Ozone Season Summary 2014

Sunil Kumar

MWAQC-TAC

October 14, 2014

Ozone Season Summary

[As of October 7, 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	46	43	32
14	15	16	17	18	19	20
39	49	55	52	55	50	54
21	22	23	24	25	26	27
56	36	34	31	25	40	55
28	29	30				
60	28	35				

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

4 Code Orange Days, 40 Code Yellow Days, 139 Code Green Days

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 October 7, 2014. Data is subject to change.

Contributing Factors for Exceedance Days

- Meteorology
  - High temp (90°F) and sunny skies
  - Light winds

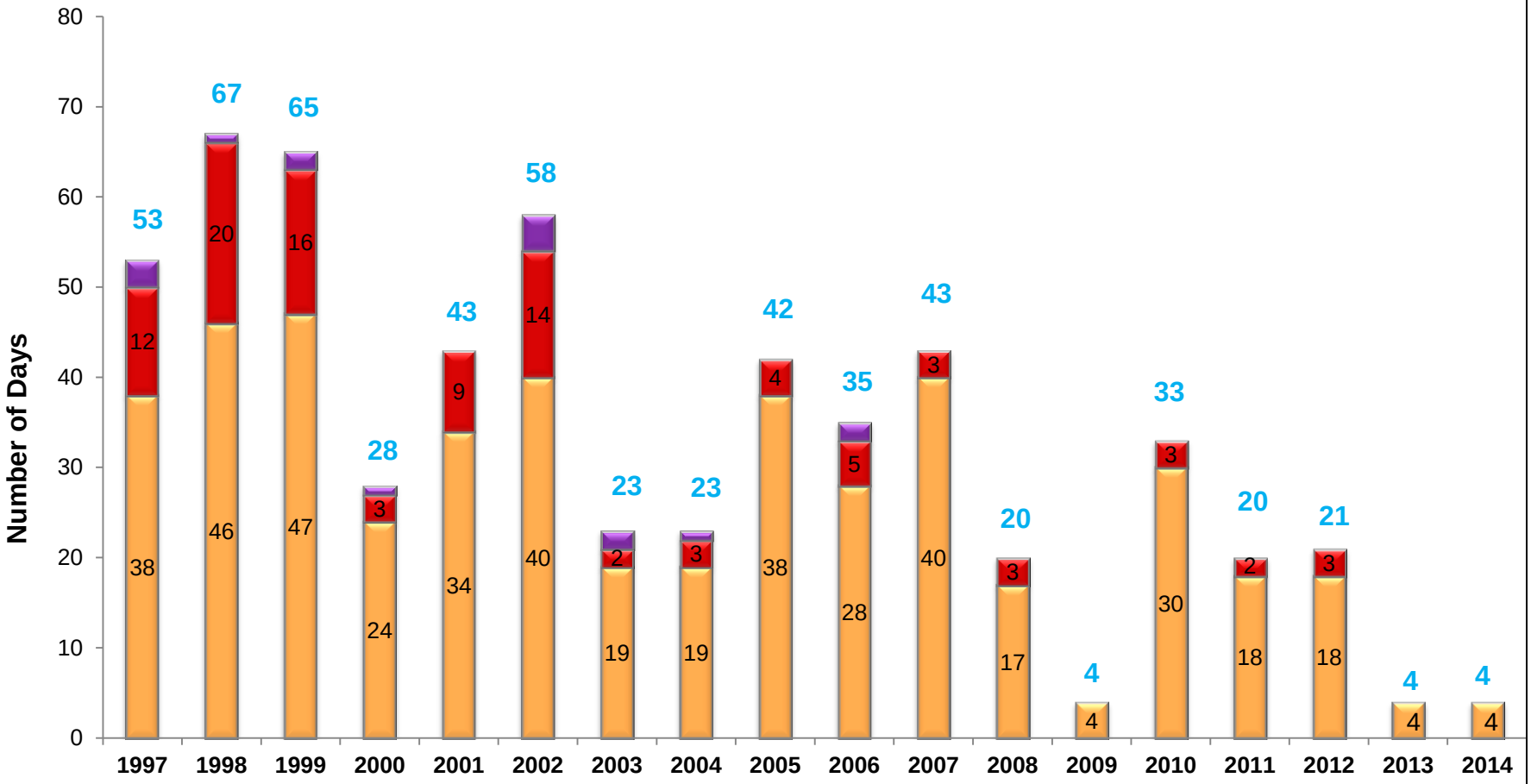
- Transport of NOx and Ozone from upwind areas
  - Upper level winds brought high ozone and NOx levels from Ohio river valley and Western PA region

- Recirculation of local emissions
  - Recirculating winds kept local emissions inside the area

Ozone Exceedance Trend

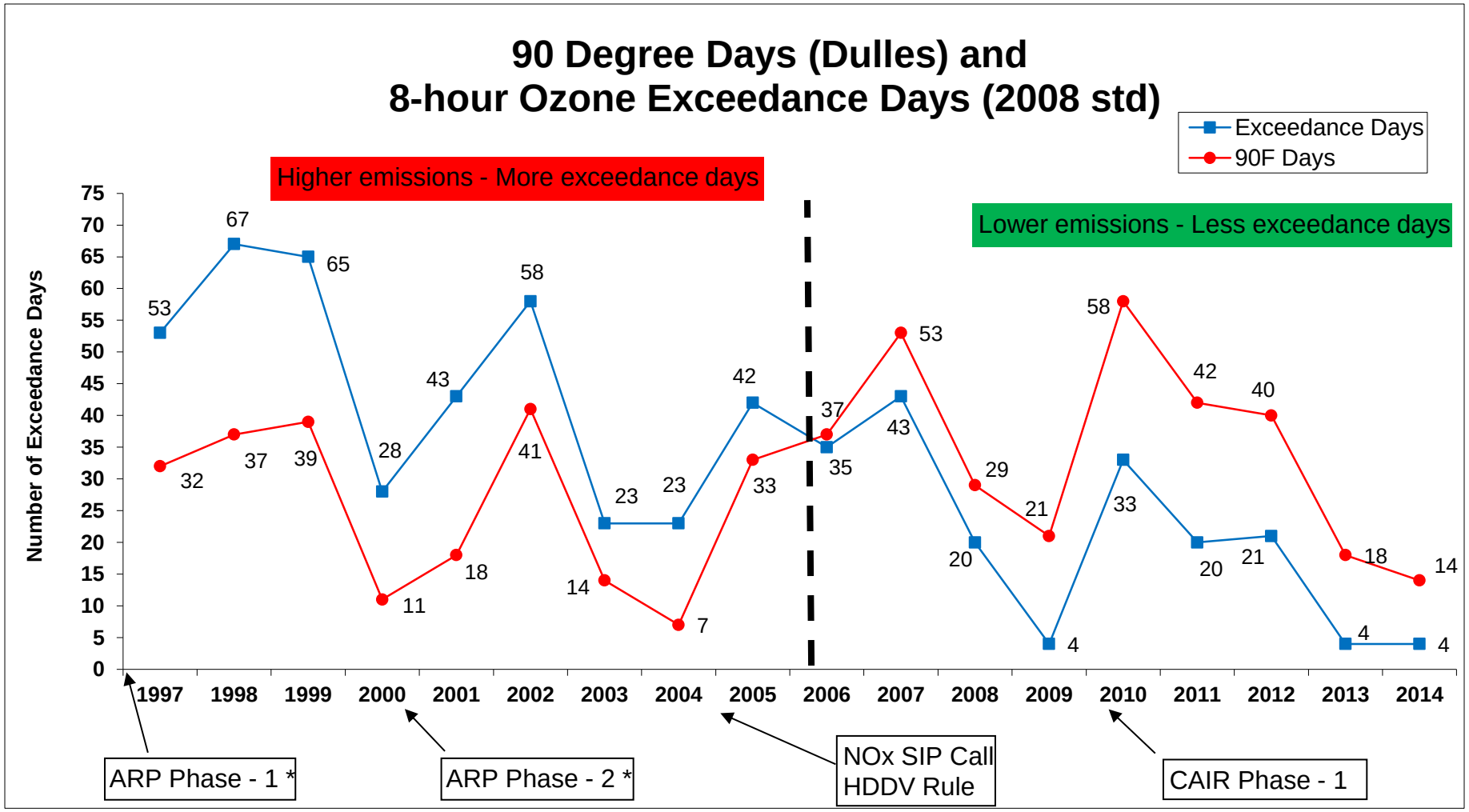
Number of Exceedance Days - 2008 Ozone Standard (75 ppb)

Breakdown of Code Orange, Red, and Purple Days
1997 - 2014



•2014 analysis is based on draft data as of October 7, 2014 and is subject to change.

90 Degree Days and Exceedance Days



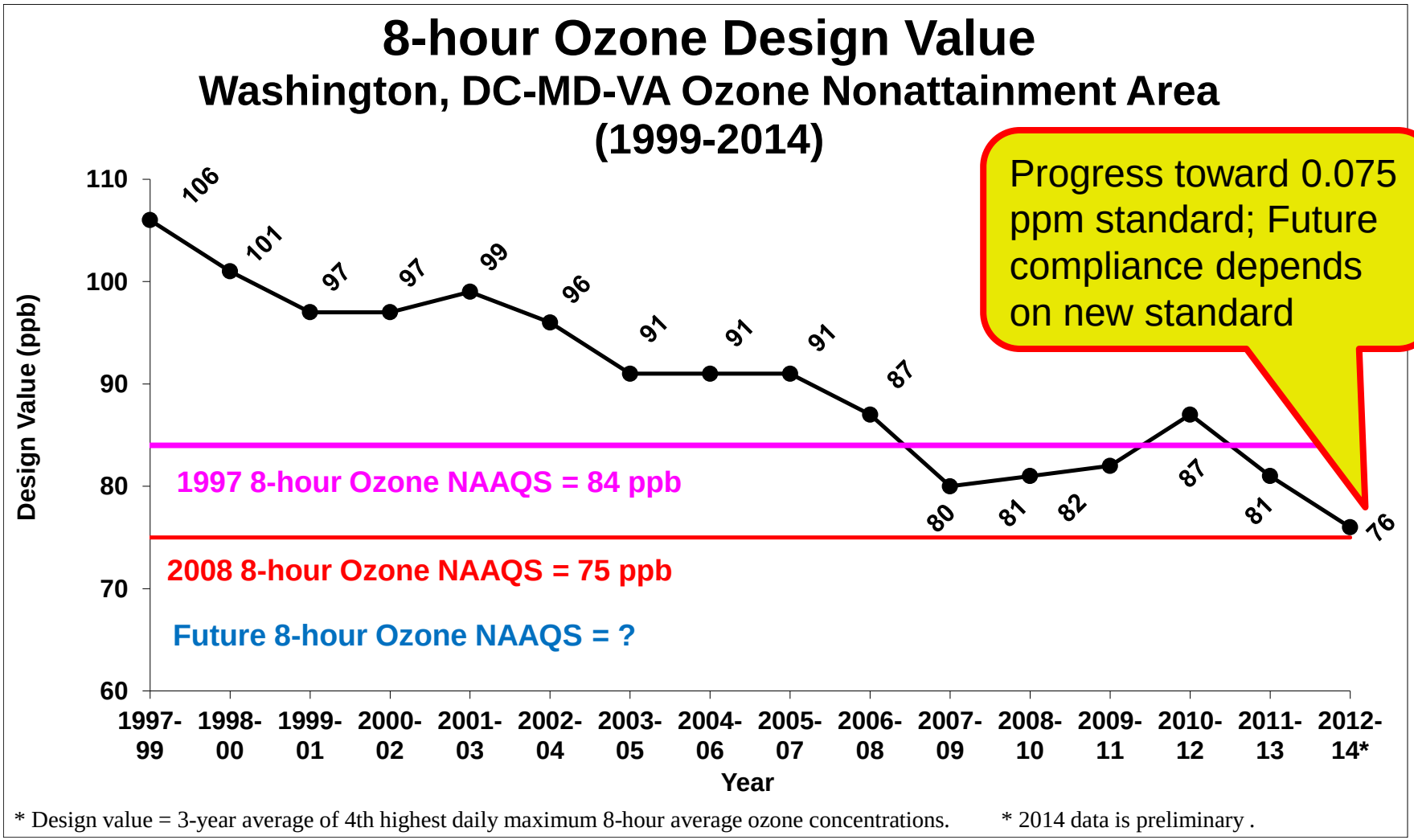
•2014 analysis is based on draft data as of October 7, 2014 and is subject to change.

Why Fewer Exceedance Days Now ?

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)	Ozone Transport Commission Rules	Low VOC Paint
Clean Air Interstate Rule (2009), DC CAIR FIP*	MD LEV Rule	Gas Can Replacement

* DC CAIR was implemented through Federal Implementation Plan.

4th Highest Ozone Value



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

* 2014 data is preliminary .

Fine Particle Summary

[As of October 7, 2014]

24-hour $PM_{2.5}$ Average (µg/m^3)

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						

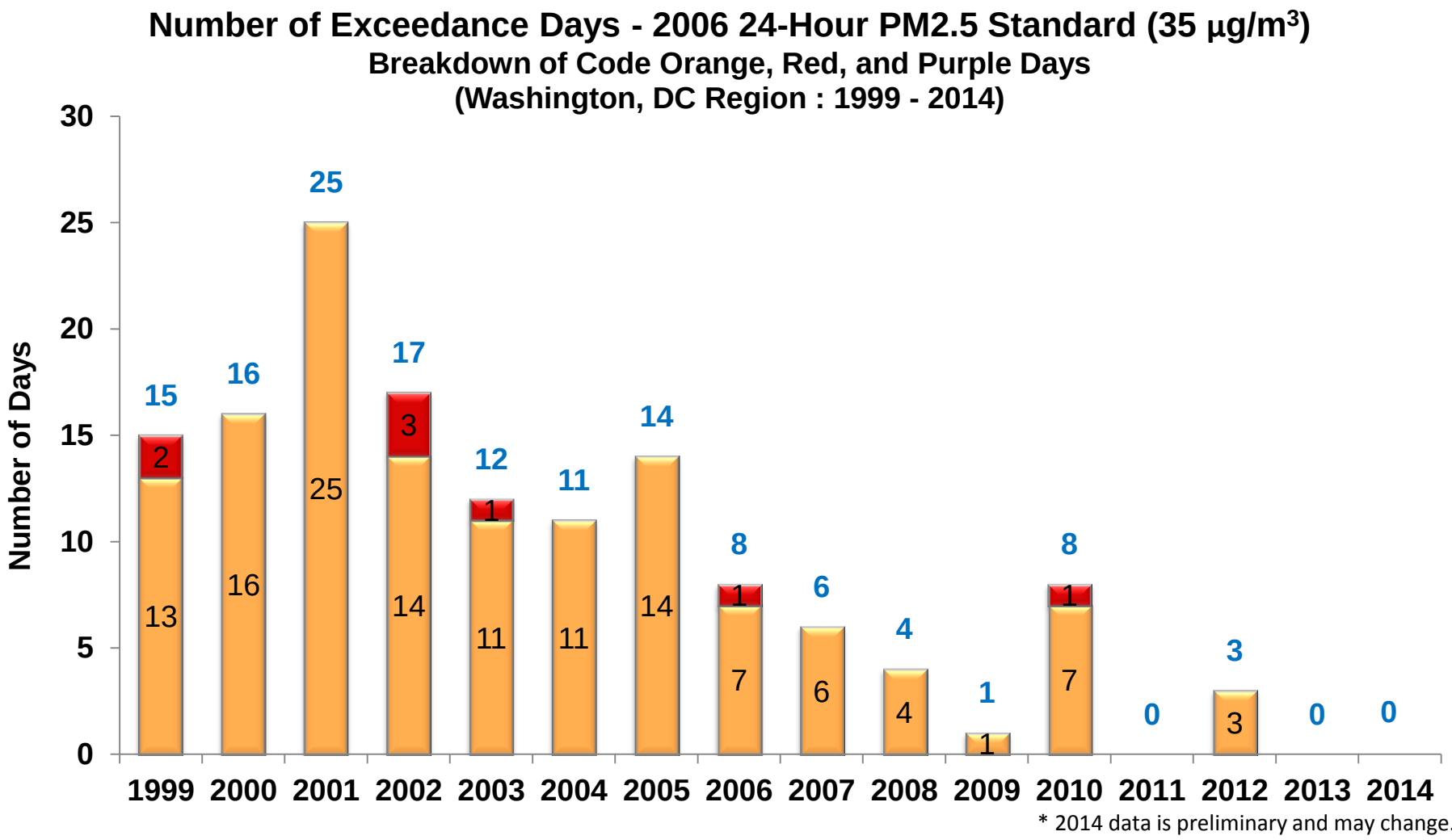
September

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	10.5	7.2	8.6
14	15	16	17	18	19	20
6.1	8.3	9.2	7.5	12.1	12.5	9.7
21	22	23	24	25	26	27
11.5	8.2	5.7	8.5	4.8	7.1	9.3
28	29	30				
12.2	14.5	10.3				

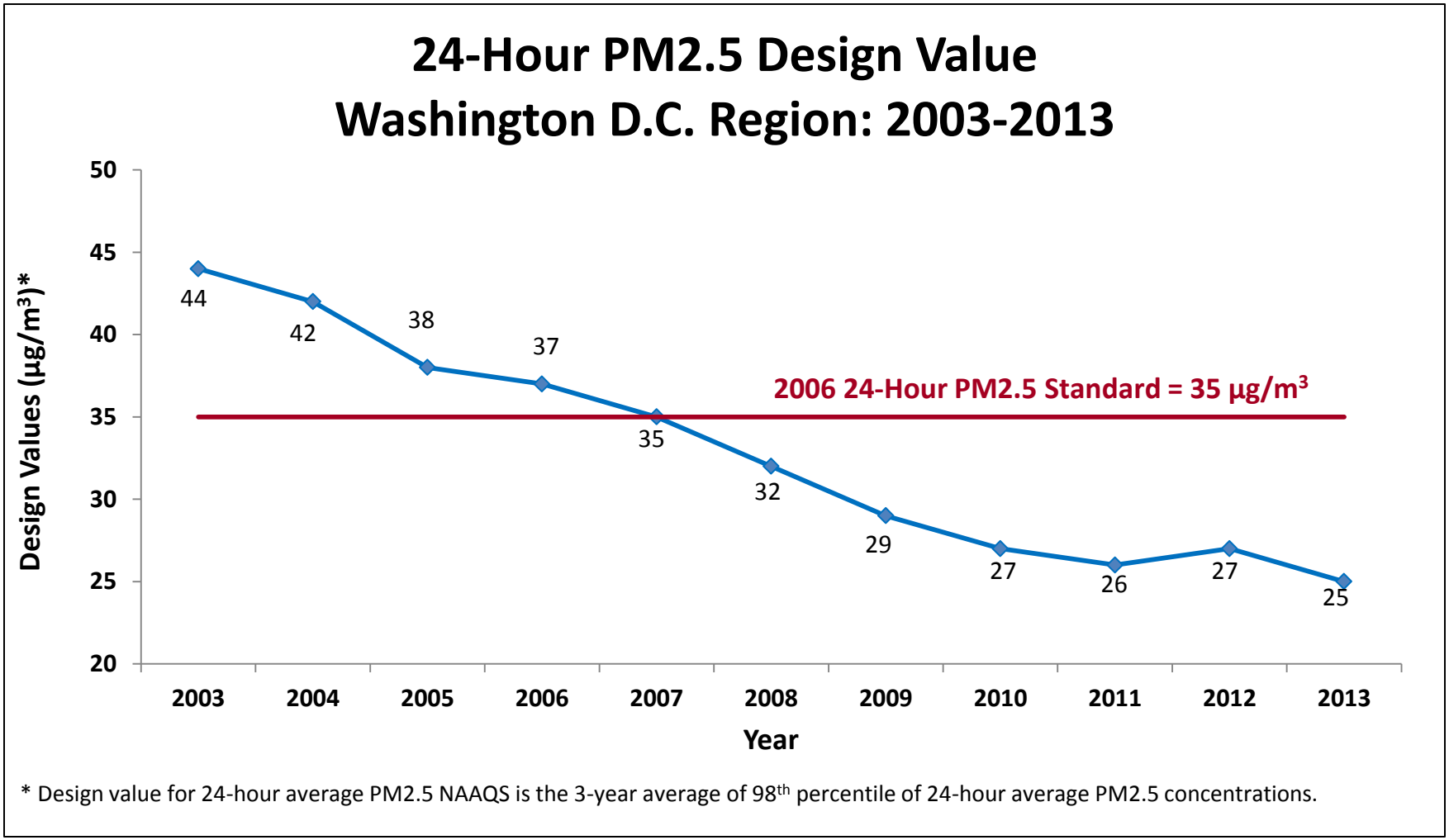
Data based on the 24-hour standard set at 35 µg/m^3. Since April 1, 2014, there have been:

53 Code Yellow Days, 130 Code Green Days

$PM_{2.5}$ Exceedance Trend



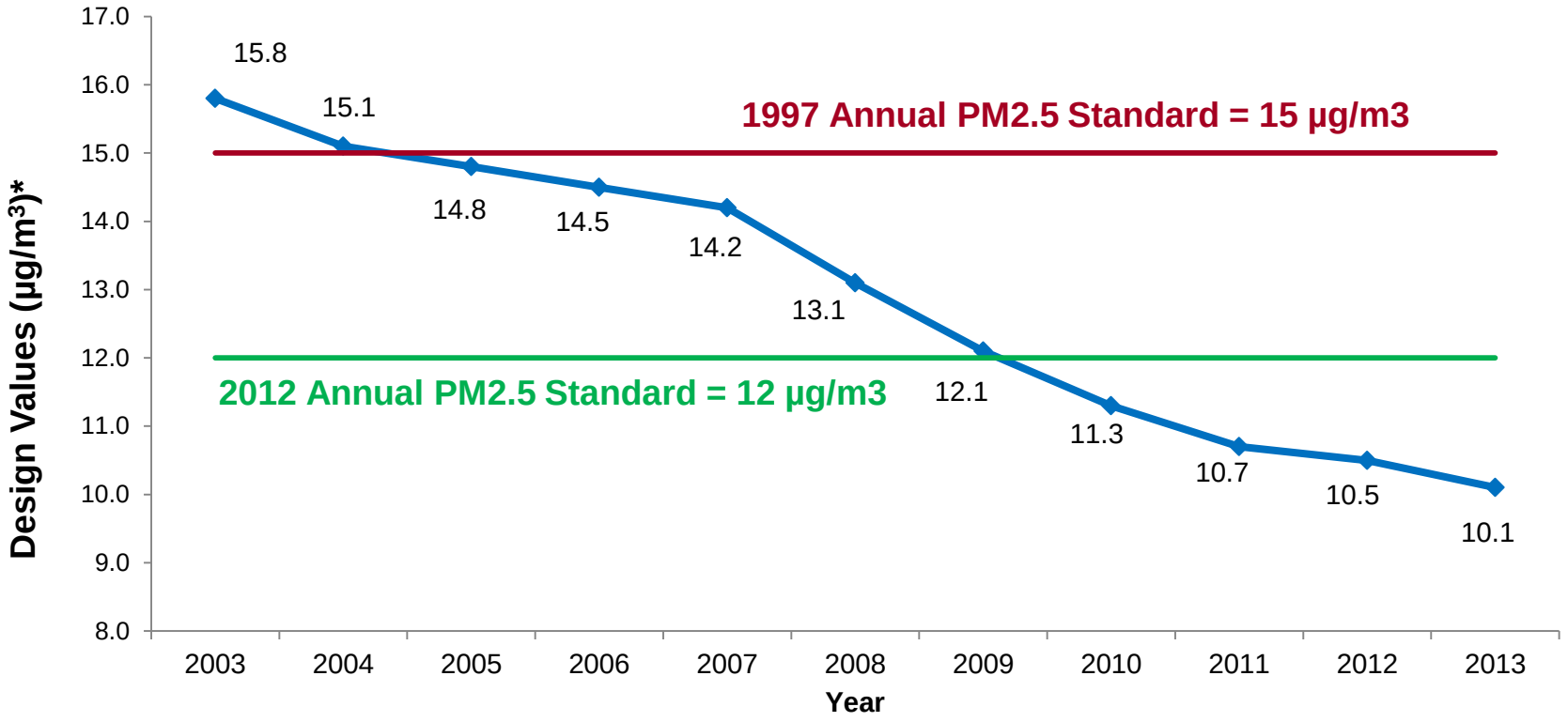
24-Hour $PM_{2.5}$ Design Value Trend



* 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.