

Metropolitan Washington, DC-MD-VA Air Quality Overview

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Metropolitan Washington Council of Governments

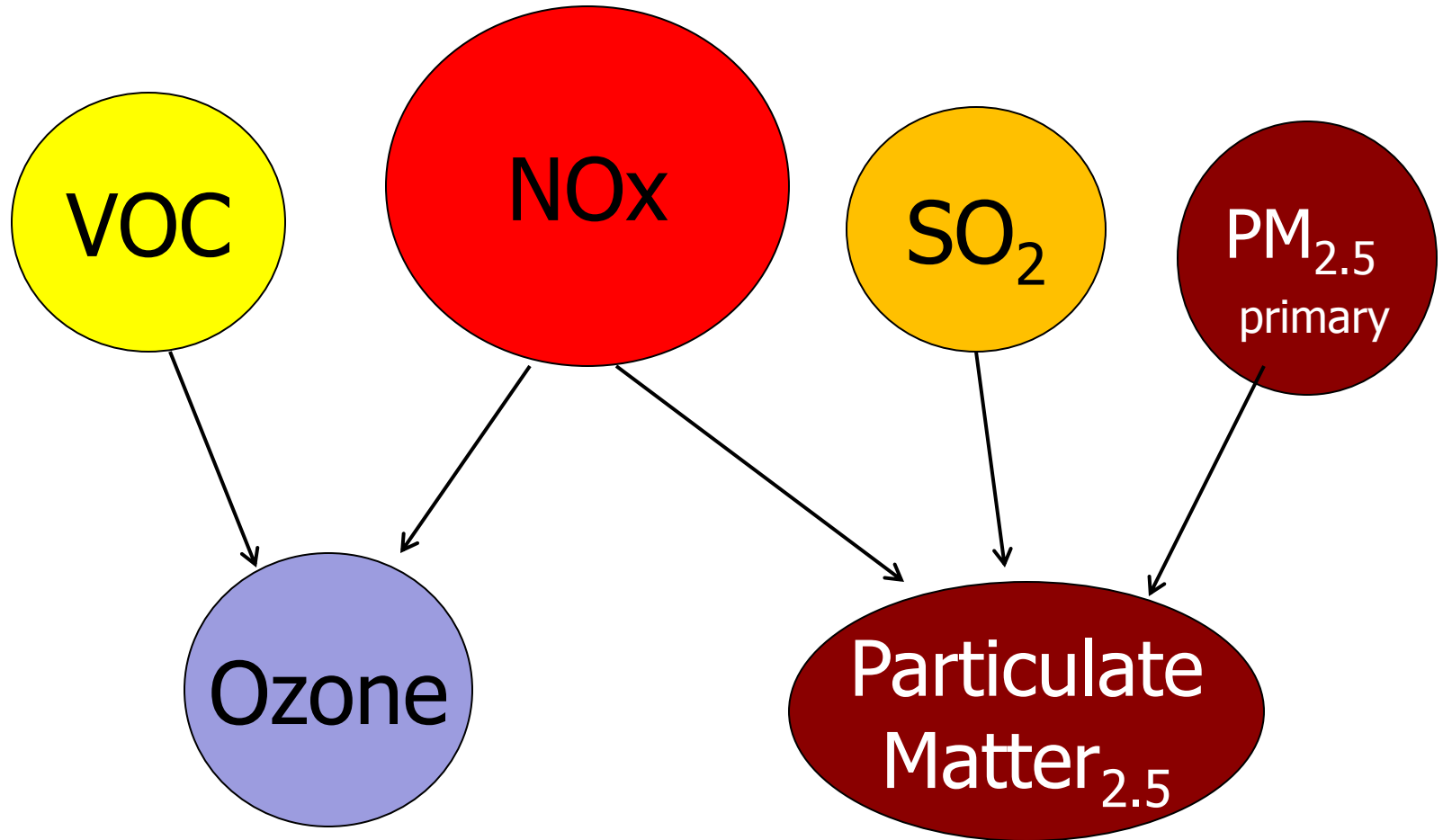
February 22, 2012



Air Quality Overview

- The Maintenance Plan to keep PM_{2.5} levels below the health standard until 2025 should be considered in the context of planning to reduce ozone levels.
- Nitrogen oxides is a precursor to both PM_{2.5} and ozone.
- Reducing nitrogen oxides is critical to achieving ozone standards and maintaining the PM_{2.5} standard.

Precursors for Ozone and Fine Particles



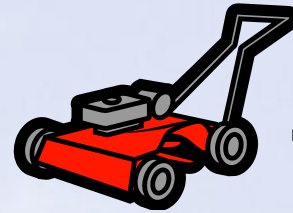
4 Sources of Air Pollution



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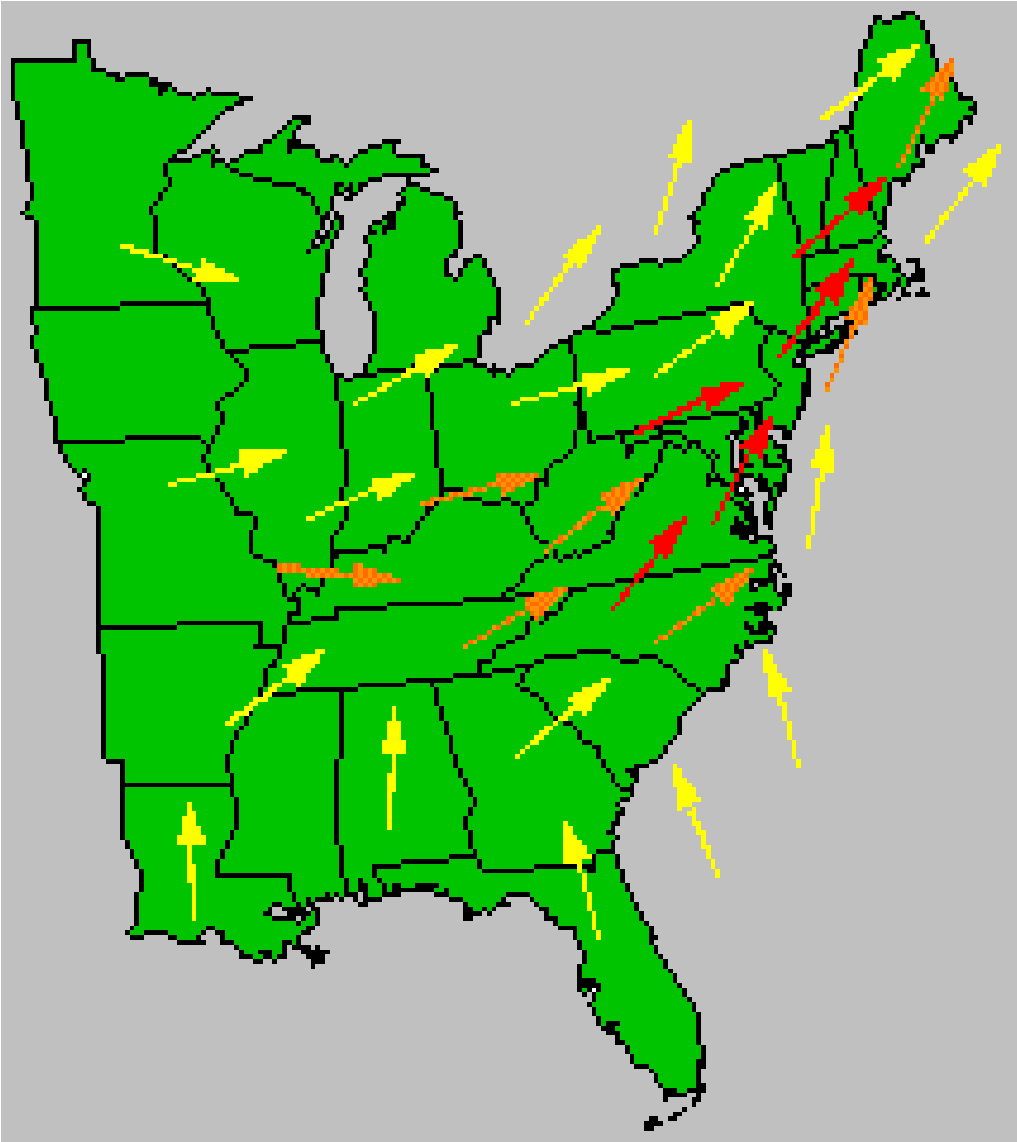
Point
Source

Mobile
Source

Area
Source

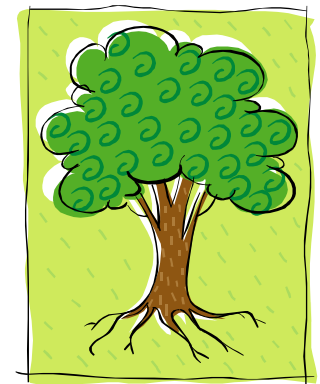
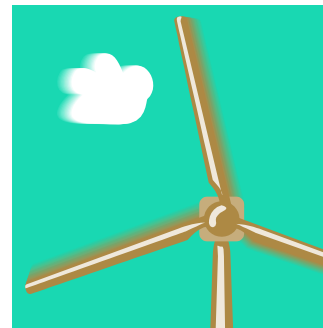
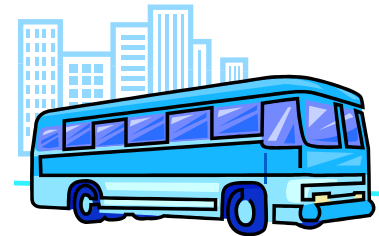
Non-road
source

Air pollution is transported over long distances



Plan to Reduce Ozone

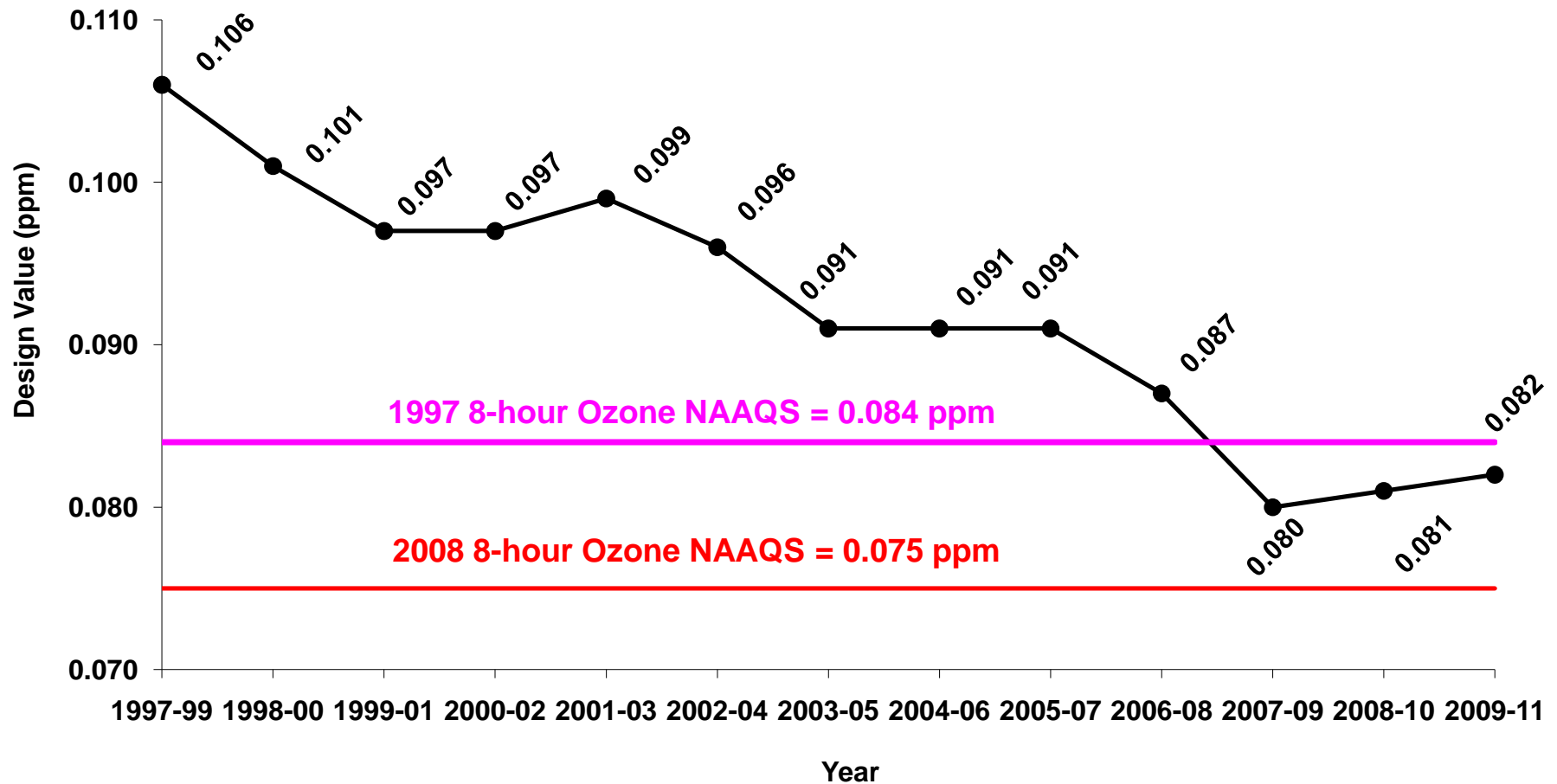
- **Point Source**
 - NOX SIP Call
 - Clean Air Interstate Rule (CAIR) - VA & DC
 - **Maryland Healthy Air Act - MD**
 - Utility Reductions (Possum Point Fuel Conversion) -VA
- **Area Source**
 - National Locomotives Rule
- **Nonroad Source**
 - 2004 Nonroad Heavy Duty Diesel Rule
- **Onroad Source**
 - Heavy-Duty Diesel Engine Rule
 - Tier 2 Motor Vehicle Emission Standards
 - Vehicle Inspection Program
- **Supplemental Measures:**
 - Telecommuting Initiative,
 - Tree Canopy Programs
 - Wind Energy Purchases,
 - Energy Efficiency in buildings,
 - LED Traffic Signal Retrofits,
 - Renewable Portfolio Standards



New Ozone Standard: Nonattainment Classifications

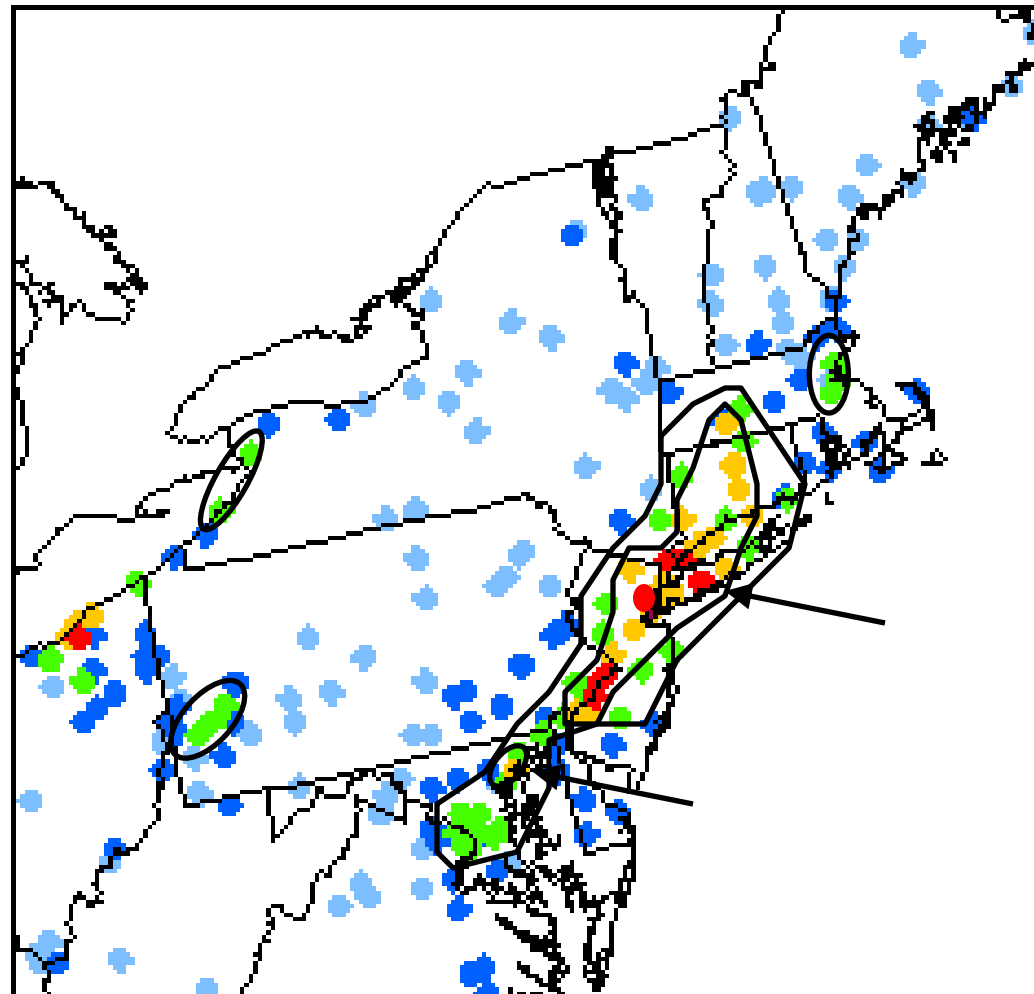
- Marginal 0.076 – 0.086 ppm
- Moderate 0.086 – 0.100 ppm
- Serious 0.100 – 0.113
- Severe 0.113 – 0.175
- Extreme 0.175 and up

8-hour Ozone Design Value Washington, DC-MD-VA Nonattainment Area (1999-2011)



* Design value = 3-year average of 4th highest daily maximum 8-hour average ozone concentrations. 2011 data is draft and may change.

Estimated Areas Above 75ppb



2018

Most red and yellow locations will fail to attain

More locations would likely fail to attain by 2015
(Probably will include all yellow and most green locations)

Based on 2020 (N48/V23) Bounding Run

Source: OTC

60 65 70 75 80 85 ppb

Air Pollution: Fine Particles

- Chemical, **particulate matter** or aerosol that modifies the natural characteristics of the atmosphere
- Created locally by emissions from coal combustion, cars & trucks, road construction
- Causes respiratory problems
- Impairs visibility



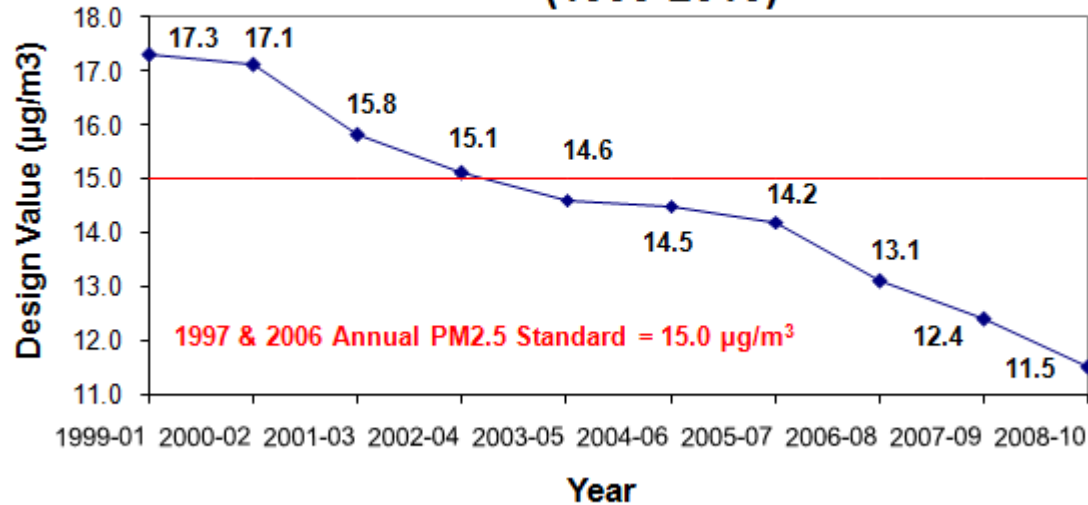
Steps to Official “Attainment” Status

- 2005 - Air quality monitors indicate that average annual concentrations are below the national health standard
- 2008 – MWAQC, States submitted PM2.5 SIP showing attainment by 2009.
- EPA issued a “Clean Data Determination,” 2009
- States request redesignation to attainment and submit a plan to maintain low levels of fine particle pollution for 10 years into future

Benefits of Attainment

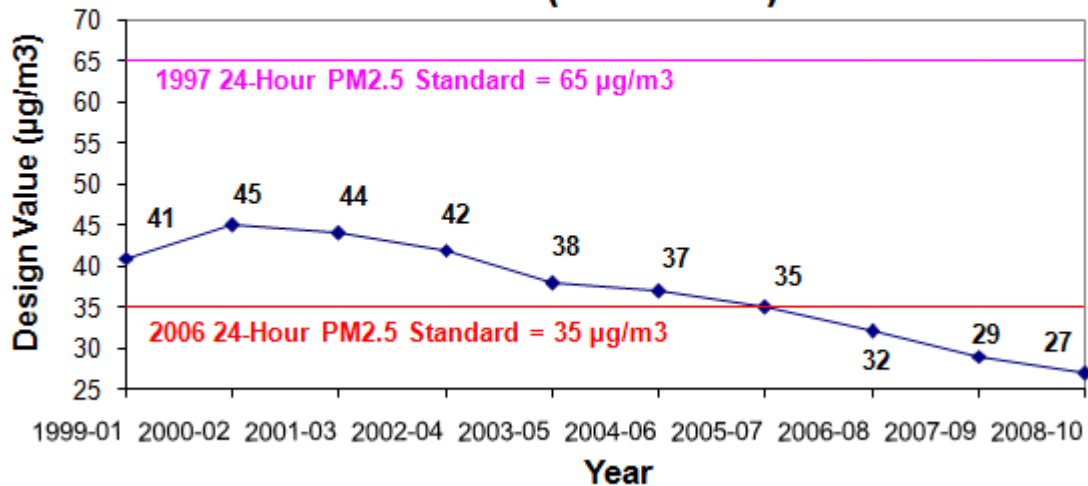
- Official recognition and public awareness:
 - Fine particle pollution (PM_{2.5}) levels are lower in the metropolitan Washington area than the level required by the federal health standard
 - Control measures such as cleaner engines, controls on power plants, diesel retrofit measures are working.
- Reduces a significant obstacle for locating new cleaner generation capacity (economic development)

Annual PM2.5 Design Value Washington, DC-MD-VA Nonattainment Area (1999-2010)



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

24-Hour PM2.5 Design Value Washington, DC-MD-VA Nonattainment Area (1999-2010)



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

PM2.5 Redesignation Request and Maintenance Plan: Overview

(Washington DC-MD-VA PM_{2.5} Nonattainment Area)

Components of Redesignation Request & Maintenance Plan

- **Emissions Inventories**
 - Continued emissions reduction in future
- **Mobile Budgets**
 - Mobile emissions ceiling for transportation conformity purposes
- **Contingency Measures**
 - Emissions controls to be implemented if region exceeds PM2.5 standard in future

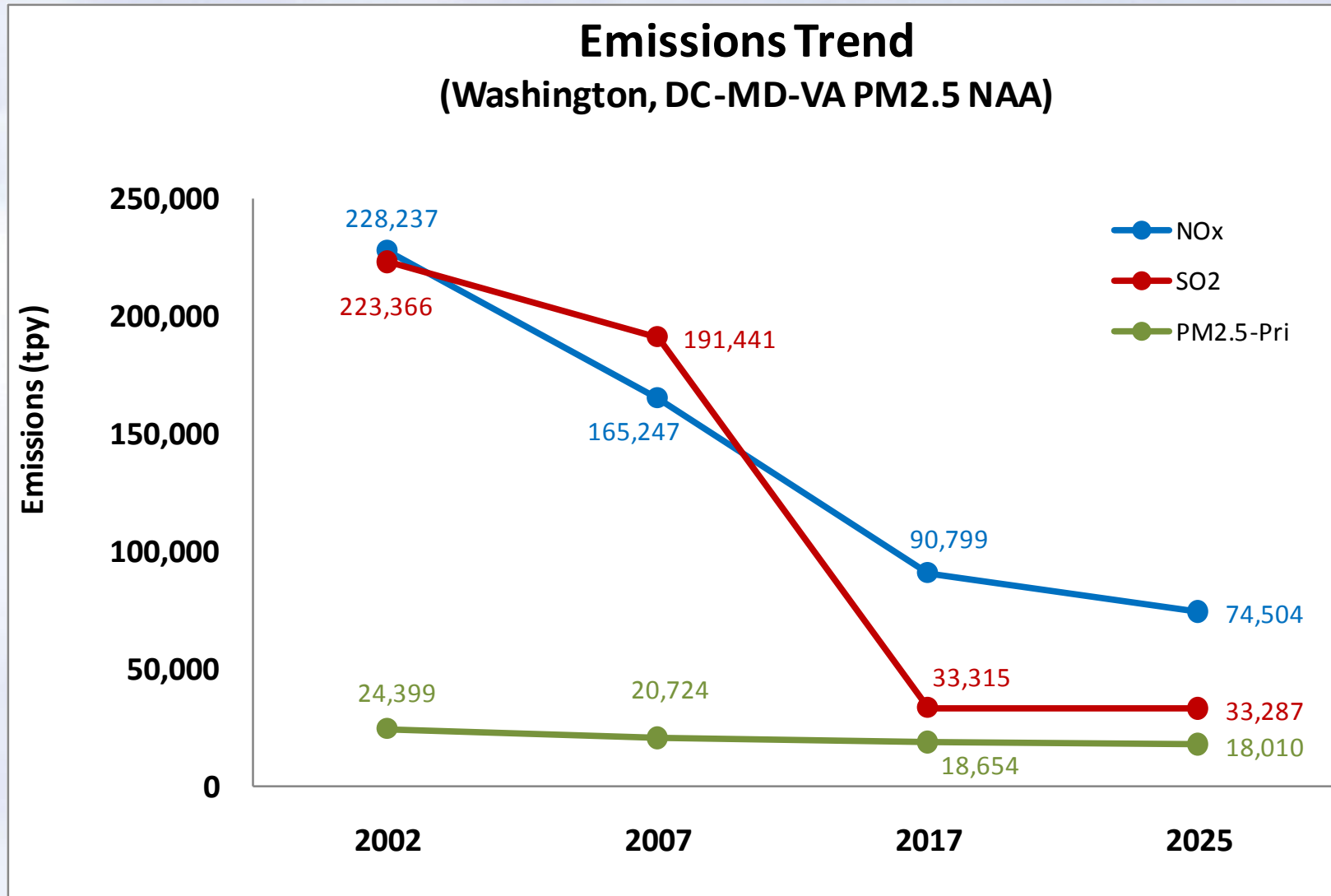
Emissions Inventories

- **Milestone Years**
 - 2002, 2007, 2017, 2025
- **Emission Sectors**
 - Point Source (Electric Generating Units & Non-EGU)
 - Area Source (residential wood burning, road dust)
 - Nonroad Source (lawn mowers, marine engine, airport, roadrail)
 - Onroad Source (motor vehicles)
- **Inventory sources**
 - Point, Area, Nonroad: MARAMA
 - Onroad Mobile (MOVES): MWCOCG

Redesignation Request & Maintenance Plan Timeframe

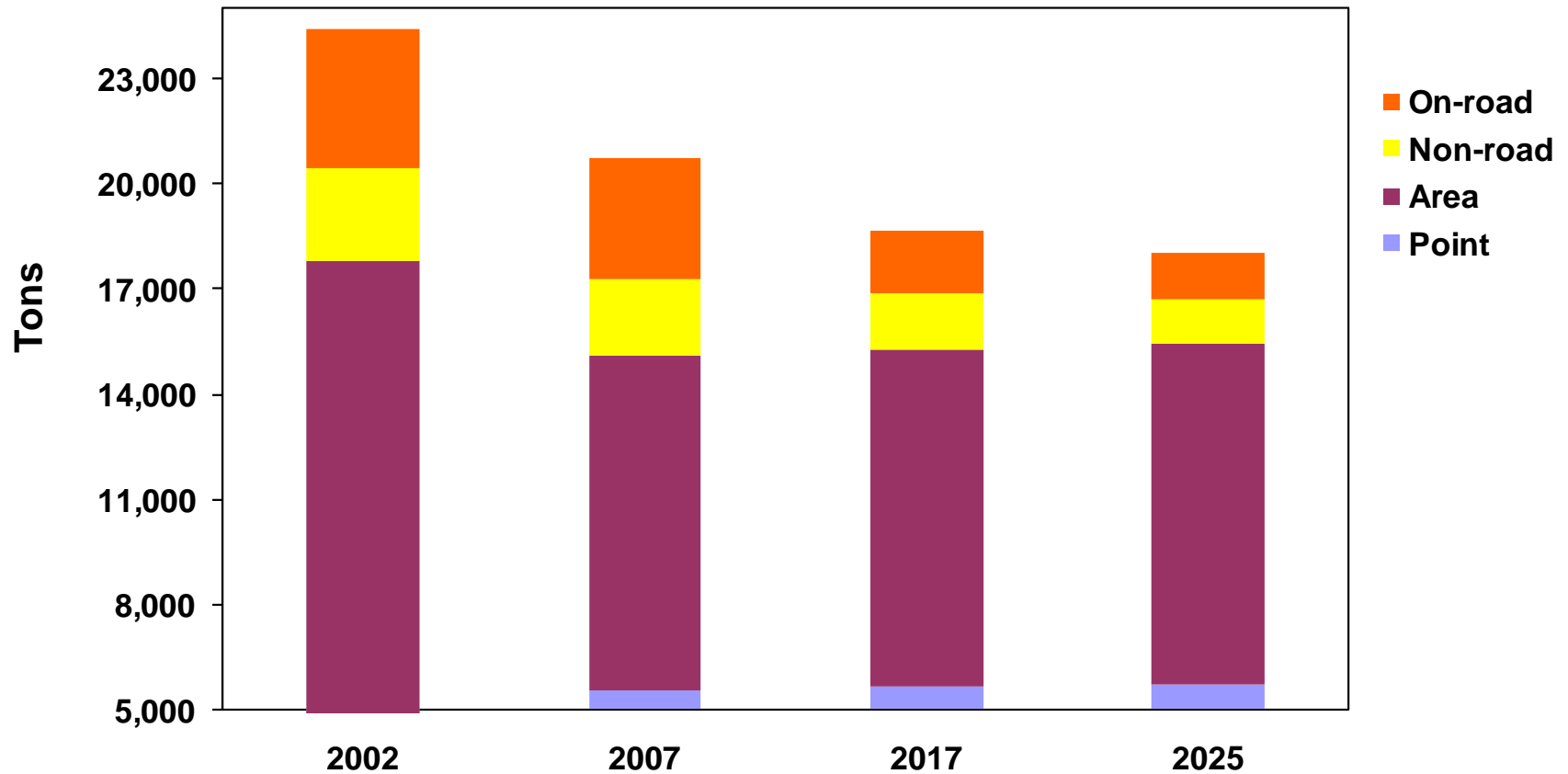


Projected Emissions Trends (NOx, SO2, PM2.5) 2007-2025

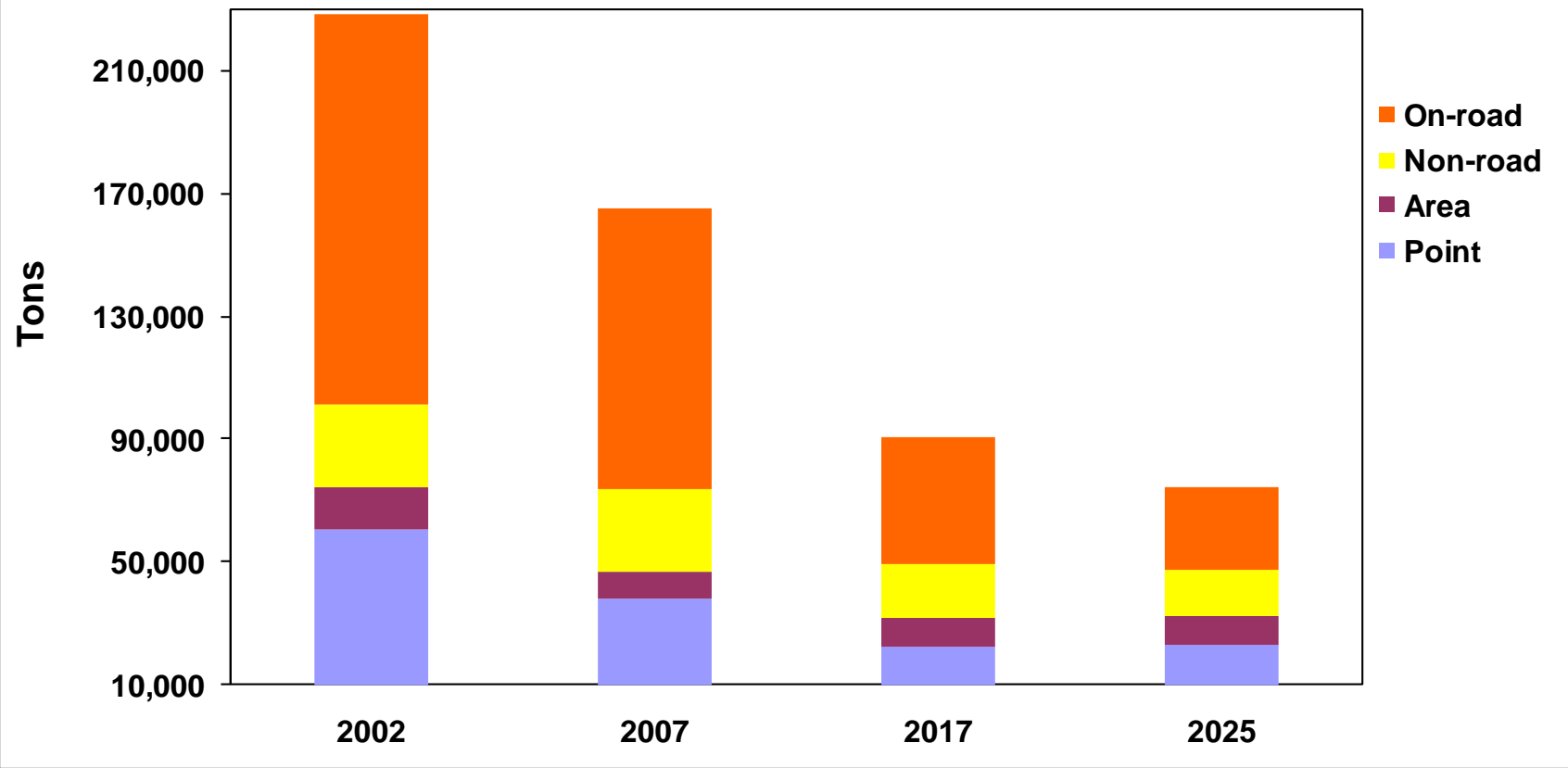


PM2.5-Pri Emission Trend

Washington, DC-MD-VA Annual PM2.5 Non-Attainment Area

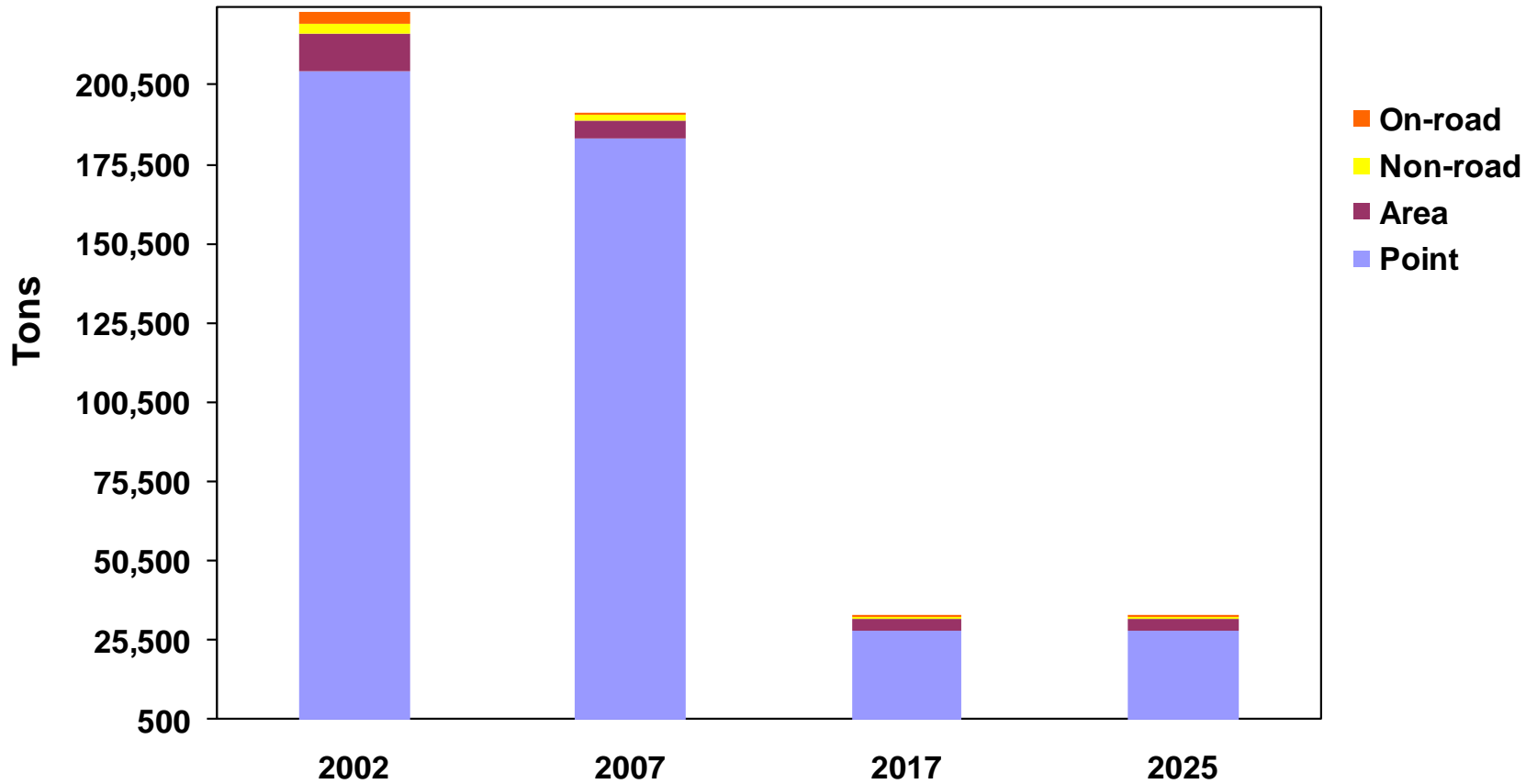


NOx Emission Trend Washington, DC-MD-VA Annual PM2.5 Non-Attainment Area



SO2 Emission Trend

Washington, DC-MD-VA Annual PM2.5 Non-Attainment Area



PM2.5 R/MP - Where We Are?

- **NO_x, SO₂, & PM_{2.5}-Pri emissions**
 - 2002 > 2007
 - Reduced emission satisfies the criterion for Redesignation Request
 - 2007 > 2017
 - 2007 > 2025
 - Downward trend demonstrates continued maintenance of 1997 annual PM_{2.5} standard (15 ug/m³)
- **Need to finalize the list of contingency measures**
- **Need to decide mobile budgets for PM_{2.5}-Pri & NO_x**

Mobile Budget

- **Mobile emissions ceiling**
- **Transportation sector emissions can not go over the ceiling**
- **Needed for transportation conformity mandated under Clean Air Act.**
- **PM2.5 Redesignation request/Maintenance Plan**
 - **PM2.5 & NOx mobile budgets**

How Do Transportation Plans Relate to the SIP?

- The SIP sets the *mobile budget*, the maximum allowable emissions from vehicles.
- TPB must ensure that the regional transportation plan does not result in emissions above this level.

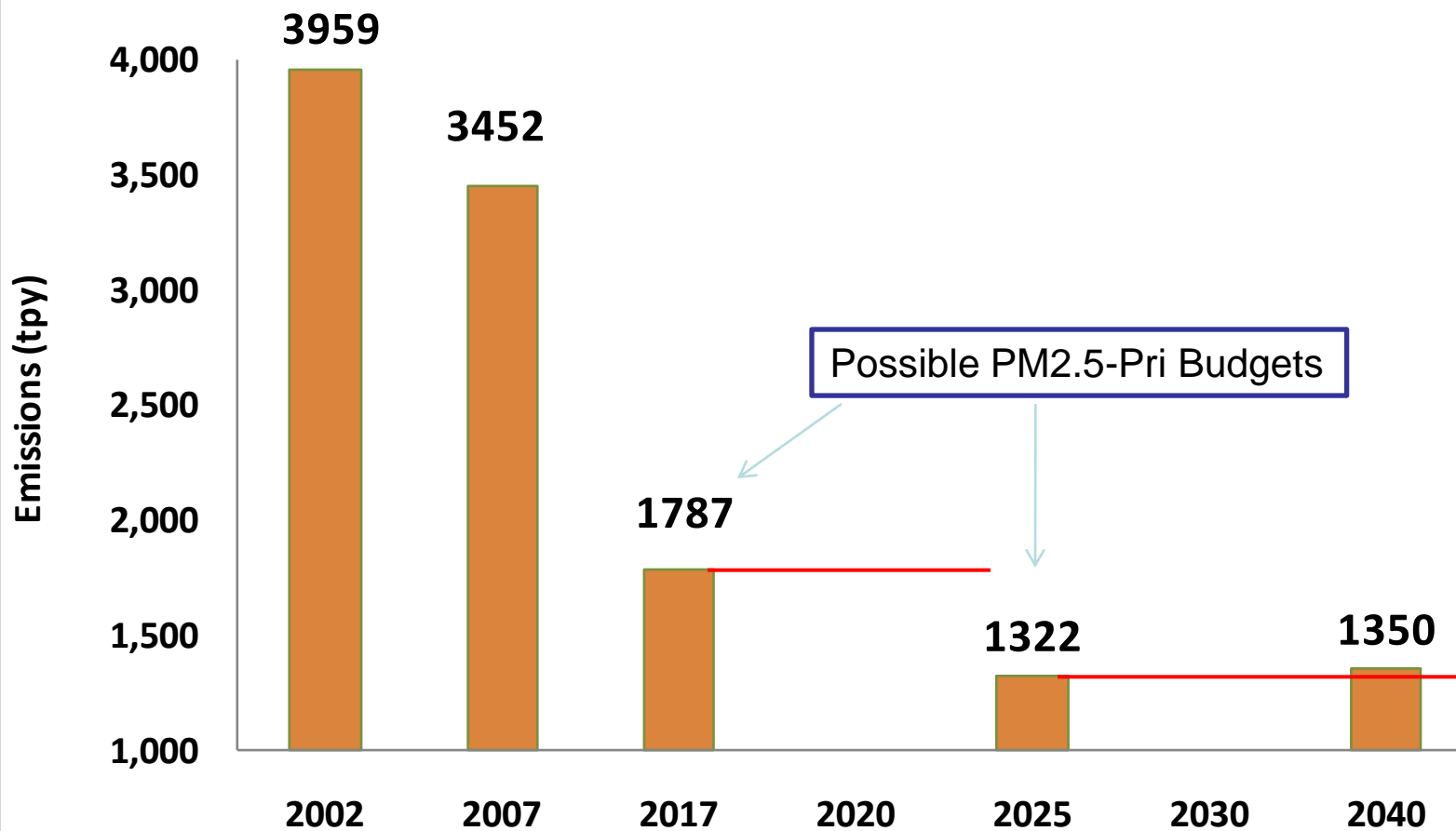
Maintenance Plan/SIP

TIP

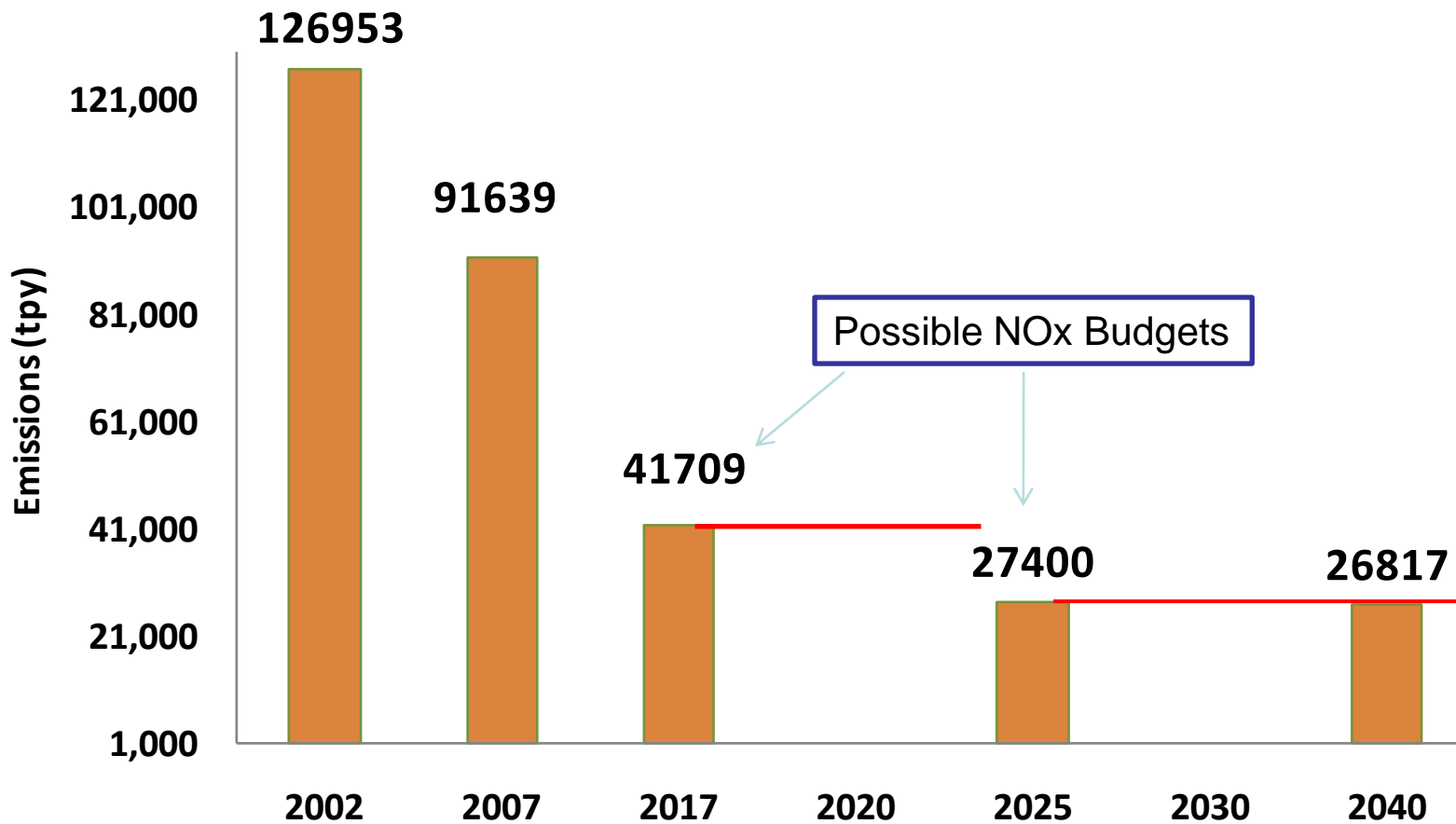


Mobile

Onroad Mobile PM2.5 Emission (Washington, DC-MD-VA PM2.5 NAA)



Onroad Mobile NO_x Emission (Washington, DC-MD-VA PM_{2.5} NAA)



Issues to be worked out

- Protect public health by reducing emissions
- Expecting new, tougher ozone and fine particle standards in the next year
- Need to reduce NO_x emissions to lower ozone and fine particle pollution
- Establish mobile budgets (emissions limits) that will conform to the plan and allow new transportation improvements to move ahead

PM2.5 Schedule to Redesignation

