

# Metropolitan Washington, DC-MD-VA Air Quality Status 2012

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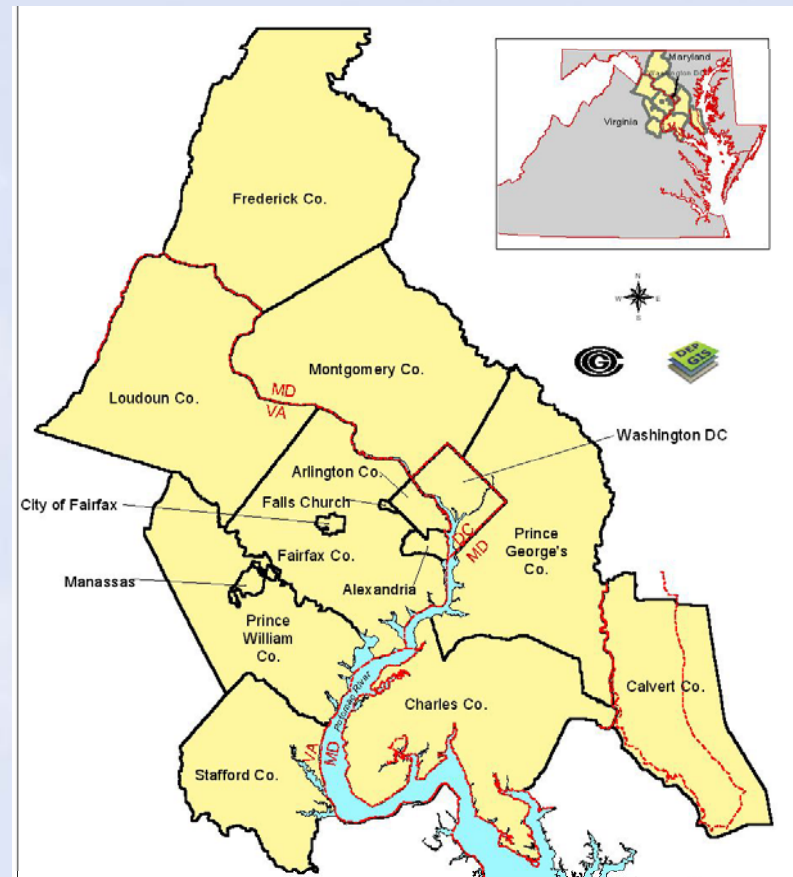


# Clean Air Act Amendments 1990

- 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

NO<sub>x</sub>

SO<sub>2</sub>

CO

Ozone

Lead

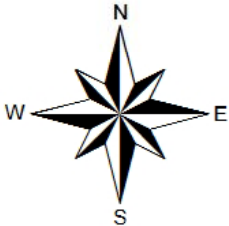
CO<sub>2</sub>

Particulate Matter

## Clean Air Act Amendments 1990

# Metropolitan Washington Ozone Monitors

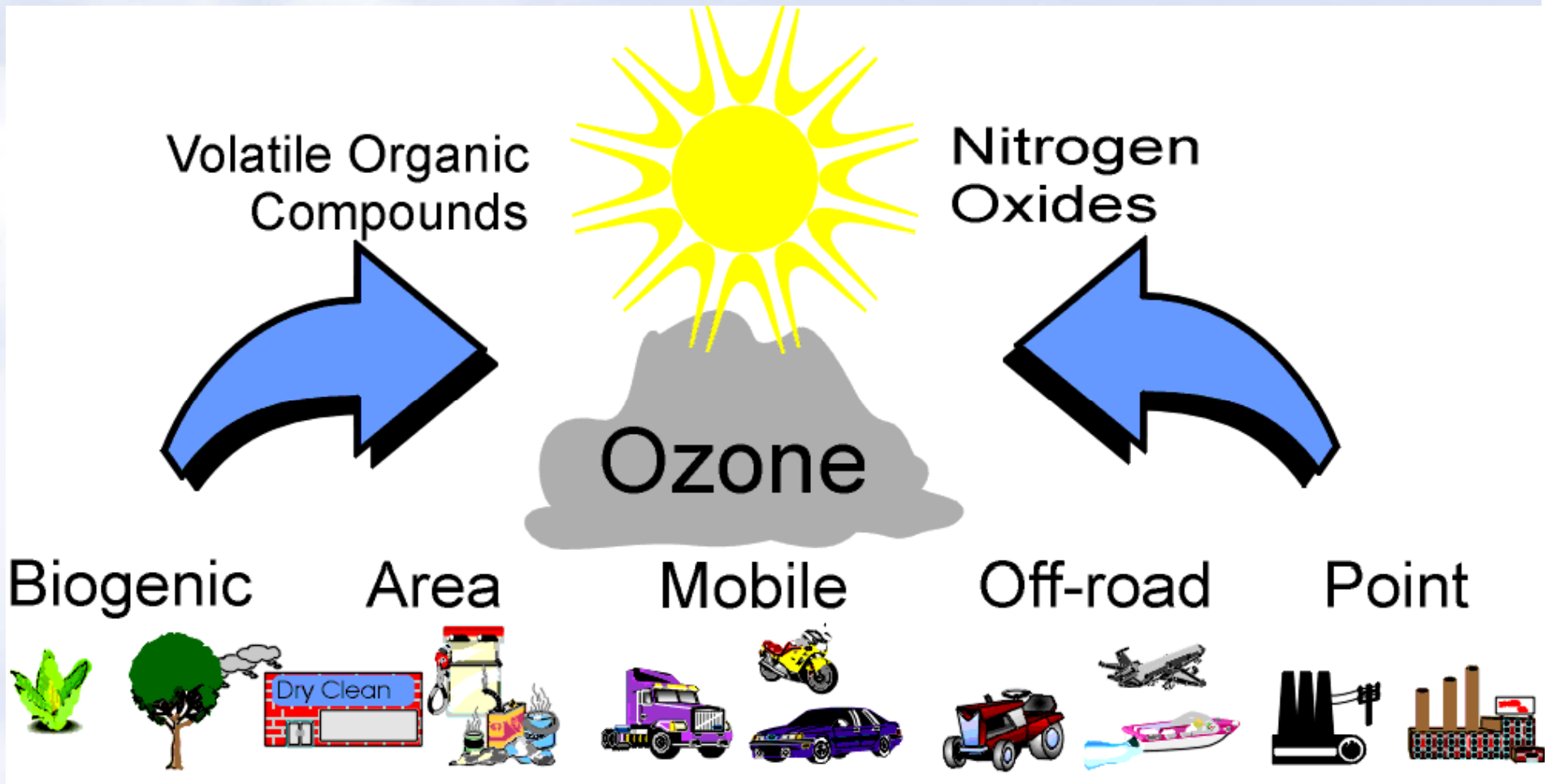
Washington, DC, MD, VA



**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?







# 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

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

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						

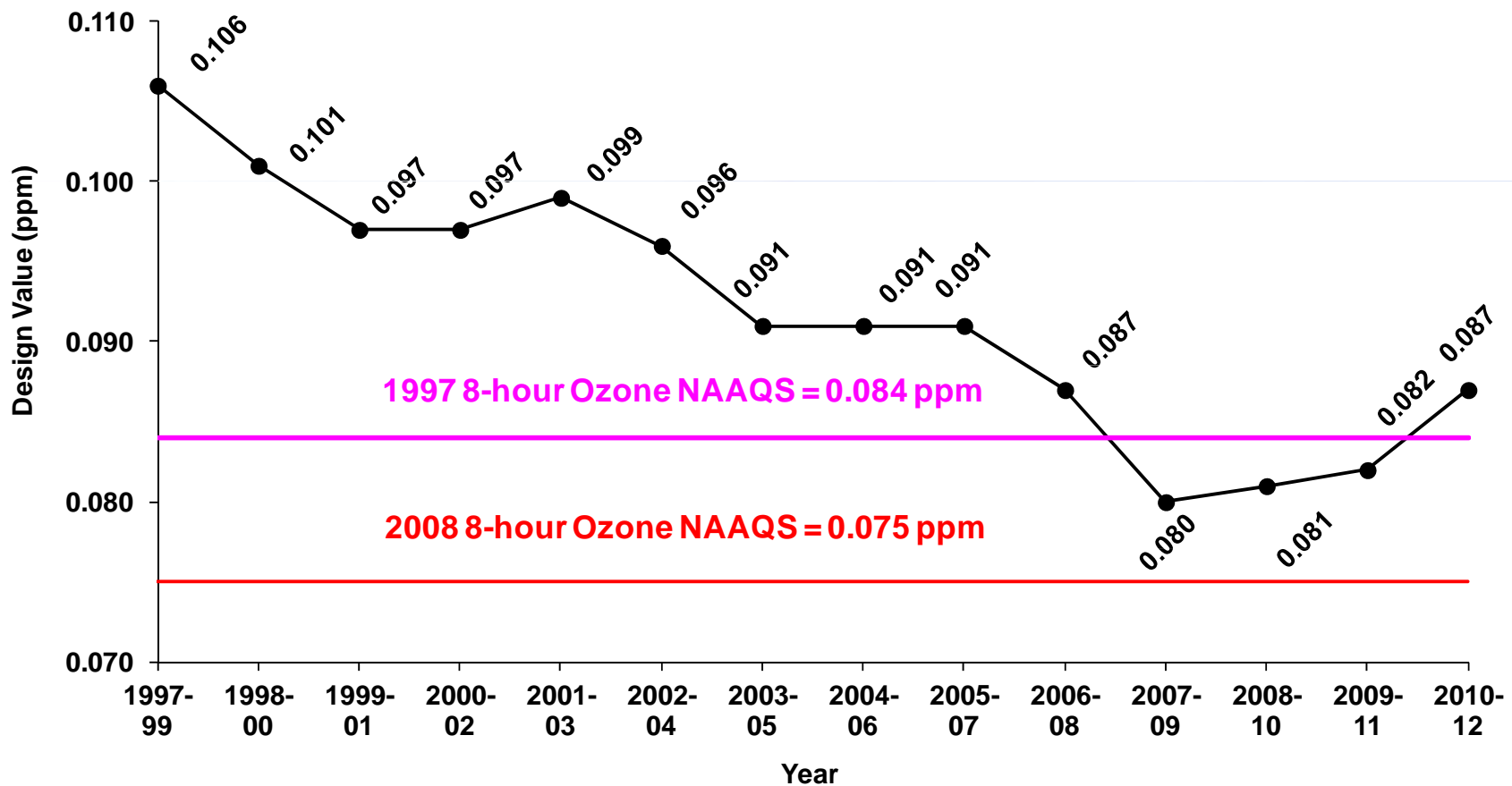
September						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1	2	3
				64	50	50
4	5	6	7	8	9	10
60	41	35	24	19	45	48
11	12	13	14	15	16	17
54	58	61	67	41	25	25
18	19	20	21	22	23	24
36	35	30	28	31	23	33
25	26	27	28	29	30	
31	32	22	41	42	41	



# Washington Region's Ozone Plan

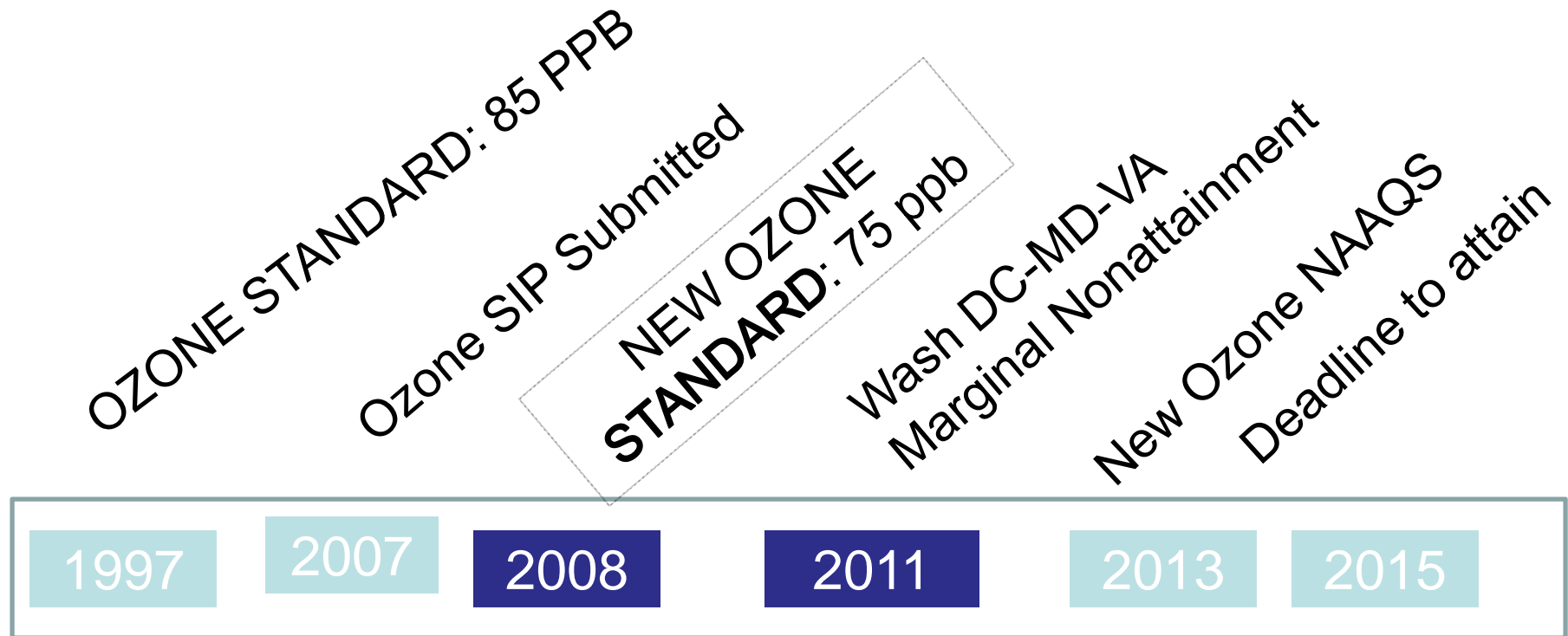
- Contains Federal, State and local control measures to reduce ozone pollution
- Demonstrates region will attain health standard in 2009
- Ozone plan (SIP) was submitted to EPA 2007
- EPA issued Clean Data Determination 2011

## 8-hour Ozone Design Value Washington, DC-MD-VA Ozone Nonattainment Area (1999-2012)



\* Design value = 3-year average of 4th highest daily maximum 8-hour average ozone concentrations. 2012 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

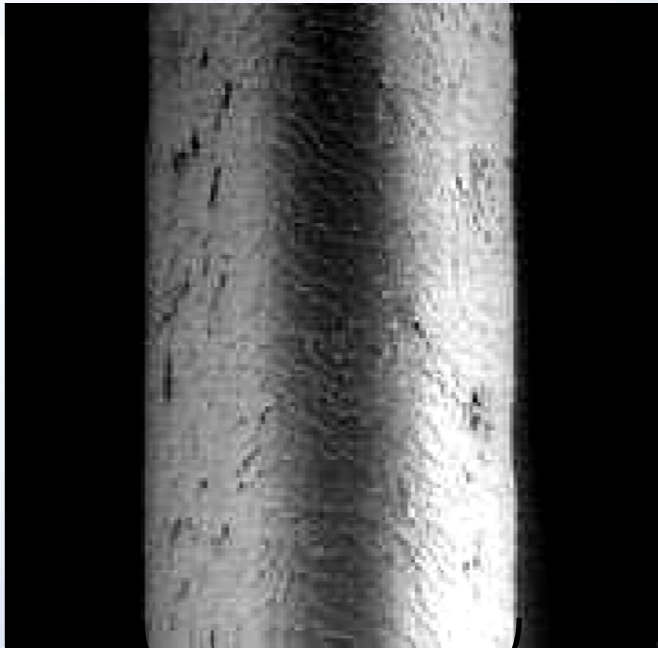
# Air Pollution: Fine Particles

- 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

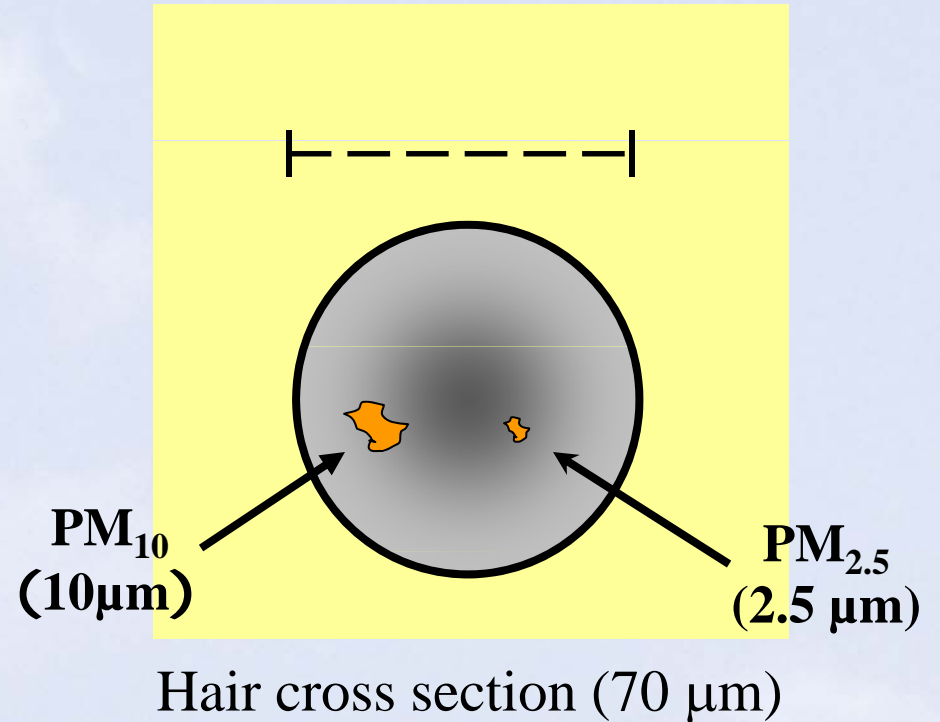


# How Fine is Fine?

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



Human Hair (70  $\mu\text{m}$  diameter)



Hair cross section (70  $\mu\text{m}$ )

# Health Effects of Particle Pollution

## Respiratory System Effects

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

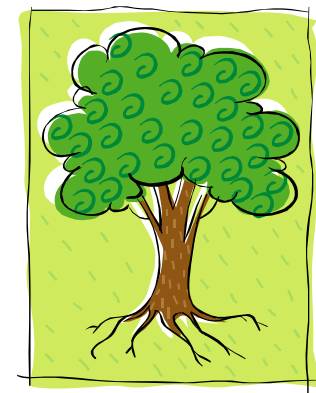
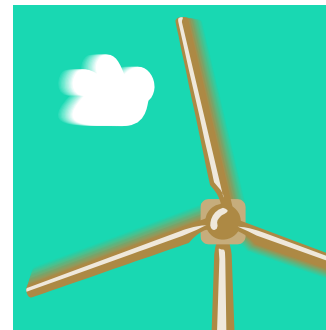
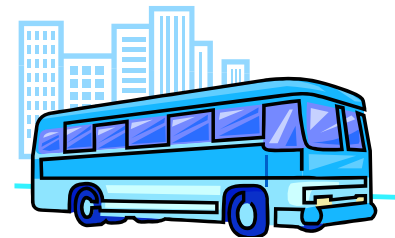
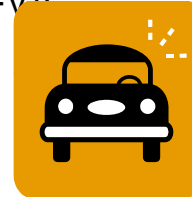
## Cardiovascular System Effects

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

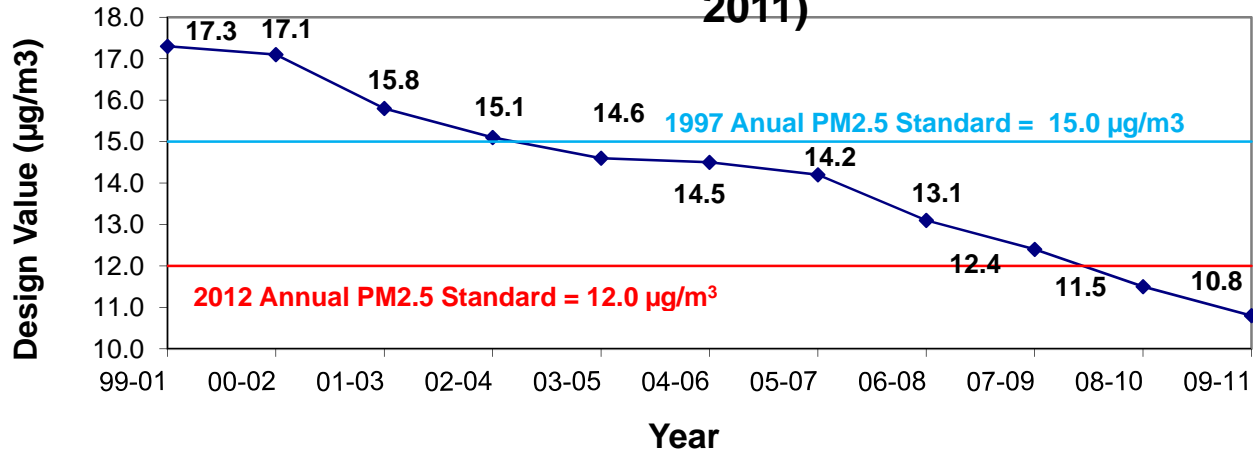


# Plan to Reduce Fine Particles

- **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

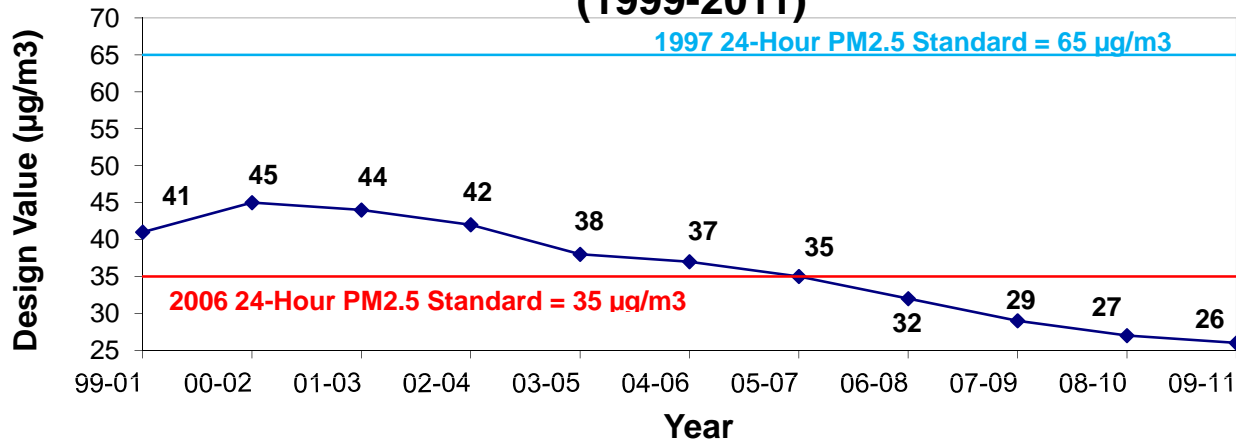


## Annual PM2.5 Design Value Washington, DC-MD-VA Nonattainment Area (1999-2011)



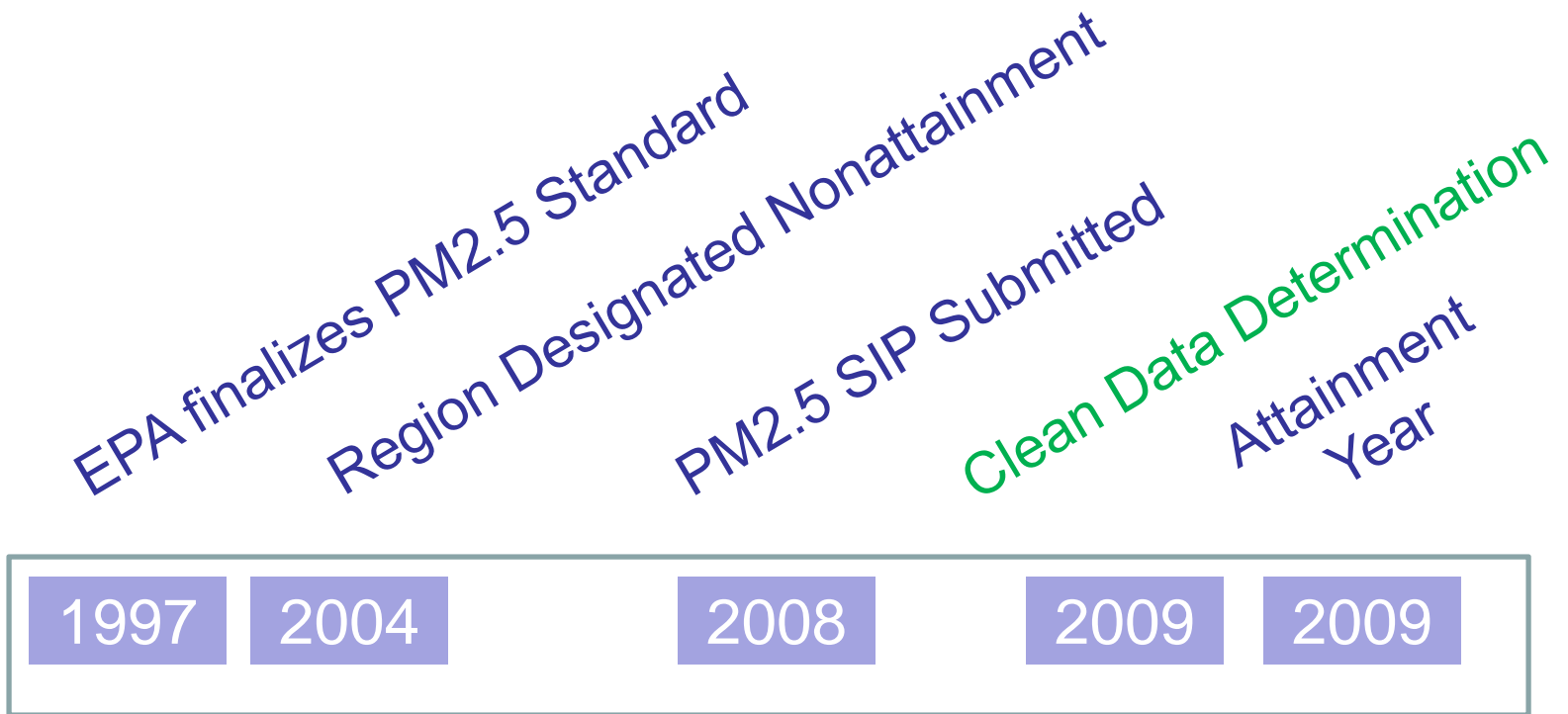
\* Design value = 3-year avg of annual mean PM2.5 concentrations.

## 24-Hour PM2.5 Design Value Washington, DC-MD-VA Nonattainment Area (1999-2011)



\* Design value = 3-year average of 98<sup>th</sup> percentile of PM2.5 concentrations.

# SIP submitted to EPA, 2008



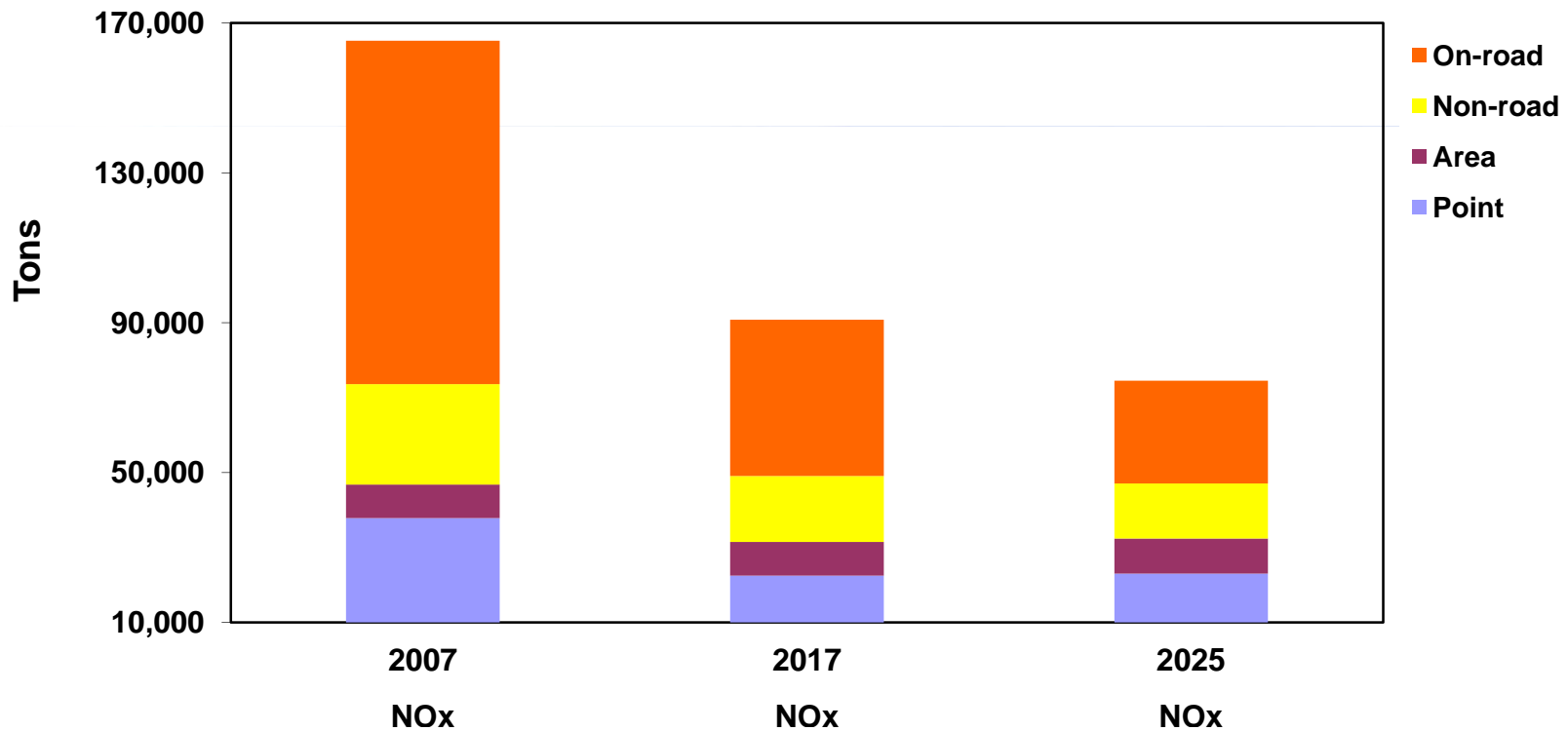
# Emissions Trends (NOx , SO2, PM2.5) 2007-2025

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

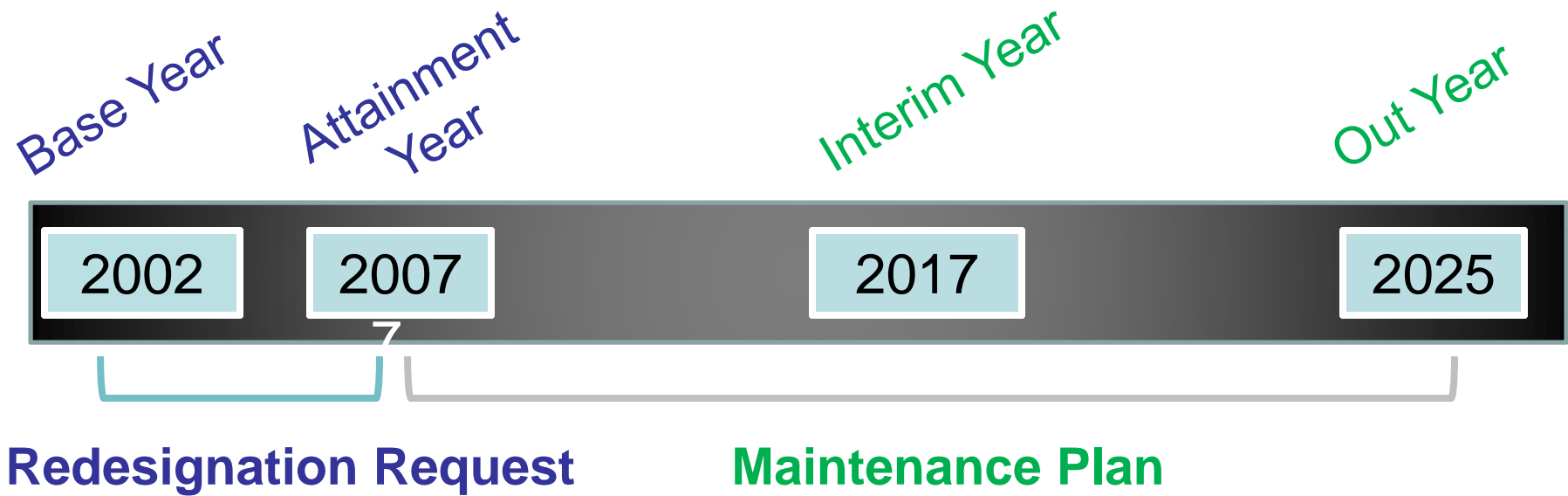


# Maintenance Plan: NOx Emissions

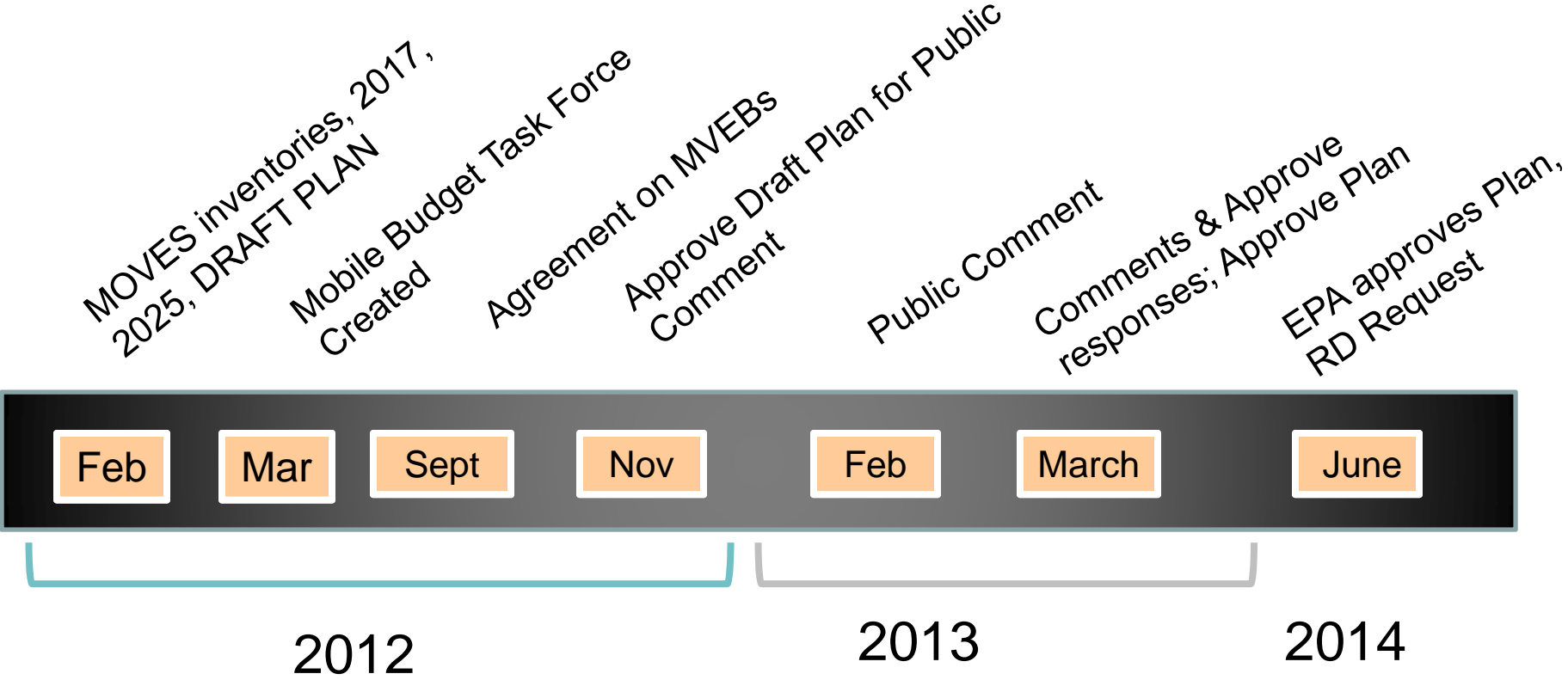
**NOx Emissions**  
Washington, DC-MD-VA Annual PM2.5 Non-Attainment Area



# Redesignation Request & Maintenance Plan Timeframe



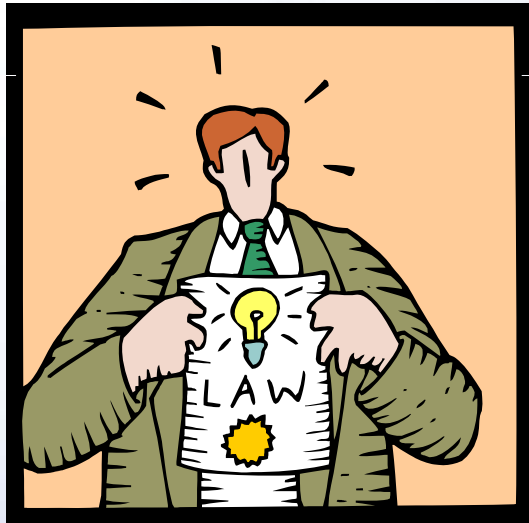
# SCHEDULE TO REDESIGNATION





# 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 AQ Challenges

- Ozone Attainment 2015
  - Will require significant NO<sub>x</sub> reductions
  - New Ozone standard proposed in 2013
- Low Sulfur Gasoline, Tier 3 Standards
- Mercury & Air Toxics
- Near-road monitoring for NO<sub>2</sub> & SO<sub>2</sub>

# Sources for Air Quality Forecasts and Data



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



[www.cleanairpartners.net](http://www.cleanairpartners.net)