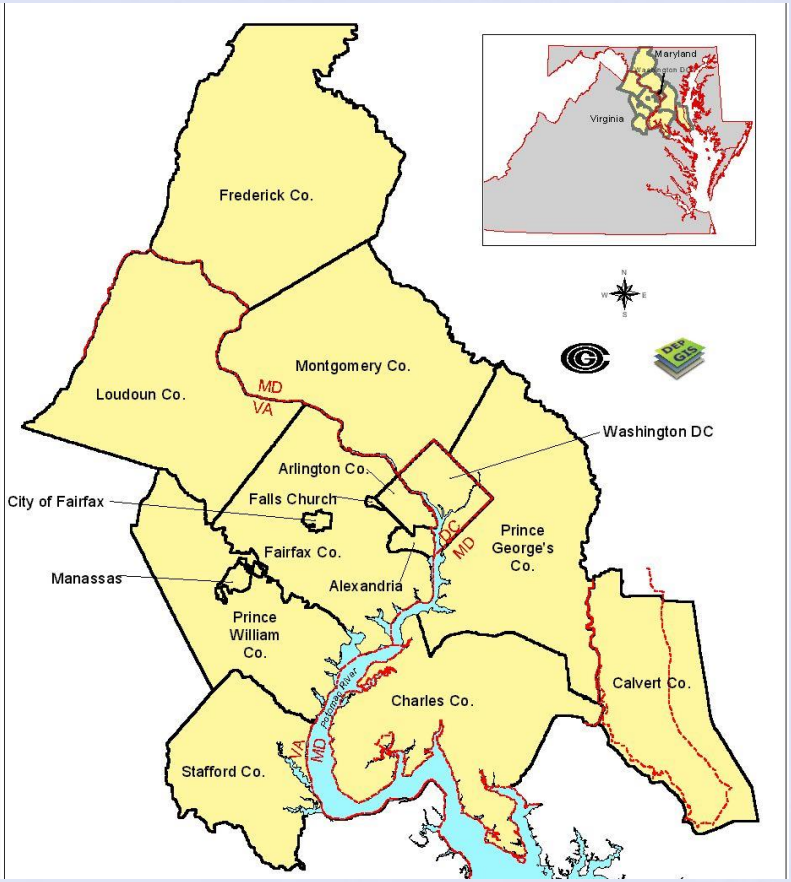
Metropolitan Washington, DC-MD-VA
Air Quality Status 2014

Clean Air Act Amendments 1990

- Regulates emission of air pollutants from human sources into the atmosphere
- CAAA classifies areas that do not meet the federal health standard as nonattainment areas, establishes process for reducing pollution to meet standards
- In 1991 Washington region was designated a “serious” ozone nonattainment area; 2003 reclassified as “severe” for 1-hr standard; 2004 reclassified as “moderate” for 8-hr standard (84 ppb); 2012 reclassified as “marginal” for current 8-hr standard (75 ppb)

MWAQC Created, 1992

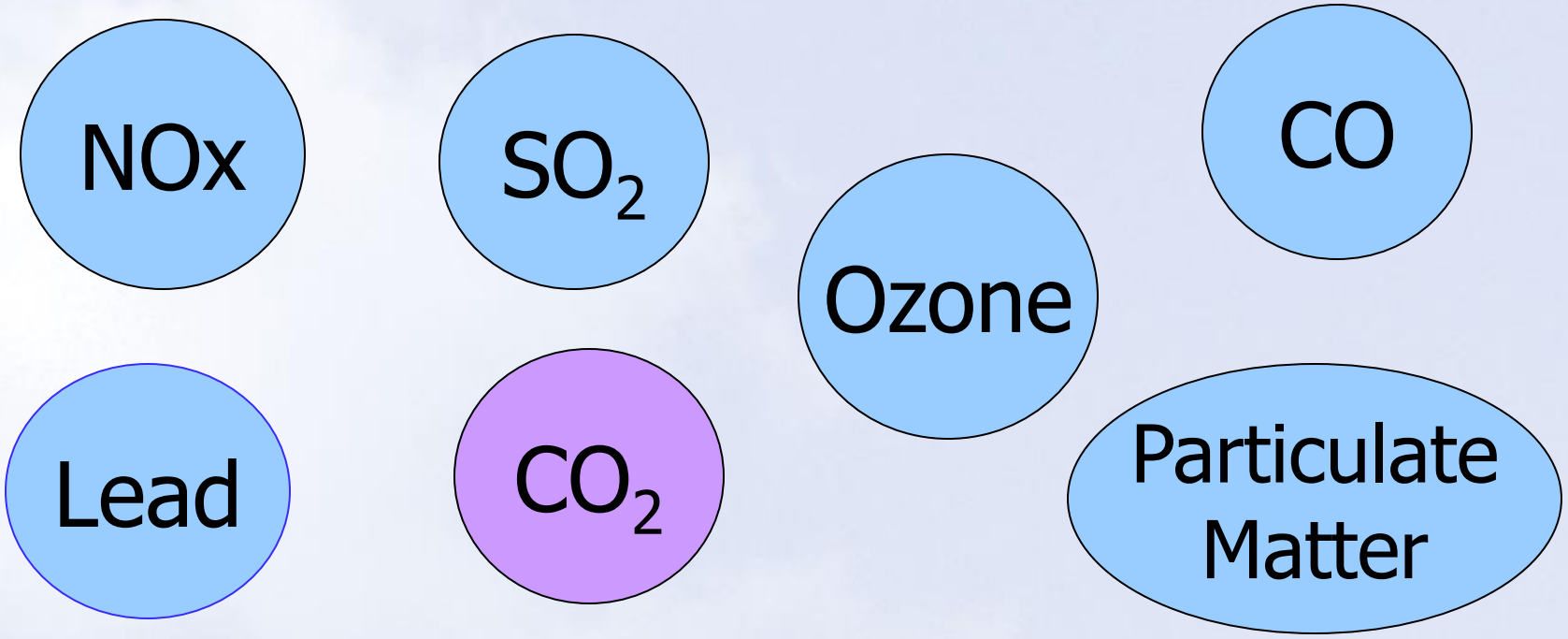
The Metropolitan Washington Air Quality Committee conducts air quality planning for the Washington nonattainment region.



MWAQC's Role

- Develop attainment plan (SIP) for Metropolitan Washington, DC-VA-MD region
- Propose control measures to reach attainment of NAAQS
- Reviews Transportation Improvement Program for conformity with State Implementation Plan (SIP)

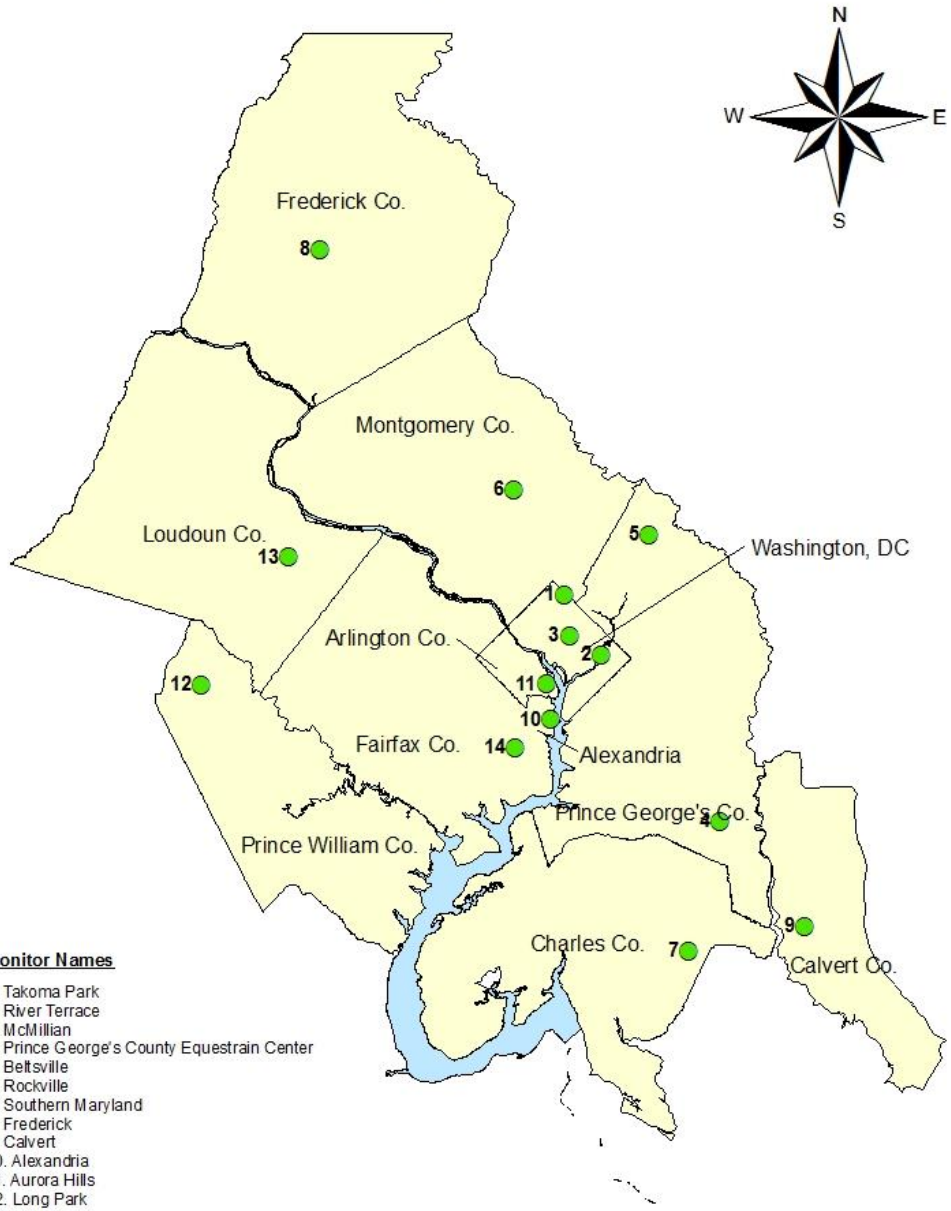
EPA set federal health standards for ambient pollutants



Clean Air Act Amendments 1990

Metropolitan Washington Ozone Monitors

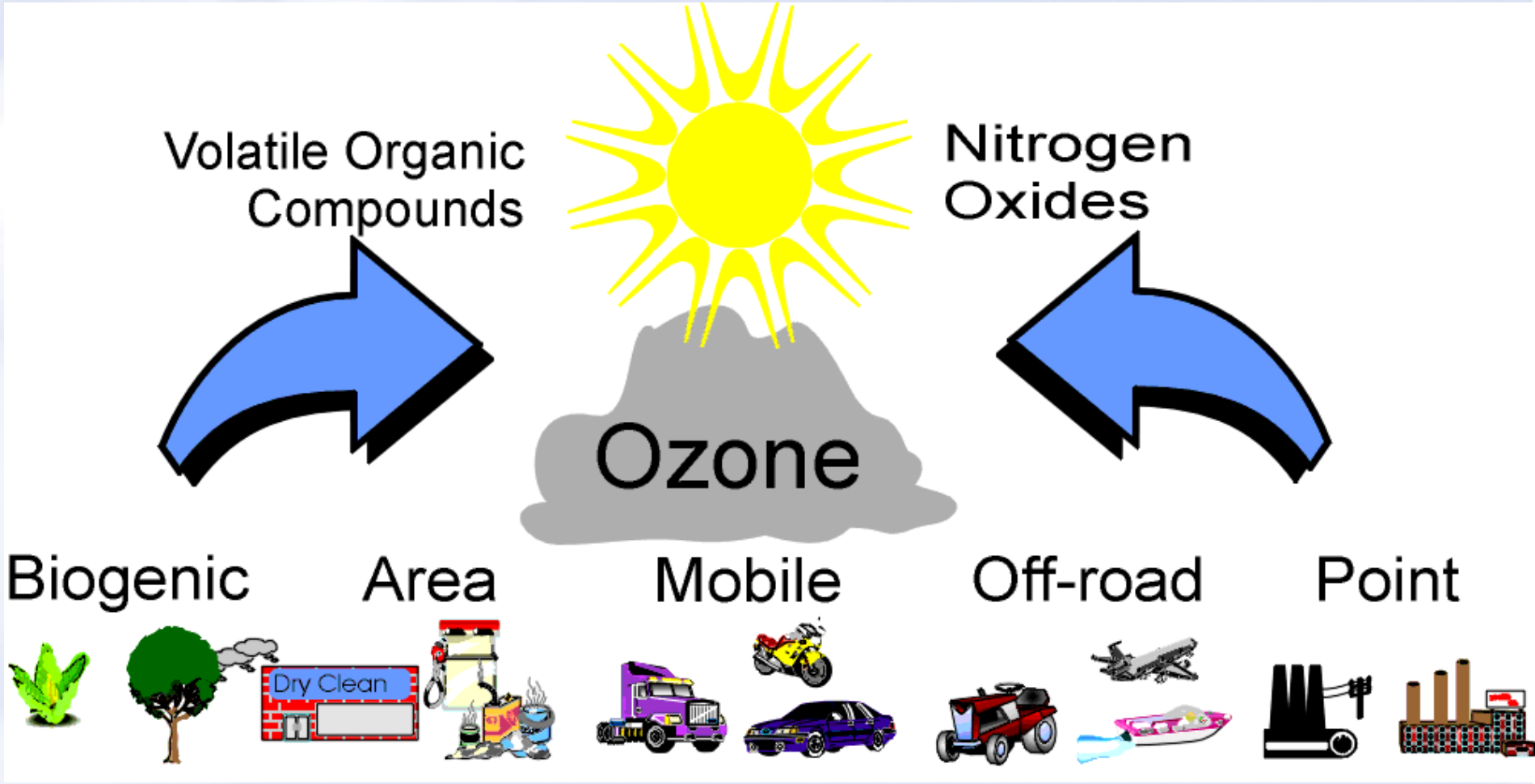
Washington, DC, MD, VA



Monitor Names

1. Takoma Park
2. River Terrace
3. McMillian
4. Prince George's County Equestrain Center
5. Beltsville
6. Rockville
7. Southern Maryland
8. Frederick
9. Calvert
10. Alexandria
11. Aurora Hills
12. Long Park
13. Ashburn
14. Franconia

How is Ground-Level Ozone Formed?



2013 Ozone Season Summary

Peak 8-Hour Ozone Concentrations (ppb)

April

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	1	2	3	4	5	6
	52	53	52	53	60	53
7	8	9	10	11	12	13
61	62	61	64	68	36	54
14	15	16	17	18	19	20
56	50	54	50	46	38	50
21	22	23	24	25	26	27
54	49	44	56	56	63	70
28	29	30				
71	52	49				

May

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
			1	2	3	4
			59	46	51	50
5	6	7	8	9	10	11
58	36	36	48	46	60	47
12	13	14	15	16	17	18
48	49	55	72	62	71	51
19	20	21	22	23	24	25
37	42	53	60	44	34	44
26	27	28	29	30	31	
50	53	57	67	74	61	

June

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
						1
						57
2	3	4	5	6	7	8
40	48	62	76	49	30	58
9	10	11	12	13	14	15
56	32	52	69	50	50	58
16	17	18	19	20	21	22
53	64	40	47	57	75	53
23	24	25	26	27	28	29
40	64	67	70	44	48	62
30						
42						

July

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	1	2	3	4	5	6
	36	30	31	22	30	37
7	8	9	10	11	12	13
33	55	47	48	59	35	47
14	15	16	17	18	19	20
28	58	69	76	77	77	54
21	22	23	24	25	26	27
62	54	53	53	51	61	48
28	29	30	31			
45	56	62	52			

August

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1	2	3
				37	59	44
4	5	6	7	8	9	10
39	48	37	47	42	44	53
11	12	13	14	15	16	17
55	63	50	36	55	66	69
18	19	20	21	22	23	24
47	37	63	54	58	32	51
25	26	27	28	29	30	31
59	61	72	35	65	67	57

September

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1	2	3	4	5	6	7
59	56	56	63	62	50	60
8	9	10	11	12	13	14
66	45	72	72	58	40	32
15	16	17	18	19	20	21
47	42	37	50	52	56	47
22	23	24	25	26	27	28
33	35	40	41	52	42	37
29	30					
40	46					

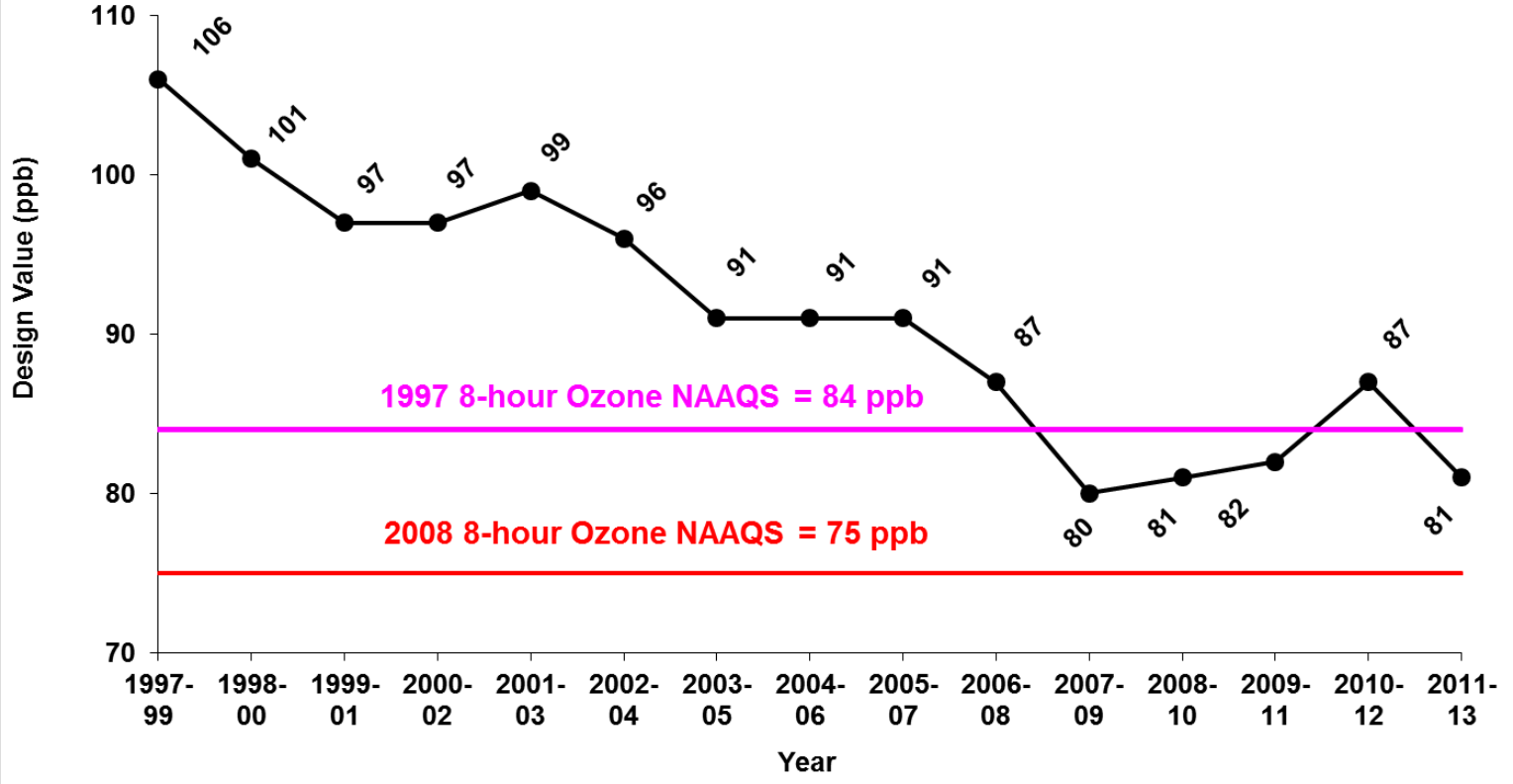
During April 1-September 30, there were:

4 Code Orange Days, 43 Code Yellow Days, 136 Code Green Days

Washington Region's Ozone Plan
(1997 Ozone Standard, 84 ppb)

- Ozone plan (SIP) was submitted to EPA 2007
- Contained Federal, State and local control measures to reduce ozone pollution
- Demonstrated region will attain health standard in 2009
- EPA issued Clean Data Determination 2011
- 2008 Ozone Standard, 75 ppb - No SIP, but a base year inventory (2011) required by July 2014

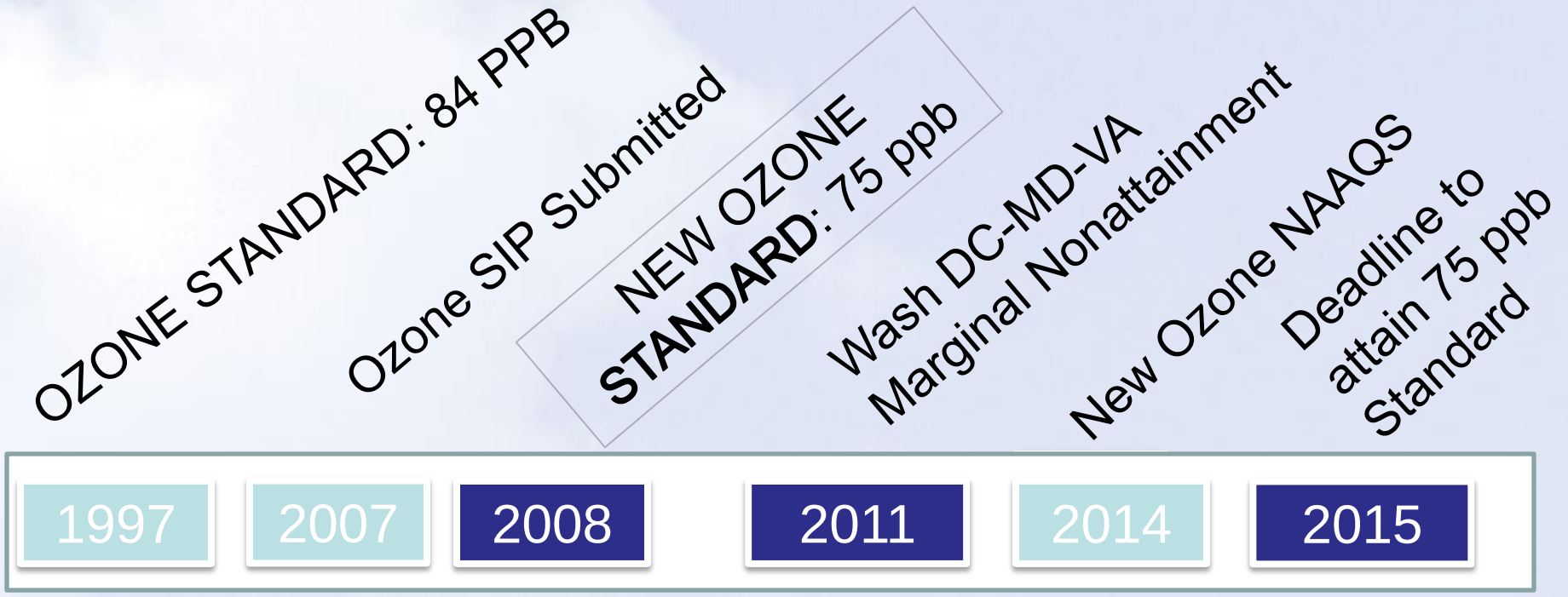
8-hour Ozone Design Value
Washington, DC-MD-VA Ozone Nonattainment Area
(1999-2013)



* Design value = 3-year average of 4th highest daily maximum 8-hour average ozone concentrations.

* 2013 data is preliminary and may change.

Current Ozone Standard : 75 ppb



New Ozone Standard: Nonattainment Classifications

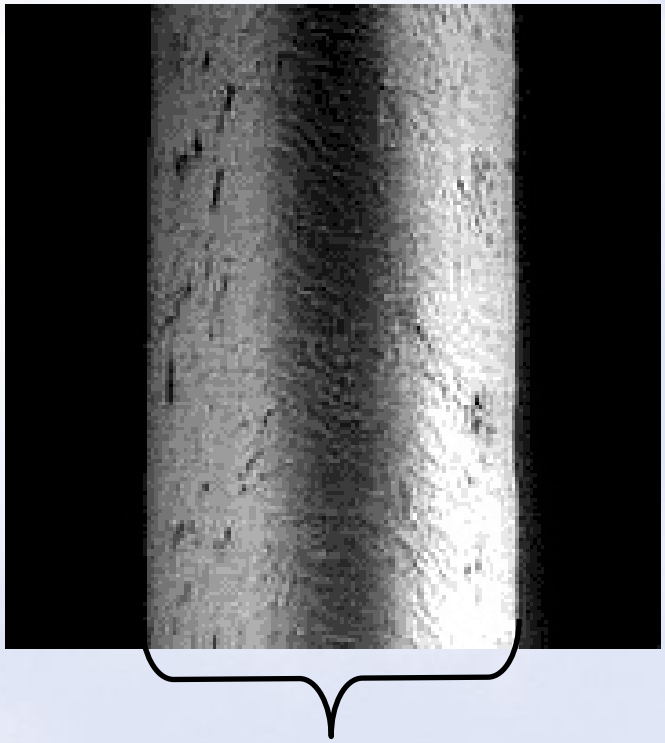
- Marginal 76 – 86 ppb
- Moderate 86 – 100 ppb
- Serious 100 – 113 ppb
- Severe 113 – 175 ppb
- Extreme 175 and up ppb

Air Pollution: Fine Particles

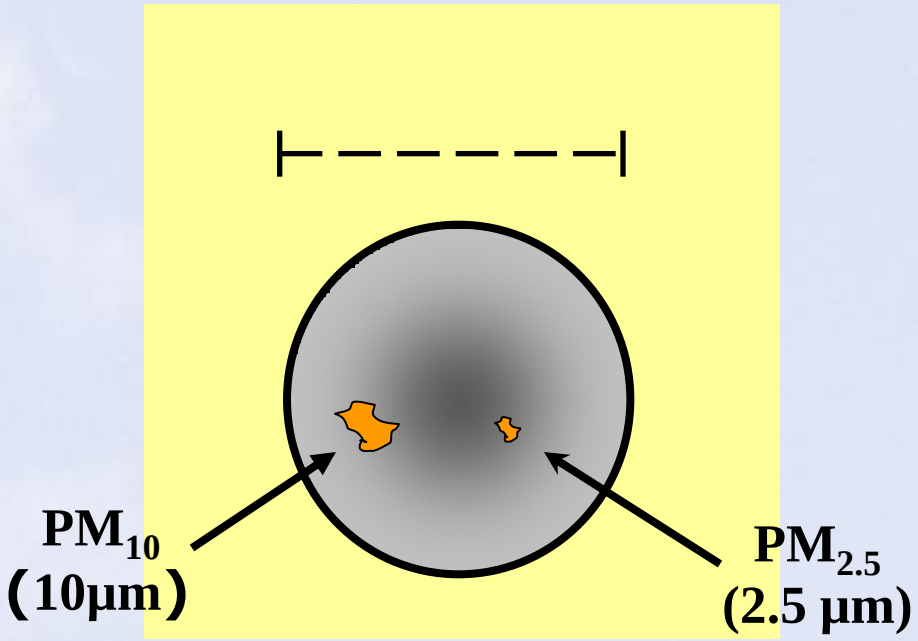
- Chemical, particulate matter or aerosol that modifies the natural characteristics of the atmosphere
- Created locally by emissions from coal combustion, cars & trucks, road construction
- Causes respiratory problems
- Impairs visibility

How Fine is Fine?

Particles are only a fraction of the size of a human hair



Human Hair (70 µm diameter)



Hair cross section (70 µm)

Health Effects of Particle Pollution

Respiratory System Effects

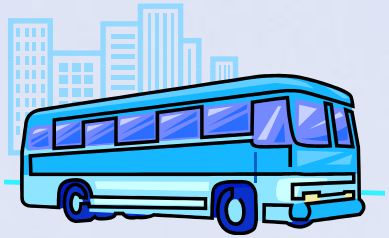
- Chronic bronchitis
- Asthma attacks
- Respiratory symptoms (cough, wheezing, etc.)
- Decreased lung function
- Airway inflammation

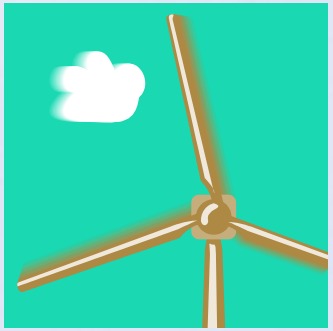
Cardiovascular System Effects

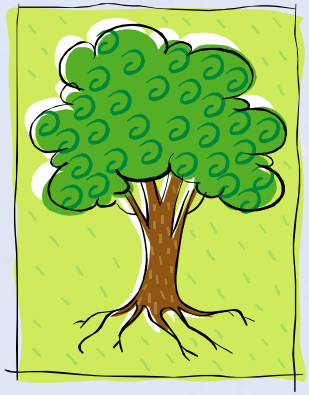
- Heart attack
- Cardiac arrhythmia
- Changes in heart rate and heart rate variability
- Premature death

Plan to Reduce Fine Particles

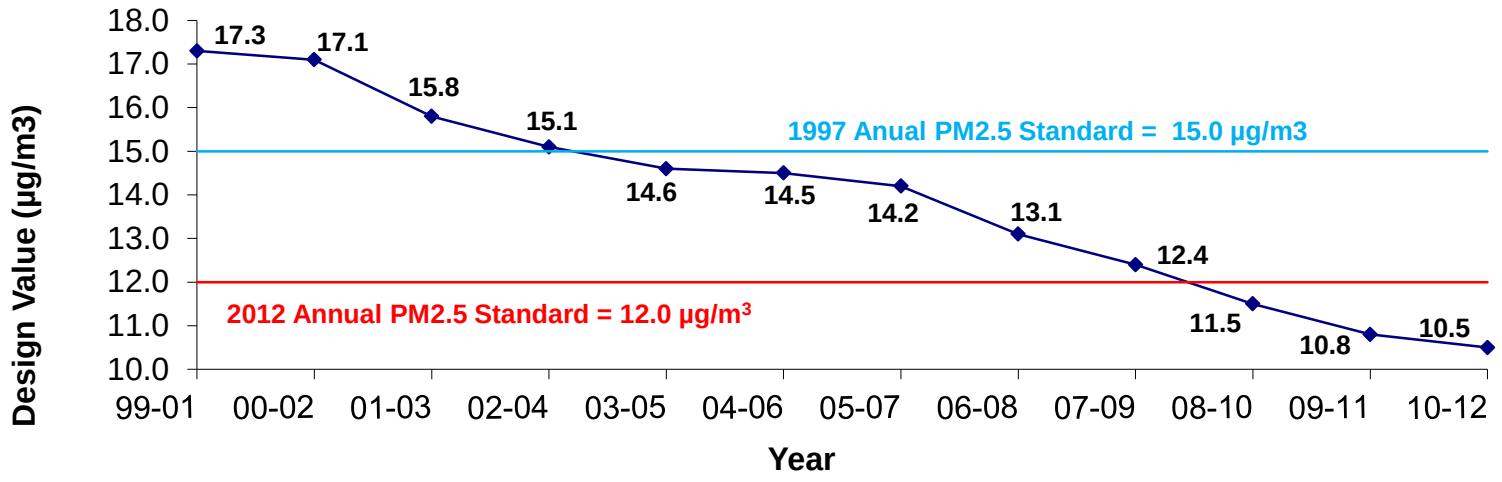
- **Point Source**
  - NOX SIP Call
  - Clean Air Interstate Rule (CAIR) - VA & DC
  - Maryland Healthy Air Act - MD
  - Utility Reductions (Possum Point Fuel Conversion) -VA
- **Area Source**
  - National Locomotives Rule
- **Nonroad Source**
  - 2004 Nonroad Heavy Duty Diesel Rule
- **Onroad Source**
  - Heavy-Duty Diesel Engine Rule
  - Tier 2 Motor Vehicle Emission Standards
  - Vehicle Inspection Program
- Supplemental Measures:
  - Telecommuting Initiative,
  - Tree Canopy Programs
  - Wind Energy Purchases,
  - Energy Efficiency in buildings,
  - LED Traffic Signal Retrofits,
  - Renewable Portfolio Standards





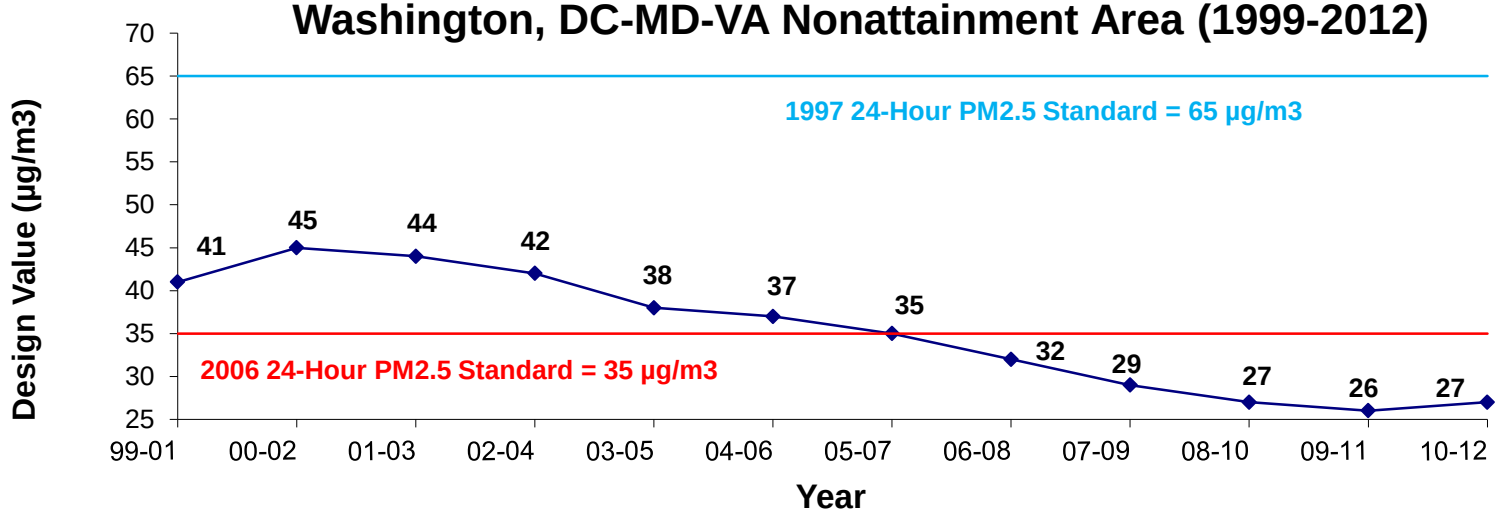


Annual PM2.5 Design Value
Washington, DC-MD-VA Nonattainment Area (1999-2012)



* Design value = 3-year avg of annual mean PM2.5 concentrations.

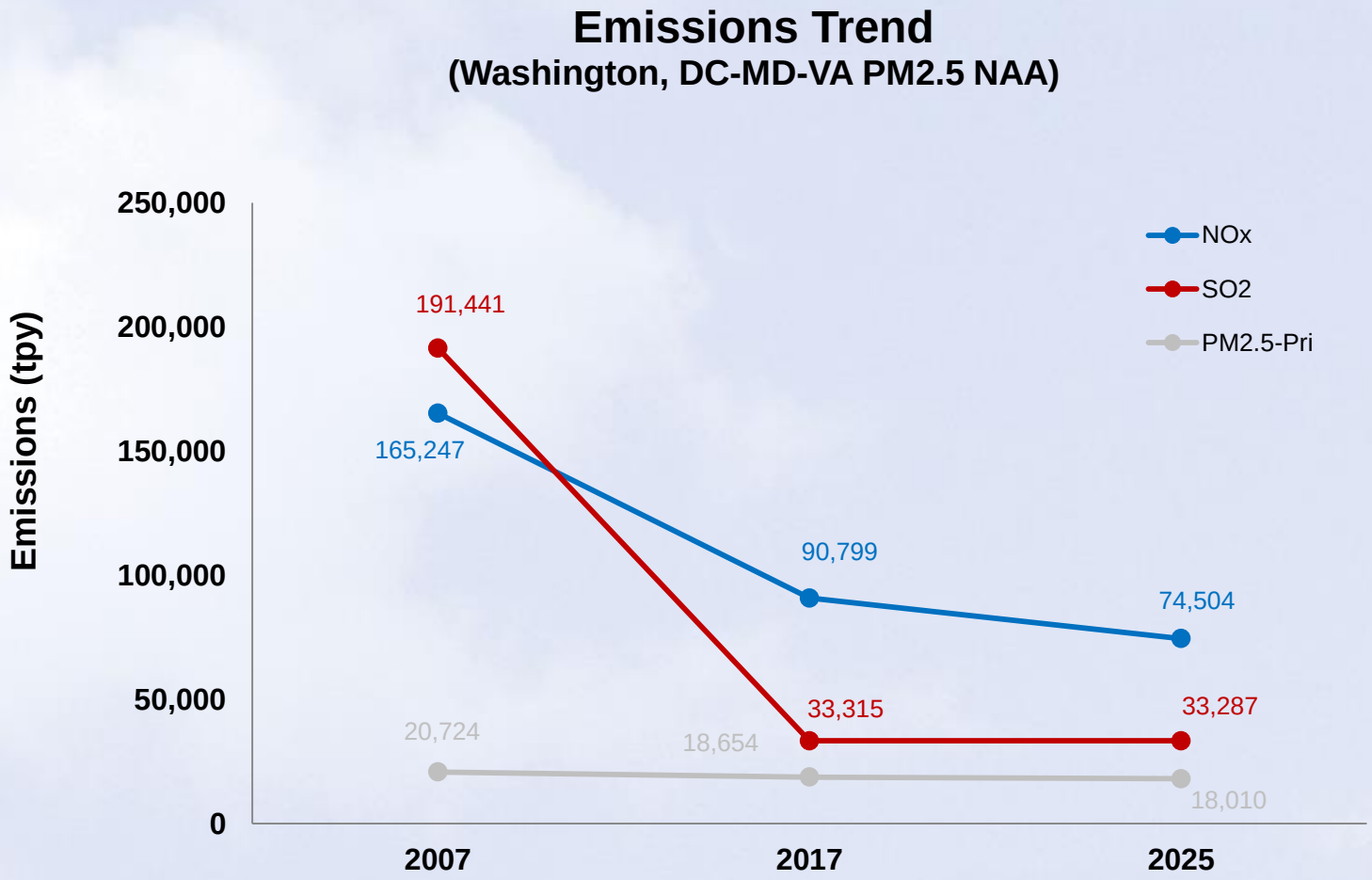
24-Hour PM2.5 Design Value
Washington, DC-MD-VA Nonattainment Area (1999-2012)



* Design value = 3-year average of 98th percentile of PM2.5 concentrations.

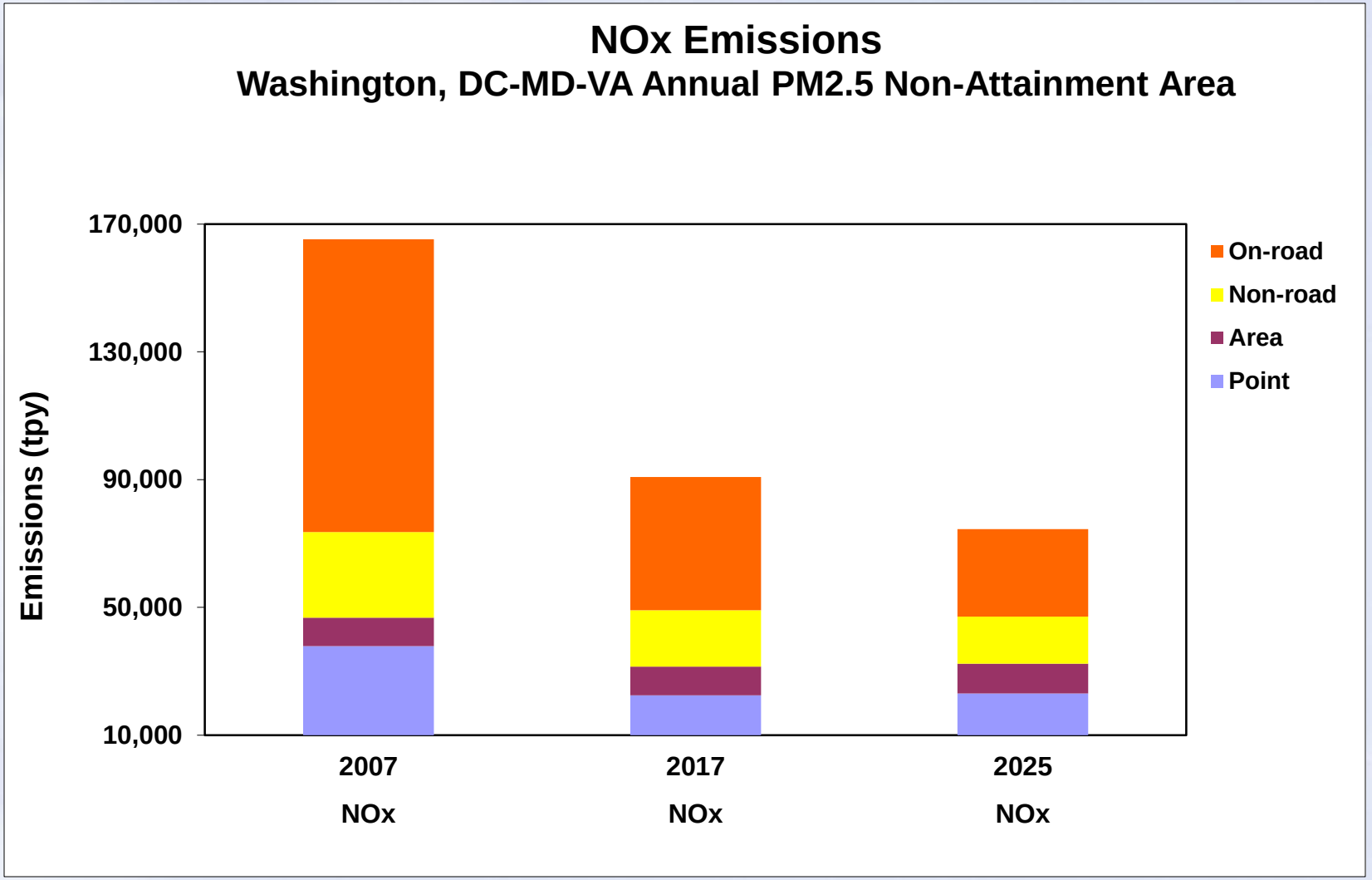
$PM_{2.5}$ SIP Planning
SIP submitted to EPA, 2008

Emissions Trends (NOx , SO2, PM2.5) 2007-2025



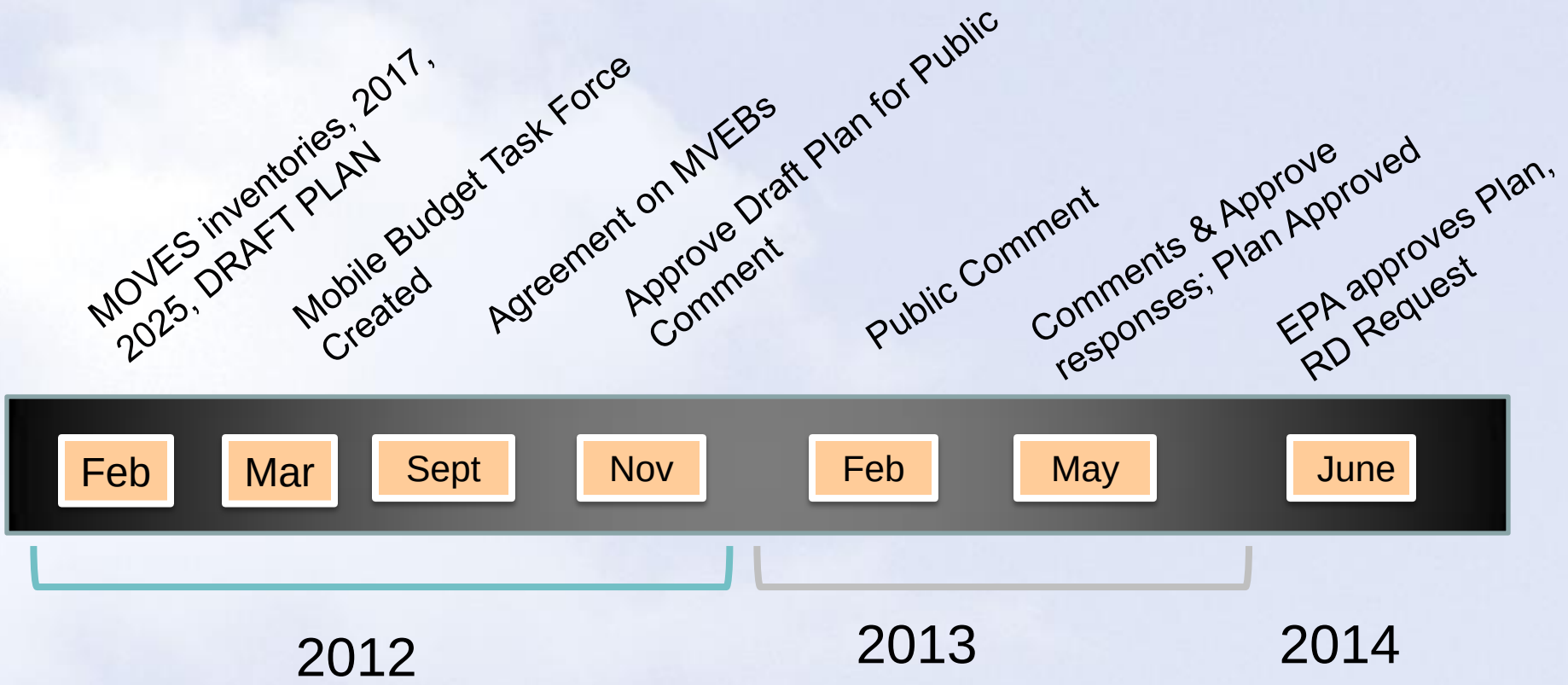
Source: PM2.5 Redesignation Request & Maintenance Plan

Maintenance Plan: NOx Emissions

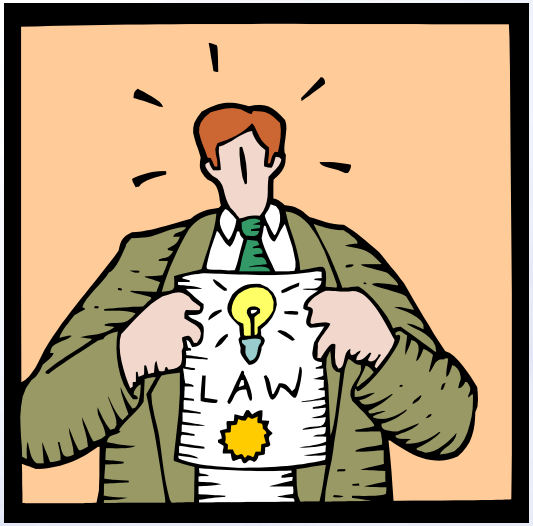


Redesignation Request & Maintenance Plan Timeframe

SCHEDULE TO REDESIGNATION



Transportation Conformity



Clean Air Act of 1977 included a provision requiring transportation investments to be consistent with (conform to) regional air quality plans.

What is Transportation Conformity?

Conformity ensures that Federal funding and approval are given to transportation activities that are consistent with air quality goals.

Ensures that these transportation activities do not worsen air quality or interfere with the "purpose" of the SIP

Regional Air Quality Challenges

- Ozone Attainment 2015
  - Will require significant NOx reductions
  - New Ozone standard likely to be proposed in 2014
- Tier 3 Rule (Tougher vehicle emission standards, Low sulfur gasoline)
- Mercury & Air Toxics
- Near-road monitoring for NO_2, $PM_{2.5}$

Sources for Air Quality Forecasts and Data

- **Current Air Quality Data & Forecasts**
  - http://www.mwcog.org/environment/air/forecast/
  - http://www.cleanairpartners.net/
- **Historical Air Quality Data**
  - http://mwcog.sonomatechdata.com/
  - http://www.cleanairpartners.net/
- **Sign Up for Air Alerts** (Air quality forecasts & current data)
  - http://www.cleanairpartners.net/airalert.cfm