Ozone Season Summary 2014

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ACPAC Meeting, COG

September 15, 2014

Ozone Season Summary

[As of September 10, 2014]

Peak 8-Hour Ozone Concentrations (ppb)

April

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
		1	2	3	4	5
		54	53	52	51	51
6	7	8	9	10	11	12
53	44	54	63	66	71	66
13	14	15	16	17	18	19
62	52	42	49	51	49	61
20	21	22	23	24	25	26
56	56	56	46	55	62	56
27	28	29	30			
59	47	43	39			

May

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1	2	3
				53	55	57
4	5	6	7	8	9	10
56	49	57	51	63	48	45
11	12	13	14	15	16	17
66	64	71	32	35	44	52
18	19	20	21	22	23	24
53	63	68	60	64	59	50
25	26	27	28	29	30	31
54	61	65	59	27	42	51

June

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1	2	3	4	5	6	7
54	59	56	73	55	56	59
8	9	10	11	12	13	14
58	56	54	50	26	47	50
15	16	17	18	19	20	21
57	87	74	61	58	65	52
22	23	24	25	26	27	28
62	57	55	50	58	57	58
29	30					
59	60					

July

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
		1	2	3	4	5
		59	62	52	46	51
6	7	8	9	10	11	12
57	67	69	47	67	76	58
13	14	15	16	17	18	19
57	60	47	59	58	63	65
20	21	22	23	24	25	26
50	55	47	65	38	57	63
27	28	29	30	31		
48	48	41	56	64		

August

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
					1	2
					50	52
3	4	5	6	7	8	9
42	71	72	77	58	58	57
10	11	12	13	14	15	16
60	48	35	50	48	53	69
17	18	19	20	21	22	23
50	50	49	54	57	48	35
24	25	26	27	28	29	30
44	56	60	76	60	56	48
31						
43						

September

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	1	2	3	4	5	6
	32	43	59	59	55	51
7	8	9	10	11	12	13
40	43	32	38			
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

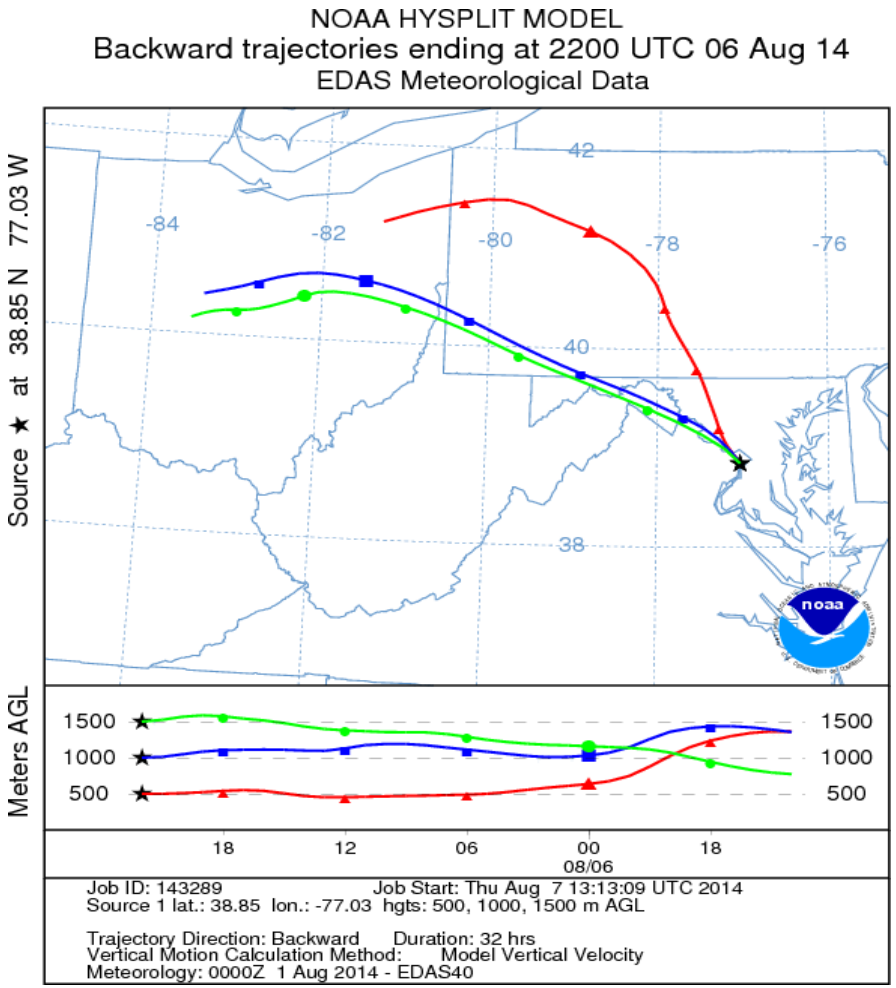
Data based on the 8-hour standard set at 75 ppb. Since April 1, 2014, there have been:

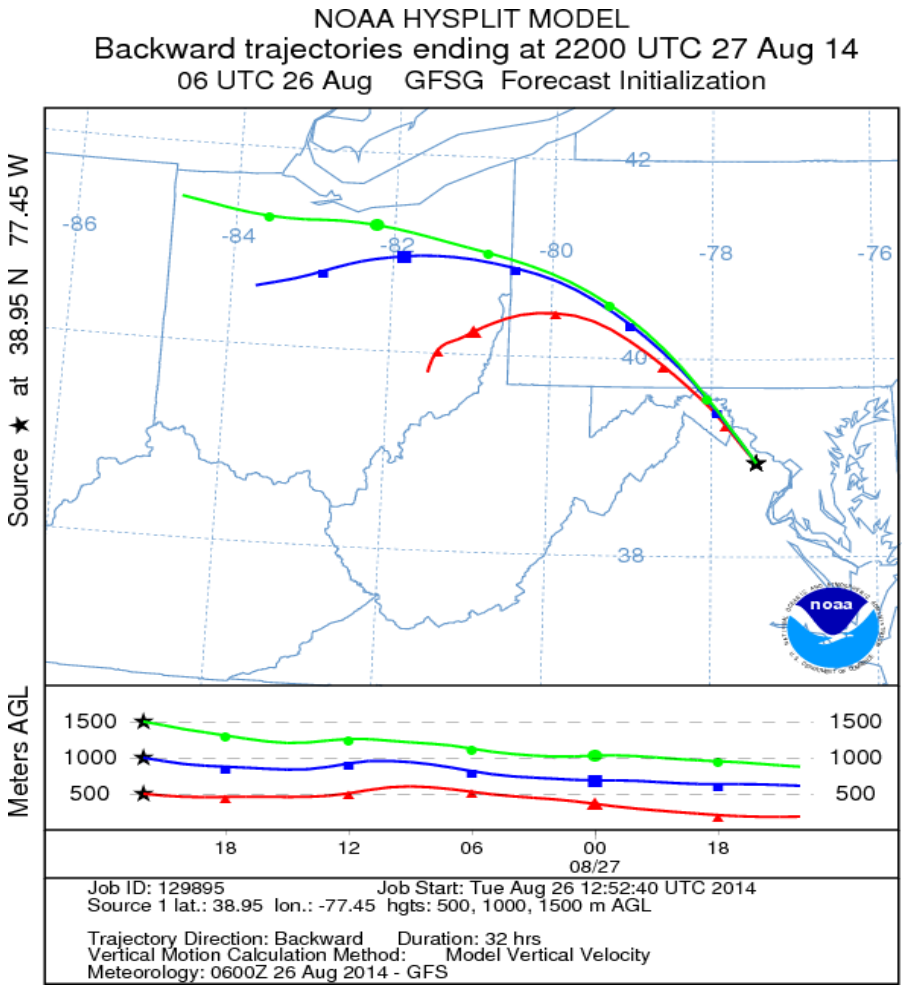
4 Code Orange Days, 39 Code Yellow Days, 120 Code Green Days

Meteorology Factors on Exceedance Days

- August 6, 2014
  - High Temperature: 90°F
  - Light winds
  - Northwesterly winds brought NOx and ozone from the Ohio River Valley
  - Clear Skies due to a high pressure system
  - Similar conditions during the two days prior caused ozone to build up
- August 27, 2014
  - High Temperature: 90°F
  - Northwesterly winds brought NOx and ozone from Western PA and OH
  - High ozone values in Western PA on August 26
  - Clear and sunny skies

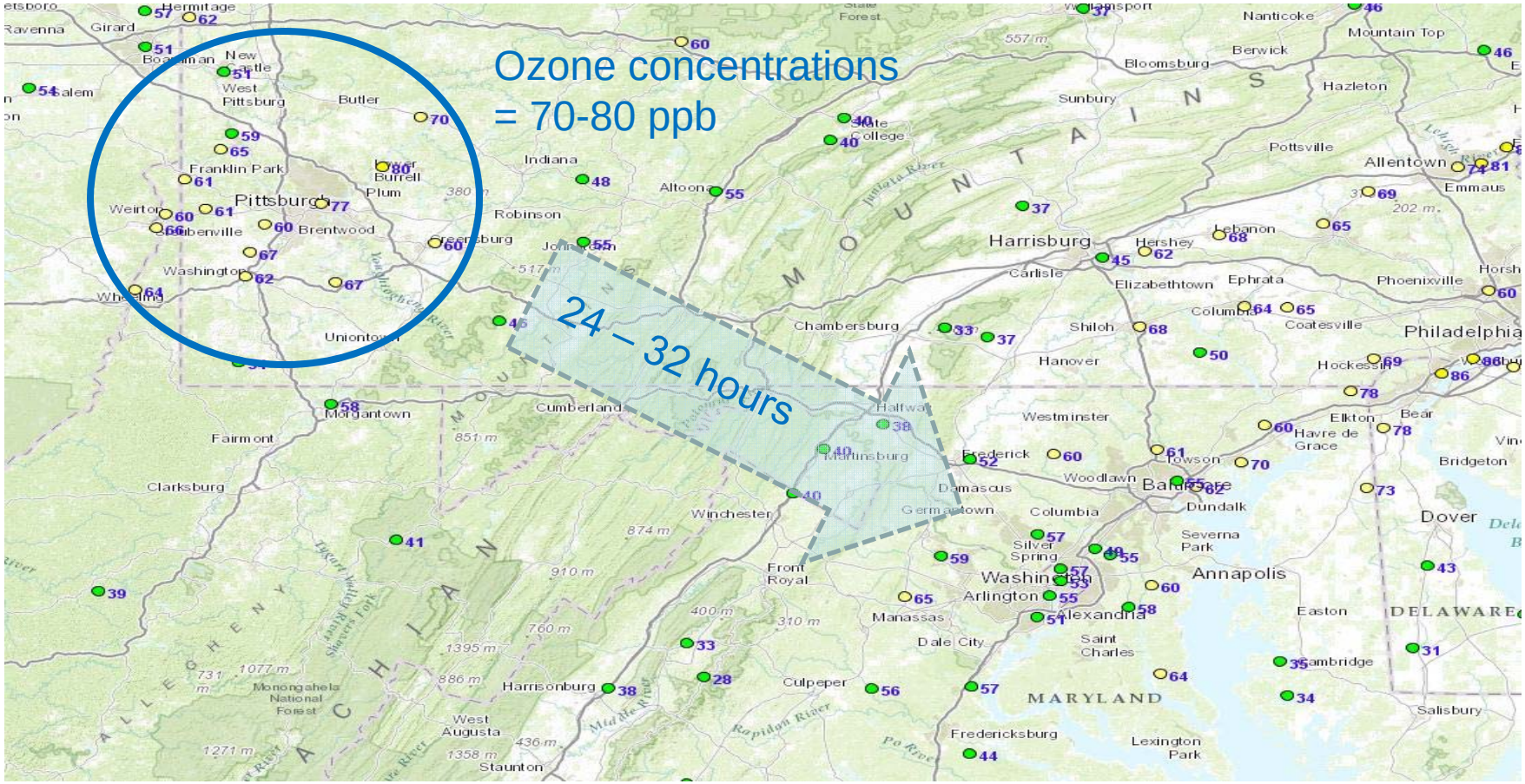
Wind Trajectories for 8/6 and 8/27





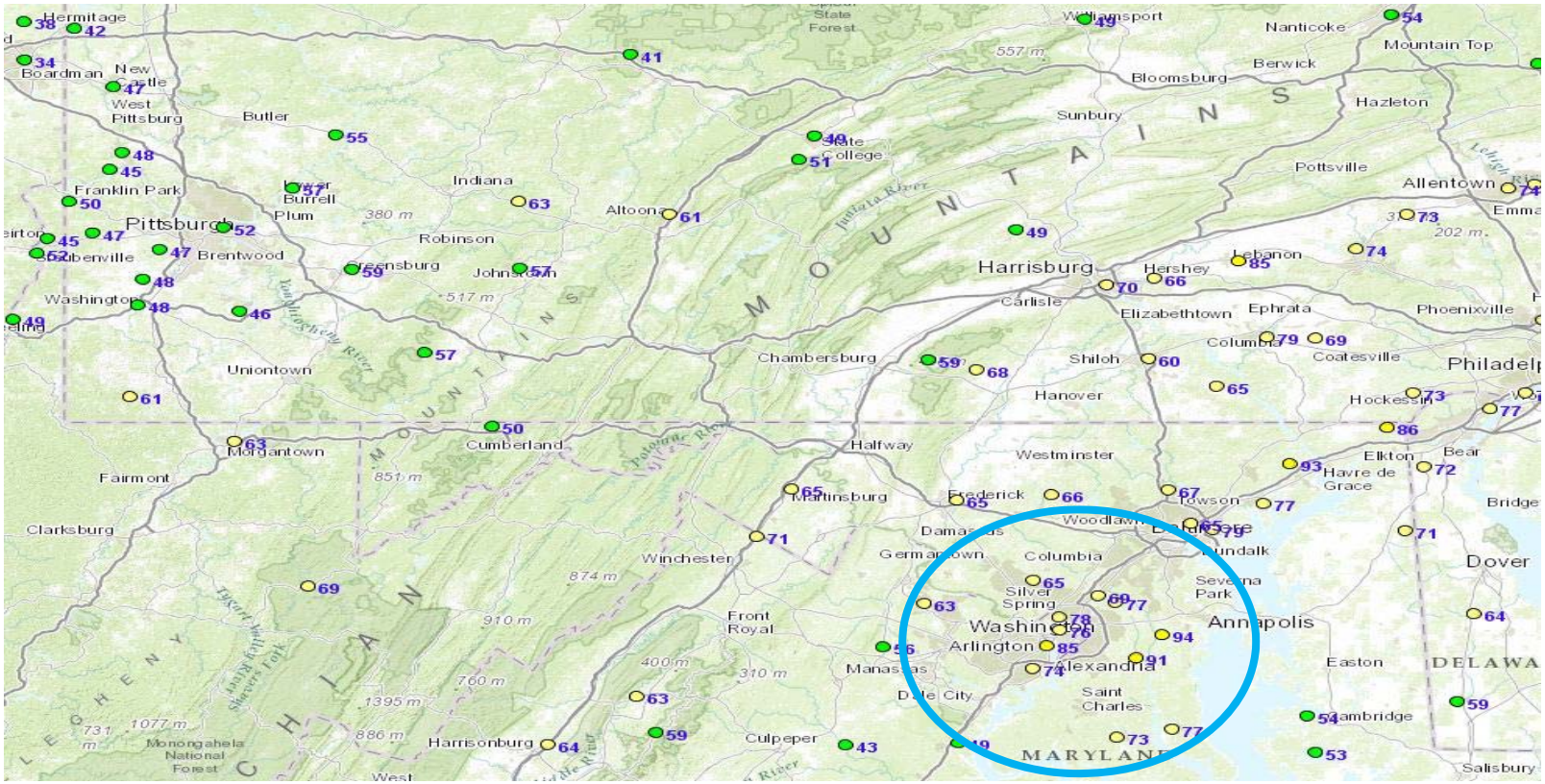
Ozone Concentration at 3 PM

August 26



Ozone Concentration at 3 PM

August 27



Ozone concentrations
= 70-90 ppb

2014 Ozone Exceedances

Date	Monitors Exceeding	Highest Monitor	8-Hr Max (ppb)
6/16/2014	4	Arlington	87
7/11/2014	1	Prince William	76
8/6/2014	1	Charles County	77
8/27/2014	2	Arlington/Prince George County (tie)	76

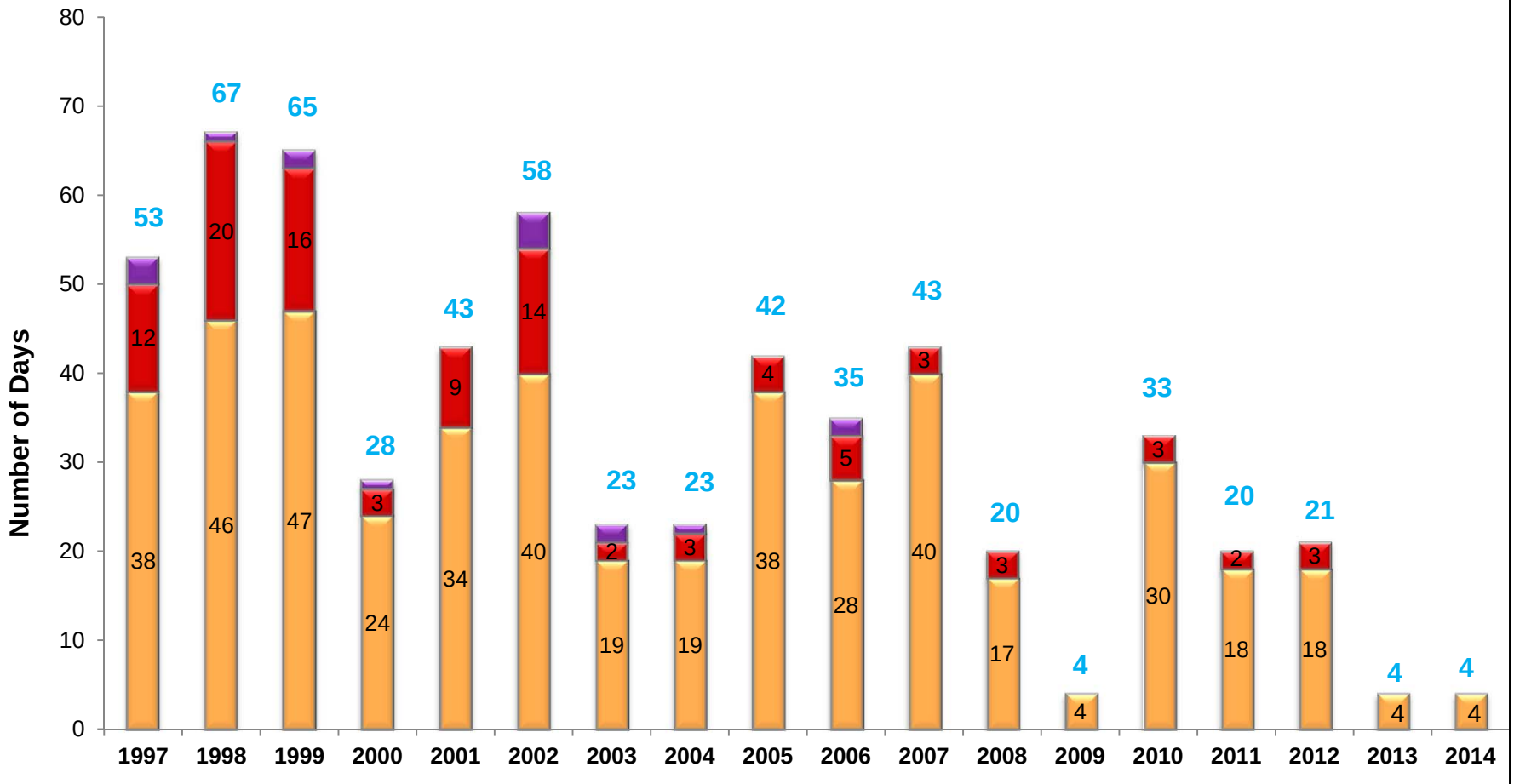
- Analysis is based on draft data until September 10, 2014. Data is subject to change.

Ozone Exceedance Trend

Number of Exceedance Days - 2008 Ozone Standard (75 ppb)

Breakdown of Code Orange, Red, and Purple Days

1997 - 2014



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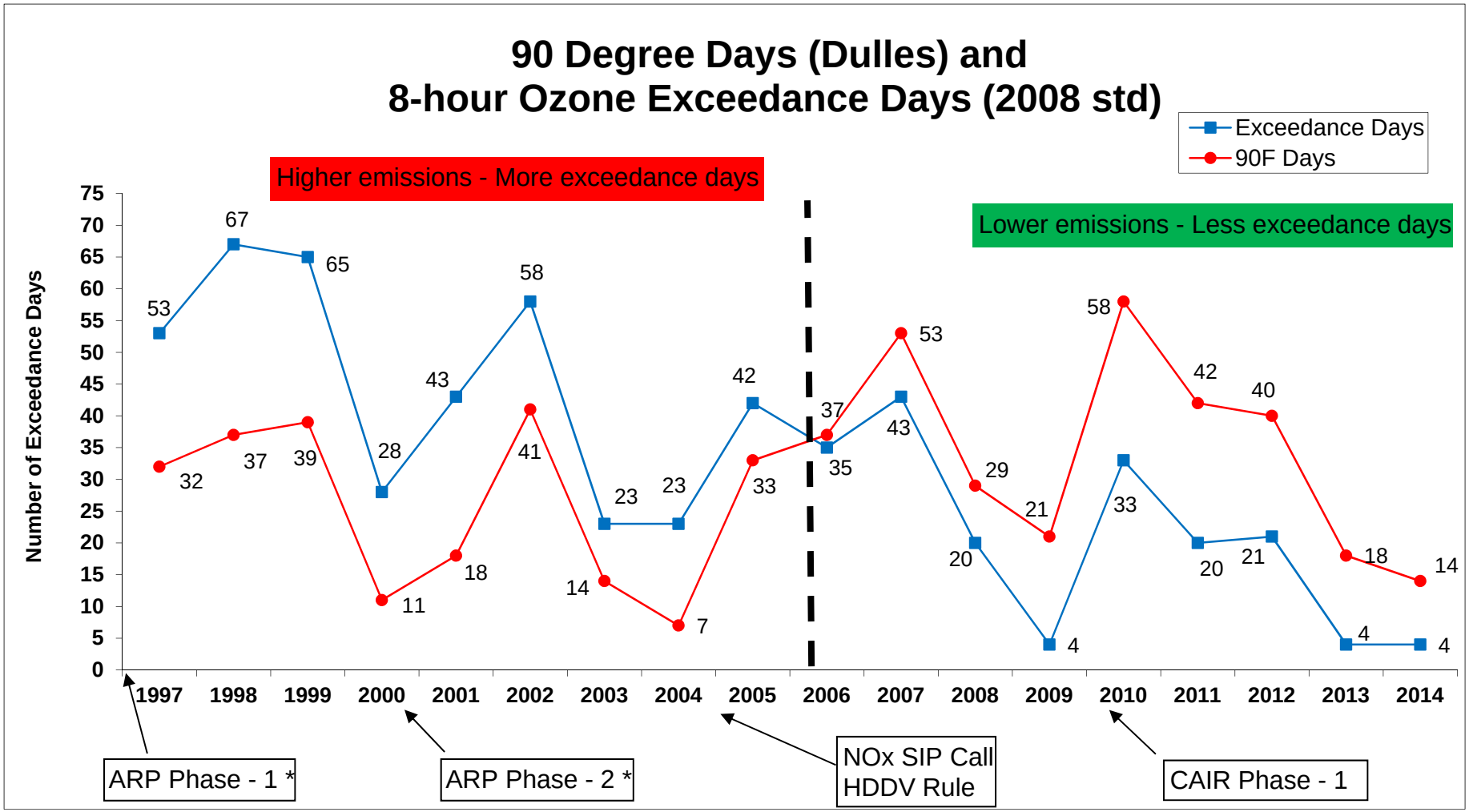
90 Degree Days and Exceedance Days



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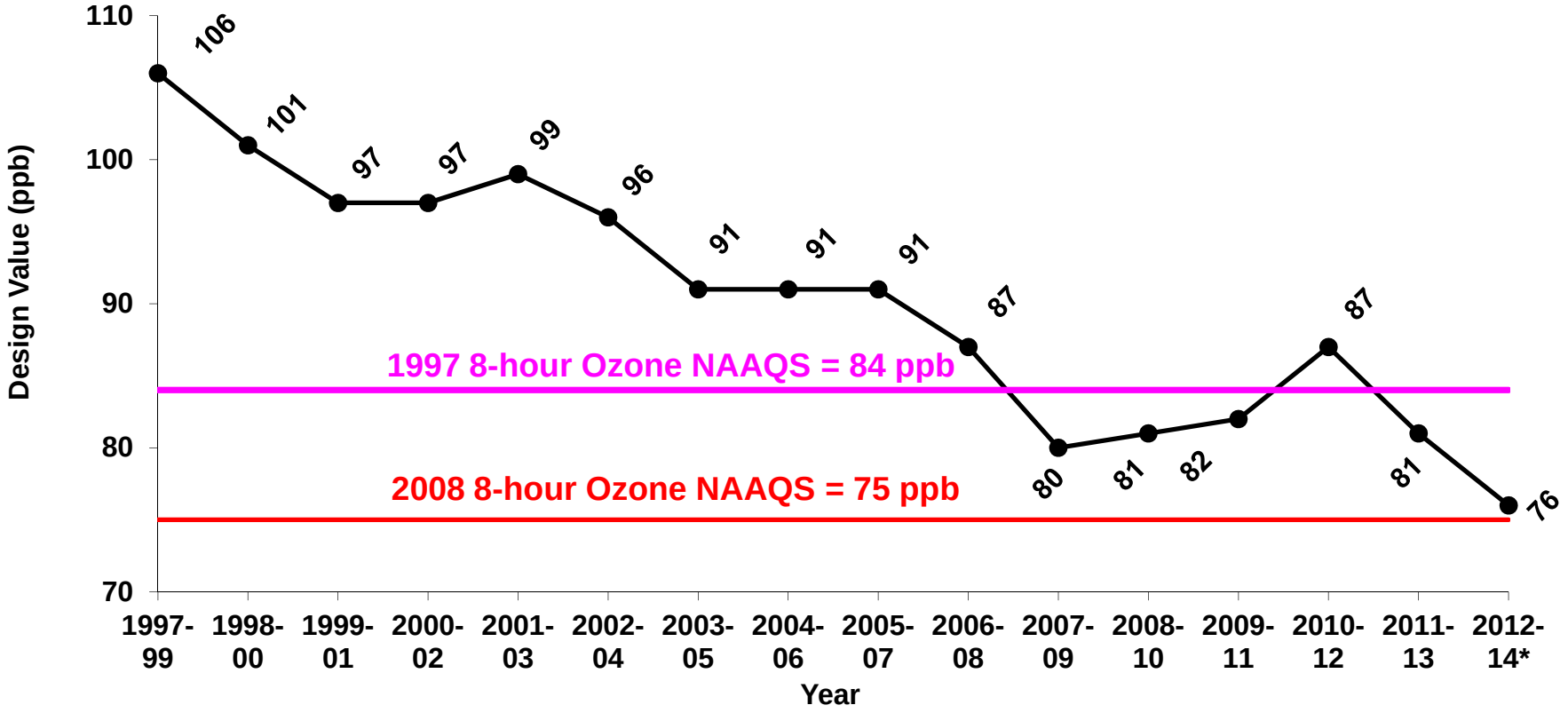
Why Fewer Exceedance Days Now ?

Emission Control Programs

Federal	State	Local
Acid Rain Program (1996/2000)	Vehicle Inspection and Maintenance Programs	Renewable Energy Programs Regional Wind Power Purchase Program Clean Energy Rewards Program Renewable Portfolio Standards
Tier 2 (LD Vehicle) Rule (2004)	MD Healthy Air Act (2009/2012)	Energy Efficiency Programs LED Traffic Signal Retrofit Program Building Energy Efficiency Programs
HD Diesel Vehicle Rule (2004/2007)	VA CAIR Rule	VRE Idling Reduction
NOx SIP Call (2004)	DC CAIR Rule	Low VOC Paint
Clean Air Interstate Rule (2009)	Ozone Transport Commission Rules	Gas Can Replacement

Ozone Design Value Trend

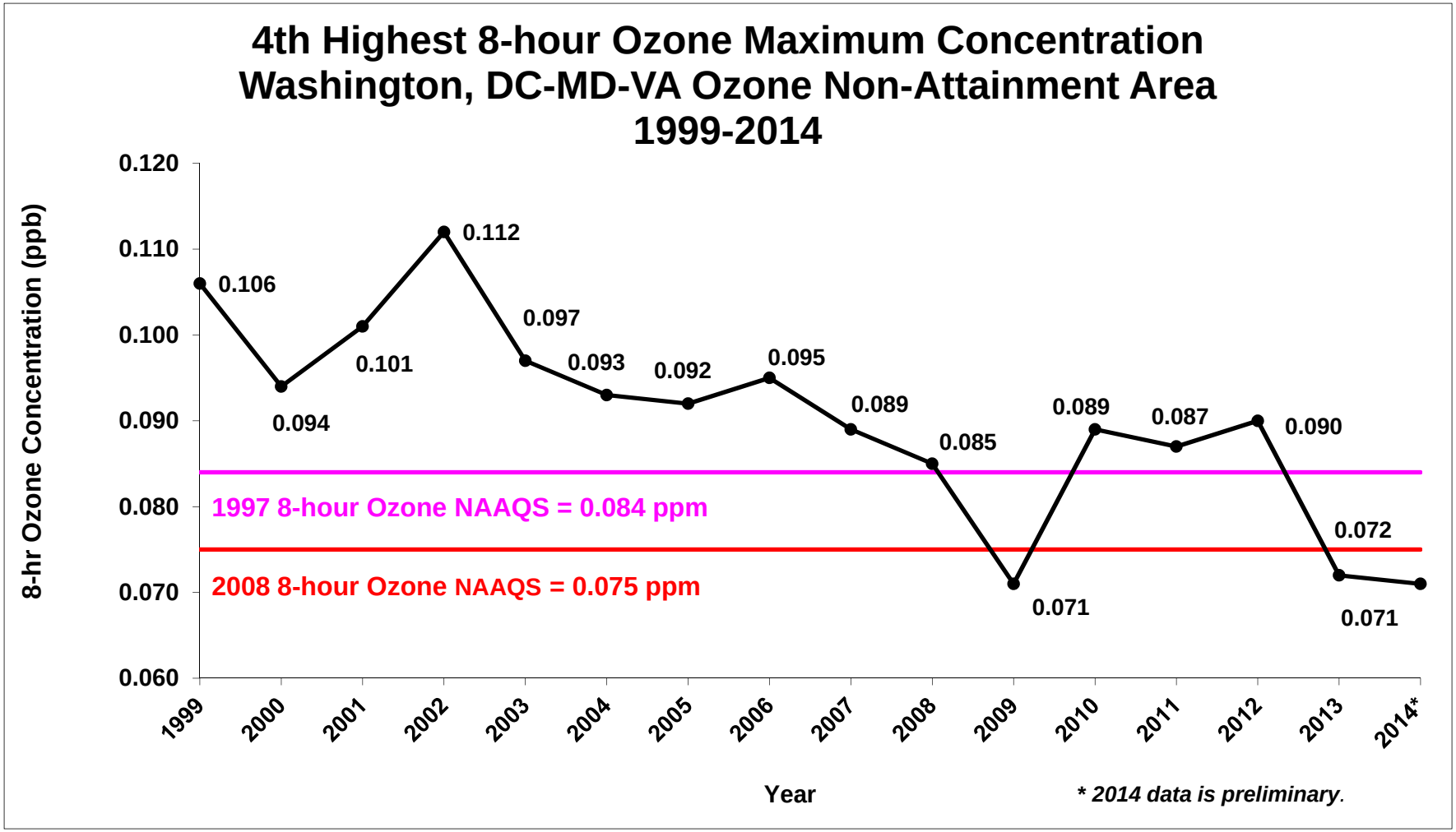
8-hour Ozone Design Value
Washington, DC-MD-VA Ozone Nonattainment Area
(1999-2014)



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

* 2014 data is preliminary

4th Highest Ozone Value



These 4th highest 8-hour ozone values in 2015 would lead to non-attainment in 2015

Site	4th Highest 8-Hour Max Ozone Concentration (ppm)
Beltsville	0.087
PG Equestrian	0.090
Arlington	0.090
Calvert	0.091
Franconia	0.092
Southern Maryland	0.094
Rockville	0.095
HU- Beltsville	0.095
McMillian NCore	0.096
Frederick	0.096
Ashburn	0.099
Long Park	0.100

•**Analysis is based on draft data until September 10, 2014. Data is subject to change.**

Fine Particle Summary

[As of September 10, 2014]

24-hour $PM_{2.5}$ Average (µg/m³)

April

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
		1	2	3	4	5
		8.7	10.3	13.7	15.8	8.6
6	7	8	9	10	11	12
5.6	7.2	10.0	10.8	10.0	9.5	10.9
13	14	15	16	17	18	19
15.9	7.9	5.8	6.0	8.9	9.4	10.9
20	21	22	23	24	25	26
10.9	7.3	11.6	7.1	5.5	9.8	10.7
27	28	29	30			
4.6	7.1	6.7	8.6			

May

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1	2	3
				10.8	9.1	10.2
4	5	6	7	8	9	10
10.7	5.7	9.4	9.6	20.4	17.2	12.1
11	12	13	14	15	16	17
9.1	14.7	12.9	11.6	12.5	7.5	10.2
18	19	20	21	22	23	24
6.6	10.0	11.0	15.5	16.9	6.0	7.1
25	26	27	28	29	30	31
7.6	12.0	16.3	14.8	4.3	6.8	6.4

June

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1	2	3	4	5	6	7
8.8	8.2	16.2	14.7	11.9	7.4	10.8
8	9	10	11	12	13	14
15.5	17.5	15.6	13.8	7.9	11.3	11.3
15	16	17	18	19	20	21
9.0	15.7	19.6	26.1	14.8	9.7	12.5
22	23	24	25	26	27	28
13.0	10.9	8.7	10.8	9.4	10.4	7.0
29	30					
8.4	10.0					

July

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
		1	2	3	4	5
		14.5	20.0	15.1	19.8	7.4
6	7	8	9	10	11	12
12.8	17.2	17.0	9.0	11.3	11.8	13.6
13	14	15	16	17	18	19
14.6	11.9	11.5	9.4	9.9	9.8	9.4
20	21	22	23	24	25	26
9.7	7.4	8.9	13.5	8.8	6.1	11.7
27	28	29	30	31		
11.3	7.7	10.4	11.2	15.6		

August

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
					1	2
					18.8	10.6
3	4	5	6	7	8	9
7.1	9.5	16.9	17.0	14.0	13.0	16.7
10	11	12	13	14	15	16
16.7	10.0	5.4	8.9	10.9	9.9	10.4
17	18	19	20	21	22	23
13.7	9.4	10.4	9.9	15.6	14.0	7.2
24	25	26	27	28	29	30
8.5	9.8	13.4	16.8	11.9	8.4	10.0
31						
13.1						

September

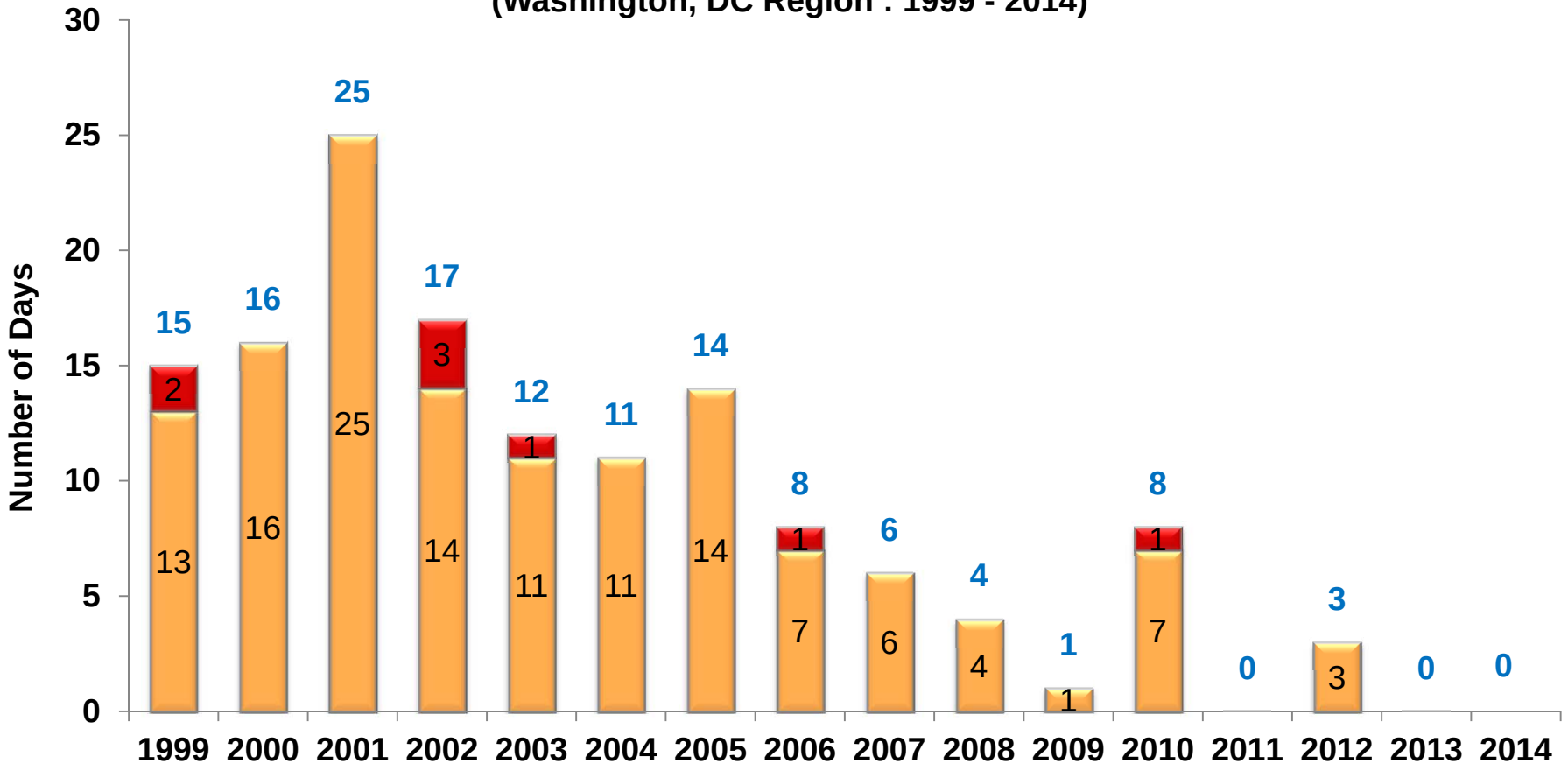
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	1	2	3	4	5	6
	8.7	12.0	10.7	10.7	12.2	11.5
7	8	9	10	11	12	13
7.3	8.3	8.8	8.6			
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Data based on the 24-hour standard set at 35 µg/m³. Since April 1, 2014, there have been:

49 Code Yellow Days, 114 Code Green Days

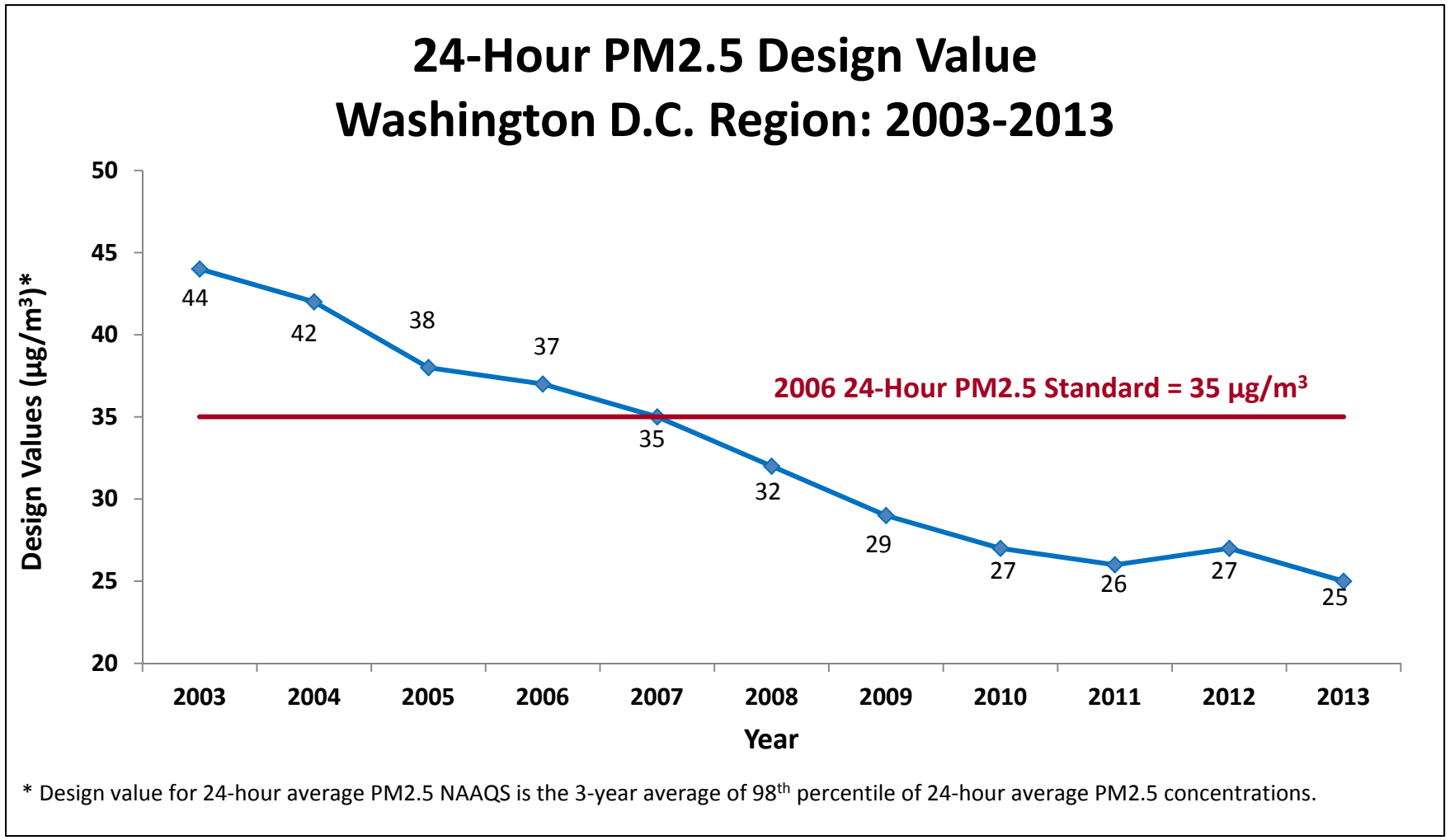
$PM_{2.5}$ Exceedance Trend

Number of Exceedance Days - 2006 24-Hour PM2.5 Standard (35 µg/m³)
Breakdown of Code Orange, Red, and Purple Days
(Washington, DC Region : 1999 - 2014)



* 2014 data is preliminary and may change.

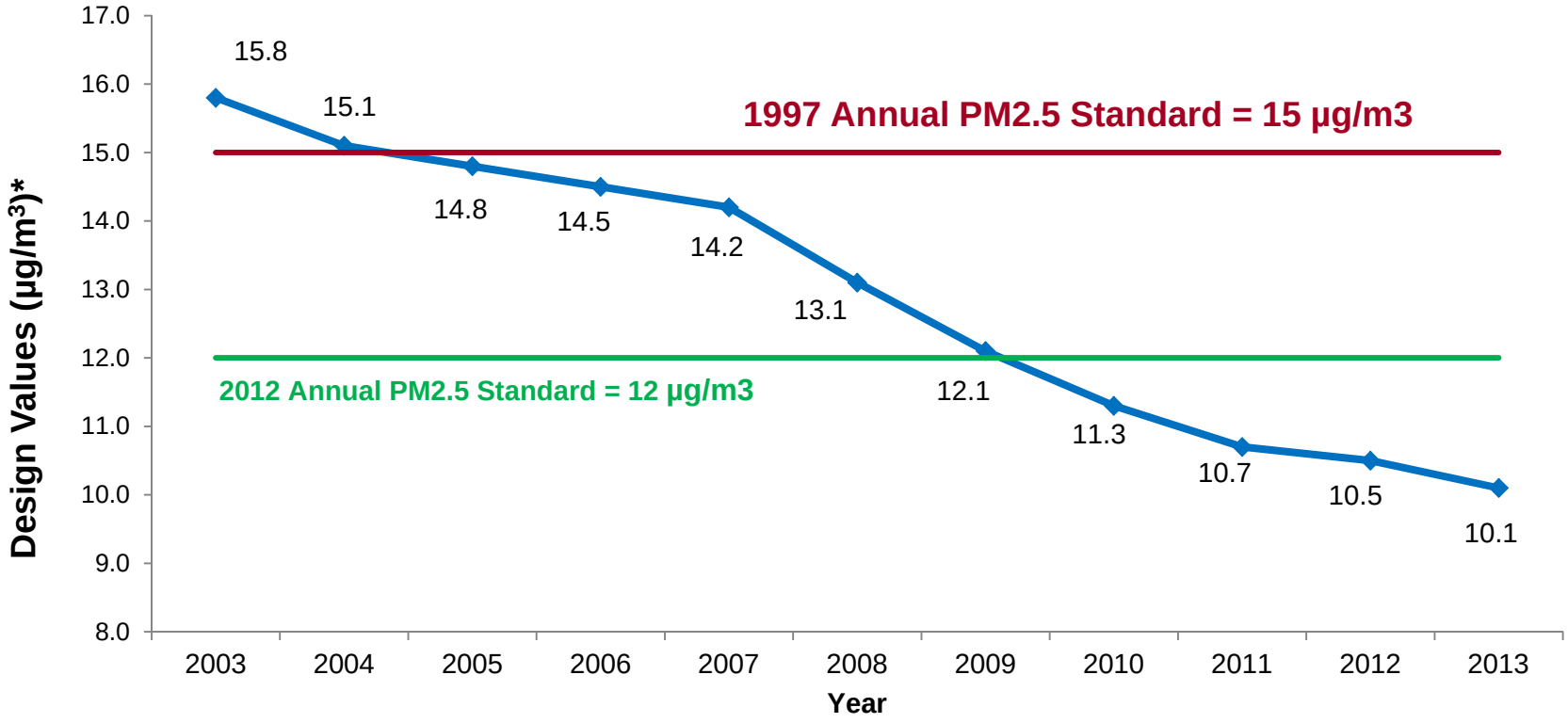
24-Hour $PM_{2.5}$ Design Value Trend



* Design value for 24-hour average PM2.5 NAAQS is the 3-year average of 98th percentile of 24-hour average PM2.5 concentrations.

Annual $PM_{2.5}$ Design Value Trend

Figure 16: $PM_{2.5}$ Annual Design Values Washington, D.C. Region, 2003-2013



* Design value for the annual PM2.5 NAAQS is the 3-year average of annual mean PM2.5 concentrations.