

Metropolitan Washington, DC-MD-VA Air Quality 101

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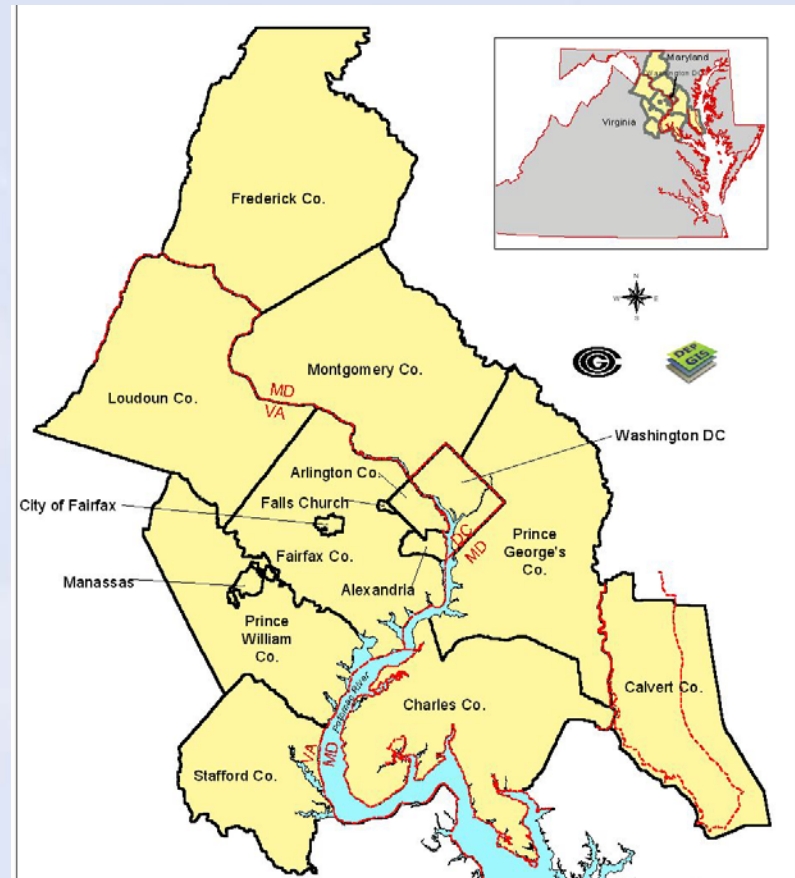
Clean Air Act Amendments

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

MWAQC Created, 1992

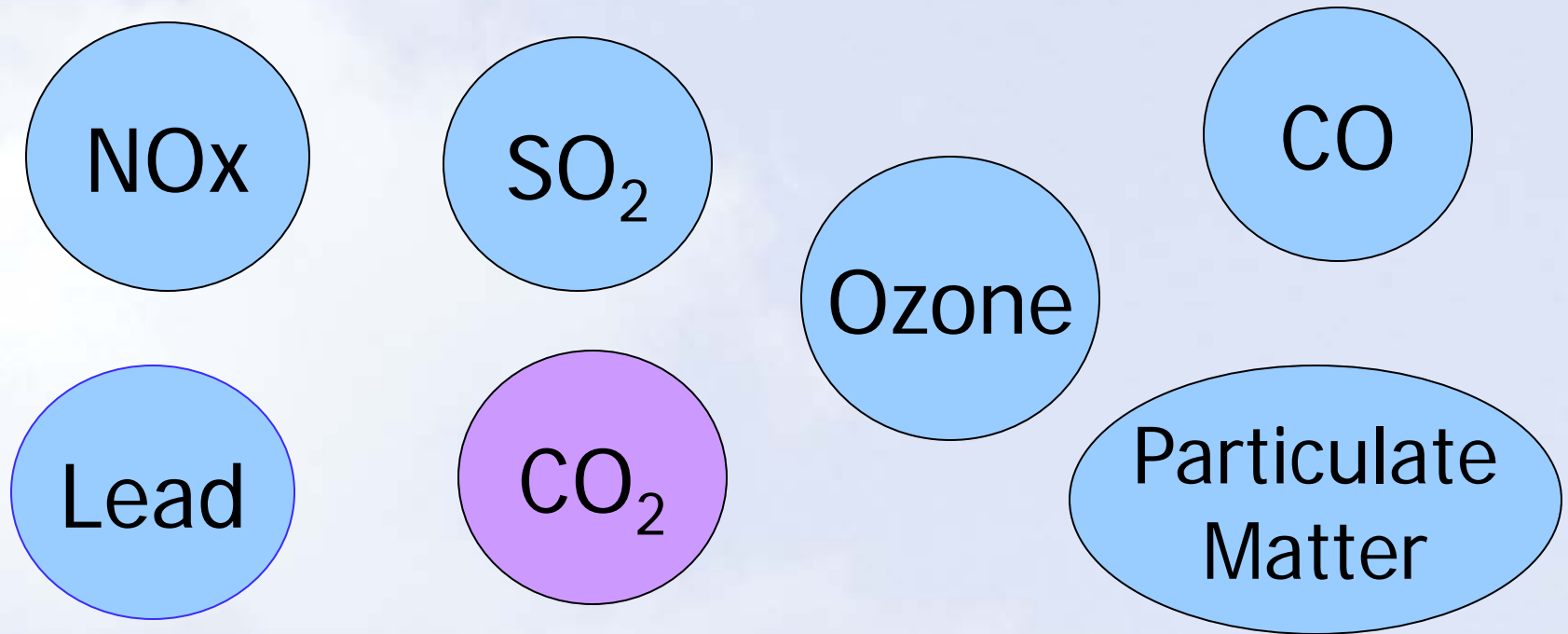
The Metropolitan Washington Air Quality Committee conducts air quality planning for the Washington nonattainment region.



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)

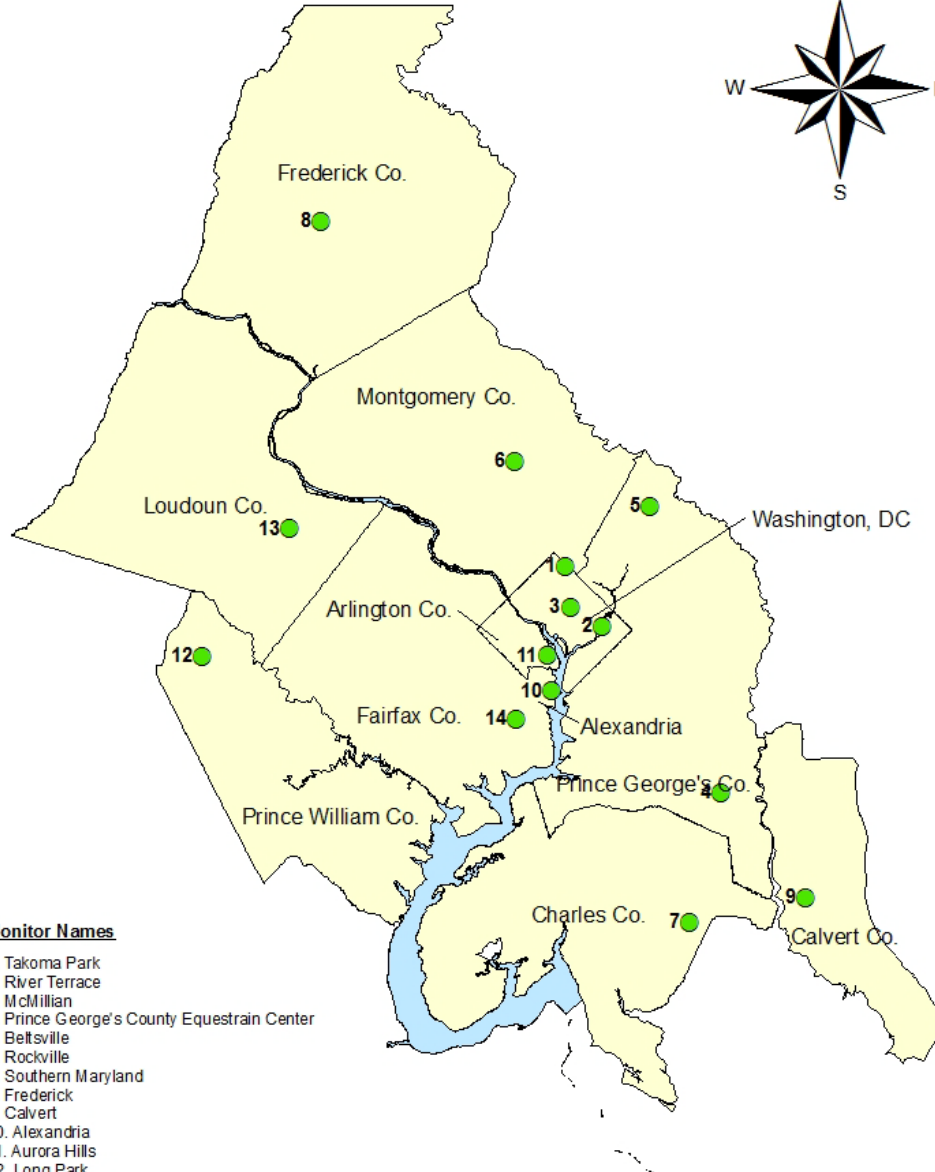
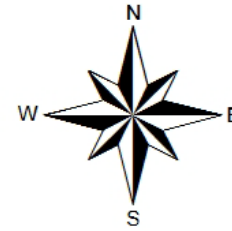
EPA set federal health standards for ambient pollutants



Clean Air Act Amendments 1990

Metropolitan Washington Ozone Monitors

Washington, DC, MD, VA

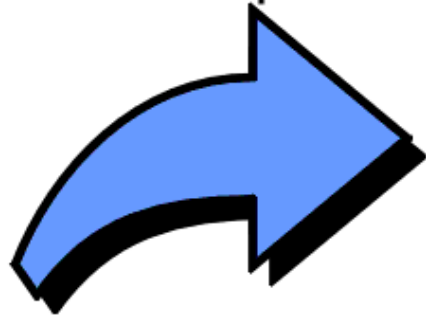


Monitor Names

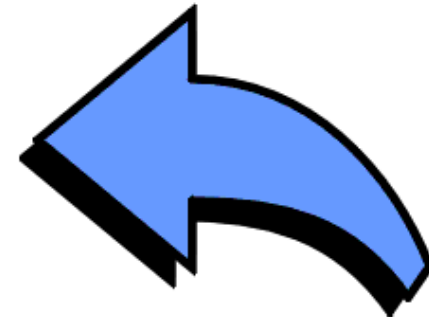
1. Takoma Park
2. River Terrace
3. McMillian
4. Prince George's County Equestrian Center
5. Beltsville
6. Rockville
7. Southern Maryland
8. Frederick
9. Calvert
10. Alexandria
11. Aurora Hills
12. Long Park
13. Ashburn
14. Franconia

How is Ground-Level Ozone Formed?

Volatile Organic
Compounds



Nitrogen
Oxides



Ozone

Biogenic



Area



Mobile



Off-road



Point





2011 Ozone Season Summary

Peak 8-Hour Ozone Concentrations (ppb)

Data based on the 8-hour standard set at 75 ppb. For the period April 15 – September 30, 2011, there were:

2 Code Red Days

19 Code Orange Days

54 Code Yellow Days

94 Code Green Days

April						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
					57	46
17	18	19	20	21	22	23
53	59	52	60	53	44	36
24	25	26	27	28	29	30
45	55	35	32	53	50	44

June						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
			1	2	3	4
			74	72	60	73
5	6	7	8	9	10	11
69	75	76	95	93	100	71
12	13	14	15	16	17	18
63	54	47	59	55	59	76
19	20	21	22	23	24	25
69	64	61	56	44	58	53
26	27	28	29	30		
51	59	76	72	69		

August						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	1	2	3	4	5	6
	87	69	49	63	60	47
7	8	9	10	11	12	13
55	66	64	61	63	76	50
14	15	16	17	18	19	20
53	55	50	64	66	71	74
21	22	23	24	25	26	27
54	48	56	60	47	68	31
28	29	30	31			
43	42	60	73			

May						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1	2	3	4	5	6	7
39	55	52	40	53	58	55
8	9	10	11	12	13	14
56	54	53	65	61	41	35
15	16	17	18	19	20	21
48	53	50	45	42	49	60
22	23	24	25	26	27	28
59	55	51	75	73	58	49
29	30	31				
46	76	96				

July						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
					1	2
					80	90
3	4	5	6	7	8	9
70	71	85	67	94	55	66
10	11	12	13	14	15	16
73	75	72	67	61	52	50
17	18	19	20	21	22	23
54	80	75	86	78	90	85
24	25	26	27	28	29	30
68	65	72	65	81	77	70
31						
67						

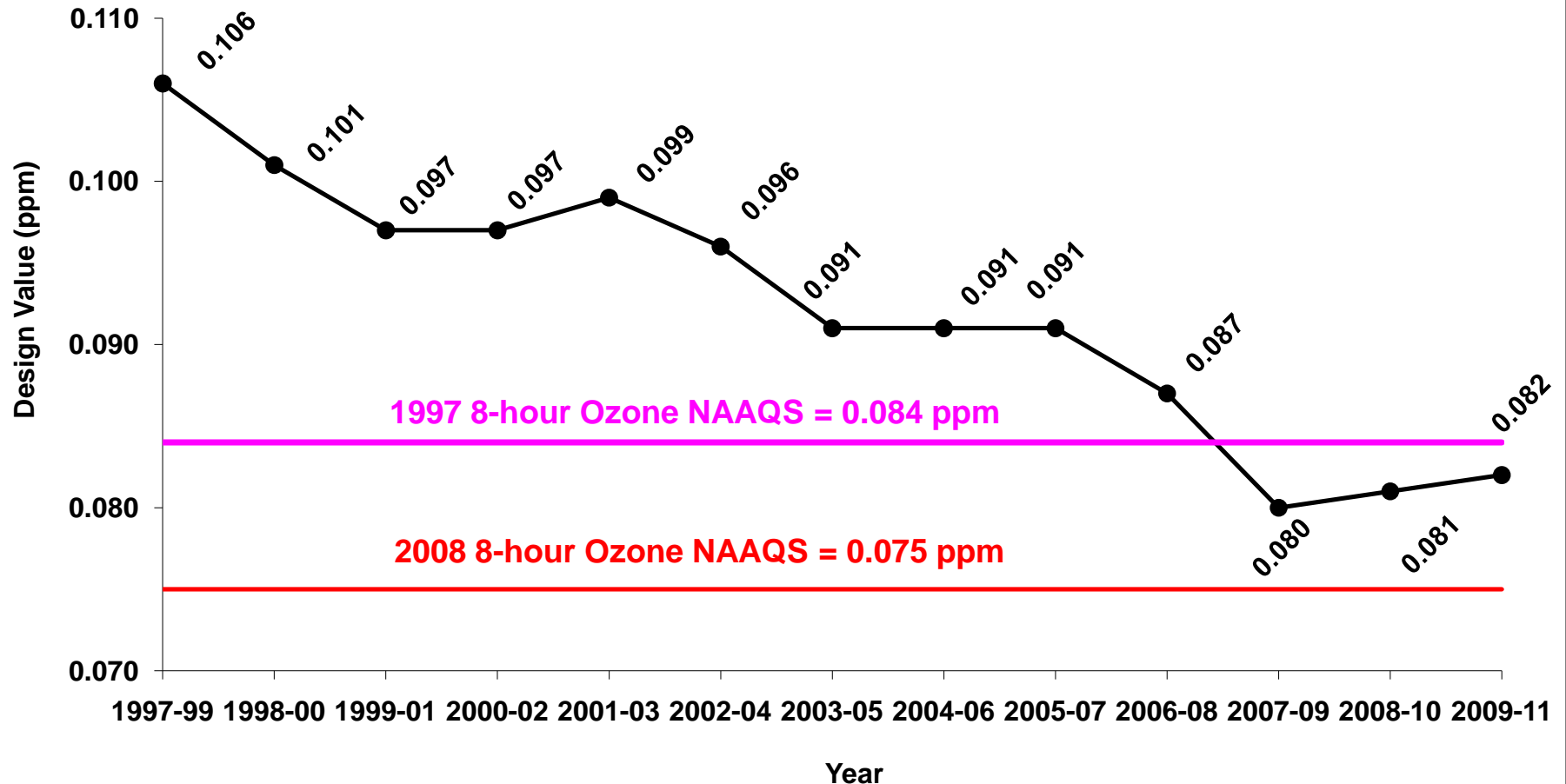
September						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1	2	3
				64	50	50
4	5	6	7	8	9	10
60	41	35	24	19	45	48
11	12	13	14	15	16	17
54	58	61	67	41	25	25
18	19	20	21	22	23	24
36	35	30	28	31	23	33
25	26	27	28	29	30	
31	32	22	41	42	41	

•Analysis is based on draft data. Data is subject to change.

Washington Region's Ozone Plan

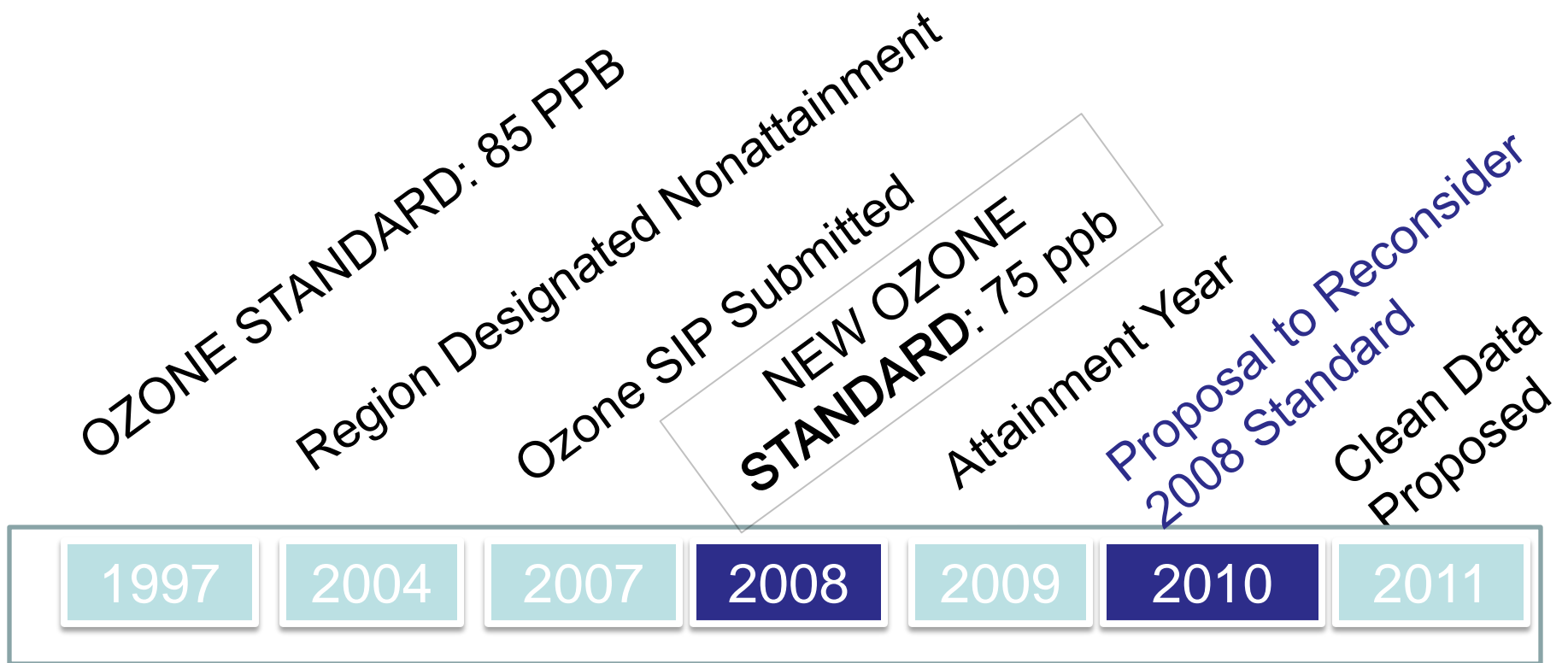
- Contains Federal, State and local control measures to reduce ozone pollution
- Demonstrates region will attain health standard by 2009
- Ozone plan (SIP) was submitted to EPA 2007
- EPA issued Clean Data Determination 2011

8-hour Ozone Design Value Washington, DC-MD-VA Nonattainment Area (1999-2011)



* Design value = 3-year average of 4th highest daily maximum 8-hour average ozone concentrations. 2011 data is draft and may change.

Current Ozone Standard : 75 ppb



New Ozone Standard: Nonattainment Classifications

- Marginal 0.076 – 0.086 ppm
- Moderate 0.086 – 0.100 ppm
- Serious 0.100 – 0.113
- Severe 0.113 – 0.175
- Extreme 0.175 and up

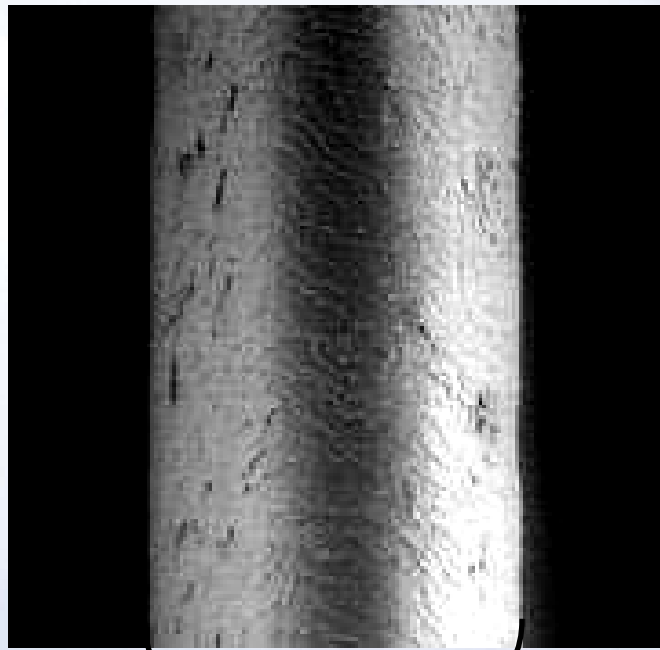
Air Pollution: Fine Particles

- 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

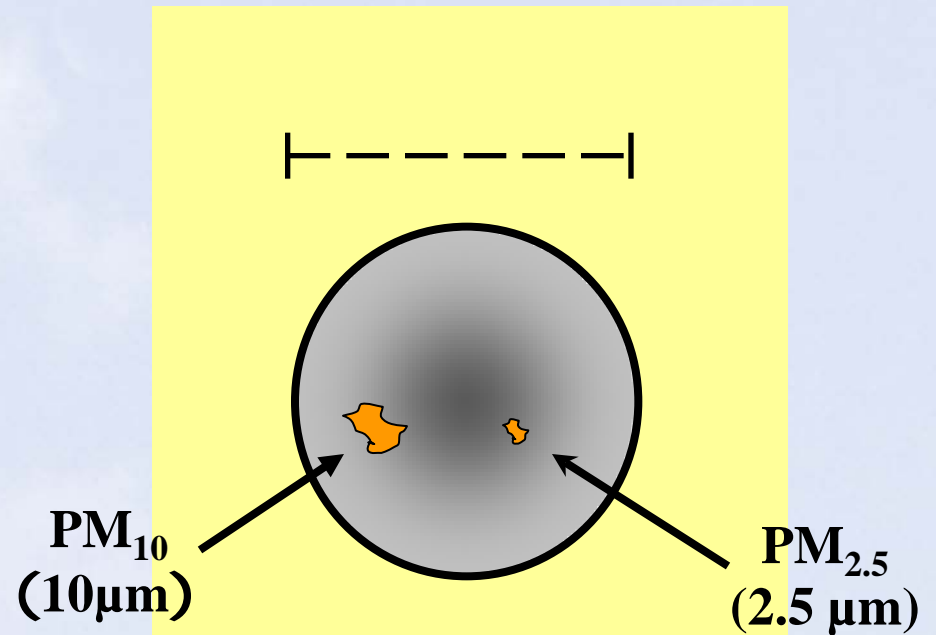


How Fine is Fine?

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

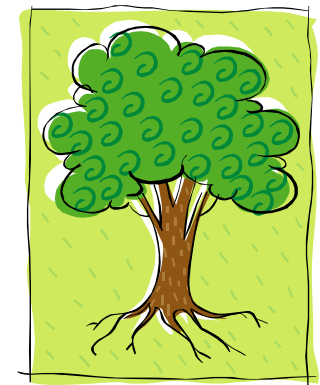
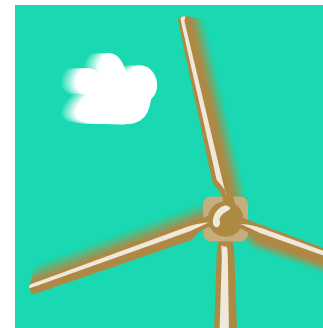
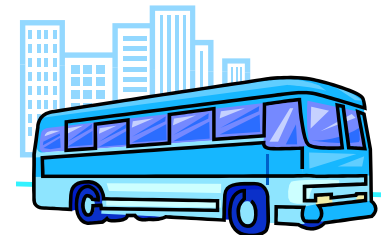
- Heart attack
- Cardiac arrhythmia
- Changes in heart rate and heart rate variability
- Premature death

Steps to Official “Attainment” Status

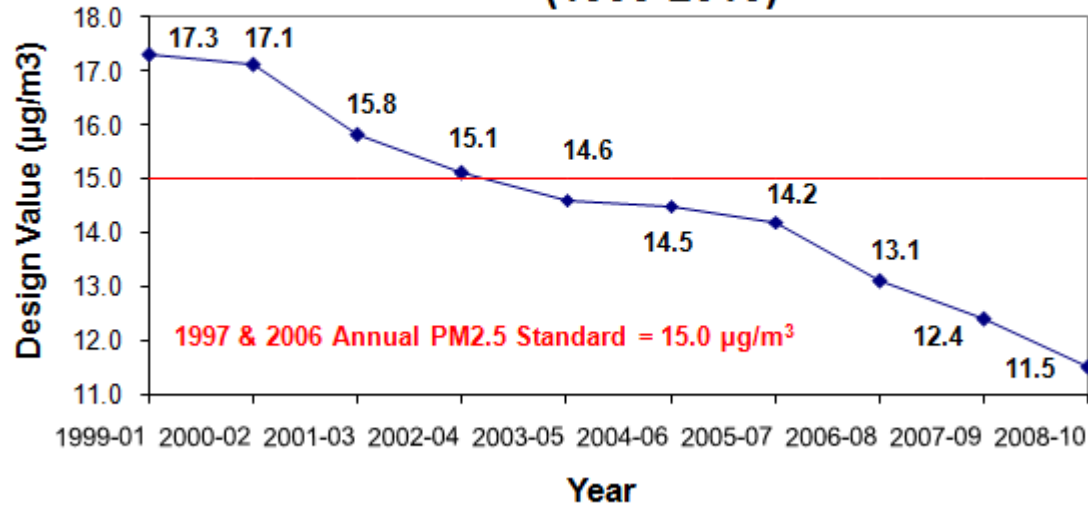
- 2005 - Air quality monitors indicate that average annual concentrations are below the national health standard
- 2008 – MWAQC, States submitted PM2.5 SIP showing attainment by 2009.
- EPA issues a “Clean Data Determination,” 2009
- States request redesignation to attainment and submit a plan to maintain low levels of fine particle pollution for 10 years into future

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

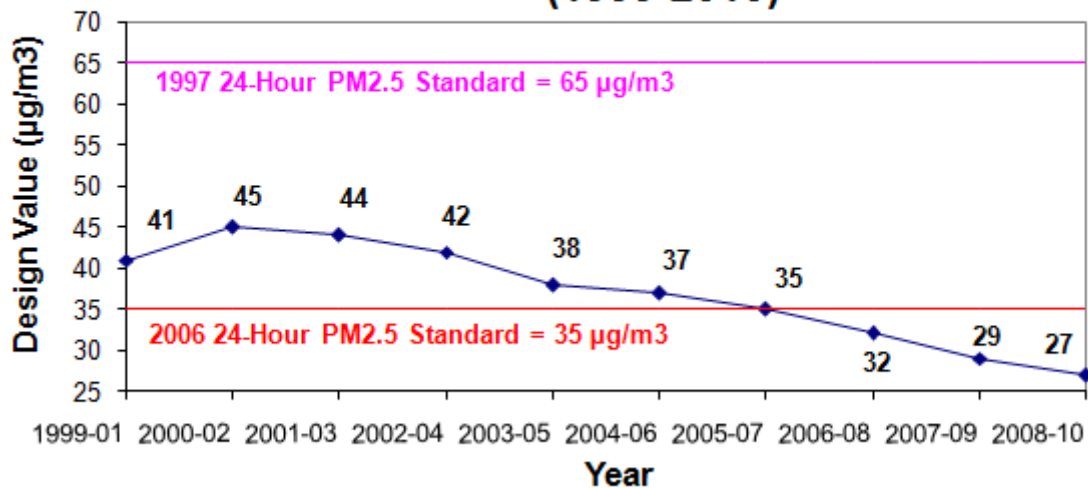


Annual PM2.5 Design Value Washington, DC-MD-VA Nonattainment Area (1999-2010)



* Design value = 3-year avg of annual mean PM_{2.5} concentrations.

24-Hour PM2.5 Design Value Washington, DC-MD-VA Nonattainment Area (1999-2010)



* Design value = 3-year average of 98th Percentile of PM_{2.5} concentrations.

SIP submitted to EPA, 2008

EPA finalizes PM2.5 Standard
Region Designated Nonattainment
PM2.5 SIP Submitted
Clean Data Determination
Attainment
Year

1997

2004

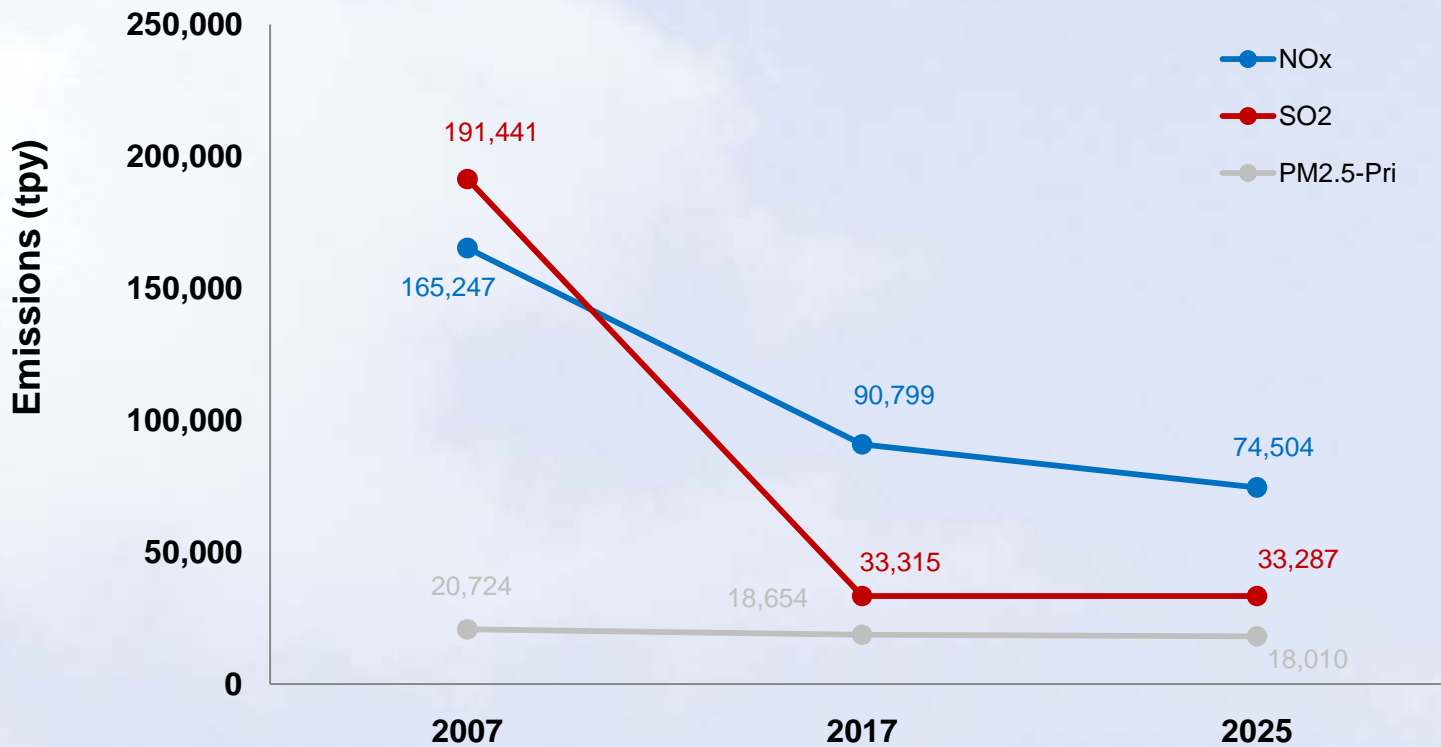
2008

2009

2009

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

Emissions Trend
(Washington, DC-MD-VA PM2.5 NAA)



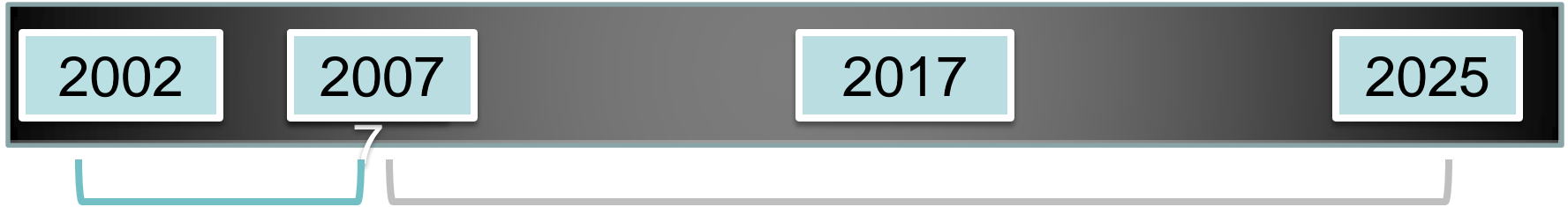
Redesignation Request & Maintenance Plan Timeframe

Base Year

Attainment Year

Interim Year

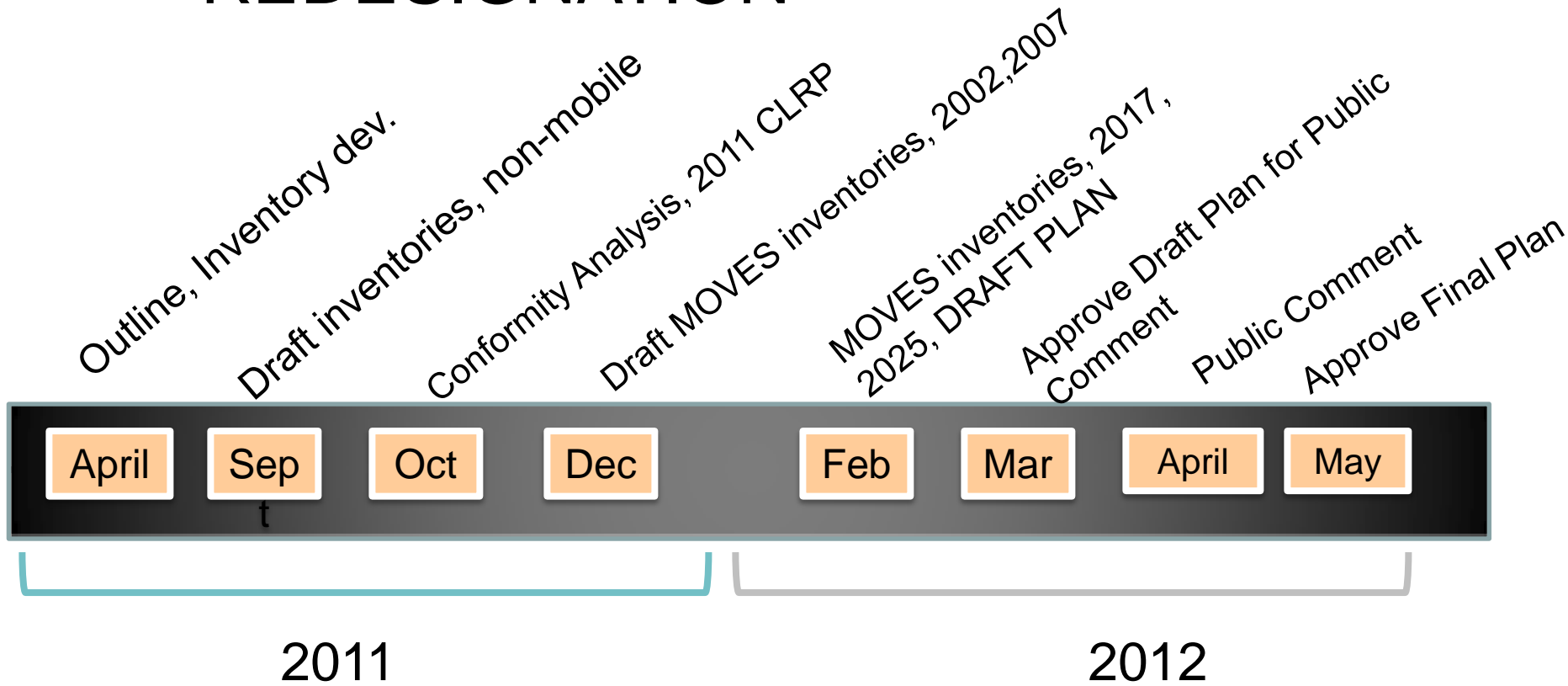
Out Year



Redesignation Request

Maintenance Plan

PM2.5 SCHEDULE TO REDESIGNATION



Sources for Air Quality Forecasts and Data



<http://www.mwcog.org/environment/air>



www.cleanairpartners.net