OZONE SEASON SUMMARY 2017

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MWAQC-Technical Advisory Committee
June 13th, 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 **55**
16 **52**	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 **47**	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	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	01
02	03	04	05	06	07	08

3 Code Orange Days, 26 Code Yellow Days, 43 Code Green Days

Analysis is based on draft data as of June 12th, 2017. Data is subject to change

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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

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Meteorology on Exceedance Days

- <u>April 11 & May 17/18</u>

  o High Temperature: 86°F - 92°F, Clear sky

  o Light southwesterly winds

  o Ozone build up on previous days

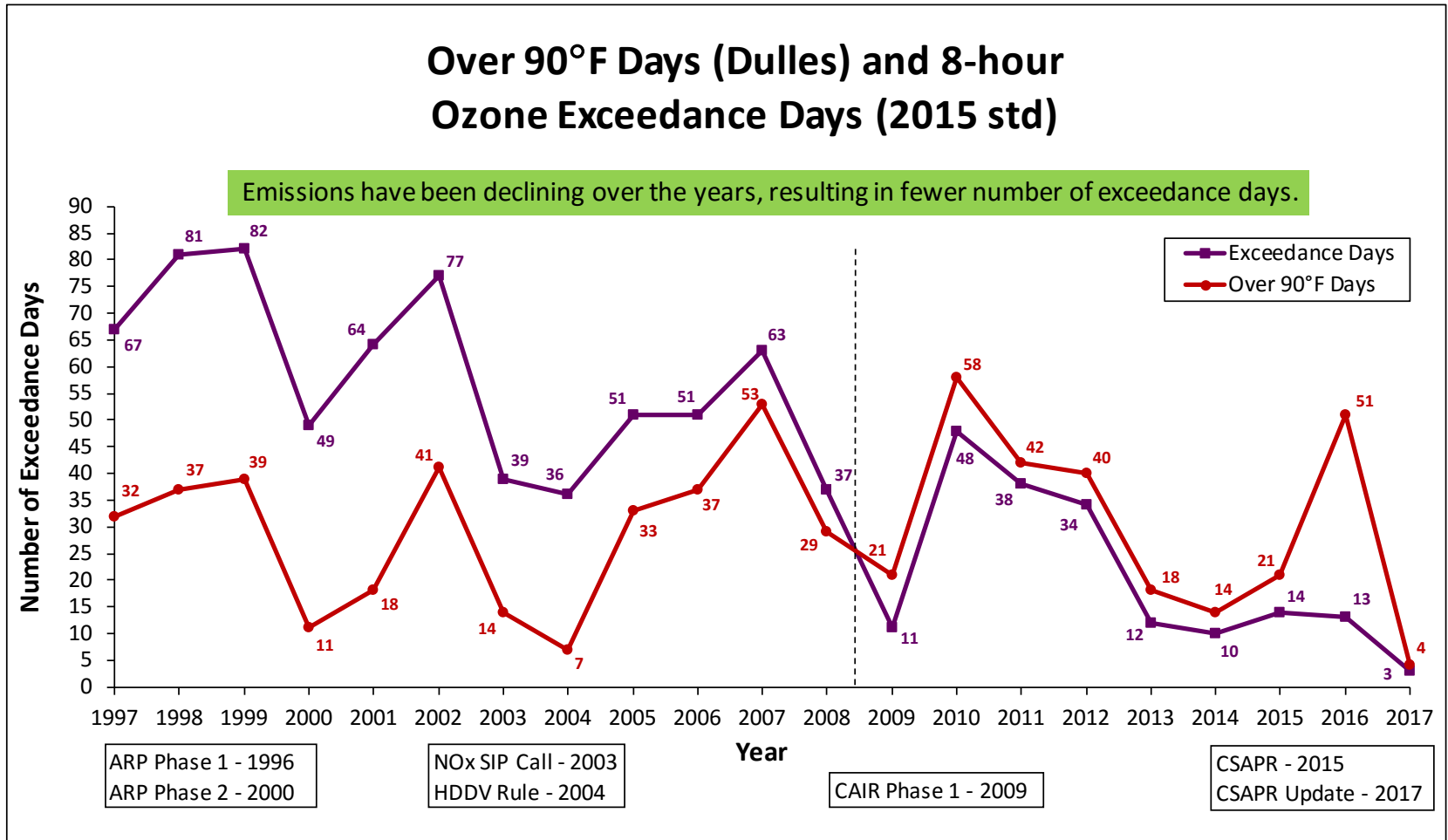 o Influenced by local and southern Mid-Atlantic emissions

May 17th at 2:00 PM
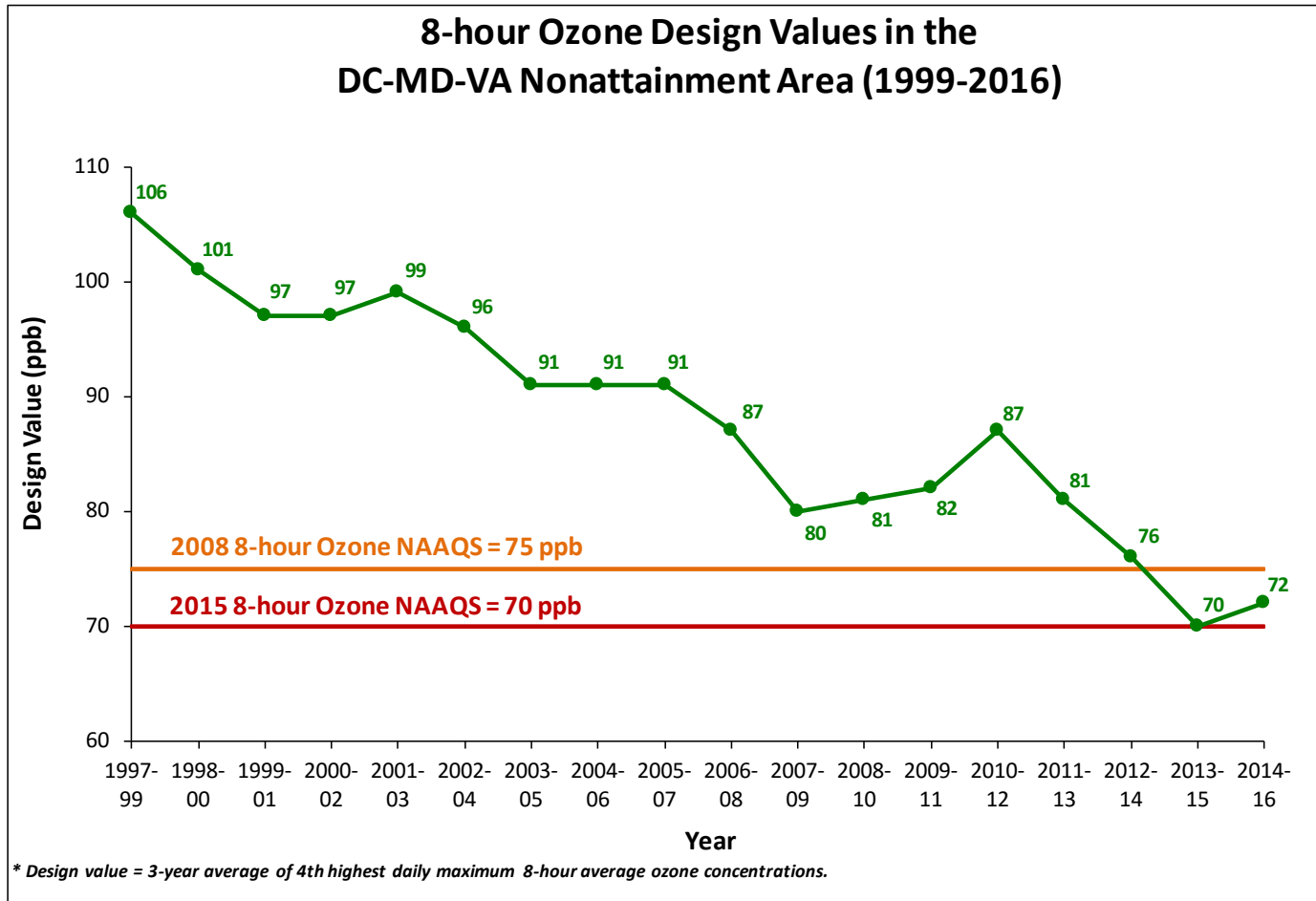
Southwest Trajectories

Local Ozone Concentrations = 60-90 ppb

Legend

24 hr Trajectories

--- 500 m   --- 1500 m

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Ozone Exceedance Trend

Number of Exceedance Days Under the 2015 Ozone Standard (70 ppb)
1997 - 2017

Legend:
- Code Purple Days (>105 ppb)
- Code Red Days (>85 ppb)
- Code Orange Days (>70 ppb)
- Total Exceedances

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

Data by year (Total Exceedances, then Code Orange / Code Red / Code Purple):
- 1997: 67 (38 / 24 / 5)
- 1998: 81 (35 / 39 / 7)
- 1999: 82 (47 / 26 / 9)
- 2000: 49 (38 / 9 / 2)
- 2001: 64 (43 / 18 / 3)
- 2002: 77 (42 / 26 / 9)
- 2003: 39 (32 / 4 / 3)
- 2004: 36 (29 / 5 / 2)
- 2005: 51 (33 / 18)
- 2006: 51 (31 / 18 / 2)
- 2007: 63 (48 / 14 / 1)
- 2008: 37 (30 / 7)
- 2009: 11
- 2010: 48 (35 / 13)
- 2011: 38 (29 / 9)
- 2012: 34 (25 / 7 / 2)
- 2013: 12
- 2014: 10 (9 / 1)
- 2015: 14 (13 / 1)
- 2016: 13
- 2017: 3

* 2017 data is incomplete and preliminary as of June 12th, 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

Exceedance Days values: 67, 81, 82, 49, 64, 77, 39, 36, 51, 51, 63, 37, 11, 48, 38, 34, 12, 10, 14, 13, 3

Over 90°F Days values: 32, 37, 39, 11, 18, 41, 14, 7, 33, 37, 53, 29, 21, 58, 42, 40, 18, 14, 21, 51, 4

Y-axis: **Number of Exceedance Days** (0 to 90)

X-axis: **Year** (1997 to 2017)

ARP Phase 1 - 1996
ARP Phase 2 - 2000

NOx SIP Call - 2003
HDDV Rule - 2004

CAIR Phase 1 - 2009

CSAPR - 2015
CSAPR Update - 2017

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Ozone Design Value Trend

8-hour Ozone Design Values in the DC-MD-VA Nonattainment Area (1999-2016)

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

* 2016 data is preliminary as of June 12th, 2017.

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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 PM2.5 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	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	01
02	03	04	05	06	07	08

13 Code Yellow Days, 59 Code Green Days

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PM2.5 Exceedance Trend

Number of Exceedance Days Under
the 2006 24-Hour PM2.5 Standard (35 µg/m³)
1999 - 2017

Legend:
- Code Red Days (>55.4 µg/m3)
- Code Orange Days (>35.4 µg/m3)
- Total Exceedances

* 2017 data is incomplete and preliminary as of June 12th, 2017.

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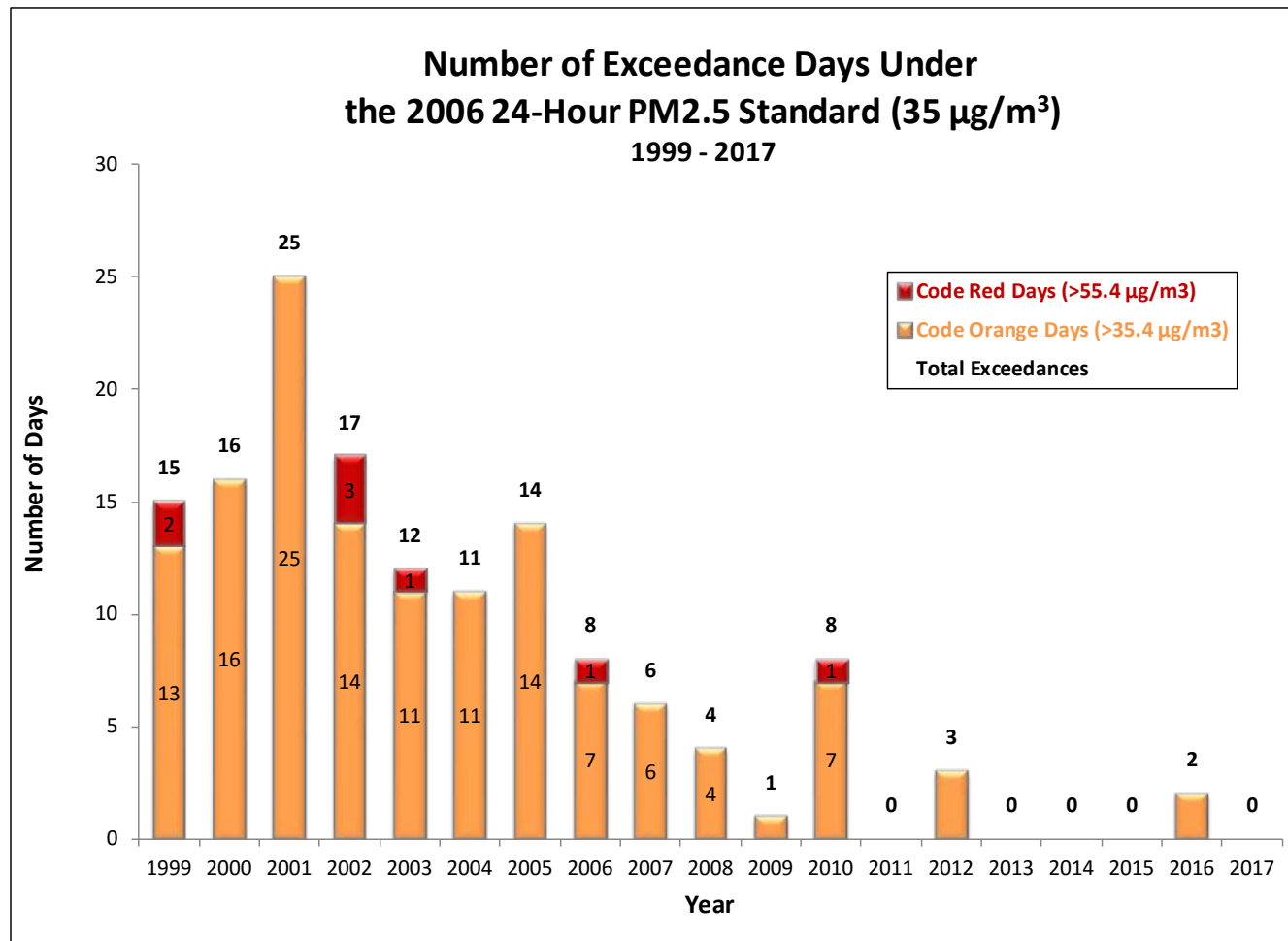
Annual PM2.5 Design Value Trend

Annual Design Values for $PM_{2.5}$
(Washington, D.C. Region, 2003-2015)

[1] The Annual Design Value for $PM_{2.5}$ is the 3-year average of the annual mean $PM_{2.5}$ concentration
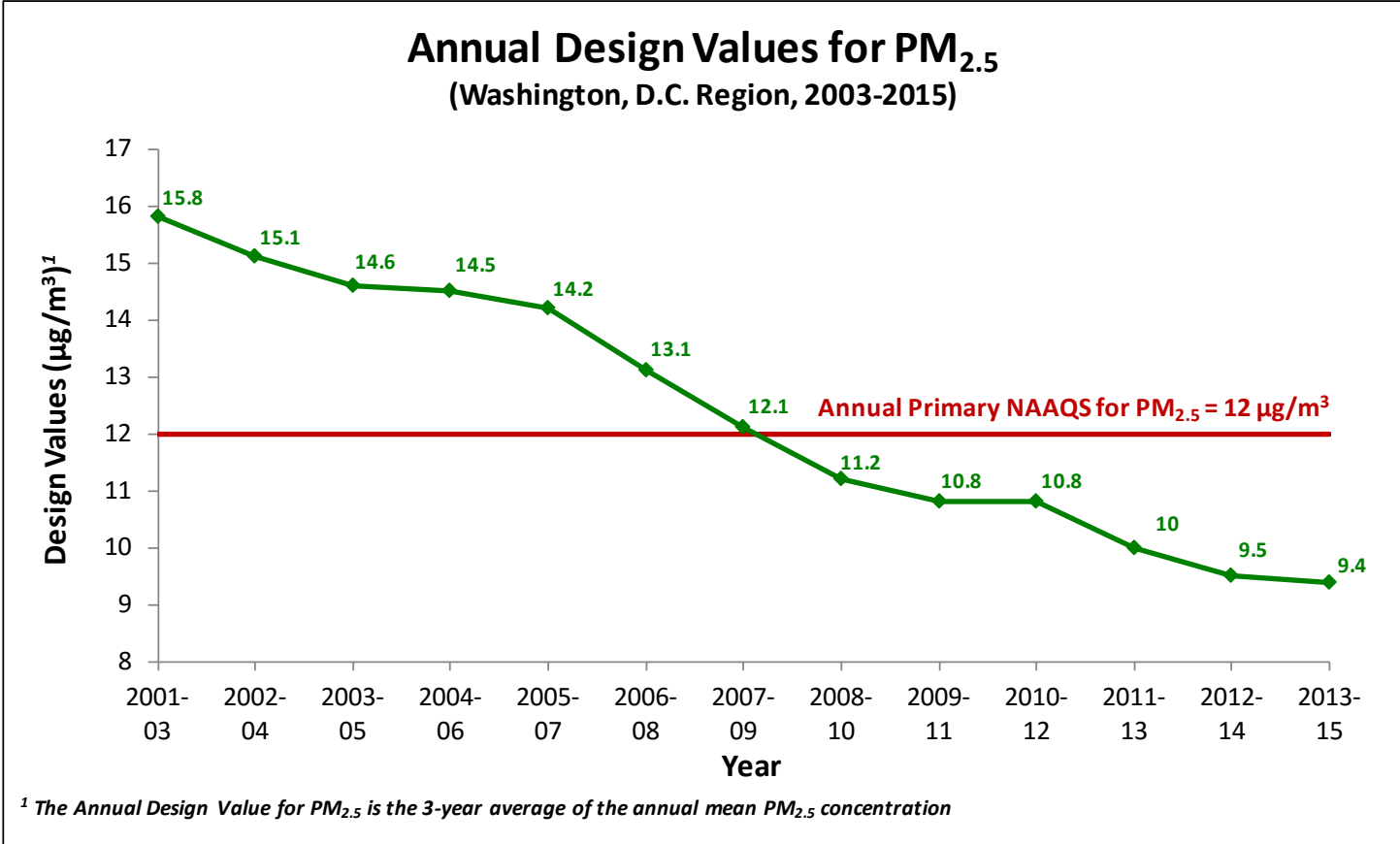
24-Hour PM2.5 Design Value Trend

24-Hour Design Values for PM$_{2.5}$
(Washington, D.C. Region, 2003-2015)

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

Design Values (μg/m^3)[1]

Values: 44, 42, 38, 37, 35, 32, 29, 27, 26, 27, 24, 22, 22

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

Year

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