OZONE SEASON SUMMARY 2017

Sunil Kumar
Principal Environmental Engineer

MWAQC-Technical Advisory Committee
October 10th, 2017

Metropolitan Washington
Council of Governments

Peak 8-Hour Average Ozone Levels (ppb)

April 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
26	27	28	29	30	31	01 **39**
02 **56**	03 **50**	04 **52**	05 **57**	06 **47**	07 **43**	08 **57**
09 **62**	10 **68**	11 **71**	12 **61**	13 **54**	14 **64**	15 **57**
16 **55**	17 **45**	18 **58**	19 **43**	20 **48**	21 **45**	22 **28**
23 **33**	24 **37**	25 **35**	26 **35**	27 **57**	28 **61**	29 **49**
30 **46**	01	02	03	04	05	06

May 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30	01 **35**	02 **55**	03 **49**	04 **48**	05 **40**	06 **33**
07 **43**	08 **54**	09 **58**	10 **68**	11 **48**	12 **35**	13 **34**
14 **61**	15 **51**	16 **64**	17 **76**	18 **72**	19 **55**	20 **43**
21 **45**	22 **35**	23 **33**	24 **50**	25 **46**	26 **48**	27 **49**
28 **49**	29 **48**	30 **43**	31 **57**	01	02	03
04	05	06	07	08	09	10

June 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
28	29	30	31	01 **61**	02 **66**	03 **63**
04 **62**	05 **50**	06 **53**	07 **41**	08 **59**	09 **62**	10 **70**
11 **61**	12 **74**	13 **72**	14 **73**	15 **64**	16 **58**	17 **43**
18 **45**	19 **36**	20 **57**	21 **61**	22 **60**	23 **29**	24 **52**
25 **51**	26 **55**	27 **53**	28 **56**	29 **65**	30 **63**	01
02	03	04	05	06	07	08

July 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
25	26	27	28	29	30	01 **43**
02 **59**	03 **64**	04 **64**	05 **56**	06 **36**	07 **57**	08 **58**
09 **51**	10 **56**	11 **56**	12 **58**	13 **56**	14 **59**	15 **57**
16 **55**	17 **56**	18 **66**	19 **76**	20 **80**	21 **68**	22 **63**
23 **48**	24 **60**	25 **43**	26 **57**	27 **56**	28 **46**	29 **36**
30 **47**	31 **61**	01	02	03	04	05

8 Code Orange Days, 74 Code Yellow Days, 101 Code Green Days

Analysis is based on draft data as of October 5, 2017. Data is subject to change
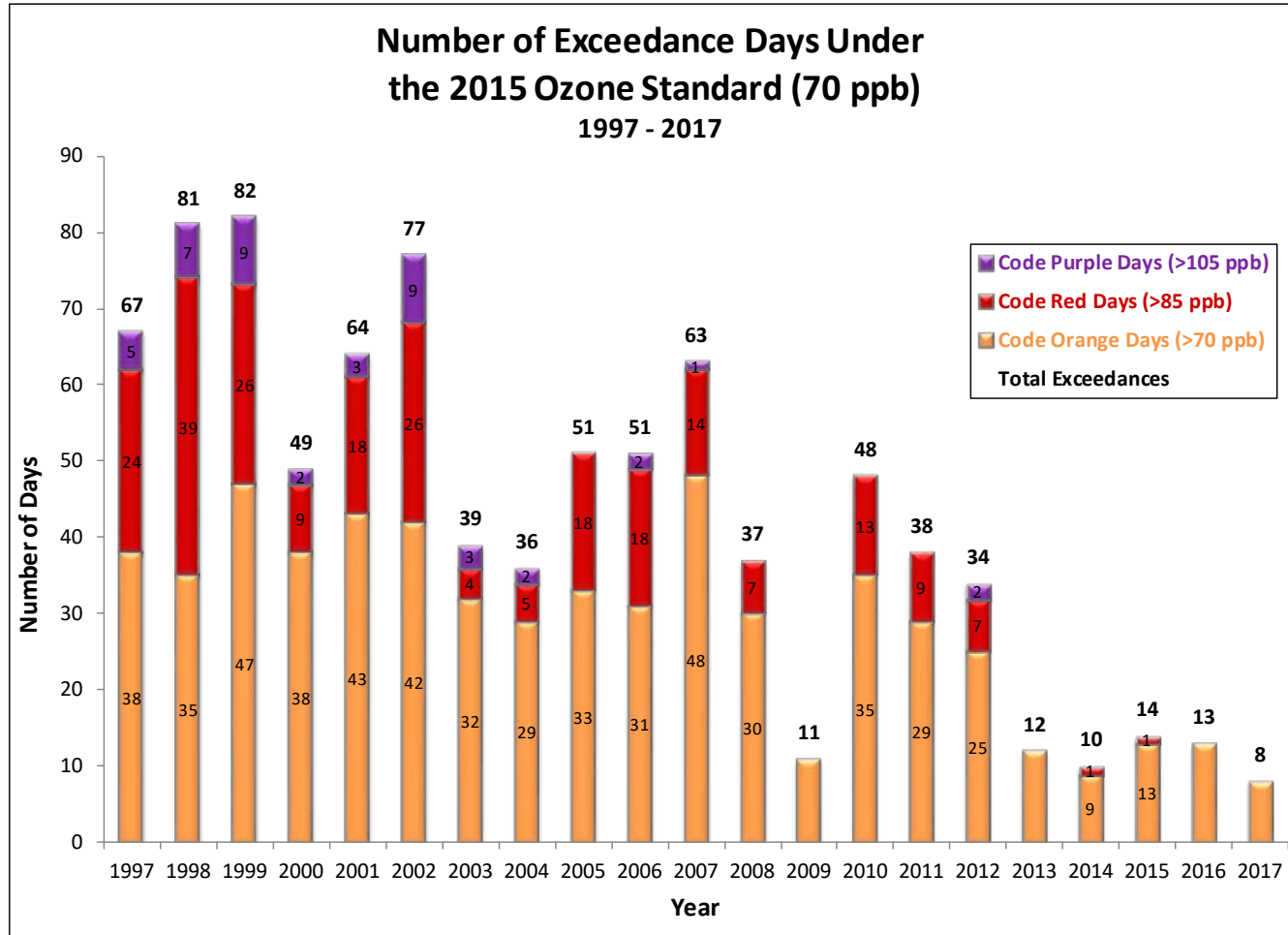
Peak 8-Hour Average Ozone Levels (ppb)

August 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30	31	01	02	03	04	05
		63	58	63	65	43
06	07	08	09	10	11	12
47	38	43	64	60	43	44
13	14	15	16	17	18	19
55	41	34	69	59	39	55
20	21	22	23	24	25	26
59	60	60	49	51	58	52
27	28	29	30	31	01	02
53	45	33	47	62		
03	04	05	06	07	08	09

September 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
27	28	29	30	31	01	02
					31	35
03	04	05	06	07	08	09
37	48	51	30	37	41	34
10	11	12	13	14	15	16
31	36	48	31	46	45	52
17	18	19	20	21	22	23
47	51	30	44	42	46	45
24	25	26	27	28	29	30
57	70	41	58	48	46	32
01	02	03	04	05	06	07

8 Code Orange Days, 74 Code Yellow Days, 101 Code Green Days

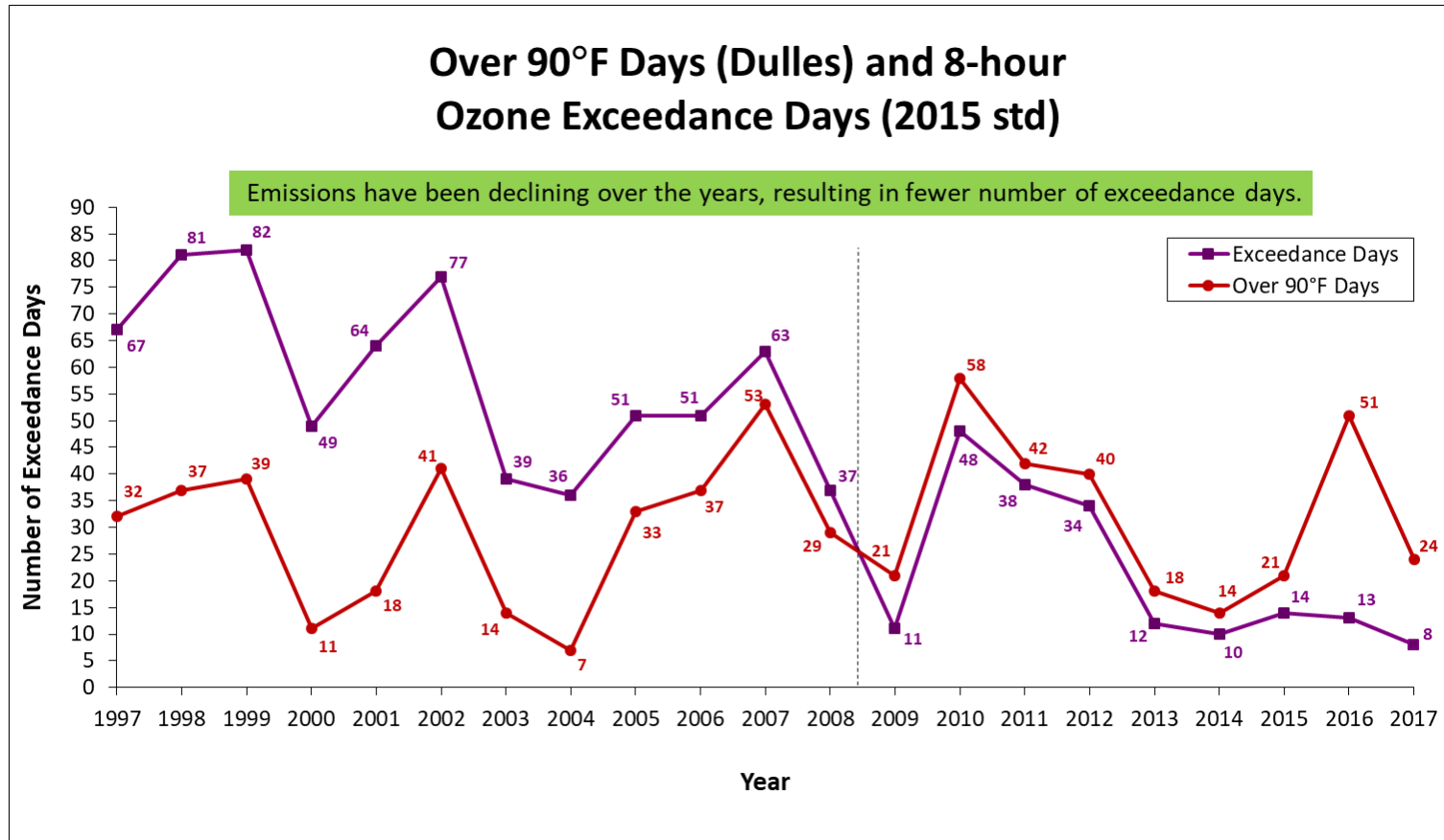Analysis is based on draft data as of October 5, 2017. Data is subject to change

Ozone Exceedance Trend

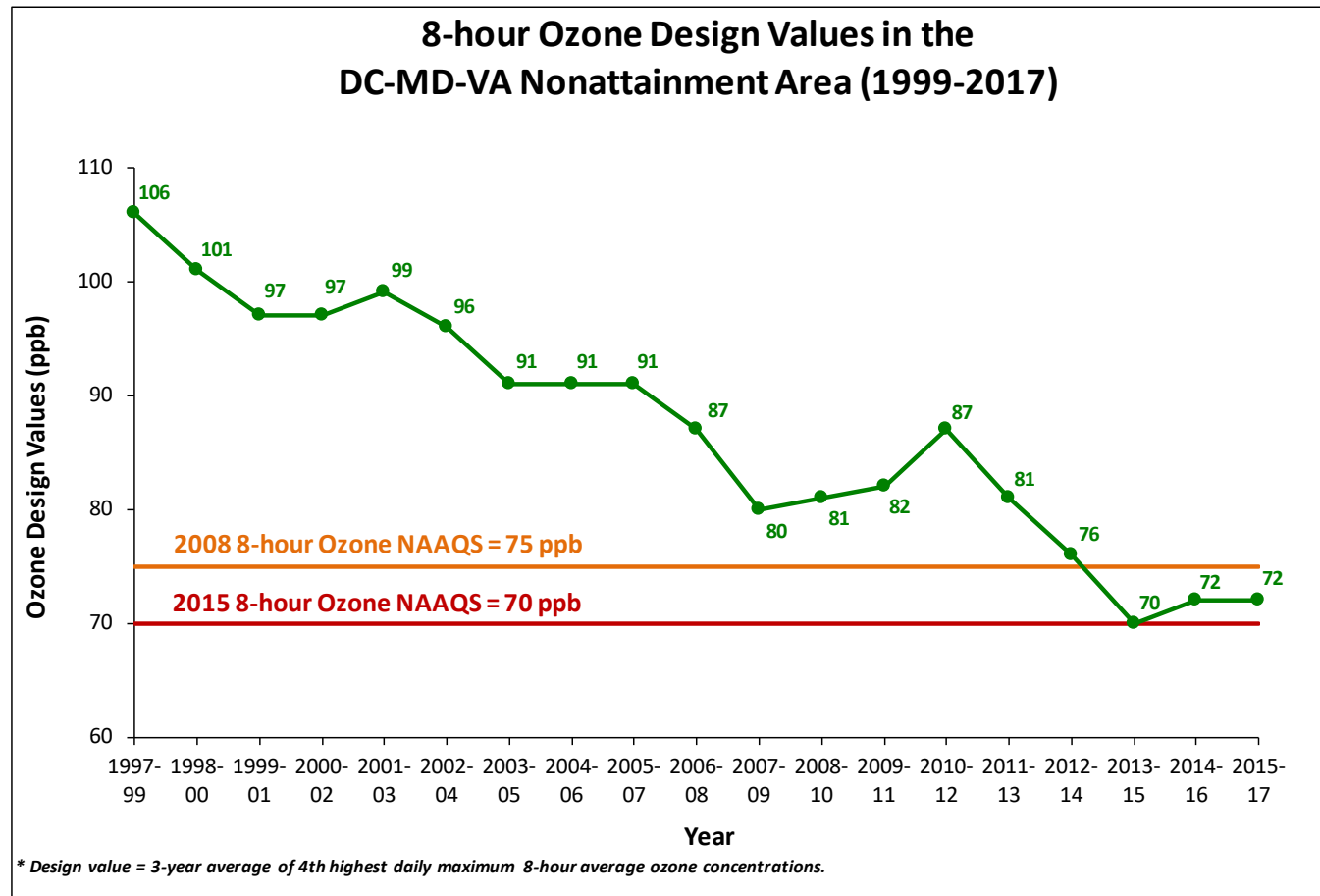* 2017 data is incomplete and preliminary as of October 5, 2017.

Ozone & Temperature Trend

Over 90°F Days (Dulles) and 8-hour Ozone Exceedance Days (2015 std)

Emissions have been declining over the years, resulting in fewer number of exceedance days.

Legend: Exceedance Days, Over 90°F Days

Y-axis: Number of Exceedance Days
X-axis: Year

* Analysis is based on draft data as of October 5, 2017. Data is subject to change.

Metropolitan Washington
Council of Governments

Ozone Design Value Trend

8-hour Ozone Design Values in the DC-MD-VA Nonattainment Area (1999-2017)

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

* 2017 data is incomplete and preliminary as of October 5, 2017

2017 Ozone Exceedances

Date	Monitors Exceeding	Highest Monitor	8-Hr Max (ppb)
4/11	2	HU-Beltsville/Rockville	71
5/17	8	Beltsville	76
5/18	2	HU-Beltsville	72
6/12	1	PG Equestrian Center	74
6/13	1	PG Equestrian Center	72
6/14	4	McMillan NCORE	73
7/19	3	McMillan NCORE	76
7/20	3	PG Equestrian Center	80

* Analysis is based on draft data as of October 5, 2017. Data is subject to change.

Why Fewer Exceedance Days Now ?

Emission Control Programs		
Federal	**State**	**Local**
Acid Rain Program Phase 1/2 (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)	Ozone Transport Commission Rules	Low VOC Paint
Clean Air Interstate Rule/ CSAPR/CSAPR Update (2009/2015/2017)		Gas Can Replacement

24-Hour Average PM$_{2.5}$ Levels (µg/m³)

APRIL 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
26	27	28	29	30	31	01 **6.7**
02 **6.8**	03 **7.1**	04 **5.2**	05 **6.1**	06 **6.4**	07 **2.6**	08 **4.7**
09 **8.5**	10 **11.0**	11 **14.0**	12 **8.7**	13 **6.7**	14 **9.7**	15 **8.6**
16 **10.3**	17 **7.2**	18 **4.2**	19 **6.1**	20 **8.2**	21 **13.6**	22 **14.0**
23 **5.0**	24 **6.0**	25 **3.4**	26 **5.0**	27 **15.3**	28 **16.1**	29 **17.2**
30 **16.3**	01	02	03	04	05	06

MAY 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30	01 **9.8**	02 **4.7**	03 **5.1**	04 **5.6**	05 **5.2**	06 **3.1**
07 **3.7**	08 **4.8**	09 **5.6**	10 **8.4**	11 **8.6**	12 **5.2**	13 **3.2**
14 **6.7**	15 **3.6**	16 **6.8**	17 **13.8**	18 **12.8**	19 **12.6**	20 **7.4**
21 **6.1**	22 **6.3**	23 **10.6**	24 **7.7**	25 **3.0**	26 **5.5**	27 **8.6**
28 **9.2**	29 **8.1**	30 **8.3**	31 **9.9**	01	02	03
04	05	06	07	08	09	10

JUNE 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
28	29	30	31	01 **8.0**	02 **9.0**	03 **11.4**
04 **14.5**	05 **12.9**	06 **8.5**	07 **6.4**	08 **6.5**	09 **8.5**	10 **10.8**
11 **13.0**	12 **17.0**	13 **17.7**	14 **15.0**	15 **10.7**	16 **11.5**	17 **8.2**
18 **11.3**	19 **9.0**	20 **6.6**	21 **10.7**	22 **14.5**	23 **10.5**	24 **8.3**
25 **7.2**	26 **6.0**	27 **5.4**	28 **5.5**	29 **10.7**	30 **12.1**	01
02	03	04	05	06	07	08

July 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
25	26	27	28	29	30	01 **9.7**
02 **12.4**	03 **12.0**	04 **26.5**	05 **20.2**	06 **8.3**	07 **6.2**	08 **7.2**
09 **7.7**	10 **13.1**	11 **14.7**	12 **10.4**	13 **11.0**	14 **7.7**	15 **7.1**
16 **6.9**	17 **8.4**	18 **9.4**	19 **10.0**	20 **18.0**	21 **14.2**	22 **7.5**
23 **6.2**	24 **6.9**	25 **5.5**	26 **7.5**	27 **9.2**	28 **8.8**	29 **5.2**
30 **6.0**	31 **9.2**	01	02	03	04	05

32 Code Yellow Days, 151 Code Green Days

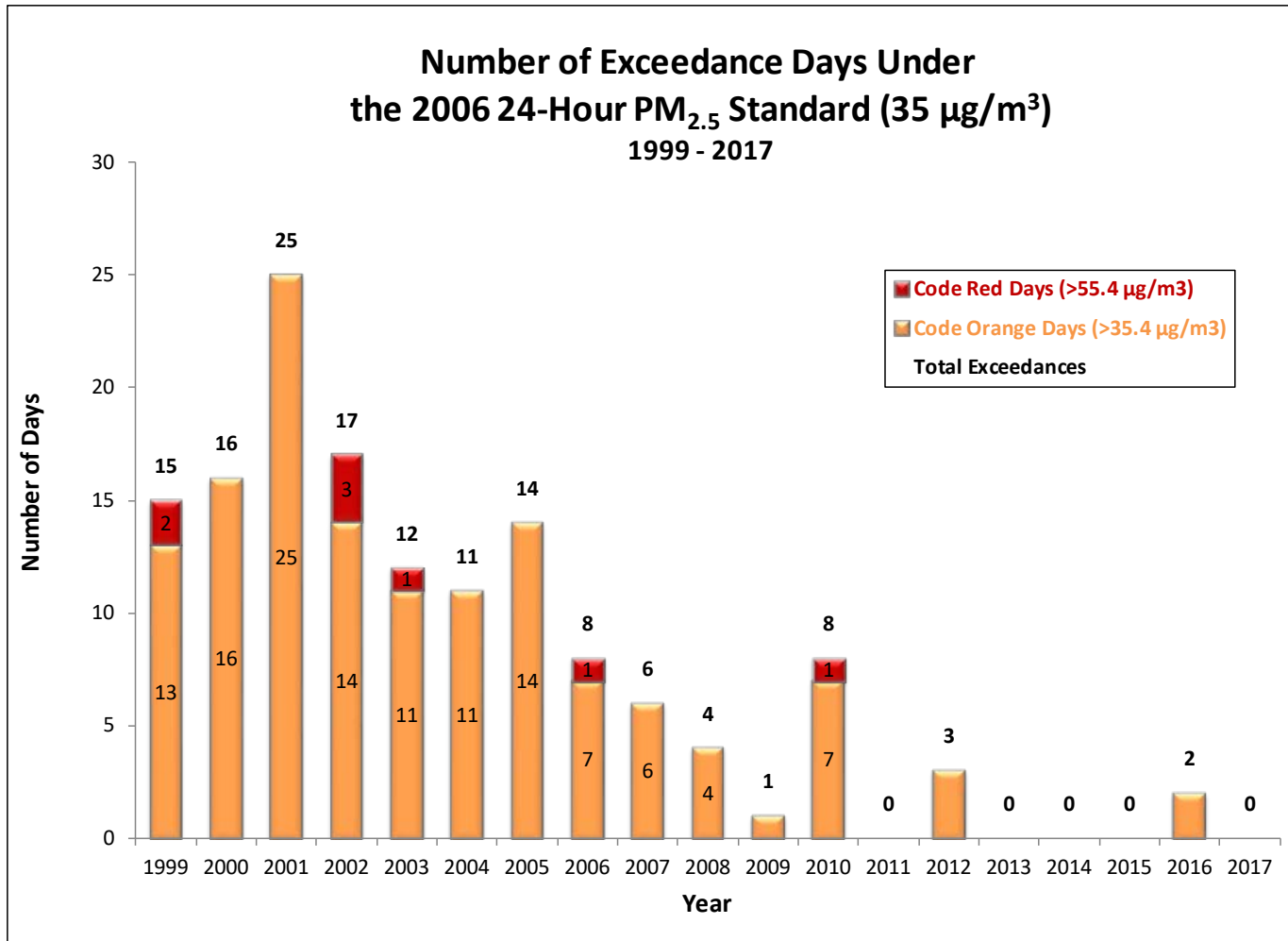Analysis is based on draft data as of October 5, 2017. Data is subject to change

Metropolitan Washington
Council of Governments

24-Hour Average PM$_{2.5}$ Levels (μg/m³)

August 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30	31	01	02	03	04	05
		10.1	11.0	10.7	11.7	6.3
06	07	08	09	10	11	12
7.2	5.8	7.5	8.7	10.7	6.6	5.9
13	14	15	16	17	18	19
8.8	10.7	8.0	10.4	13.2	8.7	5.6
20	21	22	23	24	25	26
8.7	10.4	12.7	6.5	11.0	10.3	10.0
27	28	29	30	31	01	02
11.3	9.7	5.3	8.2	9.2		
03	04	05	06	07	08	09

September 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
27	28	29	30	31	01	02
					9.8	6.1
03	04	05	06	07	08	09
6.1	13.7	16.3	12.5	7.6	7.6	6.2
10	11	12	13	14	15	16
7.9	7.4	8.6	6.2	7.4	5.9	8.9
17	18	19	20	21	22	23
9.9	10.9	13.2	12.3	10.7	11.2	7.7
24	25	26	27	28	29	30
10.6	15.7	8.9	8.6	9.9	12.1	10.3
01	02	03	04	05	06	07

32 Code Yellow Days, 151 Code Green Days

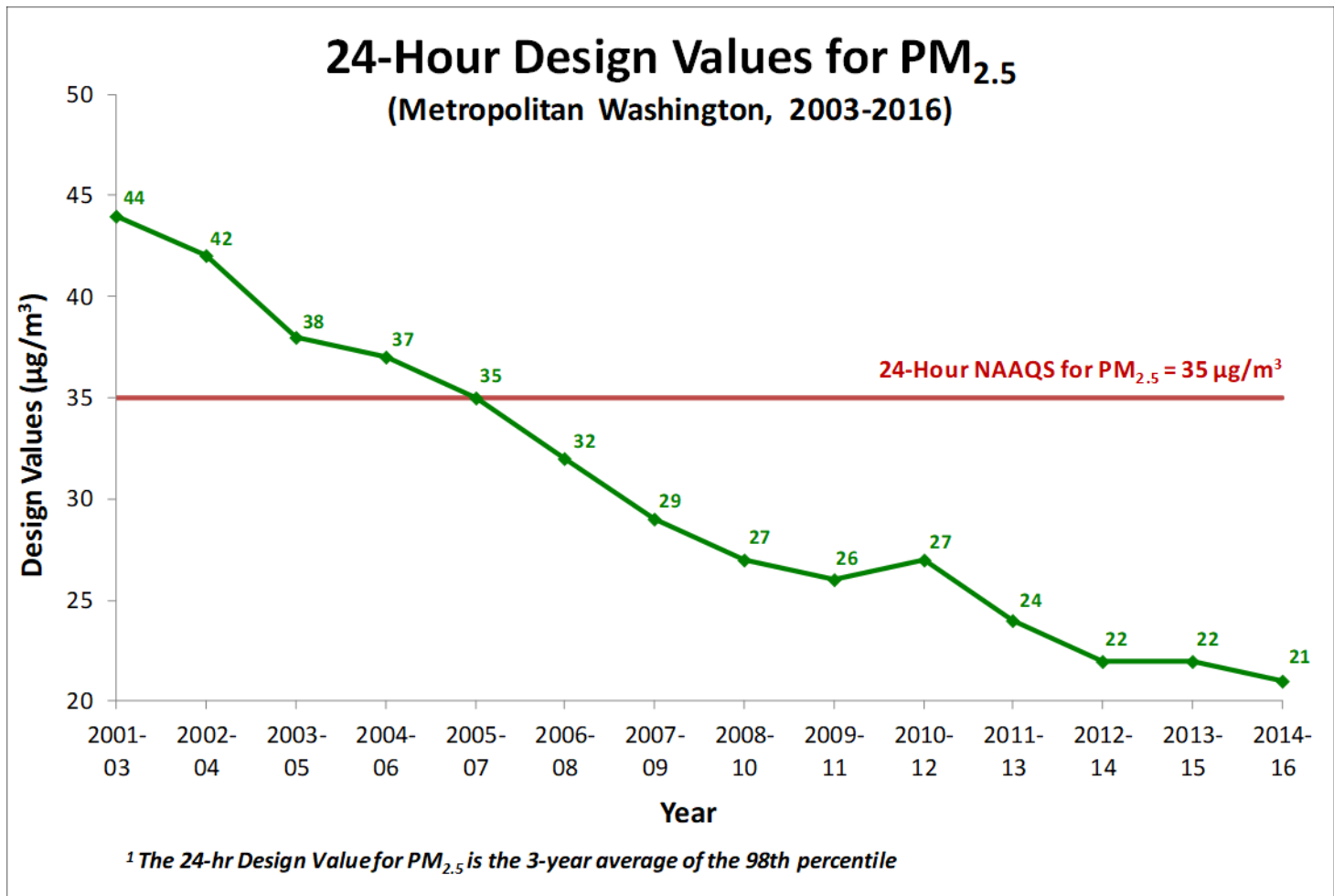Analysis is based on draft data as of October 5, 2017. Data is subject to change.

PM$_{2.5}$ Exceedance Trend

Number of Exceedance Days Under
the 2006 24-Hour PM$_{2.5}$ Standard (35 µg/m³)
1999 - 2017

* 2017 data is incomplete and preliminary as of October 5, 2017.

24-Hour PM$_{2.5}$ Design Value Trend

24-Hour Design Values for PM$_{2.5}$
(Metropolitan Washington, 2003-2016)

24-Hour NAAQS for PM$_{2.5}$ = 35 µg/m^3

[1] The 24-hr Design Value for PM$_{2.5}$ is the 3-year average of the 98th percentile

Annual PM$_{2.5}$ Design Value Trend

Annual Design Values for PM$_{2.5}$
(Metropolitan Washington, 2003-2016)

Design Values (µg/m³)[1]

Values: 15.8, 15.1, 14.6, 14.5, 14.2, 13.1, 12.1, 11.2, 10.8, 10.8, 10, 9.5, 9.4, 9.1

Years: 2001-03, 2002-04, 2003-05, 2004-06, 2005-07, 2006-08, 2007-09, 2008-10, 2009-11, 2010-12, 2011-13, 2012-14, 2013-15, 2014-16

Annual Primary NAAQS for PM$_{2.5}$ = 12 µg/m³

Year

[1] The Annual Design Value for PM$_{2.5}$ is the 3-year average of the annual mean PM$_{2.5}$ concentration