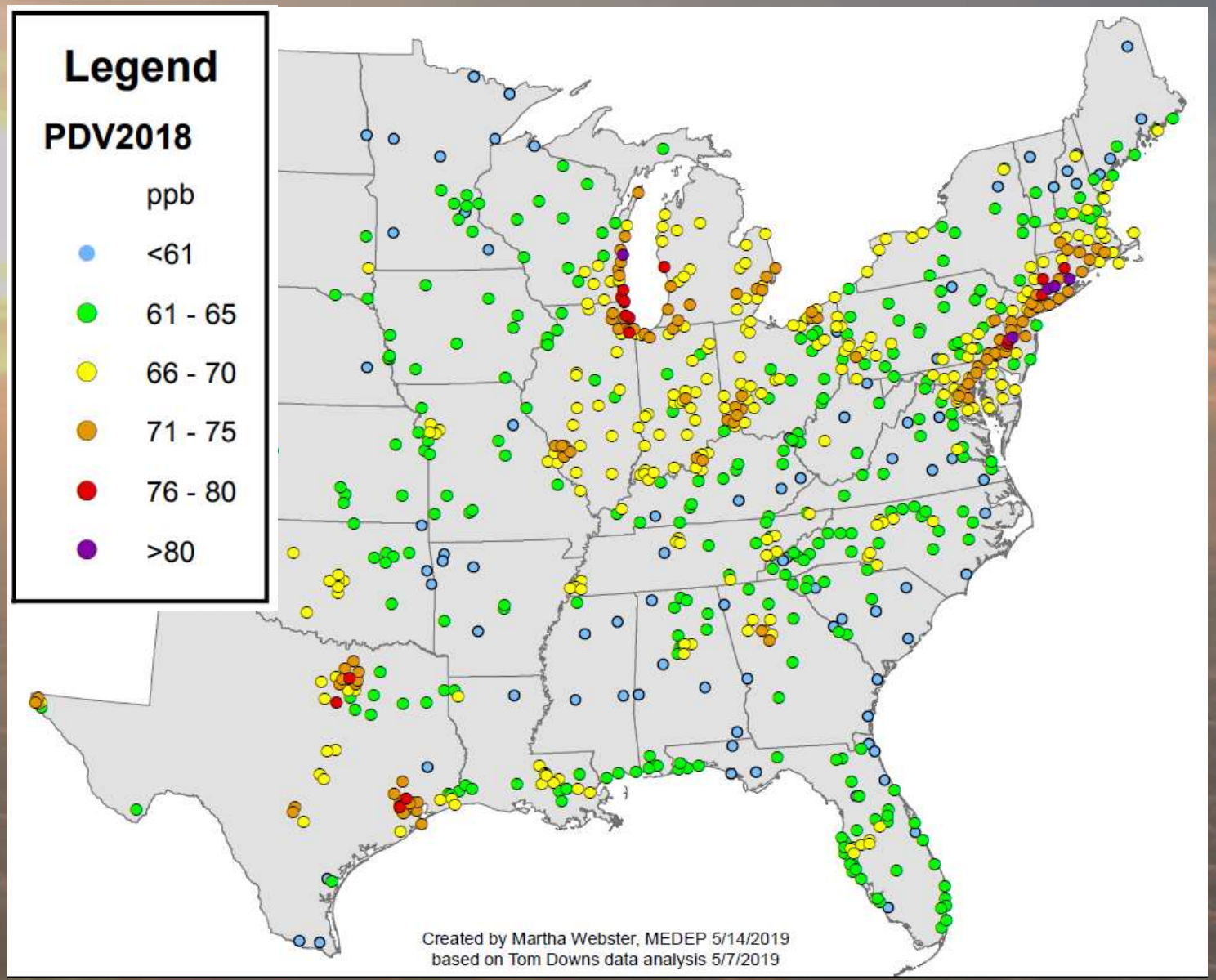
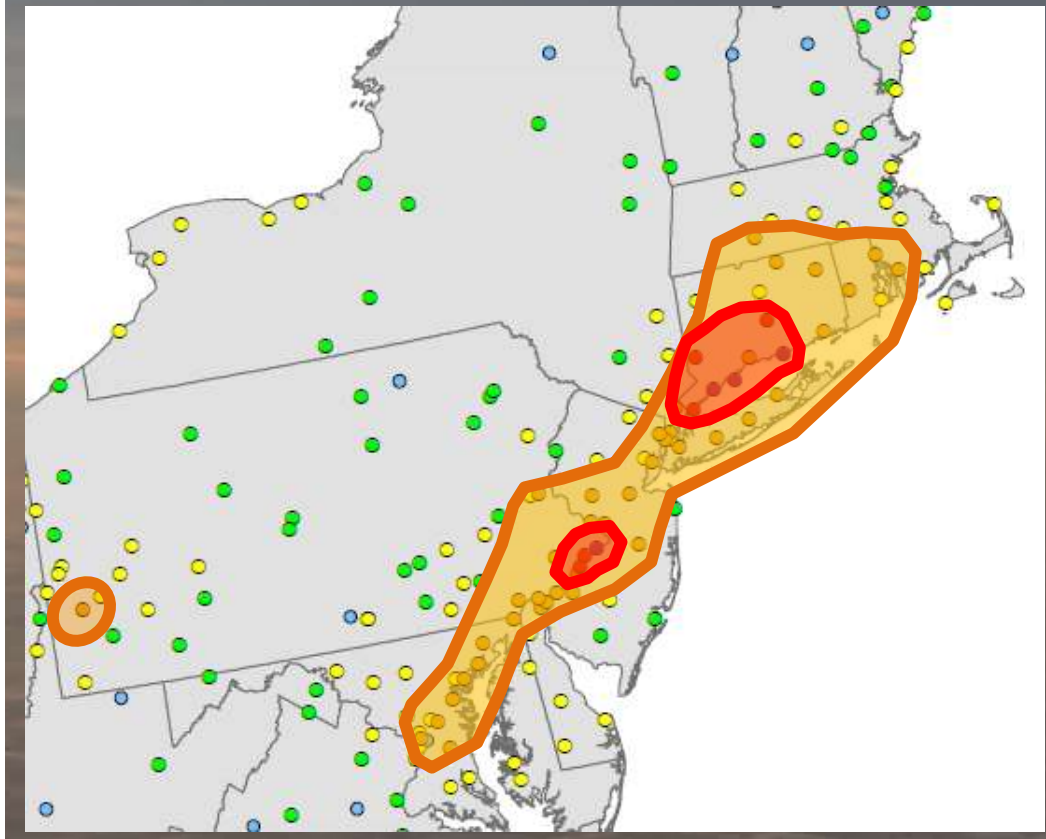
OTC Modeling Committee Update

Wilmington, Delaware

June 11, 2019

2016-2018 Design Values

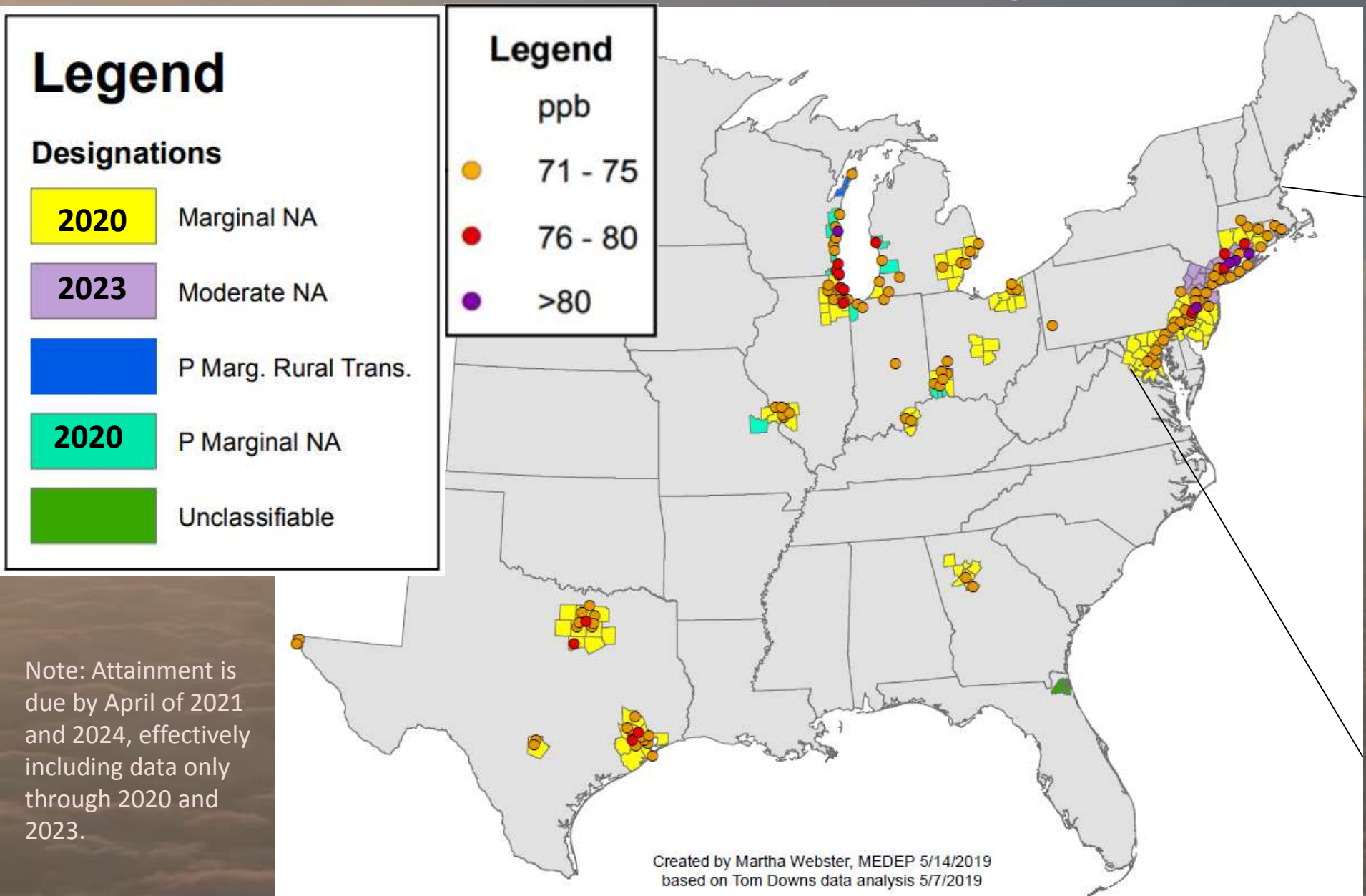




Ozone design values are the 3-year average of the year's 4th maximum 8-hour concentration at each monitor. It directly compares to the health standard (NAAQS).

2015 8-Hour Ozone NAAQS Designations

(with 2016-2018 design values)



2020 75

82

2023

81

75

2020

72

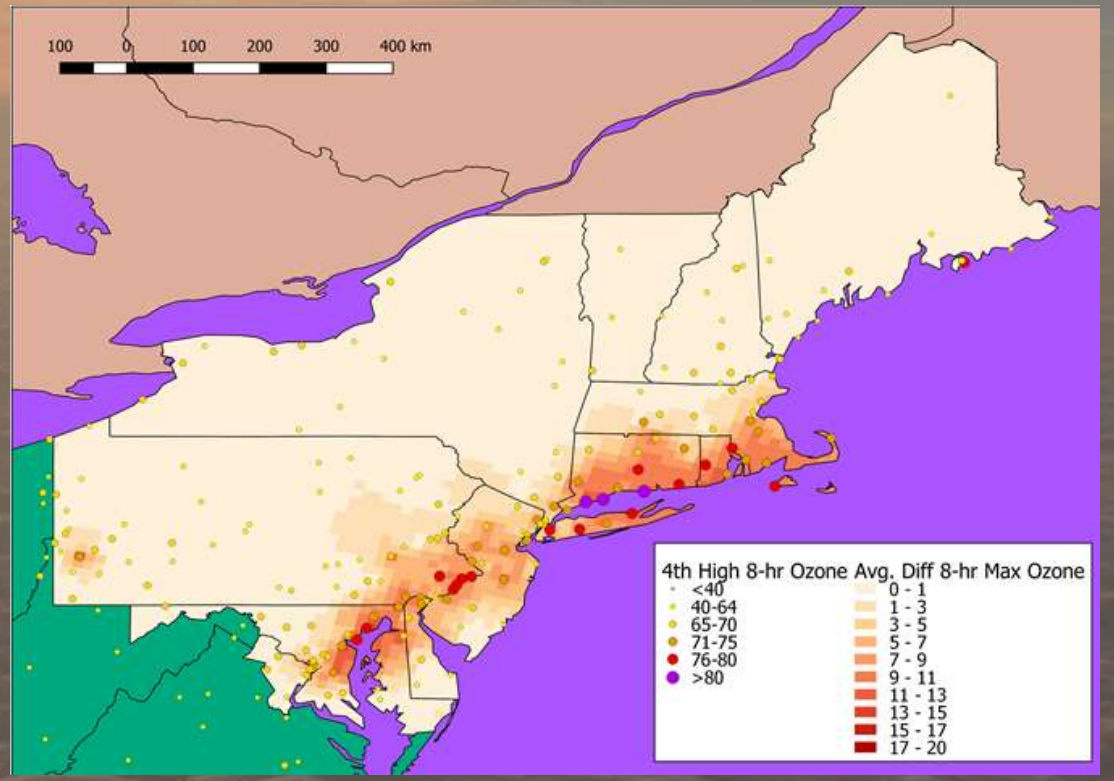
Attainment Dates

Note: Attainment is due by April of 2021 and 2024, effectively including data only through 2020 and 2023.

BenMap Modeling

Fully meeting the 2015 70ppb ozone NAAQS in the OTR +VA

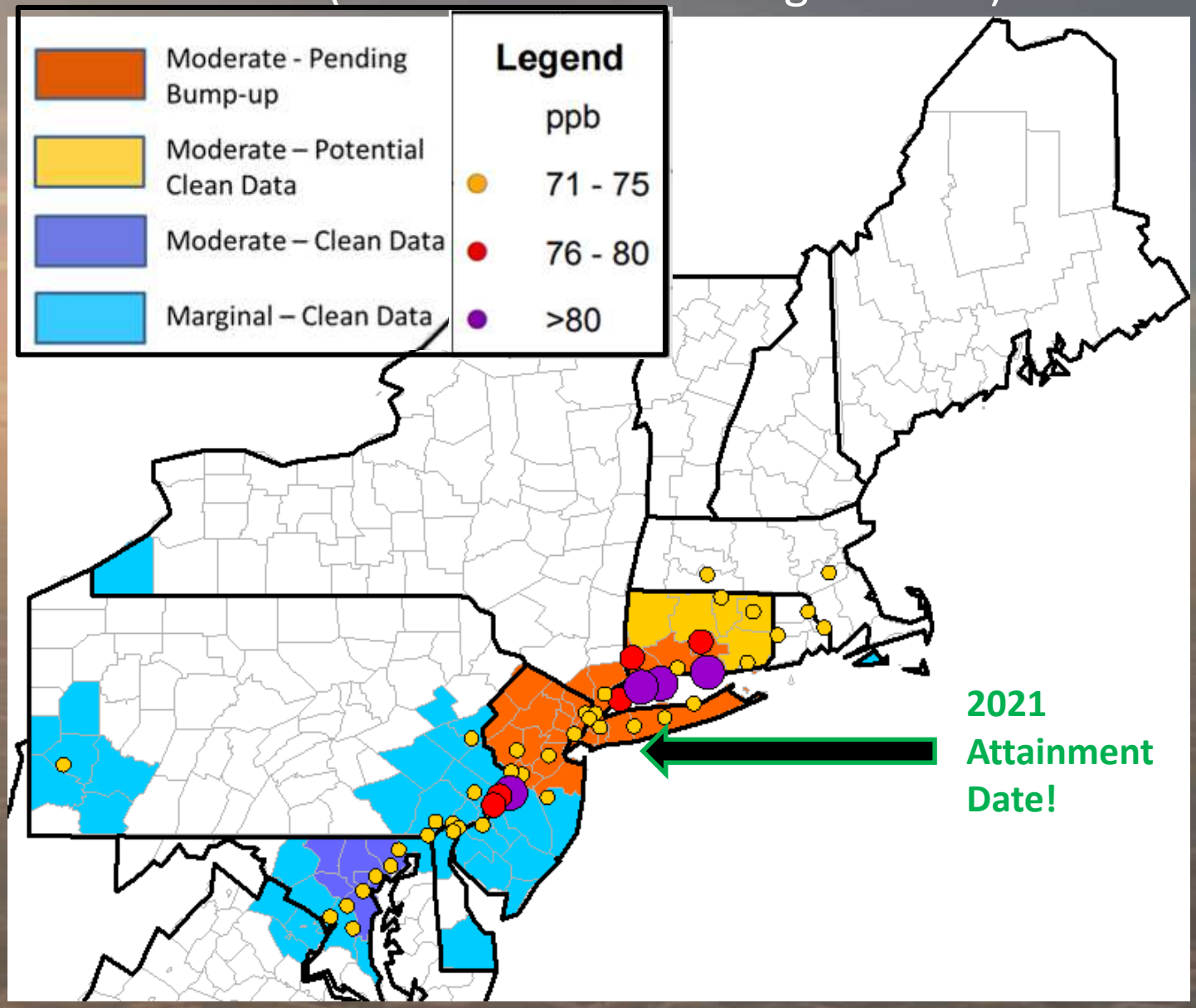
1. 1,400 deaths avoided per year
2. $11 billion in health impact valuation avoided per year



Change in avg. 8-hour max. ozone after roll back to 70ppb using 2017 data

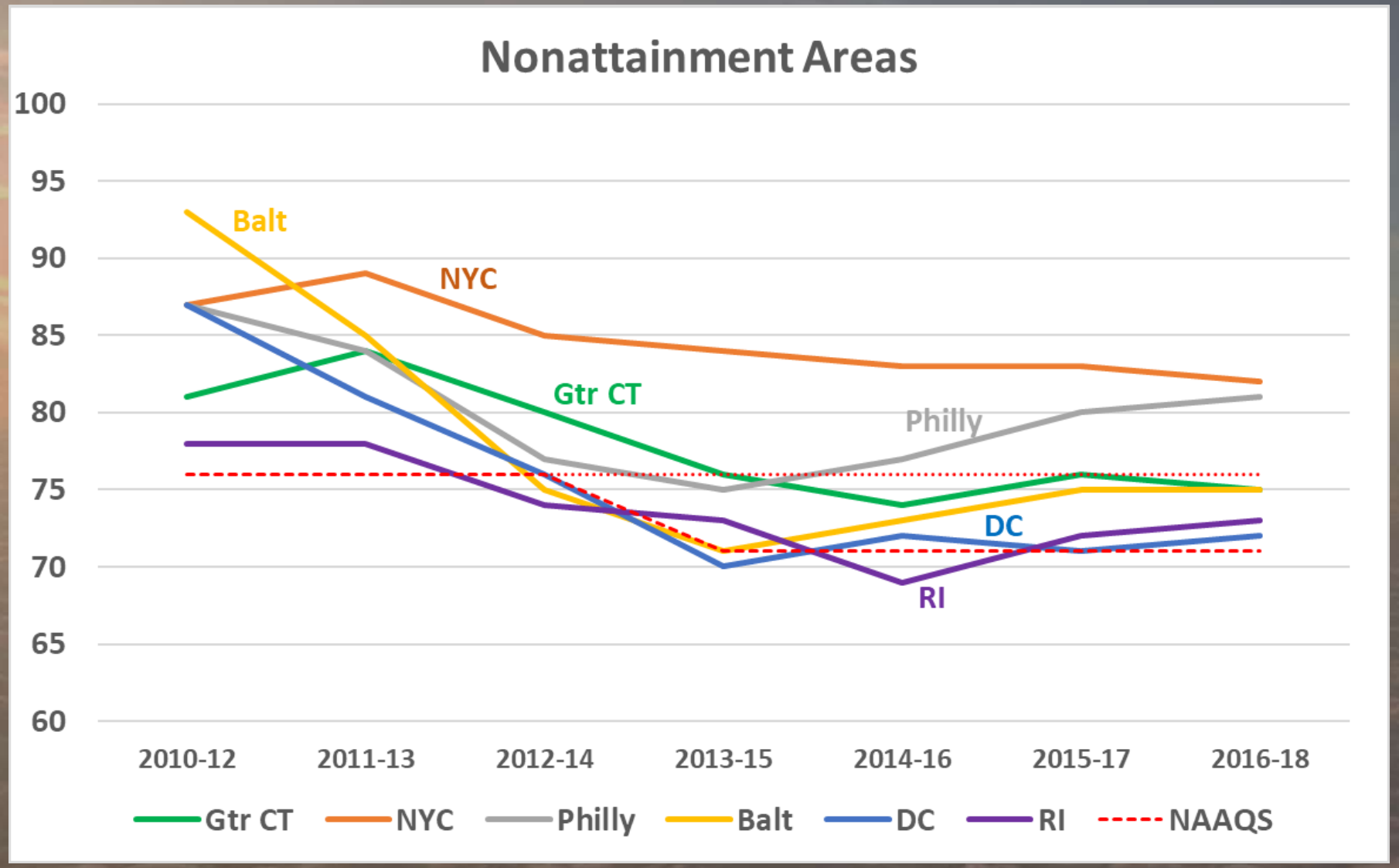
Nonattainment Areas – 2008 Ozone NAAQS

(with 2016-2018 Design Values)



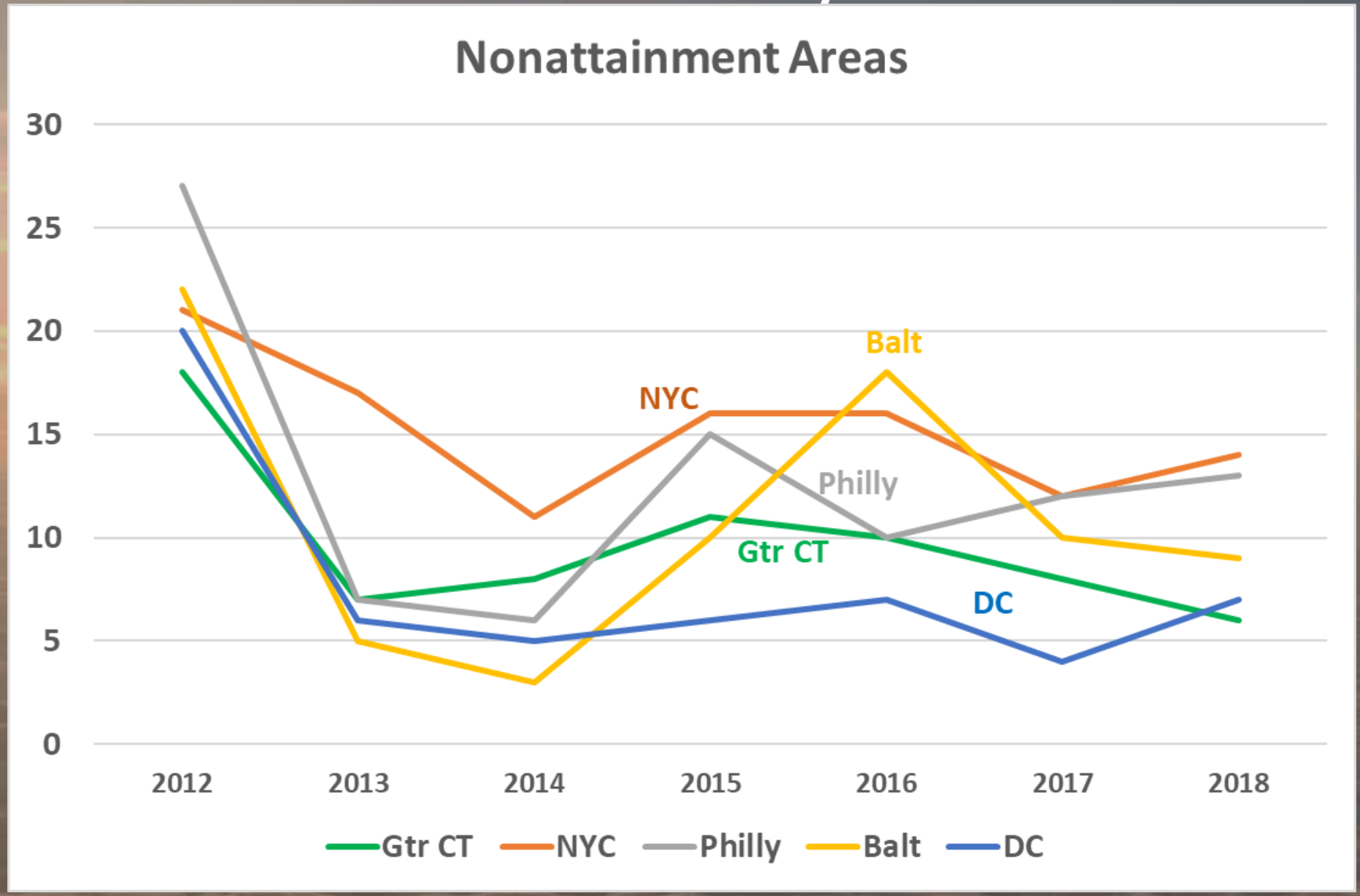
Ozone Design Values (ppb) in Key Nonattainment Areas of the OTR

Maximum design value within each nonattainment area



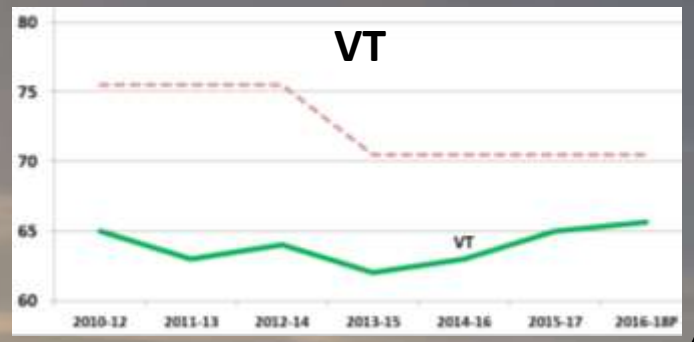
Number of Exceedance Days – 2015 NAAQS

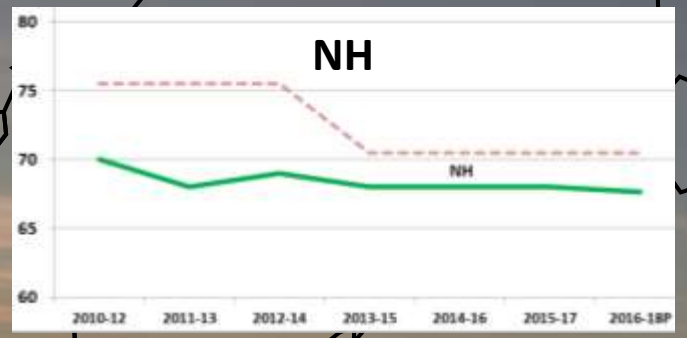
Maximum exceedance day monitor value within each nonattainment area

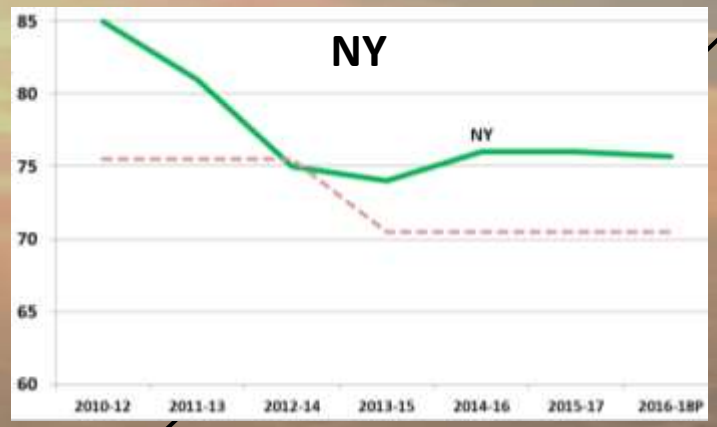


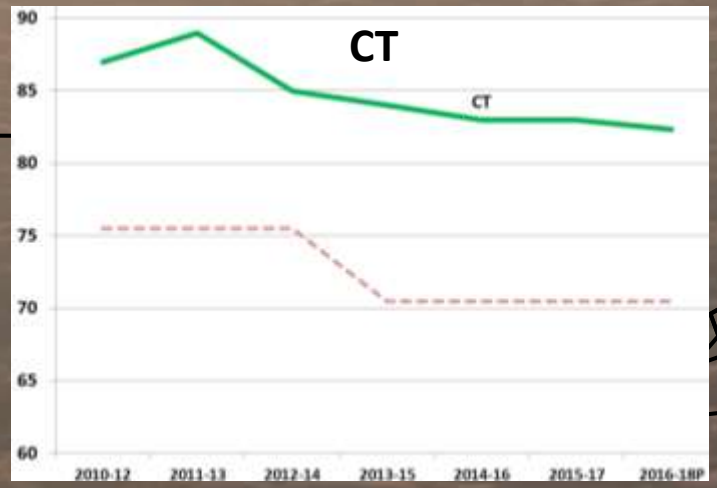
Trends

Maximum design value within each state



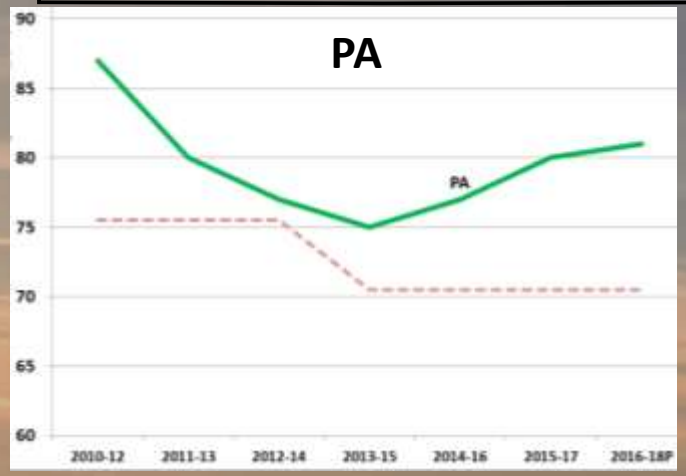


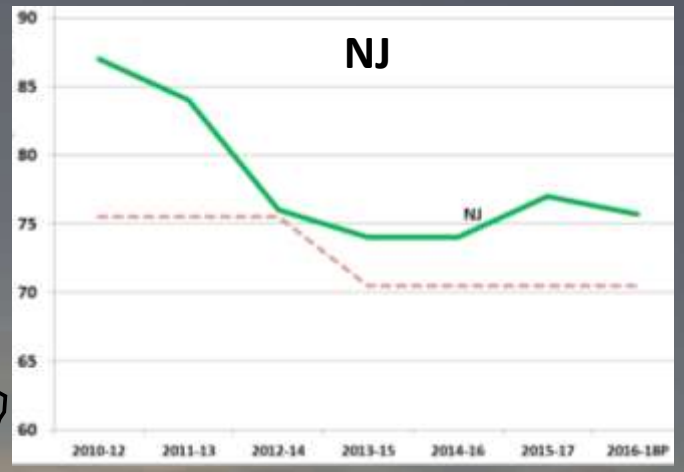


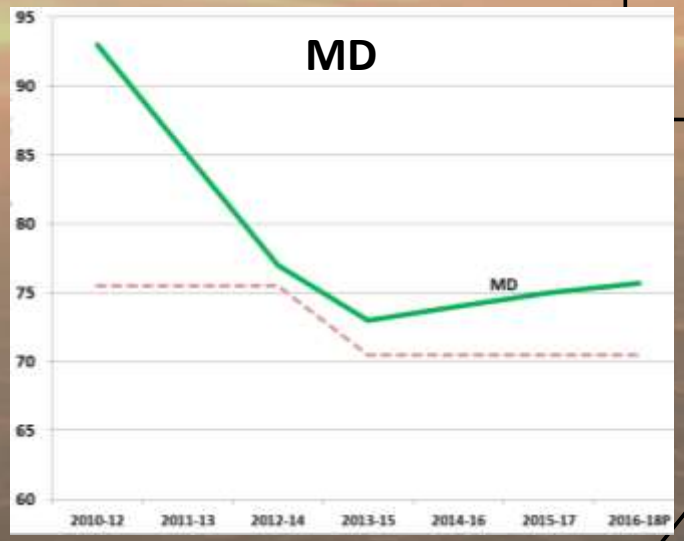


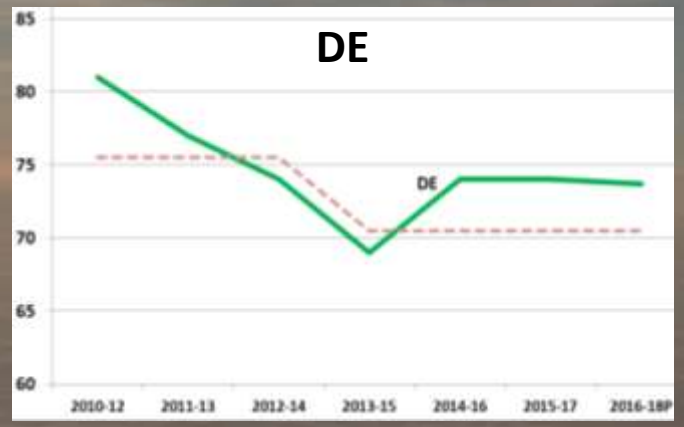
Trends

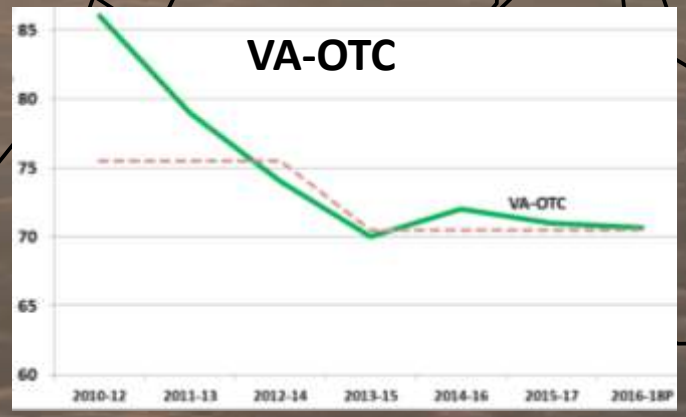
Maximum design value within each state

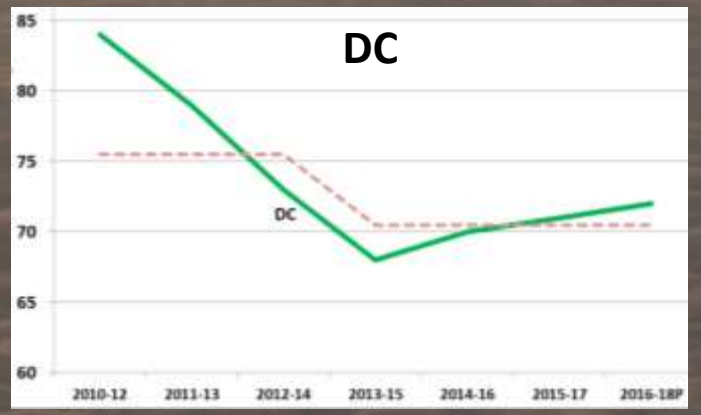




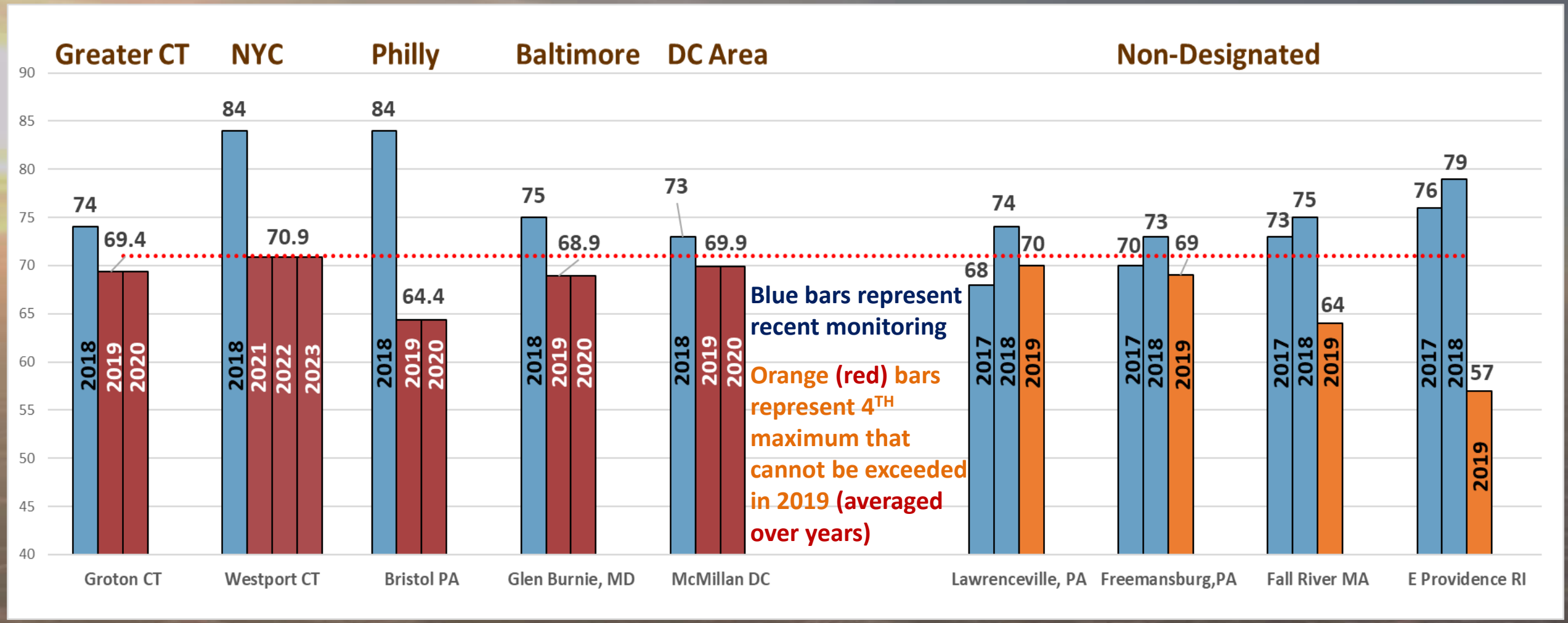






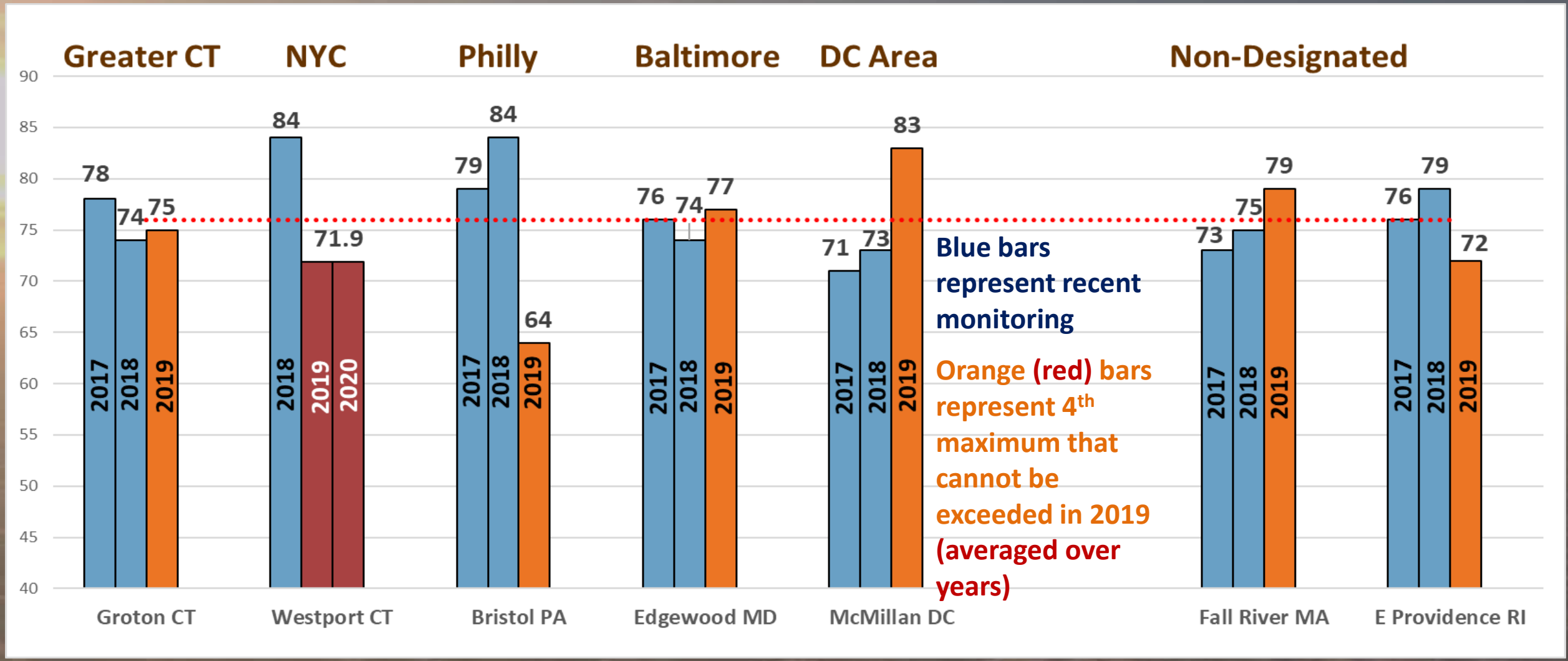


Path to Attainment
Areas in the OTR Exceeding the 2015 NAAQS



Based on 4th Maximum Daily 8-Hour Ozone Concentration (ppb)

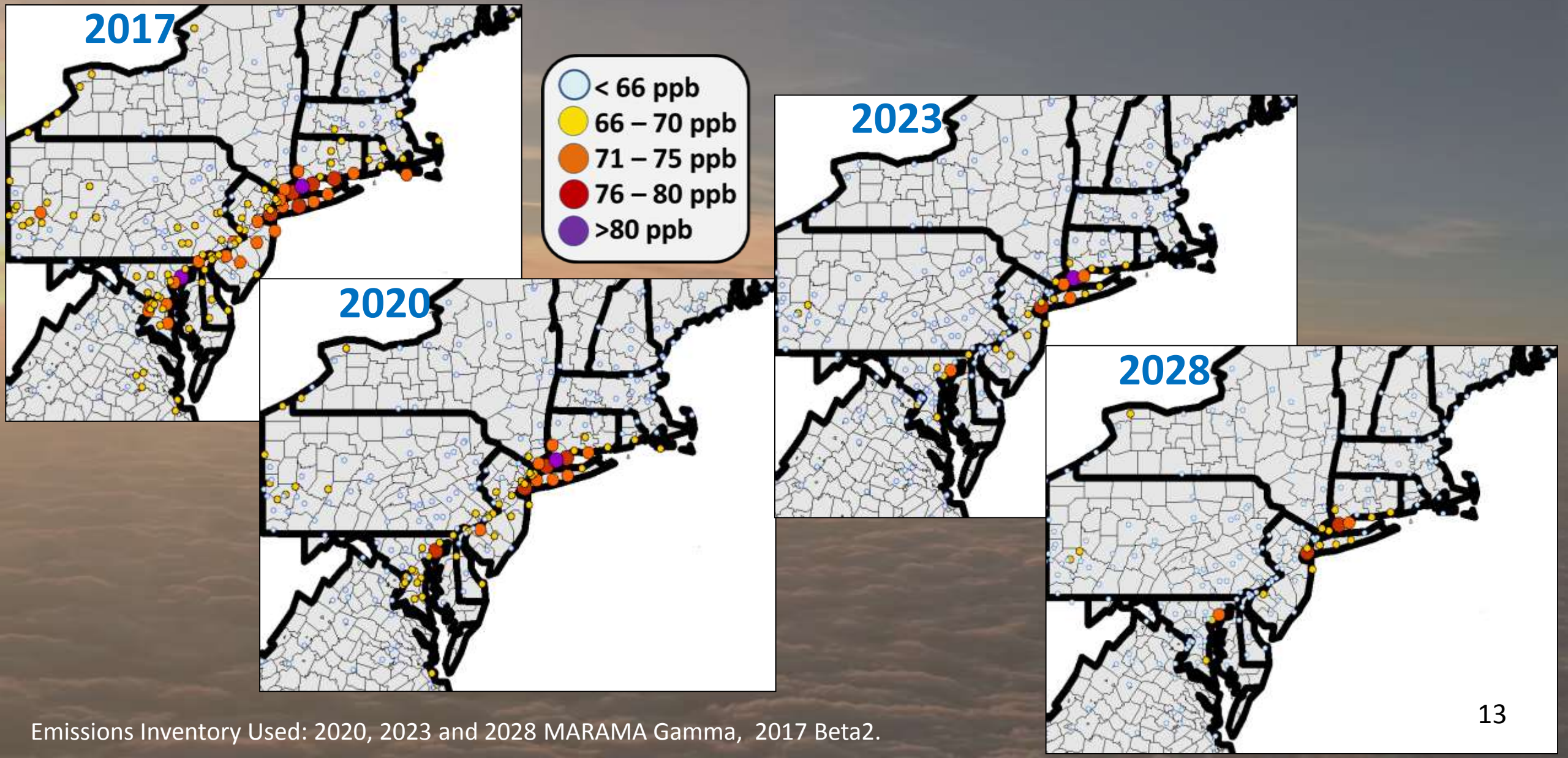
Path to Attainment
Areas in the OTR Exceeding the 2008 NAAQS



Based on 4th Maximum Daily 8-Hour Ozone Concentration (ppb)

Ozone Modeling Completed

OTC 2011 Platform Ozone Modeling Results (CMAQ)

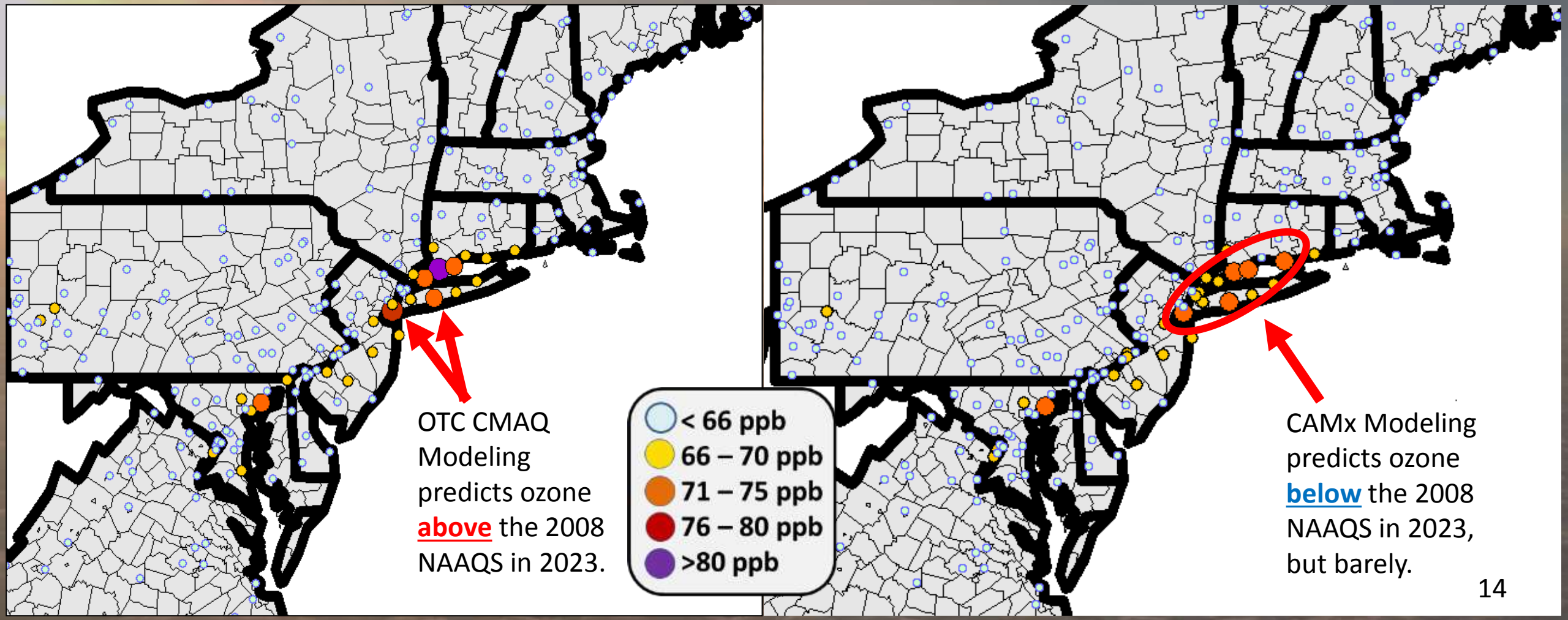


Emissions Inventory Used: 2020, 2023 and 2028 MARAMA Gamma, 2017 Beta2.

OTC vs EPA 2023 Ozone Modeling Results

OTC - CMAQ

EPA - CAMx

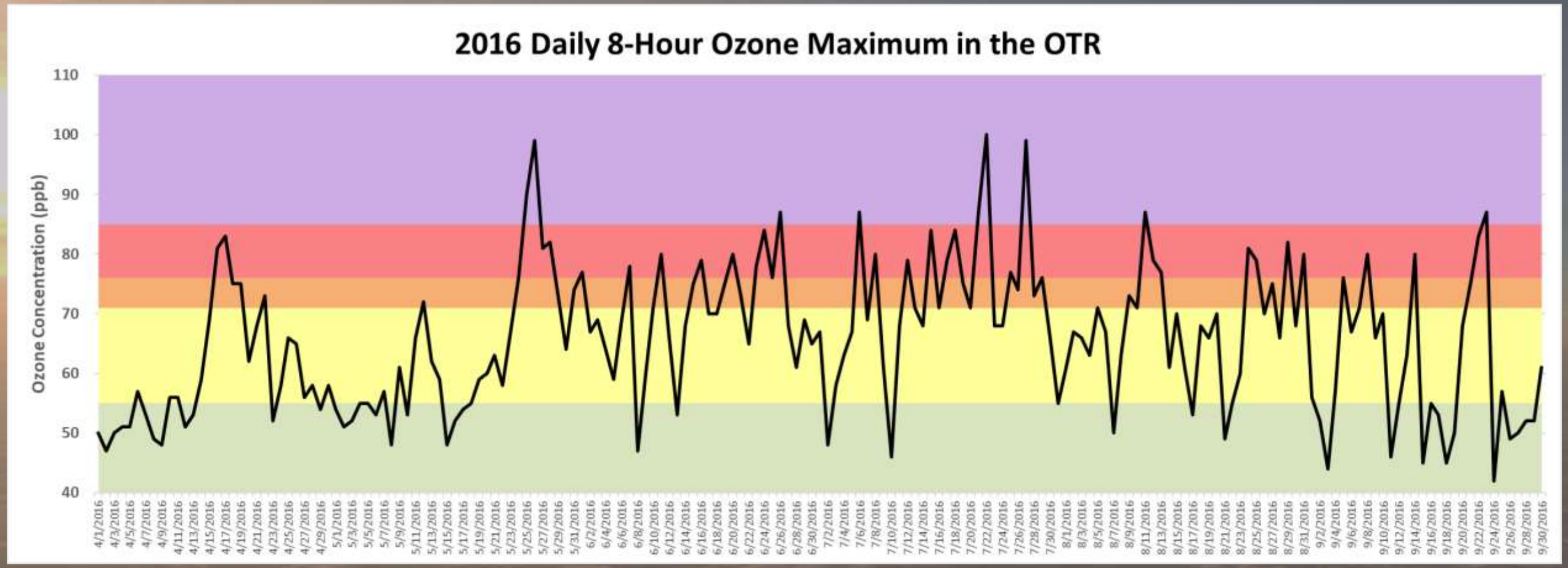


OTC CMAQ Modeling predicts ozone **above** the 2008 NAAQS in 2023.

CAMx Modeling predicts ozone **below** the 2008 NAAQS in 2023, but barely.

New 2016 Based Platform Development As Described in Work Plan

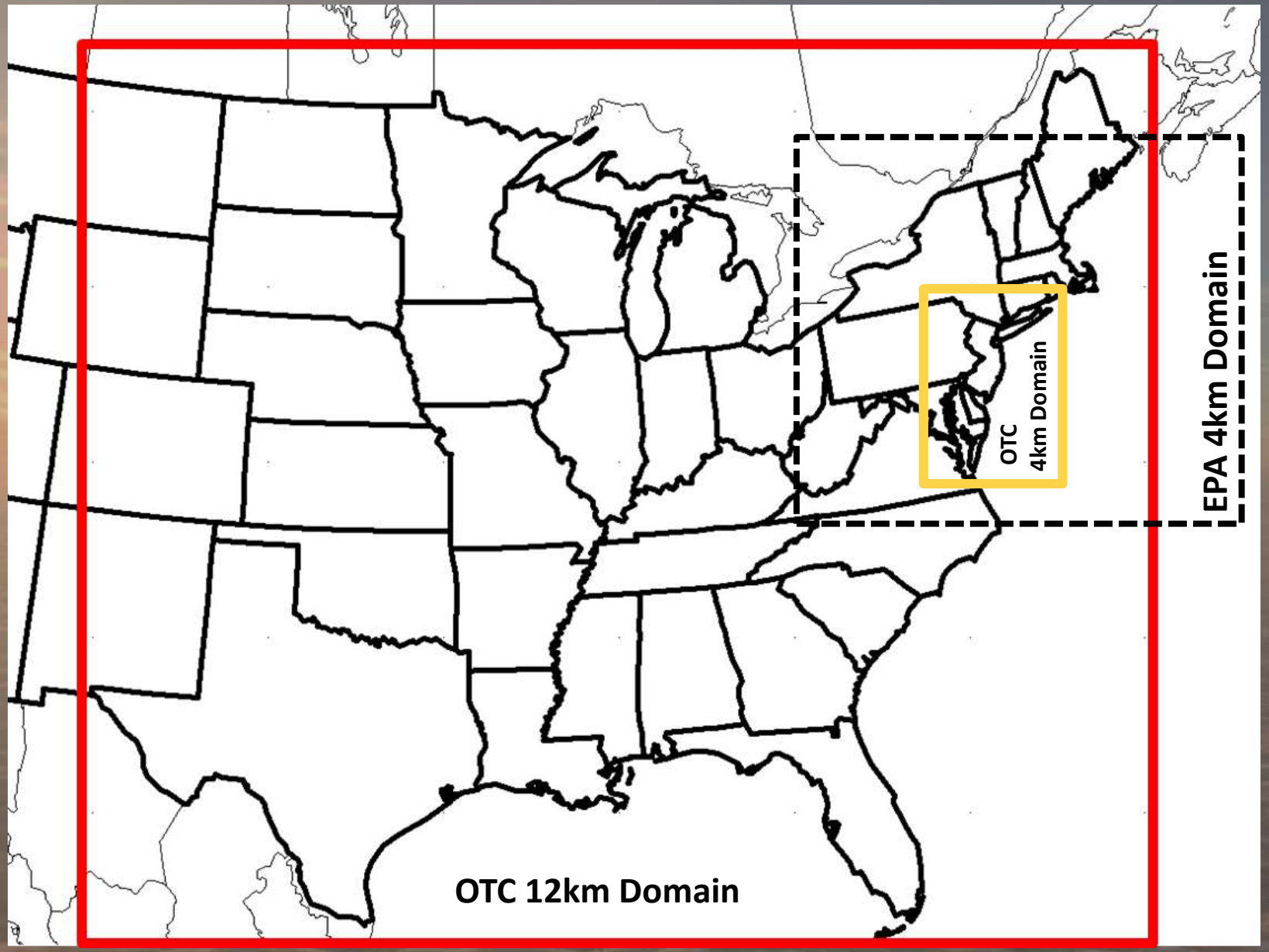
New Platform Base Year - 2016 Ozone Season



- 61 days exceeding 70ppb
- 39 days exceeding 76ppb
- 9 days exceeding 85 ppb

- 164 different monitors in all OTR states and DC exceeded 70ppb
- 127 different monitors in 11 states (+DC) exceeded 76ppb
- 27 different monitors in 7 states exceeded 85 ppb

Proposed Modeling Domains



Emission Inventory Development

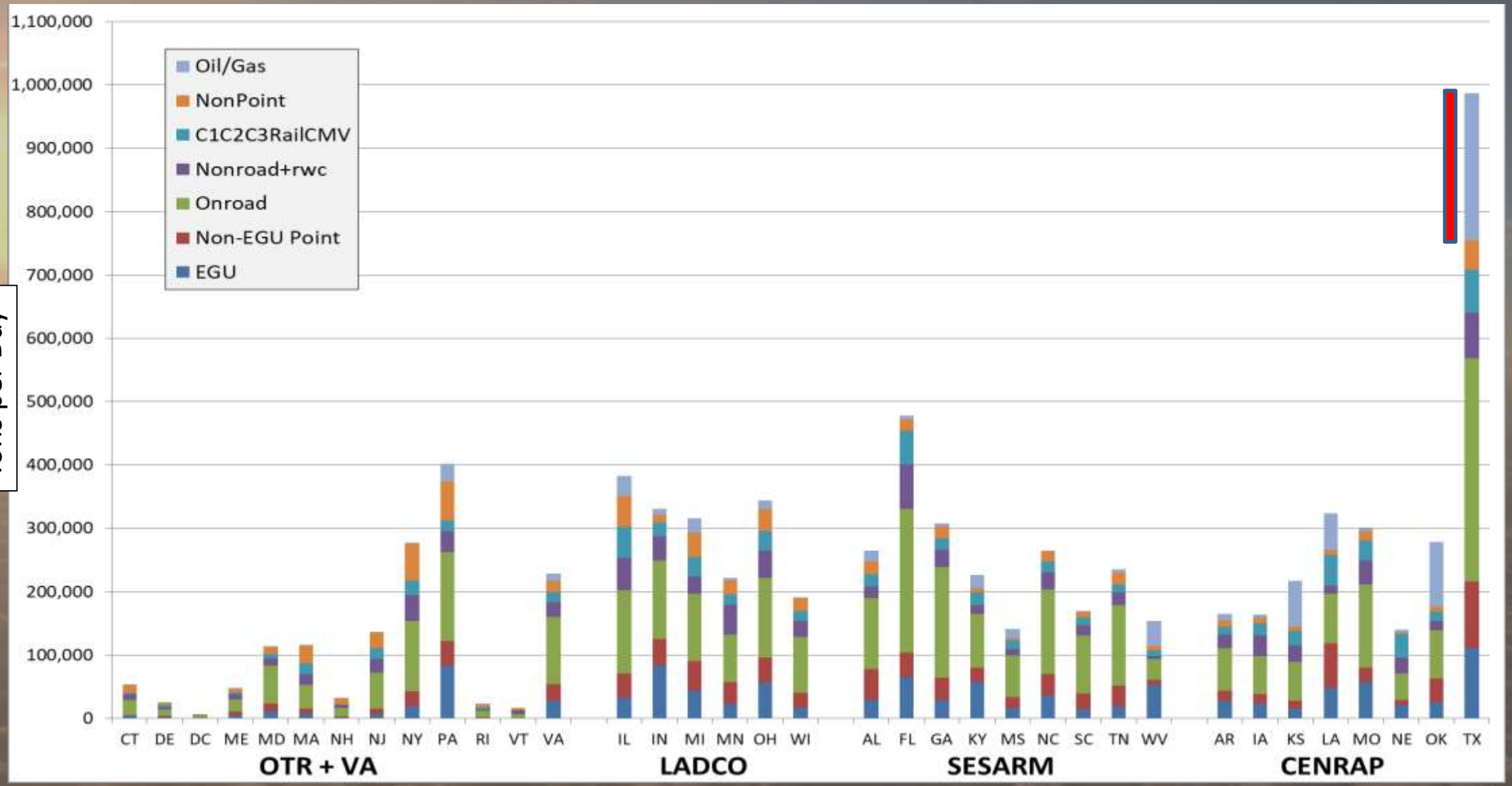
- The modeling emission inventory used by OTC is developed in partnership between member states with MARAMA leadership.
  - Part of a larger collaborative effort between states and EPA to develop a common emission inventory.
  - Emission inventory calculation and development is a complicated and detailed oriented project that takes from beginning to end.

  - Emissions of several pollutants need to be estimated for every emission source in every grid cell for every hour of the year within the modeling domain.
  - Emissions are then projected into future years policy requirements.

Emission Inventory Development

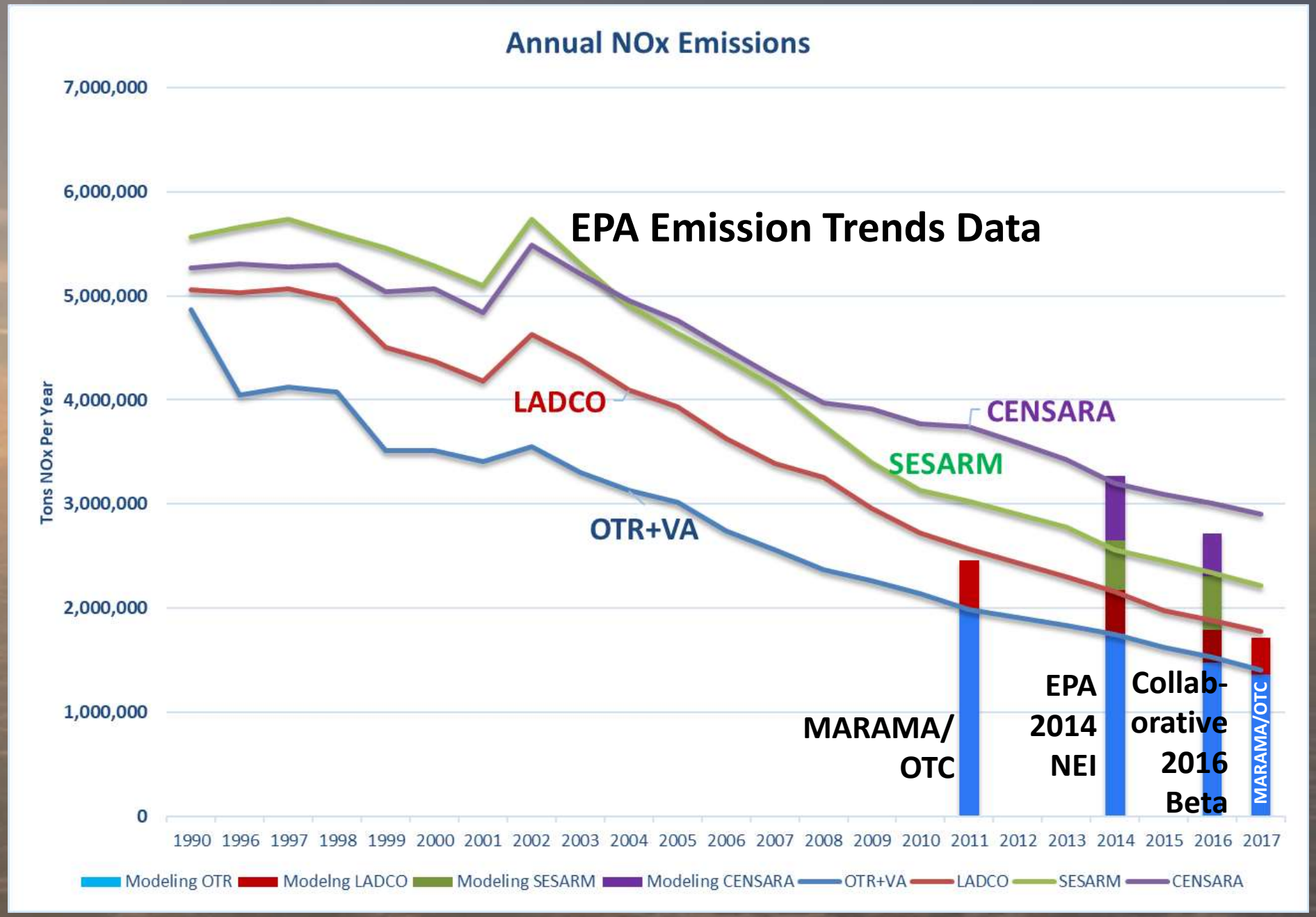
- The collaborative emission inventory is based on the 2014 NEI and grown to 2016 to fit the meteorology year chosen for this platform.
  - 2016 Alpha inventory was produced for initial platform testing.
  - An improved 2016 Beta is now available for further analysis.
    - A 2023 projected version of 2016 Beta is expected soon.
  - A planned 2016V1, and any subsequent versions will be used for policy modeling analyses (Winter 2020 with projections TDB).
- OTC is currently conducting 2016 Beta model performance testing with CMAQ and CAMx as part of a collaborative effort between states and EPA.

2016 Base Case NOx Emissions – Collaborative 2016 Beta



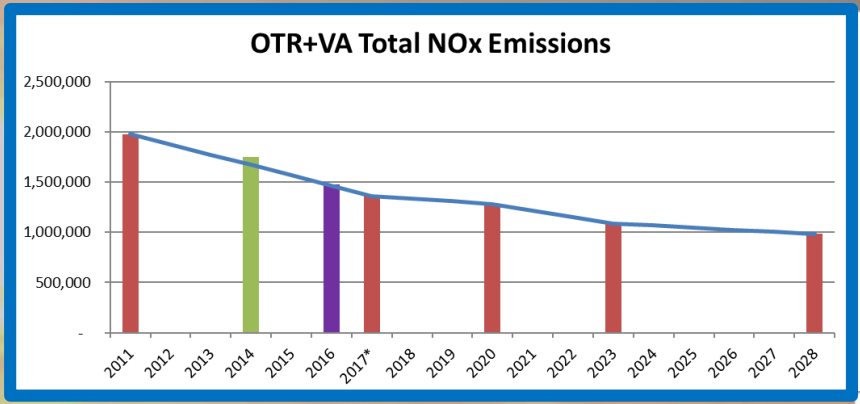
Man-made NOx Emission Trends

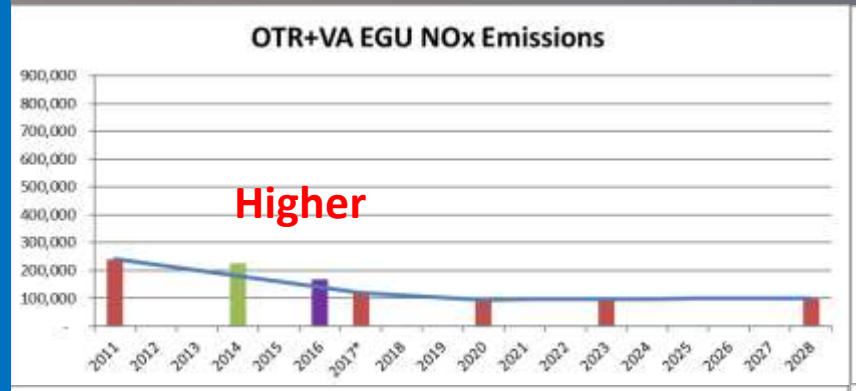
(Tons per Year)

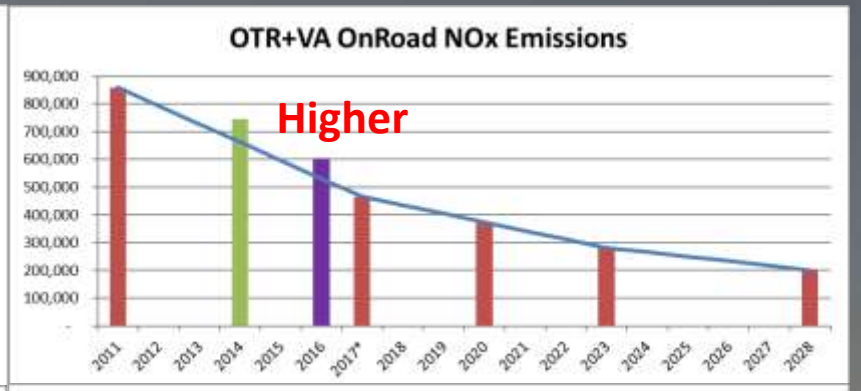


NOx - EPA 2016 Beta vs MARAMA/OTC

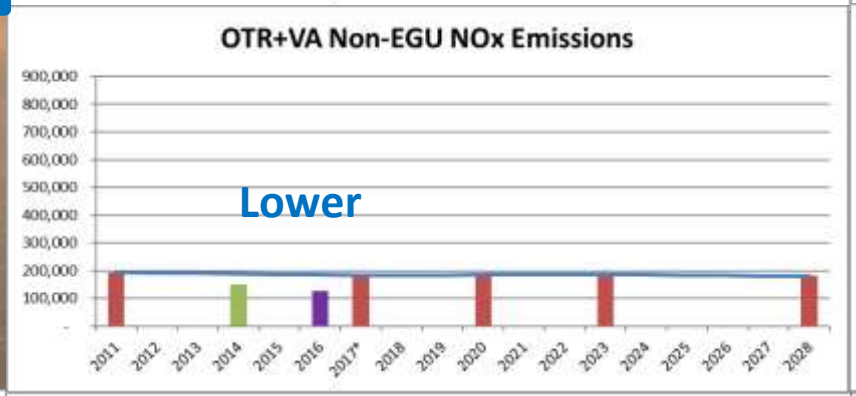
(Tons per year)

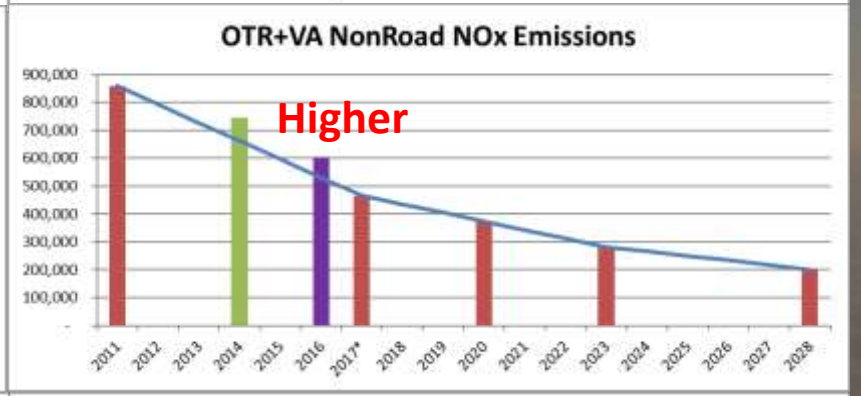


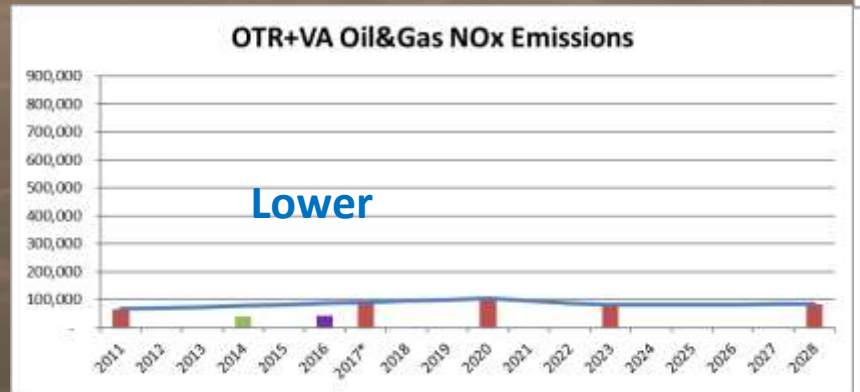


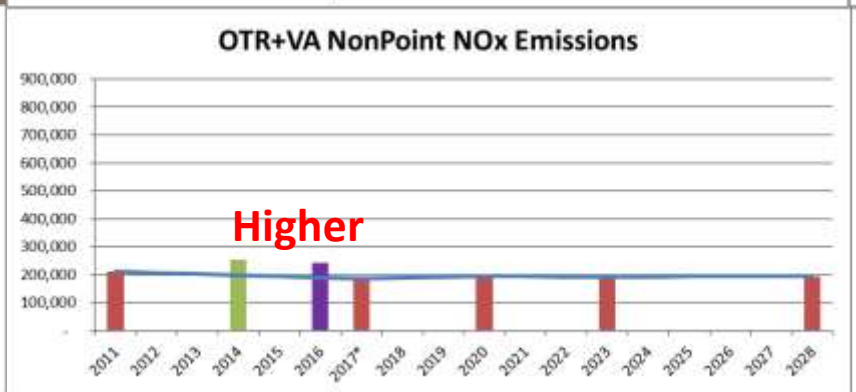


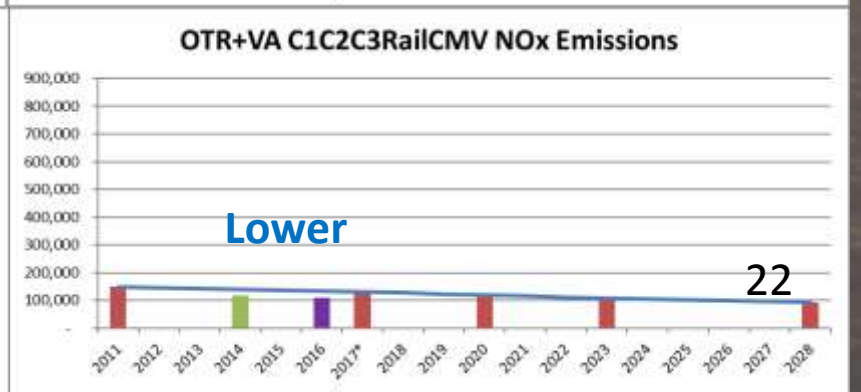
- Red bars represent MARAMA 2011 based Gamma emissions and projections (*Beta2)
- Purple bars represent Collaborative 2016 Beta base year emissions
- Green bars represent 2014 NEI











Tentatively Planned Modeling (Work plan)

1. SIP required modeling
2. Peak ozone day analyses (in conjunction with SAS Committee)
3. Heavy-duty diesel standards (in conjunction with Mobile Source Committee)
4. Updated contribution modeling (?)
5. Update BenMap roll-back analysis to include 2018 ozone data

Contact Information

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