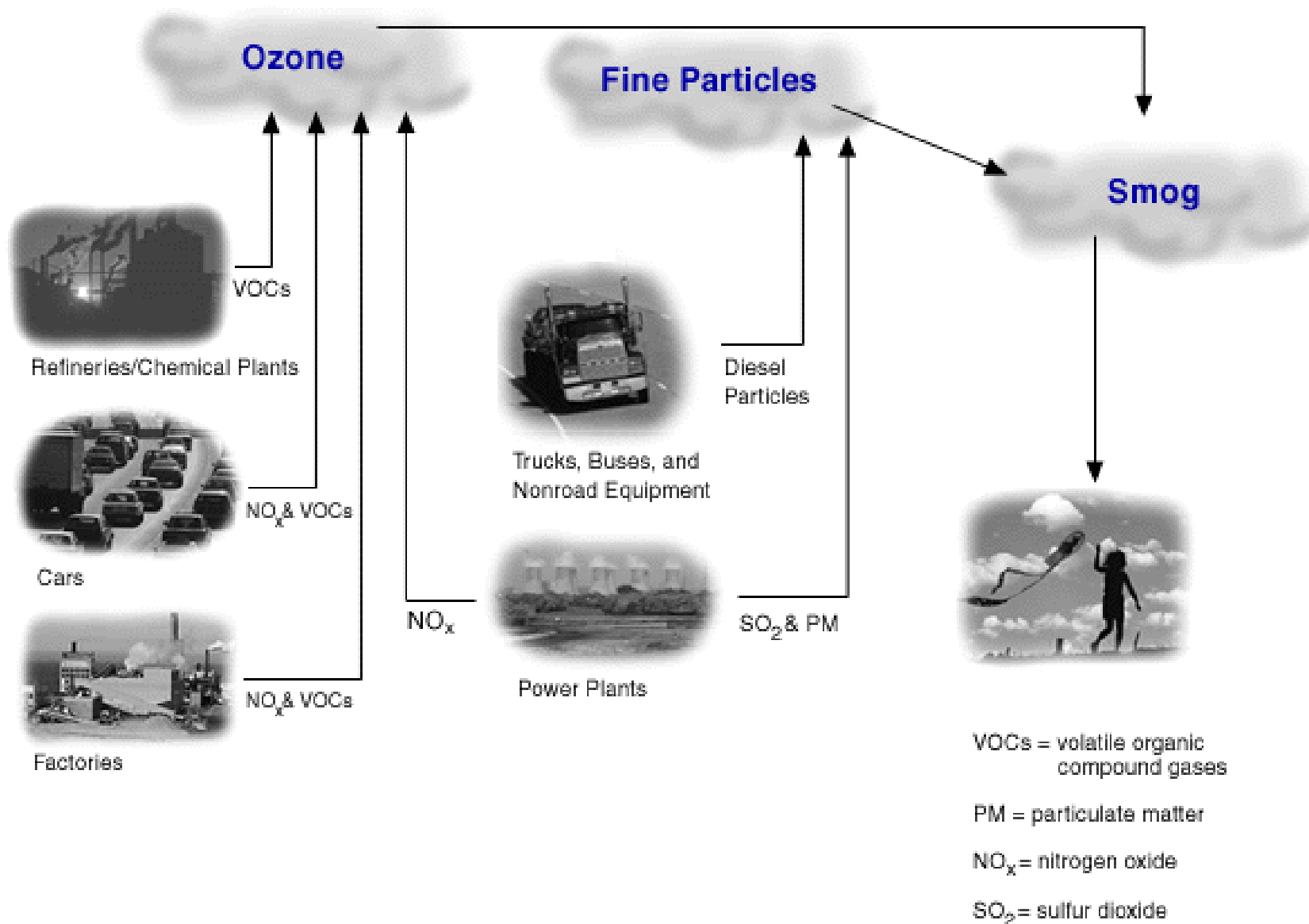


# Requirements for Ozone Areas - CAAA

- Requirements for all nonattainment areas
  - Nonattainment New Source Review
    - Emissions offsets
    - Lowest Achievable Control Technology
- Additional requirements for moderate nonattainment areas are the ones you really want to avoid
  - Inspection/maintenance of vehicles
  - 15% reduction in inventory
  - Stage 2 vapor recovery at gasoline dispensing stations

# Overview of CAA Ozone Planning & Control Requirements by Classification

|  |   | NSR offset ratio     | Major source threshold |  |
|--|---|----------------------|------------------------|--|
| <b>EXTREME</b><br>(20 years to attain)   | TRAFFIC CONTROLS DURING CONGESTION        | 1.5 : 1<br>Extreme   | 10                     |  |
|  | CLEAN FUELS REQUIREMENT FOR BOILERS       |                      |                        |  |
| <b>SEVERE</b><br>(15/17 years to attain) | PENALTY FEE PROGRAM FOR MAJOR SOURCES     | 1.3 : 1<br>Severe    | 25                     |  |
|  | LOW VOC REFORMULATED GAS                  |                      |                        |  |
|  | VMT GROWTH OFFSET                         |                      |                        |  |
|  | VMT DEMONSTRATION (& TCMs IF NEEDED)      |                      |                        |  |
| <b>SERIOUS</b><br>(9 years to attain)    | NSR REQUIREMENTS FOR EXISTING SOURCE MODS | 1.2 : 1<br>Serious   | 50                     |  |
|  | ENHANCED I/M                              |                      |                        | CLEAN FUELS PROGRAM (IF APPLICABLE)        |
|  | MODELED DEMO OF ATTAINMENT                |                      |                        | MILESTONE CONTINGENCY MEASURES FOR RFP     |
|  | 18% RFP OVER 6 YEARS                      |                      |                        | ENHANCED MONITORING PLAN                   |
|  | STAGE II GASOLINE VAPOR RECOVERY          |                      |                        |  |
|  | BASIC I/M                                 |                      |                        | CONTINGENCY MEASURES FOR FAILURE TO ATTAIN |
| <b>MODERATE</b><br>(6 years to attain)   | 15% RFP OVER 6 YEARS                      | 1.15 : 1<br>Moderate | 100                    |  |
|  | MAJOR SOURCE VOC/NOx RACT                 |                      |                        | ATTAINMENT DEMONSTRATION                   |
|  | TRANSPORTATION CONFORMITY DEMONSTRATION   |                      |                        |  |
| <b>MARGINAL</b><br>(3 years to attain)   | NEW SOURCE REVIEW PROGRAM                 | 1.1 : 1<br>Marginal  | 100                    |  |
|  | BASELINE EMISSION INVENTORY (EI)          |                      |                        | PERIODIC EMISSION INVENTORY UPDATES        |



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# Sources of Urban Air Pollution

- Mobile Sources (Vehicles)
  - On road
  - Off road
  - Small engines
- Area Sources
- Small commercial/institutional sources
- Large stationary sources

# What are area and Mobile Sources?

| On-Road Mobile Sources  | Area Sources   | Area Sources (cont'd)   |
|---|--|---|
| <b>Cars</b><br><b>Buses</b><br><b>Trucks</b>  | <b>Agricultural Field Burning</b><br><b>Agricultural Pesticide Use</b><br><b>Agricultural Production - Animal Waste</b><br><b>Agricultural Production - Fertilizer Application</b>   | <b>Human Perspiration</b><br><b>Industrial Processes: Construction</b><br><b>Industrial Surface Coating</b><br><b>Mineral Processes: SIC 32</b><br><b>Paved Roads</b>   |
| <b>Non-Road Mobile Sources</b>  | <b>Agriculture Production - Crops, Tilling</b>   | <b>Petroleum Bulk Stations/Terminals: Breathing</b>   |
| <b>Lawn &amp; Garden Equipment</b><br><b>Off Road Vehicles (e.g., ATVs)</b><br><b>Snowmobiles</b><br><b>Boats</b><br><b>Planes</b><br><b>Trains</b><br><b>Construction Equipment</b><br><b>Farm Equipment</b> | <b>Animal Cremation</b><br><b>Asphalt Paving</b><br><b>Auto body Refinishing</b><br><b>Commercial and Consumer Products Usage</b><br><b>Commercial Cooking</b><br><b>Domestic Animals - Waste Emissions</b><br><b>Dry Cleaners</b><br><b>Fluorescent Lamp Breakage</b><br><b>Fluorescent Lamp Recycling</b><br><b>Gasoline Service Stations</b><br><b>Gasoline Trucks in Transit</b><br><b>Grain Elevators</b><br><b>Graphic Arts</b><br><b>Hospital Sterilization</b><br><b>Human Cremation</b> | <b>Refrigeration</b><br><b>Residential Fossil Fuel Combustion</b><br><b>Residential Wood Burning</b><br><b>Solvent Cleaning</b><br><b>Stationary Fuel Combustion, Commercial/Institutional</b><br><b>Stationary Source Fuel Combustion, Industrial</b><br><b>Structure Fires</b><br><b>Surface Coatings - Architectural</b><br><b>Swimming Pools</b><br><b>Tank/Drum Cleaning</b><br><b>Traffic Markings</b><br><b>Unpaved Roads</b><br><b>Waste Disposal, Open Burning</b><br><b>Waste Incineration</b><br><b>Wild Animals - Waste Emissions</b> |



# VOC Emissions Inventory, tons per year

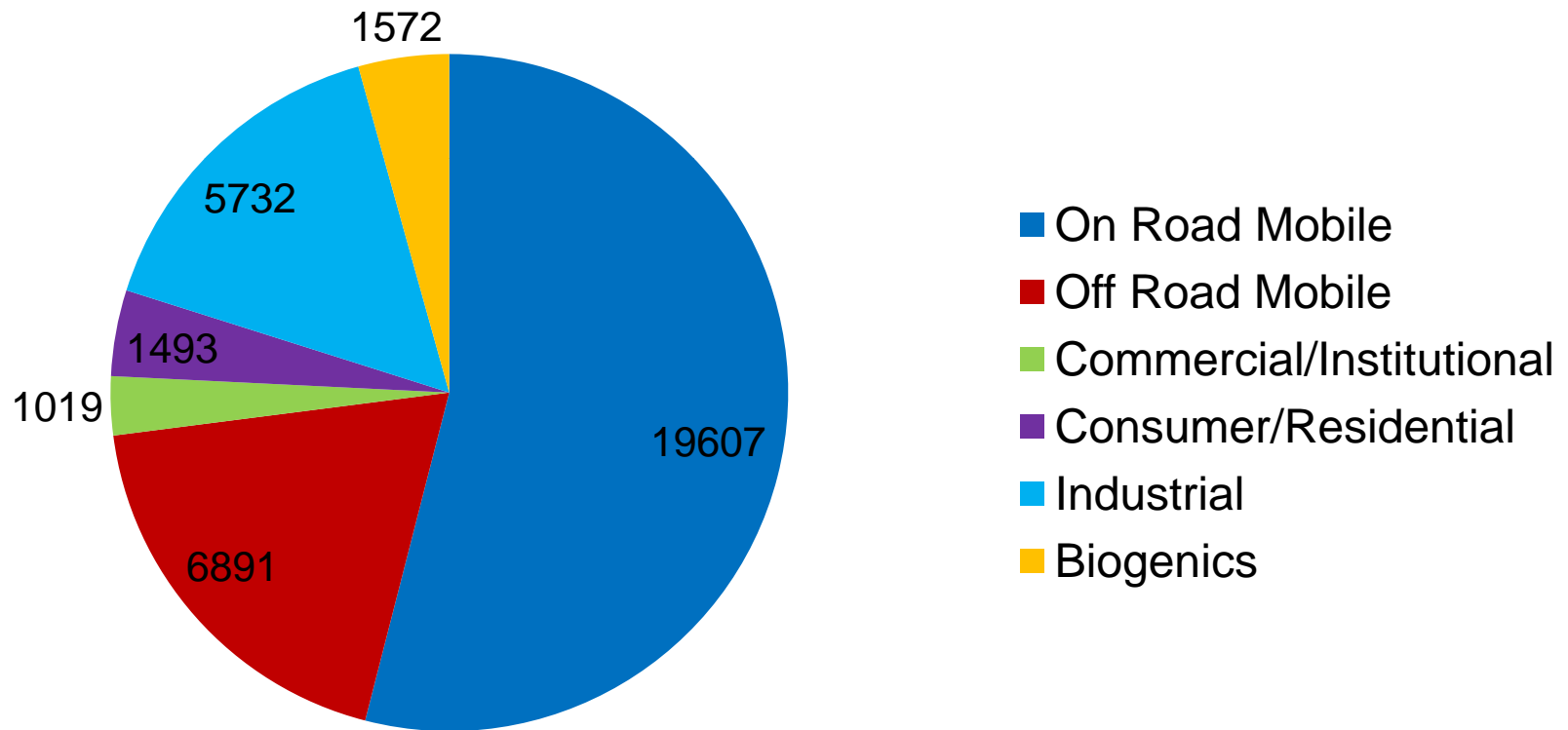
|                       | Area  | Mobile | Point | TOTAL |
|-----------------------|-------|--------|-------|-------|
| 1977                  | 15000 | 35000  | 23000 | 73000 |
| 1999 NEI              | 27000 | 27000  | 2000  | 56000 |
| Current<br>(2008 NEI) | 16000 | 19000  | 1700  | 37000 |

# NO<sub>x</sub> Emissions Inventory, tons per year

|                       | Area | Mobile | Point | TOTAL |
|-----------------------|------|--------|-------|-------|
| 1977                  |      |        | 18000 |       |
| 1999 NEI              | 3000 | 40000  | 8000  | 51000 |
| Current<br>(2008 NEI) | 3000 | 36000  | 5000  | 44000 |

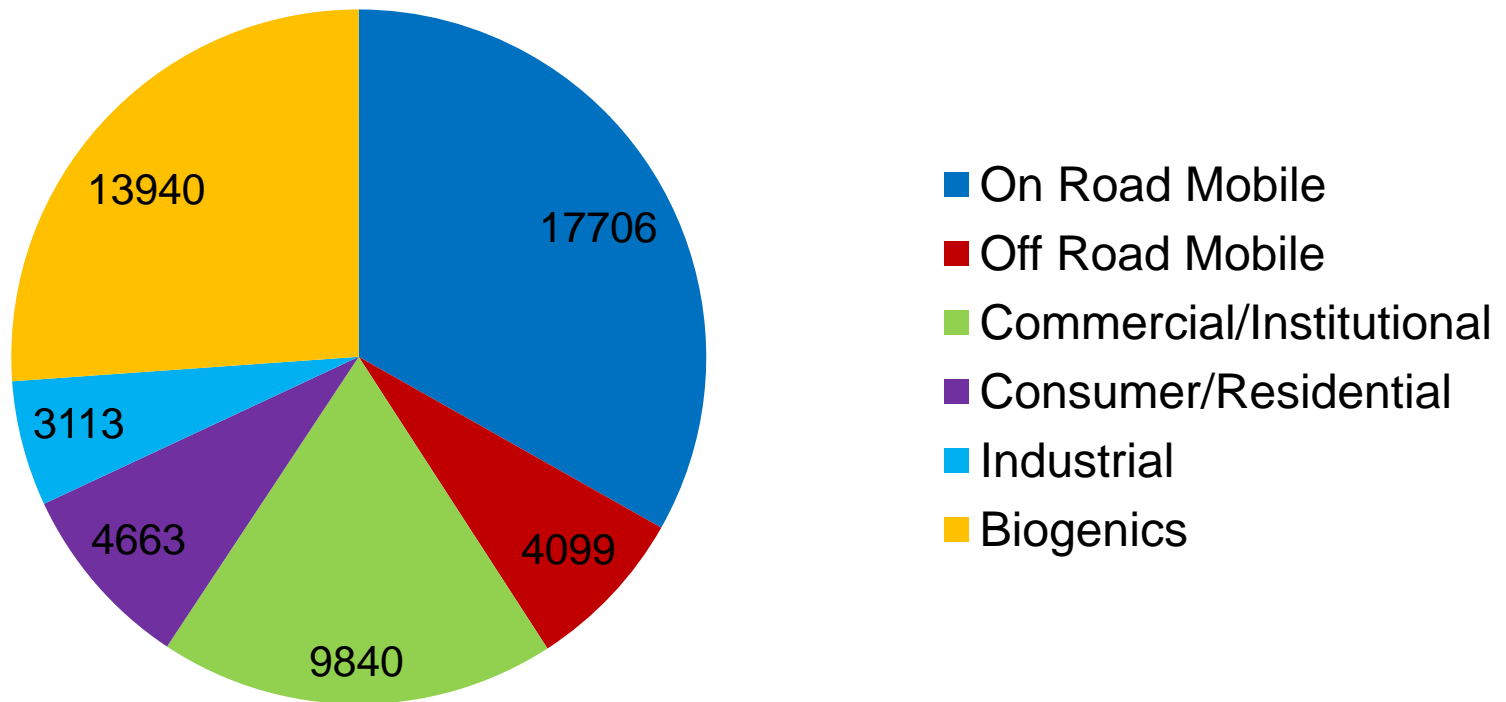
# 2008 Annual Inventory

## NO<sub>x</sub>



# 2008 Annual Inventory

## VOC



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# Ozone Advance Program

- Ozone Advance is a collaborative effort by EPA, states, tribes, and local communities to encourage emission reductions in ozone attainment areas, to help them continue to meet the National Ambient Air Quality Standard (NAAQS).
- Program Goals:
  - Help attainment areas take action in order to keep ozone levels below the level of the standard to ensure continued health protection,
  - Better position areas to remain in attainment,
  - Efficiently direct available resources toward actions to address ozone problems quickly.

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# Our Goal

- Specifically identify ozone precursor emissions
- By emissions category (point, area, mobile) identify potential emissions reduction measures
- Analyze potential emissions reductions and make recommendations for appropriate implementation

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# Process Going Forward

- Prepare a detailed emissions inventory
- Form four subgroups to begin the identification of emission reduction possibilities
  - National Measures,
  - Point Sources,
  - Area Sources, and
  - Mobile Sources

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# National Measures

- NOx/SO<sub>2</sub> Reductions from EGUs
  - CAIR/CSAPR or Replacement/Legislation
  - MATS
  - 110 (a)(2)(D) SIPs
- Tier 3 Vehicle Rule
- Low-sulfur Gasoline



# Control Options—Point Sources

- VOC Reasonably Available Control Technology (RACT) extend applicability to all counties and smaller sources:
- NOx Reasonably Available Control Technology (RACT) extend applicability to all counties and smaller combustion sources

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# Control Options—Area Sources

- Consumer Products
- Architectural and Industrial Maintenance Coatings
- Gas Can Replacement Program
- Auto Body Refinishing
- Graphic Arts
- Open Burning Awareness Campaign
- Residential Insulation
- Residential Energy Efficient appliance exchanges

# Control Options—On-Road Mobile Sources

- Cash for Clunkers (VOC/NO<sub>x</sub>)
- Clean Diesel Grants (NO<sub>x</sub>)
- Alternative Fuel Conversions (VOC)
- Reduced Fare Program with RTA during APAs (VOC/NO<sub>x</sub>)
- New I/M Program (VOC/NO<sub>x</sub>)
- National Measures (VOC/NO<sub>x</sub>)

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# Control Options—Non-Road Mobile Sources

- Clean Diesel Grants (NO<sub>x</sub>)
- Lawnmower Exchange Program (VOC)
- Alternative Fuel Conversions (VOC)
- National Measures (NO<sub>x</sub>)

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# Next Step

- Control Options Identification will Continue
- Public Awareness Remains an Ongoing Objective
- We will Hold Another Public Meeting in December to Inform Regarding Options and Solicit Feedback/Comments
- Our Plan will be Prepared

# Questions?

