2013 Ozone Season Summary & 10 Year Trend

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MWAQC

September 25, 2013

2013 Ozone Season

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					
22	23	24	25	26	27	28
29	30					

Since April 1, 2013, there have been:

4 Code Orange Day, 43 Code Yellow Days, 122 Code Green Days

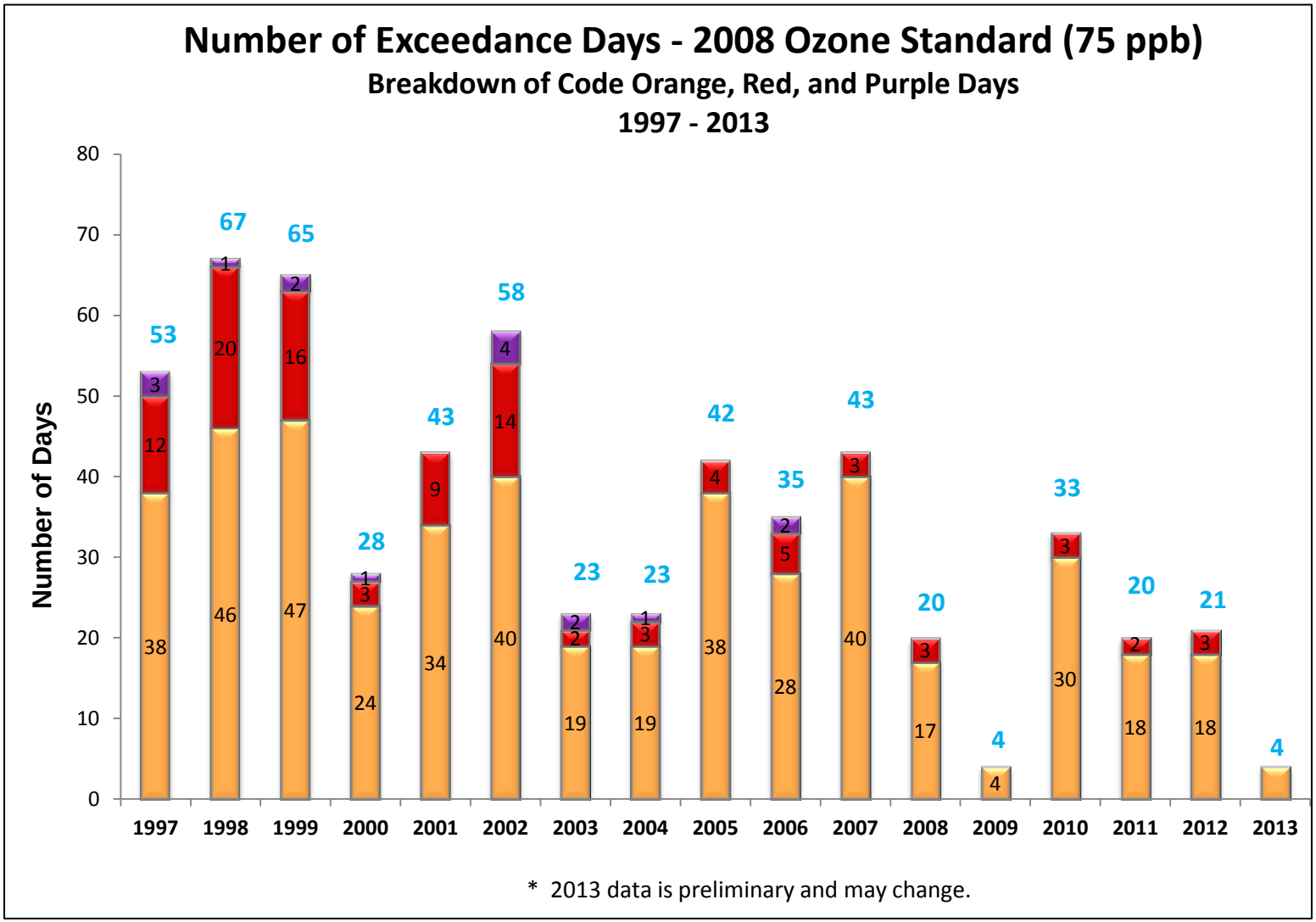
•2013 data is current as of September 16, 2013. Data is subject to change.

2013 Ozone Exceedances

Date	# of Monitors Exceeding	Highest Monitor	Highest Concentration (ppb)
6/5/2013	1	Frederick	76
07/17/2013	1	Franconia	76
07/18/2013	1	Beltsville	77
07/19/2013	1	Beltsville	77

*** 2013 data is current as of Sep 16, 2013 and is subject to change.**

Ozone Exceedance Trend



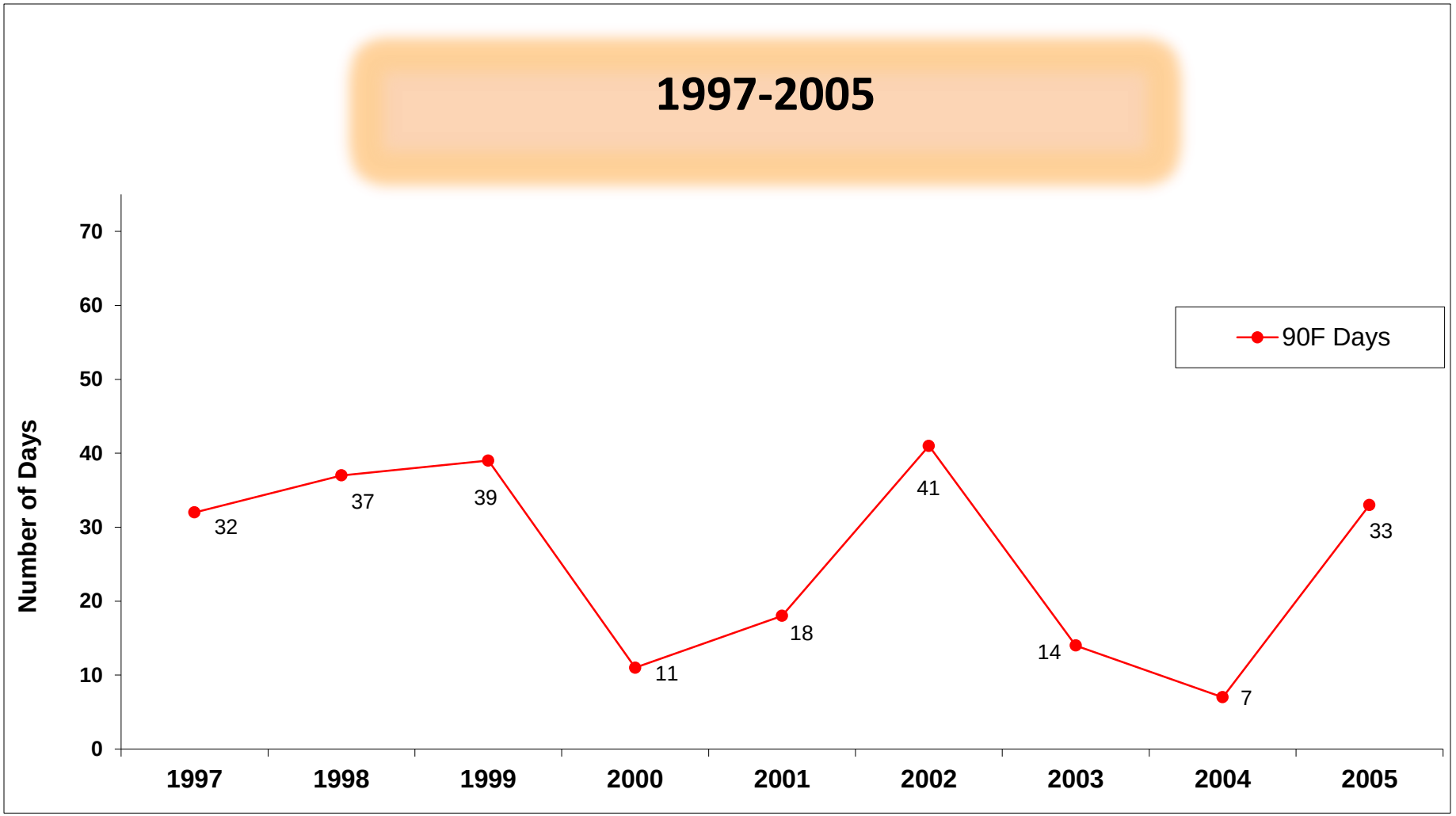
*** 2013 analysis is based on draft data as of September 16, 2013 and is subject to change.**

Ozone Exceedances – Changing Trends

- Two distinct periods in Ozone exceedance trend
  - 1997-2005
  - 2006-2013
- Ozone = Temperature + Emissions
- Higher temp = Higher Ozone
  - 90° temp – Important for ozone exceedance
- Higher emissions = Higher Ozone

90° Days Vs Ozone Exceedance Days

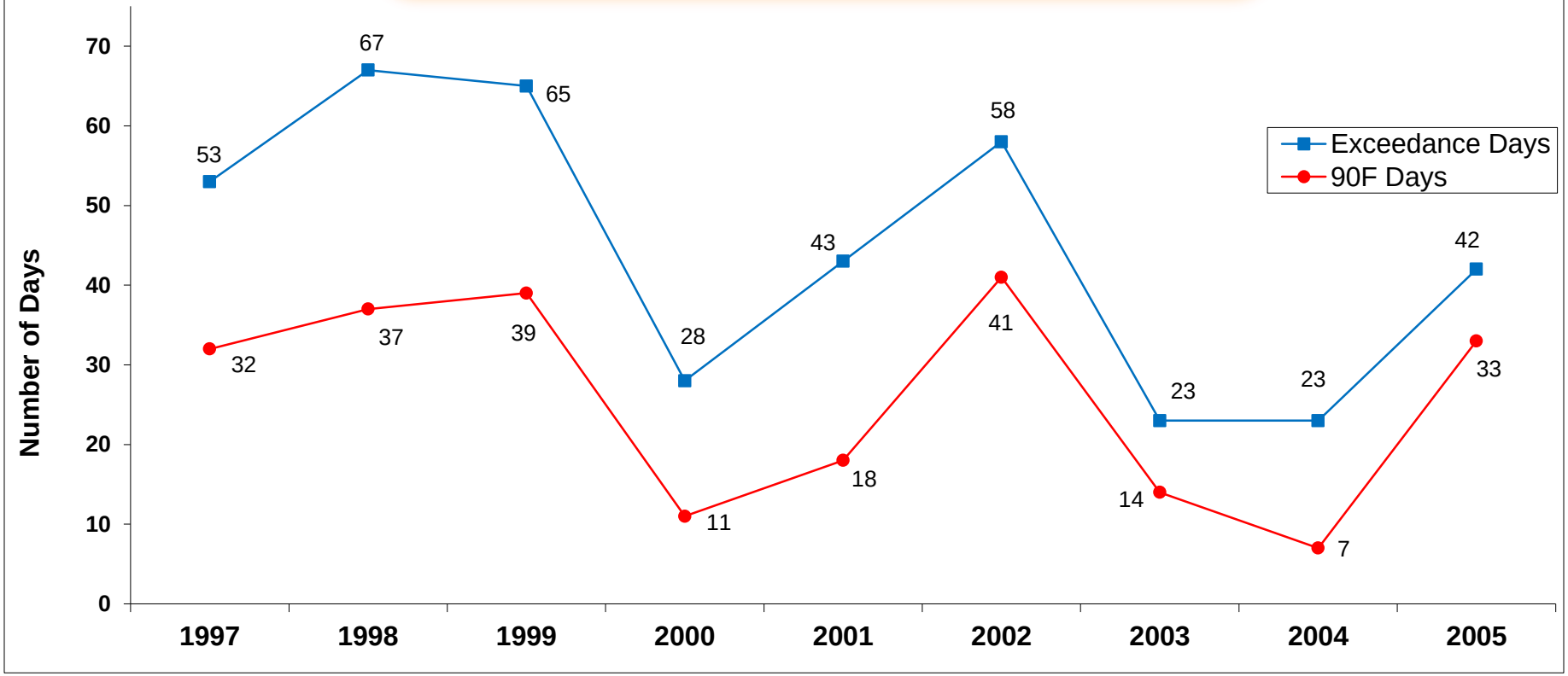
1997-2005



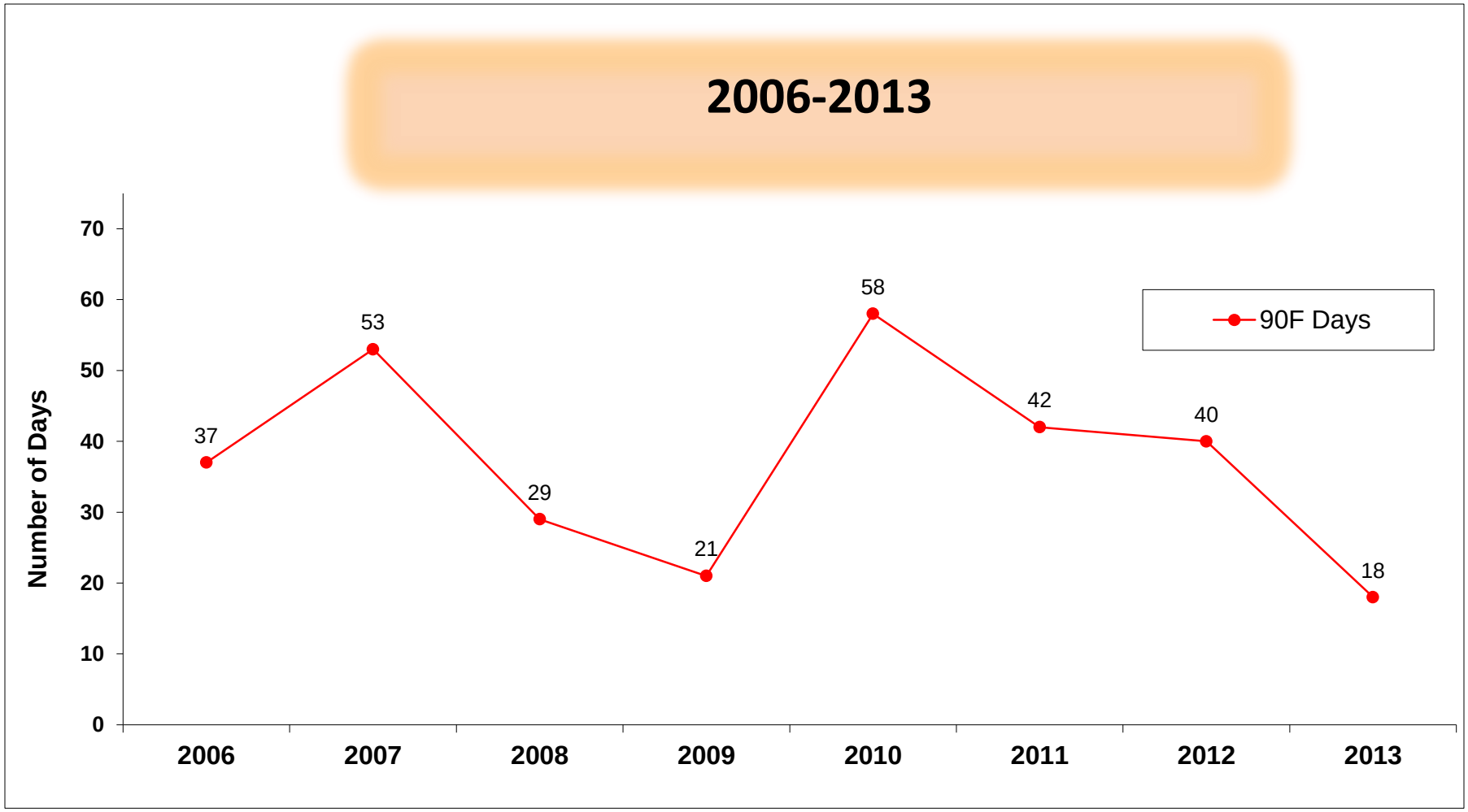
90° Days Vs Ozone Exceedance Days

1997-2005

90 degree temp = Ozone exceedance guaranteed



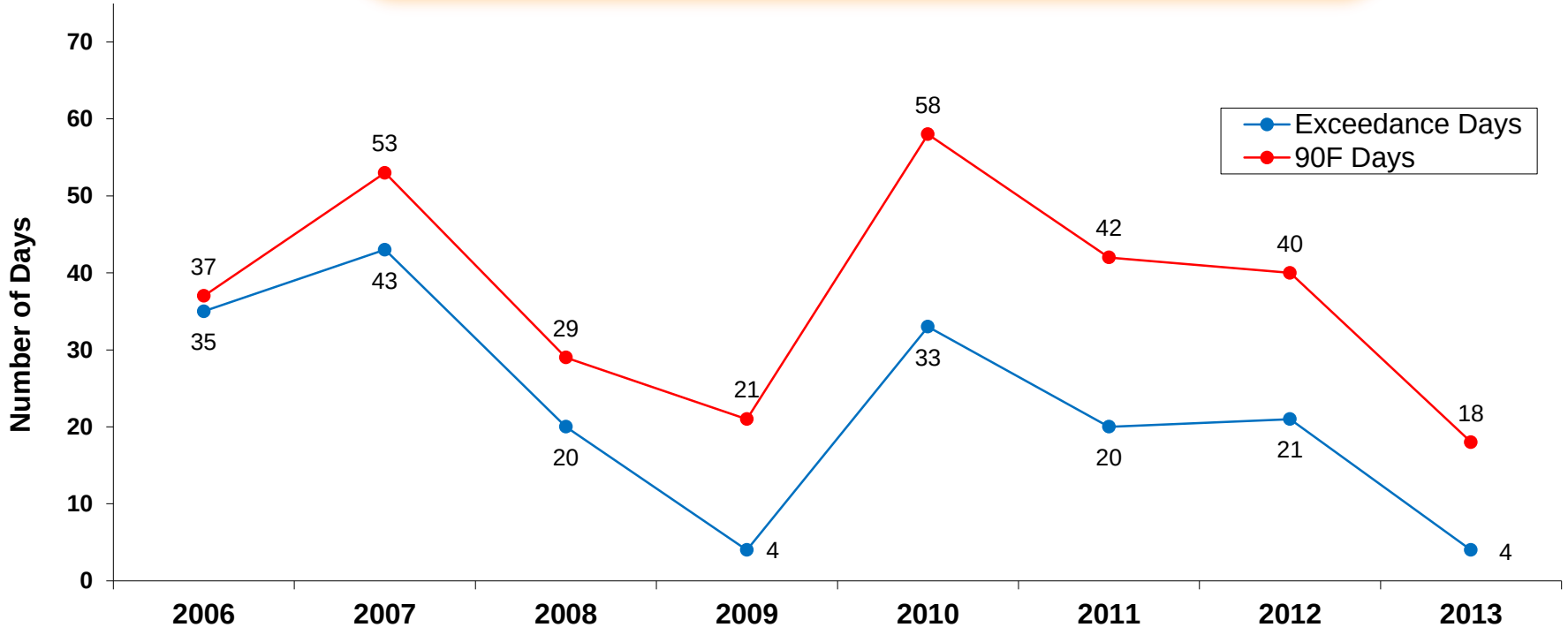
90° Days Vs Ozone Exceedance Days



90° Days Vs Ozone Exceedance Days

2006-2013

90 degree temp = Ozone exceedance not guaranteed



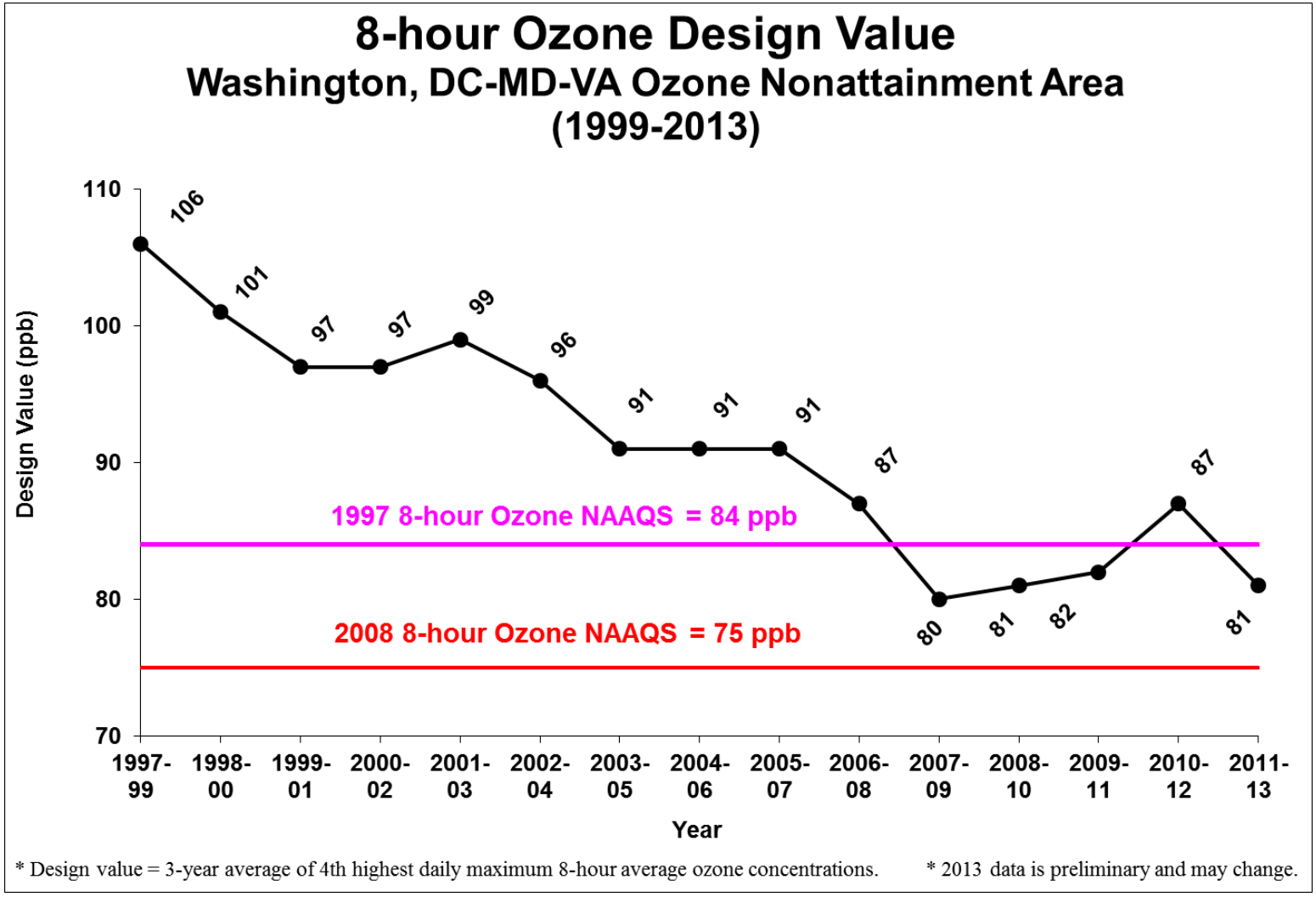
Why less exceedance days now ?

- **Ozone = Temperature + Emissions**
- **Emissions are much lower 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)	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



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

* 2013 data is preliminary and may change.

2013 Fine Particle Summary

24-Hour PM2.5 Concentrations (ug/m3)

April

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	1	2	3	4	5	6
	15.1	7.3	9.4	8.3	13.9	8.7
7	8	9	10	11	12	13
10.1	14.7	14.0	19.0	14.9	13.3	11.8
14	15	16	17	18	19	20
11.6	12.3	12.1	14.7	14.7	9.0	7.3
21	22	23	24	25	26	27
7.9	6.6	13.0	13.6	8.9	9.0	14.2
28	29	30				
11.3	7.0	5.2				

May

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
			1	2	3	4
			7.5	5.5	7.4	6.8
5	6	7	8	9	10	11
9.8	10.0	6.2	9.5	13.0	15.5	13.2
12	13	14	15	16	17	18
7.7	6.5	8.8	15.5	17.2	12.4	7.5
19	20	21	22	23	24	25
11.1	12.4	14.9	20.0	19.3	6.5	7.1
26	27	28	29	30	31	
6.5	8.3	17.1	20.0	16.9	14.7	

June

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
						1
						11.7
2	3	4	5	6	7	8
8.5	9.6	6.8	11.0	7.3	5.9	12.9
9	10	11	12	13	14	15
13.7	4.8	8.8	16.8	10.8	5.2	13.2
16	17	18	19	20	21	22
14.3	13.4	14.9	8.6	8.7	9.0	6.6
23	24	25	26	27	28	29
7.4	9.6	10.7	9.1	9.7	7.4	7.8
30						
12.5						

July

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	1	2	3	4	5	6
	4.2	4.3	6.1	7.0	6.5	5.7
7	8	9	10	11	12	13
4.3	5.5	13.7	9.7	8.2	9.7	6.5
14	15	16	17	18	19	20
6.2	11.9	14.5	19.6	21.2	22.3	13.7
21	22	23	24	25	26	27
10.2	8.0	7.1	8.0	7.1	9.4	12.0
28	29	30	31			
10.5	8.6	13.1	14.8			

August

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
				1	2	3
				9.5	10.3	11.6
4	5	6	7	8	9	10
5.8	5.6	8.2	9.9	8.8	10.2	9.8
11	12	13	14	15	16	17
12.3	16.9	12.5	4.4	5.7	6.5	7.9
18	19	20	21	22	23	24
6.8	7.4	10.3	11.1	7.8	10.7	7.7
25	26	27	28	29	30	31
5.1	7.1	20.6	15.1	16.4	14.0	12.0

September

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1	2	3	4	5	6	7
9.0	8.8	9.2	6.8	10.3	5.3	10.1
8	9	10	11	12	13	14
14.1	5.7	19.8	21.2	15.3	6.6	6.5
15	16	17	18	19	20	21
7.9	9.3					
22	23	24	25	26	27	28
29	30					

Since April 1, 2013, there have been:

55 Code Yellow Days and 114 Code Green Days

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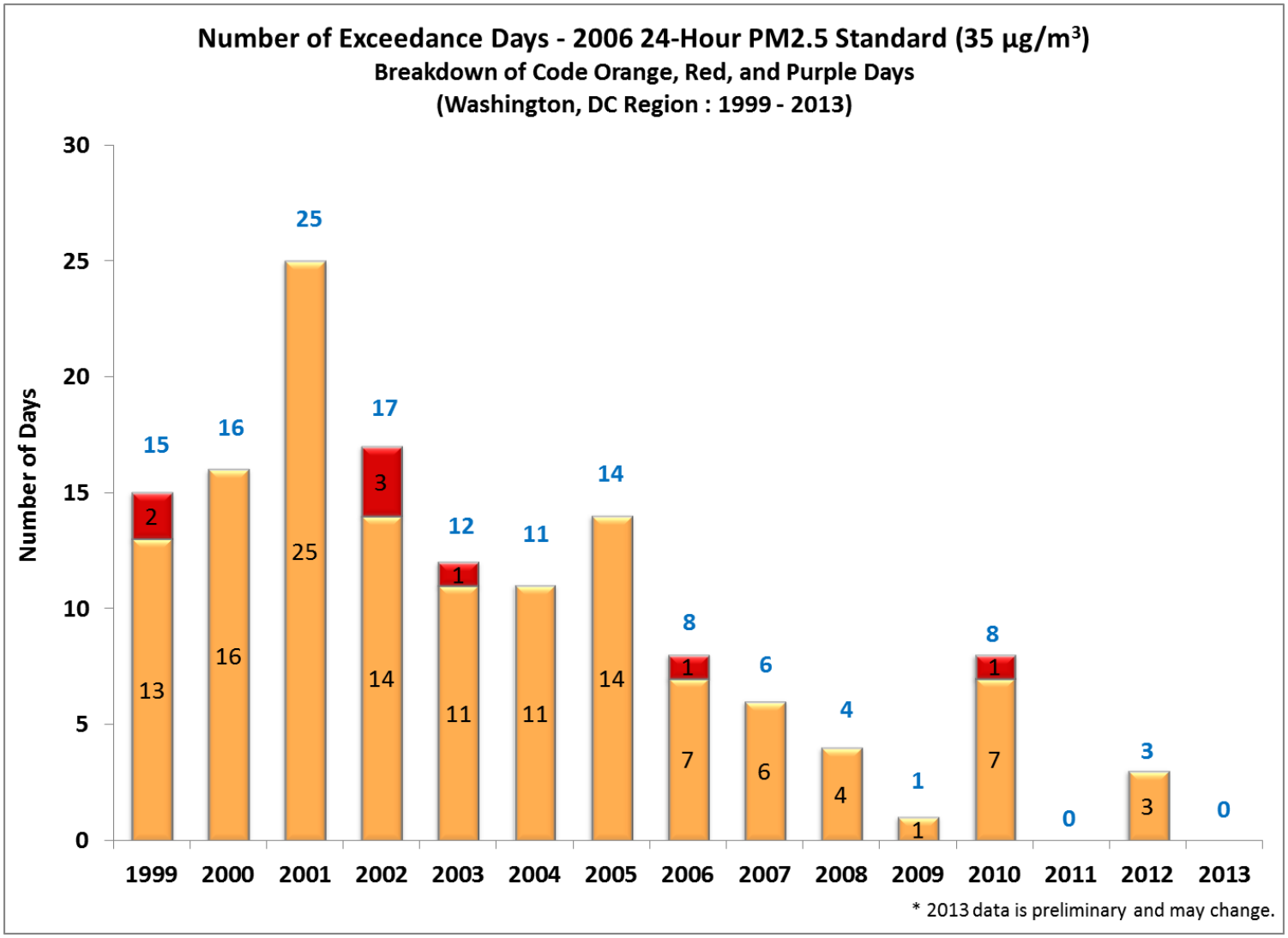
PM2.5 Exceedance Trend



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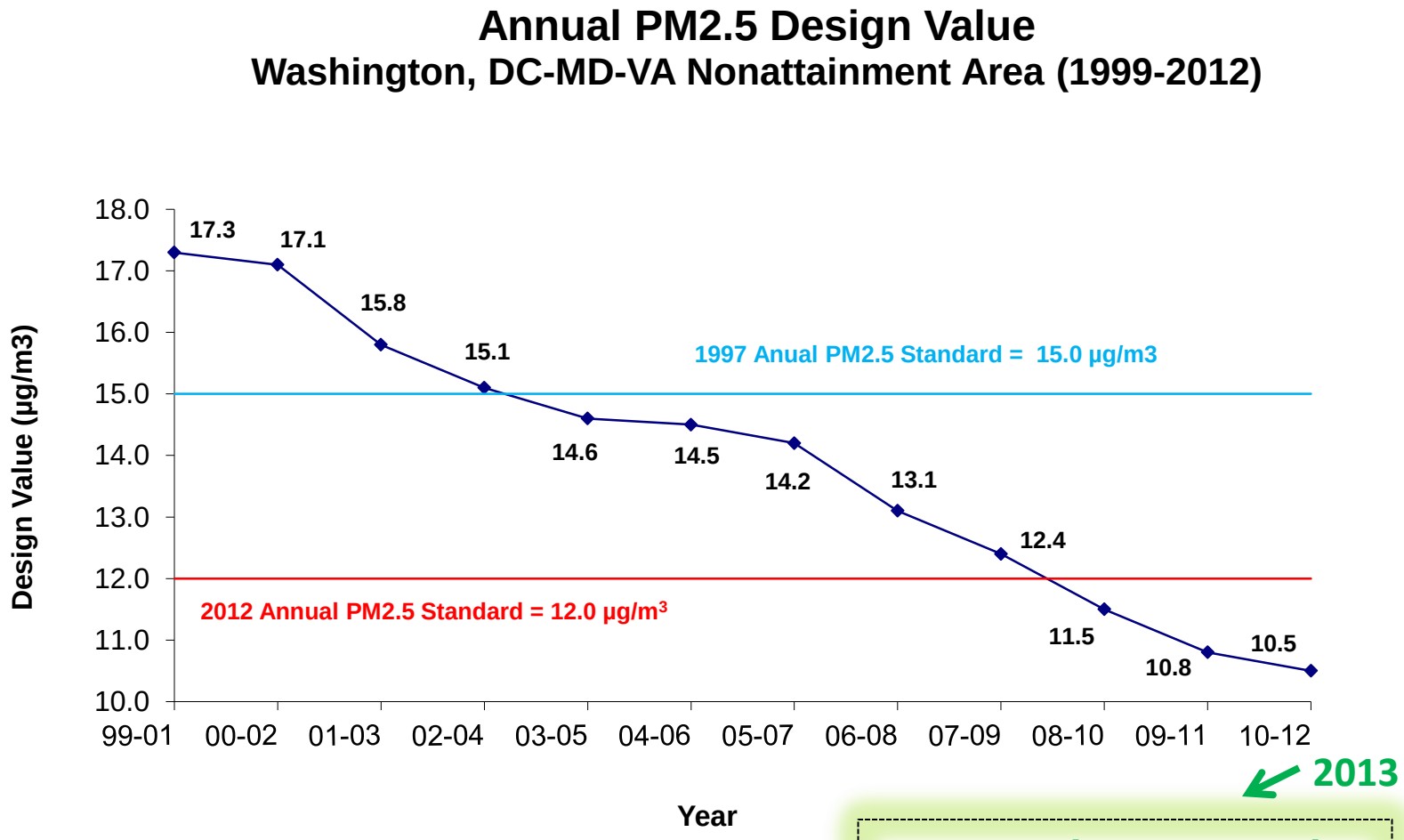
Annual $PM_{2.5}$ Design Value Trend

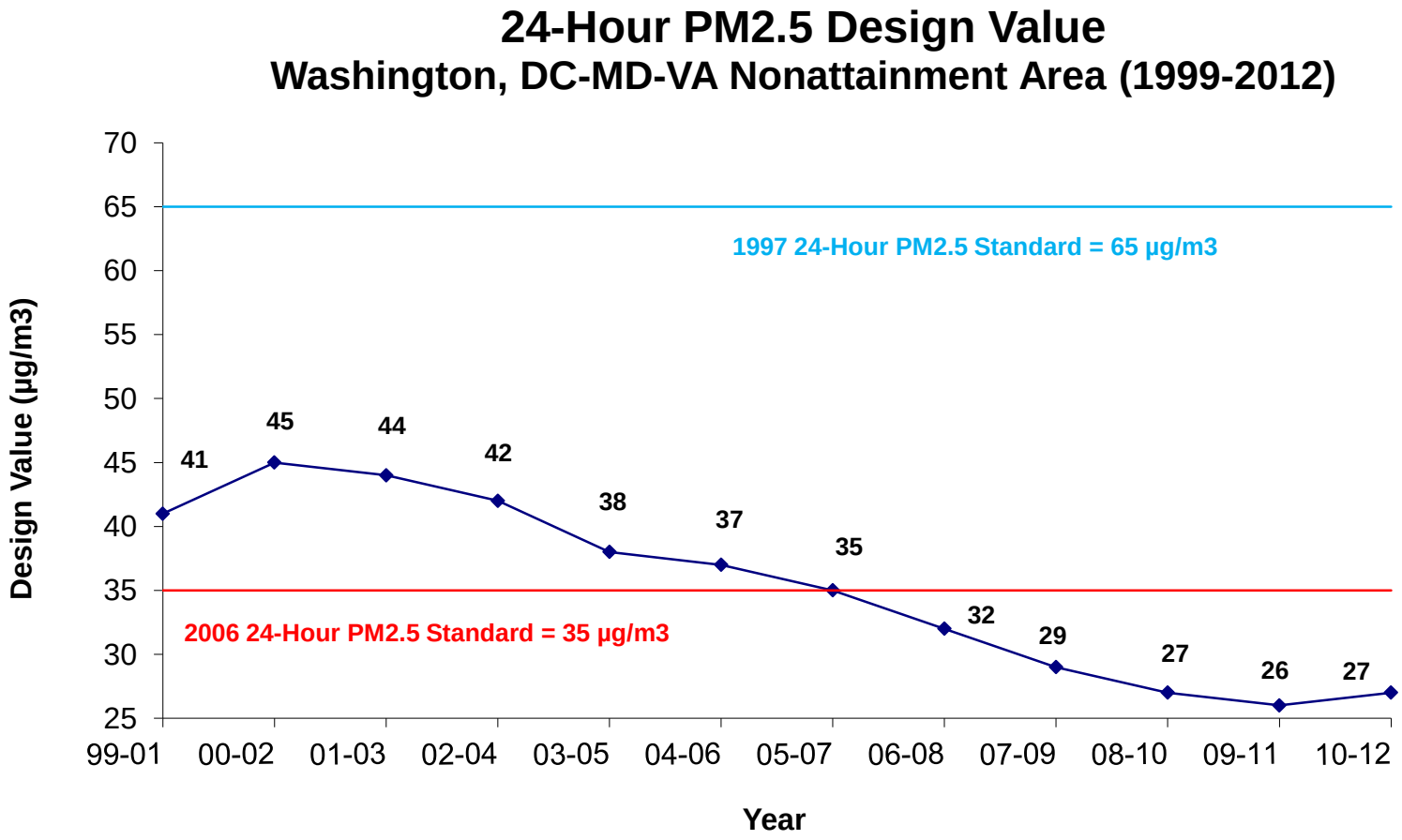


2013

PM2.5 Maintenance Plan

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

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



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