



Ozone Season Summary

2015

Sunil Kumar

MWAQC-TAC Meeting

September 8, 2015



Ozone Season Summary

Peak 8-Hour Ozone Concentrations (ppb)

APRIL 2015							MAY 2015							JUNE 2015						
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
		51	62	46	46	53					43	52	68	1	2	3	4	5	6	7
6	7	8	9	10	11	12	4	5	6	7	8	9	10	8	9	10	11	12	13	14
57	45	39	37	42	58	60	67	71	67	70	72	45	41	56	60	67	88	60	59	57
13	14	15	16	17	18	19	11	12	13	14	15	16	17	15	16	17	18	19	20	21
60	43	53	58	51	65	58	48	59	46	59	60	61	40	45	42	55	46	47	52	46
20	21	22	23	24	25	26	18	19	20	21	22	23	24	22	23	24	25	26	27	28
48	52	54	50	55	48	52	52	52	47	38	59	60	68	68	52	63	64	60	43	42
27	28	29	30				25	26	27	28	29	30	31	29	30					
47	50	61	60				60	65	48	69	66	52	43	53	58					

JULY 2015							AUGUST 2015							SEPTEMBER 2015						
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
		60	46	62	54	54						67	54		1	2	3	4	5	6
6	7	8	9	10	11	12	3	4	5	6	7	8	9	7	8	9	10	11	12	13
39	62	41	39	60	57	71	62	64	73	55	53	55	55			72	77	68		
13	14	15	16	17	18	19	10	11	12	13	14	15	16	14	15	16	17	18	19	20
50	54	56	60	48	48	62	37	52	48	55	75	75	67							
20	21	22	23	24	25	26	17	18	19	20	21	22	23	21	22	23	24	25	26	27
68	54	56	67	68	63	62	68	59	44	39	63	60	69							
27	28	29	30	31			24	25	26	27	28	29	30	28	29	30				
58	70	49	51	67			31	62												

* Since April 1, 2015, there have been 2 Code Orange Days, 60 Code Yellow Days, and 94 Code Green Days

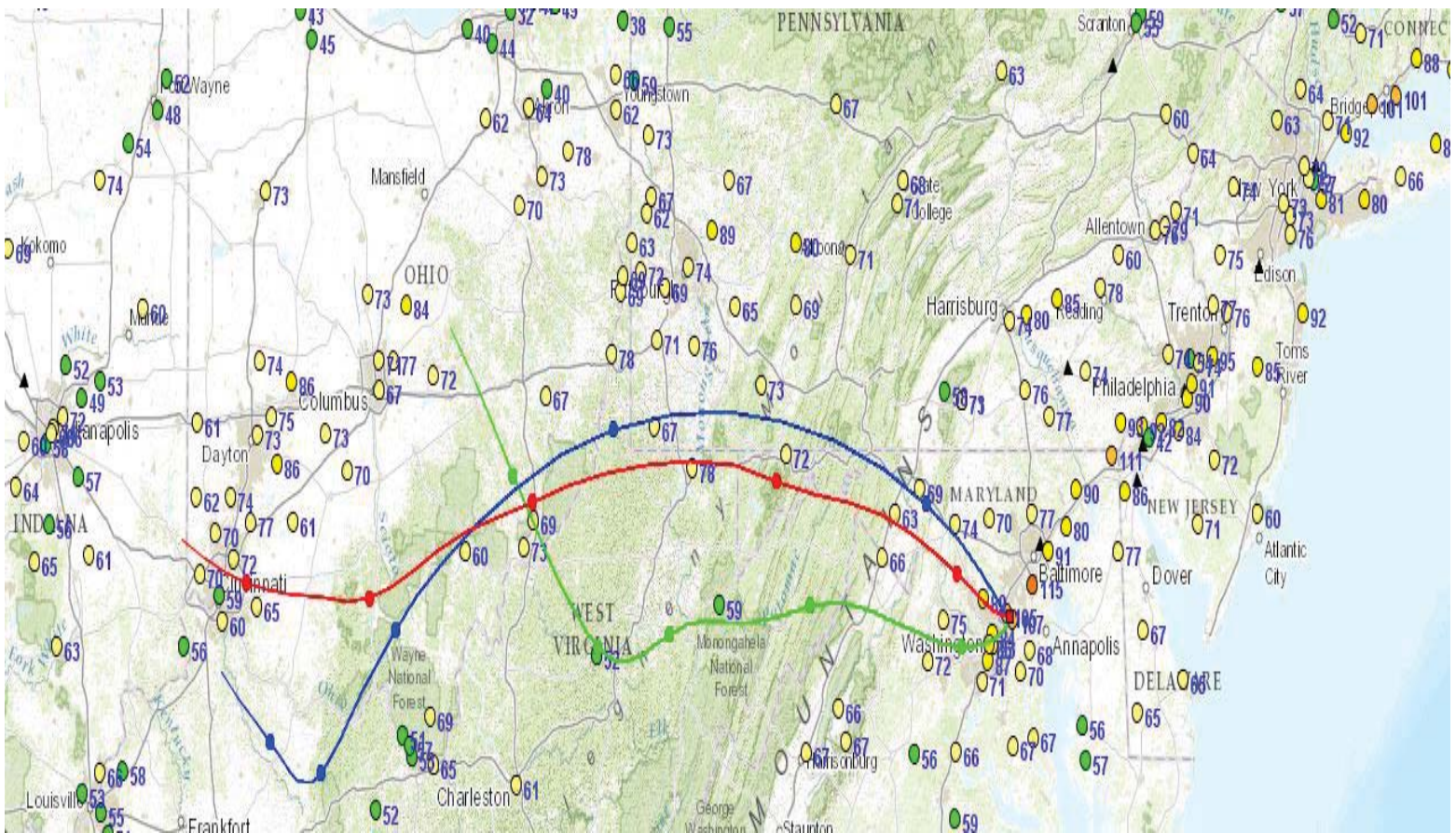


Meteorology Factors on Exceedance Days

- June 11 & September 2
 - High Temperatures: 92°F/93°F
 - Light winds
 - Westerly winds brought ozone from Ohio River Valley
 - Similar conditions during the previous day caused ozone to build up
 - Clear skies
 - Recirculation (September 2)
 - Canadian wildfire smoke (June 11 only)

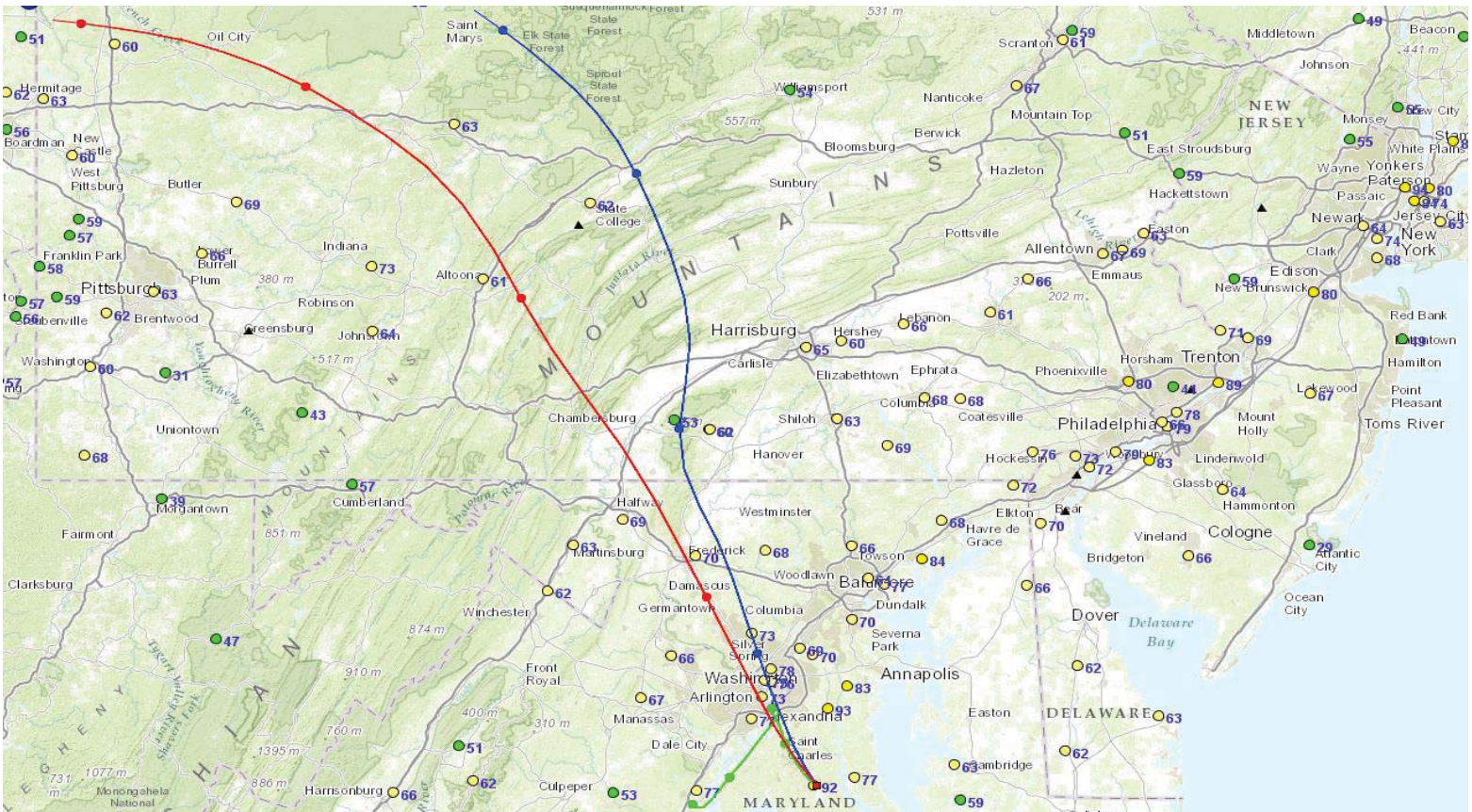


Wind Trajectories (June 11)





Wind Trajectories (September 2)





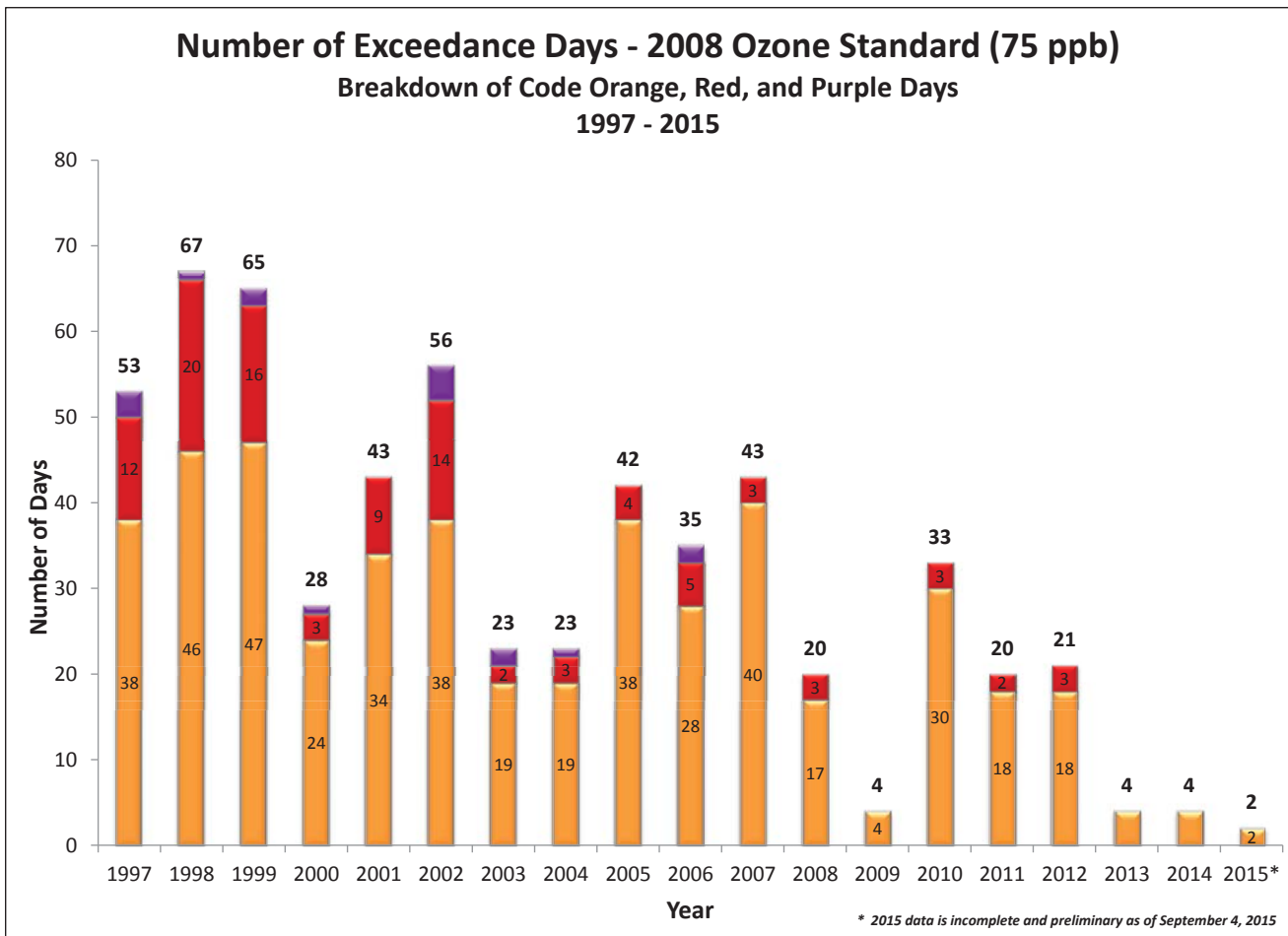
2014 Ozone Exceedances

Date	Monitors Exceeding	Highest Monitor	8-Hr Max (ppb)
6/11/15	6	HU-Beltsville	88
9/2/2015	1	Southern Maryland	77

*Analysis is based on draft data as of September 4, 2015. Data is subject to change.

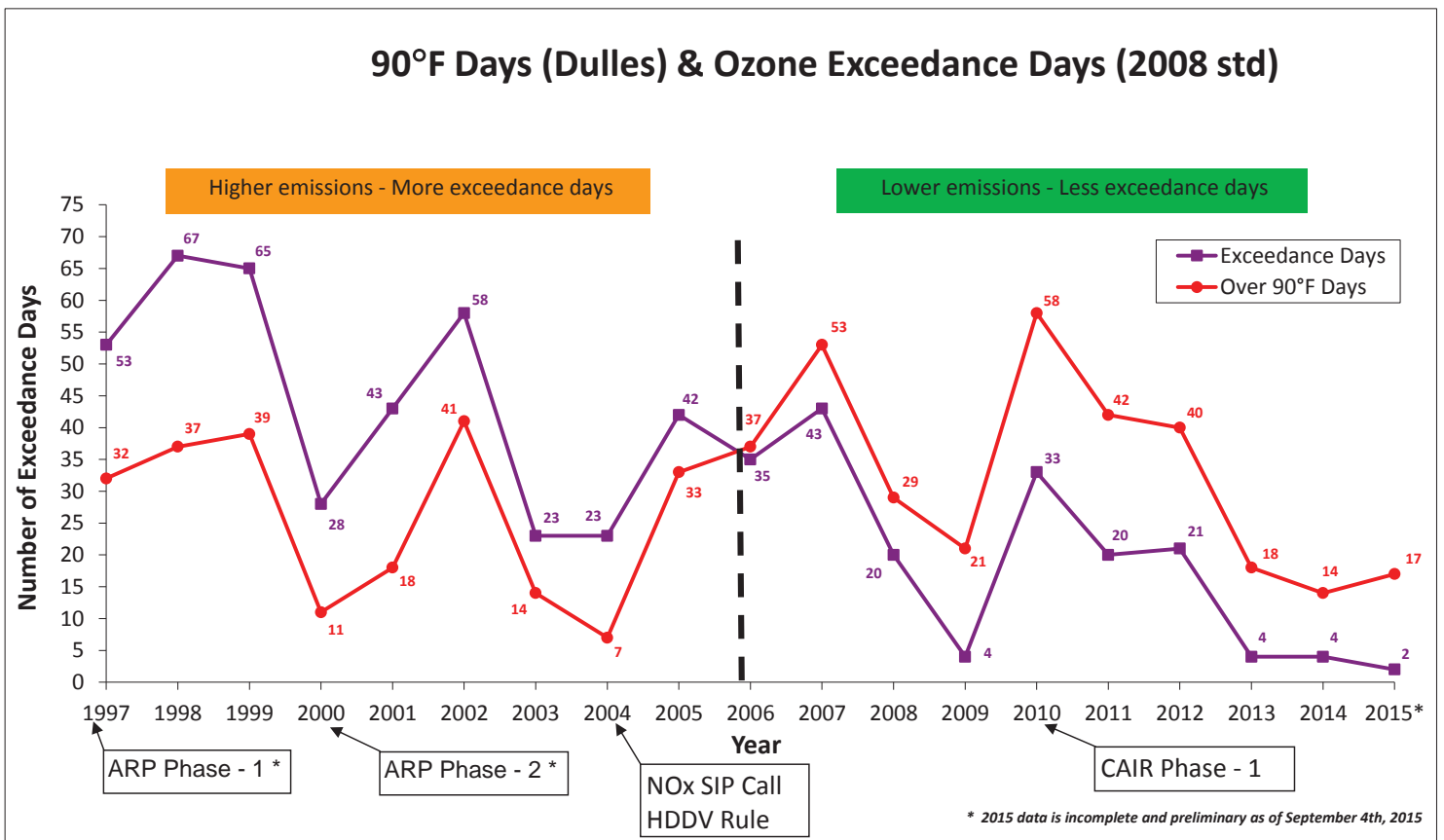


Ozone Exceedance Trend





Trends of 90°F Days and Exceedance Days





Why Fewer Exceedance Days Now ?

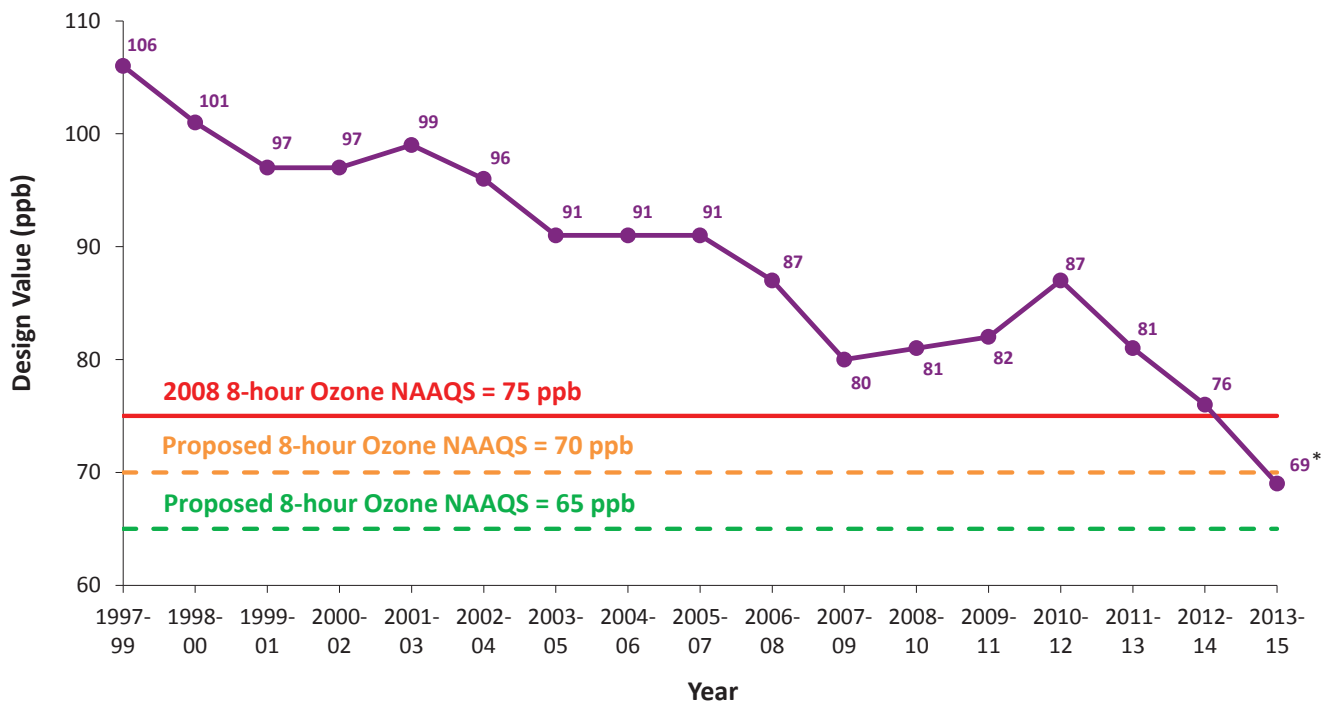
Emission Control Programs

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 CSAPR Rule	VRE Idling Reduction
NOx SIP Call (2004)	DC CSAPR Rule	Low VOC Paint
Clean Air Interstate Rule/CSAPR (2009/2015)	Ozone Transport Commission Rules	Gas Can Replacement



Ozone Design Value Trend

8-hour Ozone Design Value for the Washington, DC-MD-VA Ozone Nonattainment Area (1999-2015)



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

* 2015 design value is preliminary and based on incomplete data as of September 4, 2015.



Fine Particle Summary

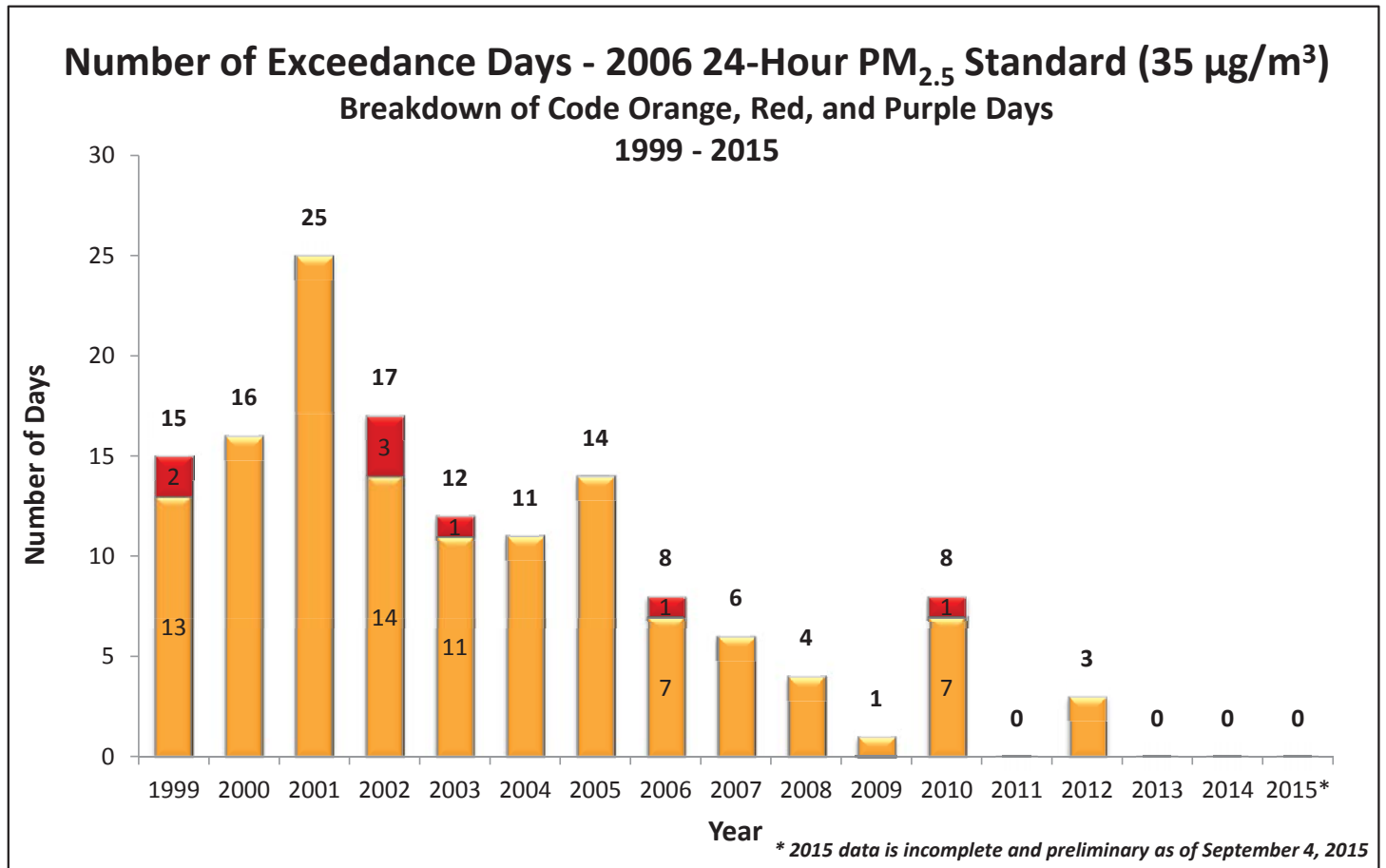
24-hour PM_{2.5} Concentrations (µg/m³)

APRIL 2015							MAY 2015							JUNE 2015						
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
		1	2	3	4	5					1	2	3	1	2	3	4	5	6	7
		10.5	11.4	16.6	7.5	6.8					13.1	14.3	19.2	9.7	4.7	6.8	7.7	6.5	9.9	9.6
6	7	8	9	10	11	12	4	5	6	7	8	9	10	8	9	10	11	12	13	14
10.1	16.7	8.8	12.1	12.7	8.2	9.1	21.2	24.4	21.5	16.7	18.7	12.7	17.4	10.0	11.5	24.6	32.5	17.2	14.2	13.9
13	14	15	16	17	18	19	11	12	13	14	15	16	17	15	16	17	18	19	20	21
11.6	13.4	8.9	10.0	13.5	17.2	13.9	20.5	16.1	6.5	5.6	9.3	15.8	11.0	10.5	8.8	10.5	9.1	14.0	11.7	8.1
20	21	22	23	24	25	26	18	19	20	21	22	23	24	22	23	24	25	26	27	28
12.7	11.3	12.5	9.0	7.6	11.0	10.9	12.7	10.6	8.4	8.5	8.4	6.0	11.5	10.3	15.0	6.0	11.2	12.6	5.7	5.1
27	28	29	30				25	26	27	28	29	30	31	29	30					
10.9	11.0	13.2	16.3				14.1	13.5	11.2	12.7	14.2	8.7	12.2	8.2	10.9					
JULY 2015							AUGUST 2015							SEPTEMBER 2015						
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
		1	2	3	4	5						1	2		1	2	3	4	5	6
		20.5	22.1	21.9	29.2	20.1						11.4	12.4		18.1	26.7	21.7			
6	7	8	9	10	11	12	3	4	5	6	7	8	9	7	8	9	10	11	12	13
12.4	20.2	17.8	10.9	12.1	15.5	17.2	10.7	11.3	10.9	10.7	10.8	9.0	10.2							
13	14	15	16	17	18	19	10	11	12	13	14	15	16	14	15	16	17	18	19	20
16.5	10.1	6.1	6.7	11.6	10.1	14.2	9.3	10.9	6.8	5.9	9.3	12.5	15.8							
20	21	22	23	24	25	26	17	18	19	20	21	22	23	21	22	23	24	25	26	27
11.5	13.0	9.1	9.6	9.7	13.9	13.7	14.1	17.1	12.4	9.2	7.4	8.7	8.7	28	29	30				
27	28	29	30	31			24	25	26	27	28	29	30							
14.2	17.2	10.6	12.9	10.4			12.7	9.7	10.0	8.8	11.4	12.6	15.7							
							17.2													

* Since April 1, 2015, there have been 72 Code Yellow Days and 84 Code Green Days

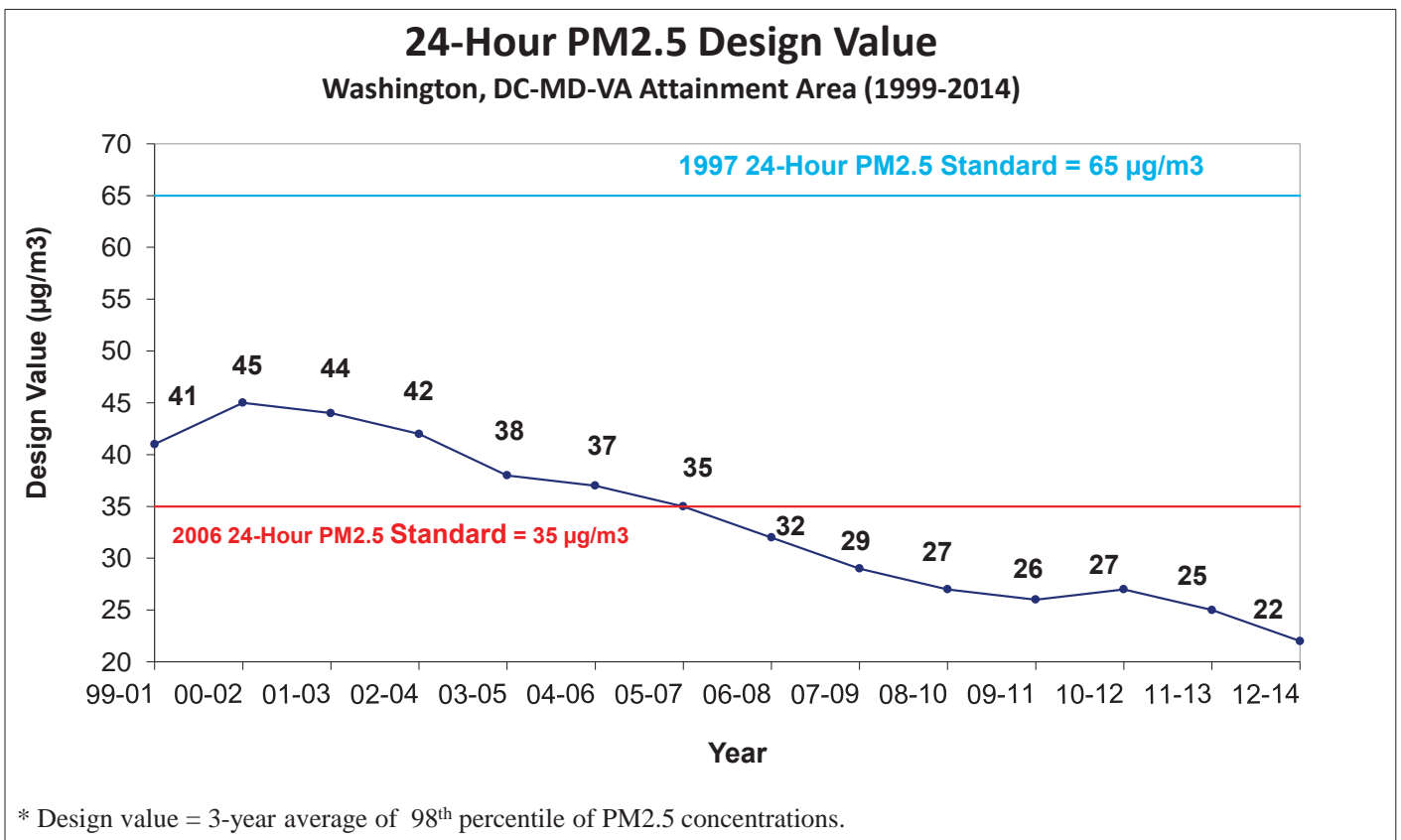


PM_{2.5} Exceedance Trend





24-Hour PM_{2.5} Design Value Trend





Annual PM_{2.5} Design Value Trend

