Maryland
Department of
the Environment

Cleaning the Air

Fine Particles: Well below health standards

Ozone: Lowest levels in 30 years

Mercury: Huge emission reductions

New Ozone & Sulfur Dioxide Standards: Our next set of challenges … but new programs on the way

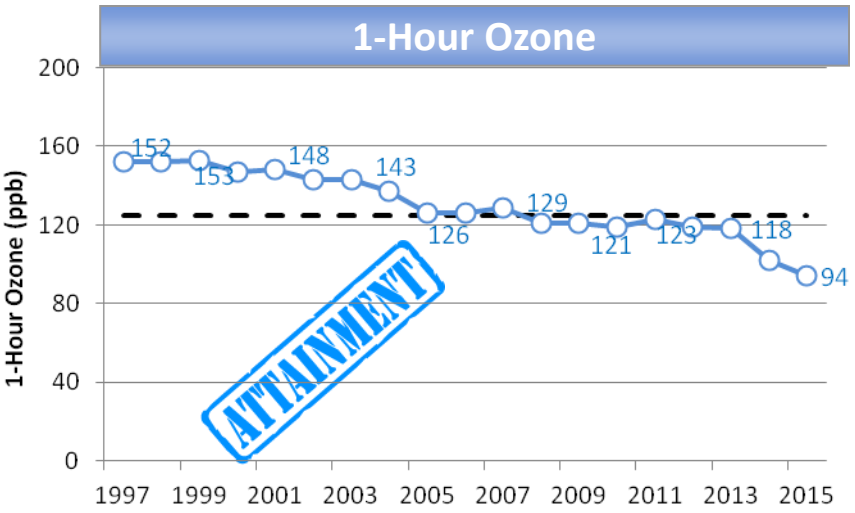
Topics Covered

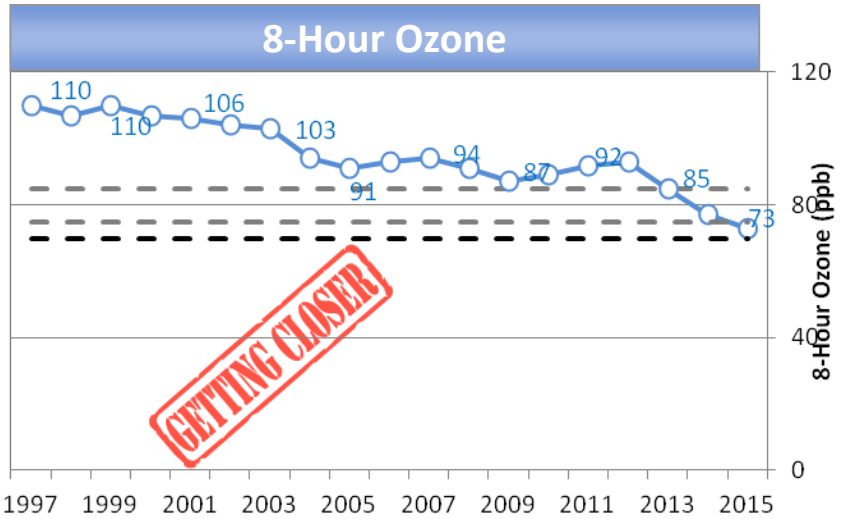
- Maryland's air quality
  - 10 years of dramatic progress
- What happened to drive that progress?
- New Challenges
- Opportunities to work together for even cleaner air

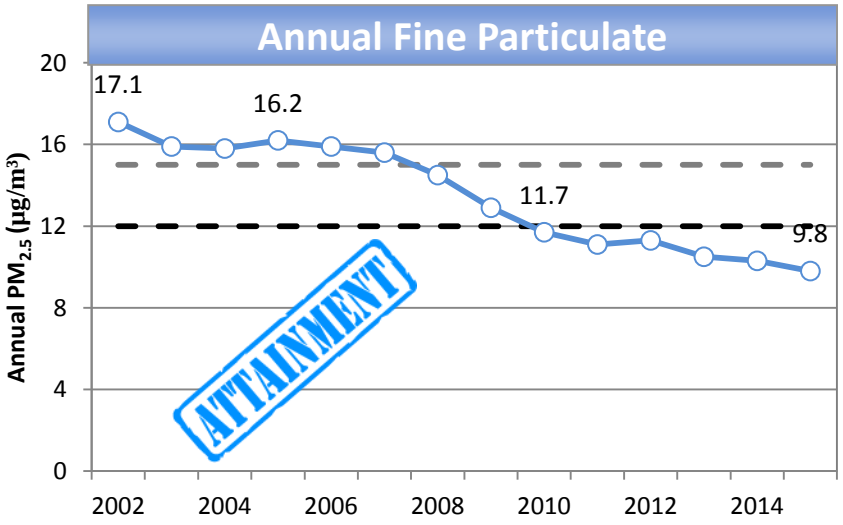
CLEANING THE AIR

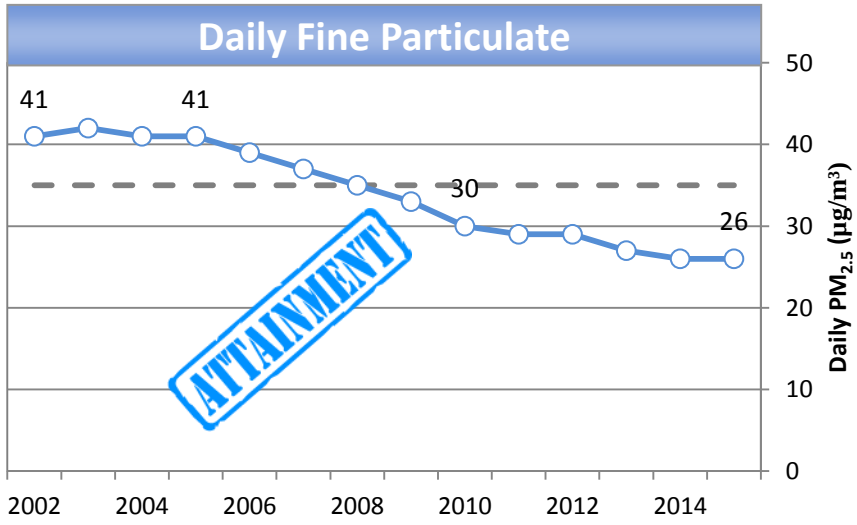
DRAMATIC PROGRESS OVER THE PAST 10 YEARS

Progress in Cleaning Maryland's Air





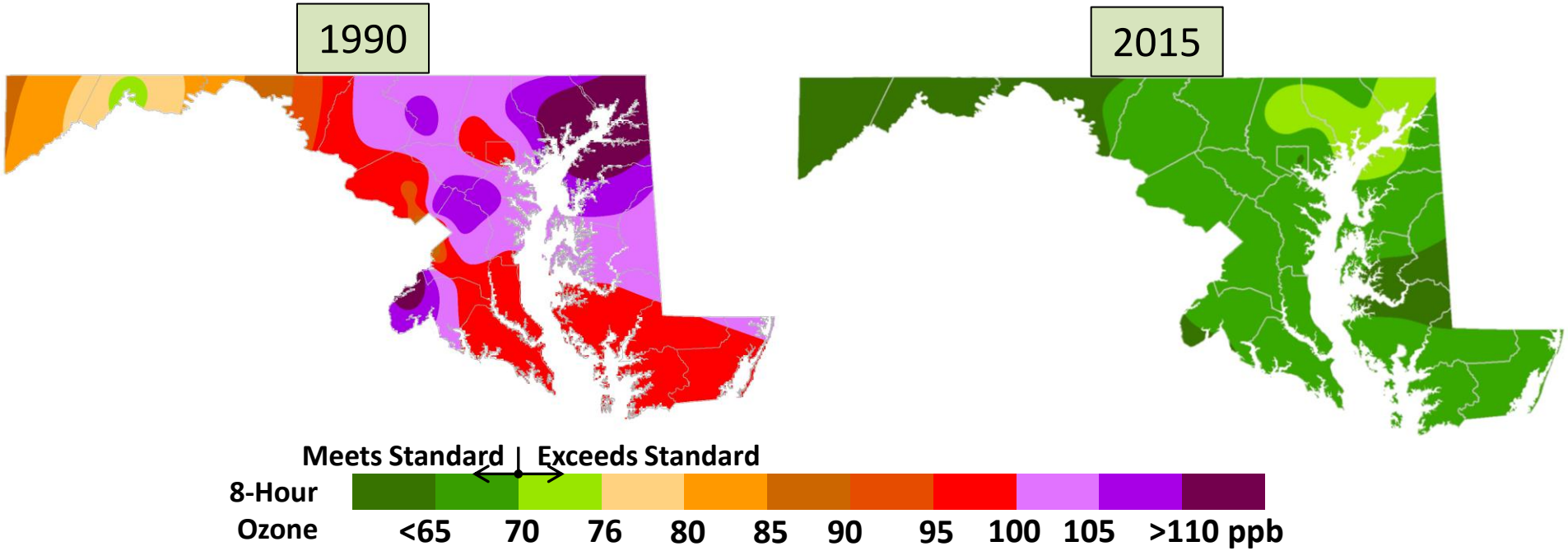




Clean Air Progress in Baltimore

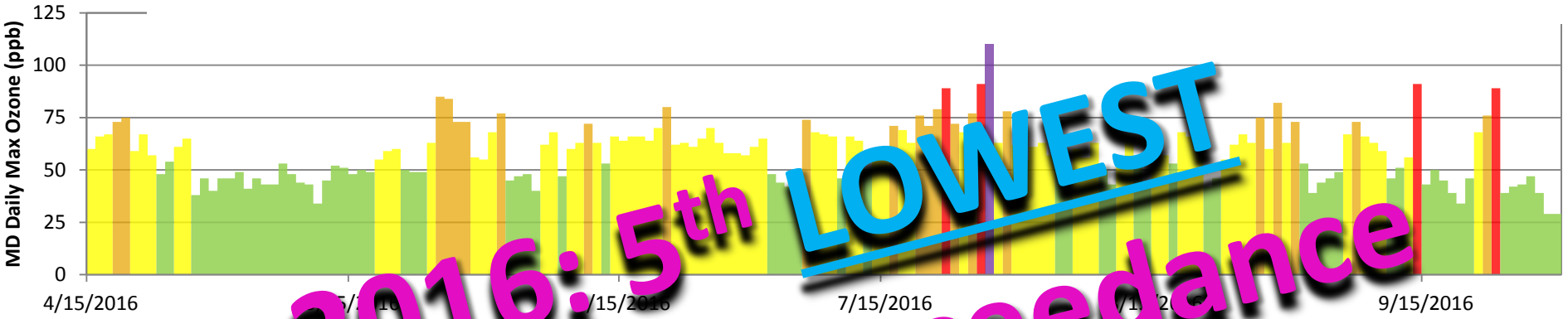
- Baltimore has historically measured some of the highest ozone in the East
- From 2013 to 2015, the Baltimore area did not exceed the current ozone standard
  - First time in 30 years … weather did play a role
- EPA has now finalized a "Clean Data Determination"
- With hotter, less ozone friendly weather, Baltimore may see higher ozone … but continued progress is indisputable
- New, lower standard begins in 2017
  - New challenges

The Shrinking Ozone Problem



- In 2015 no monitors were above the 75 ppb threshold
- In 2015 only small areas of Baltimore, Harford and Cecil Counties were above the new ozone threshold of 70 ppb

2016 Ozone Season- Decoupling Complete



2016: 5th LOWEST Number of Exceedance Days

90 Degree Days

YEAR	No. Days	Avg. T_{max}
2016	4	85.3
2015	26	83.6
2014	14	82.5
20		
2		
2		
2		

Av

Th summer of 2016 was ***warmer*** than no al and ***SIGNIFICANTLY cooler*** than the past 3 years. However, Maryland had only marginally more

Exceedance Days

YEAR	70ppb	75ppb	84ppb
2016*	27	14	5
2015	20	8	2
2014	11	5	1
2013	19	9	0

We no longer see high temperature always drive high ozone … the atmosphere in the Mid-Atlantic has changed so that continued NOx reductions will create even greater ozone reductions

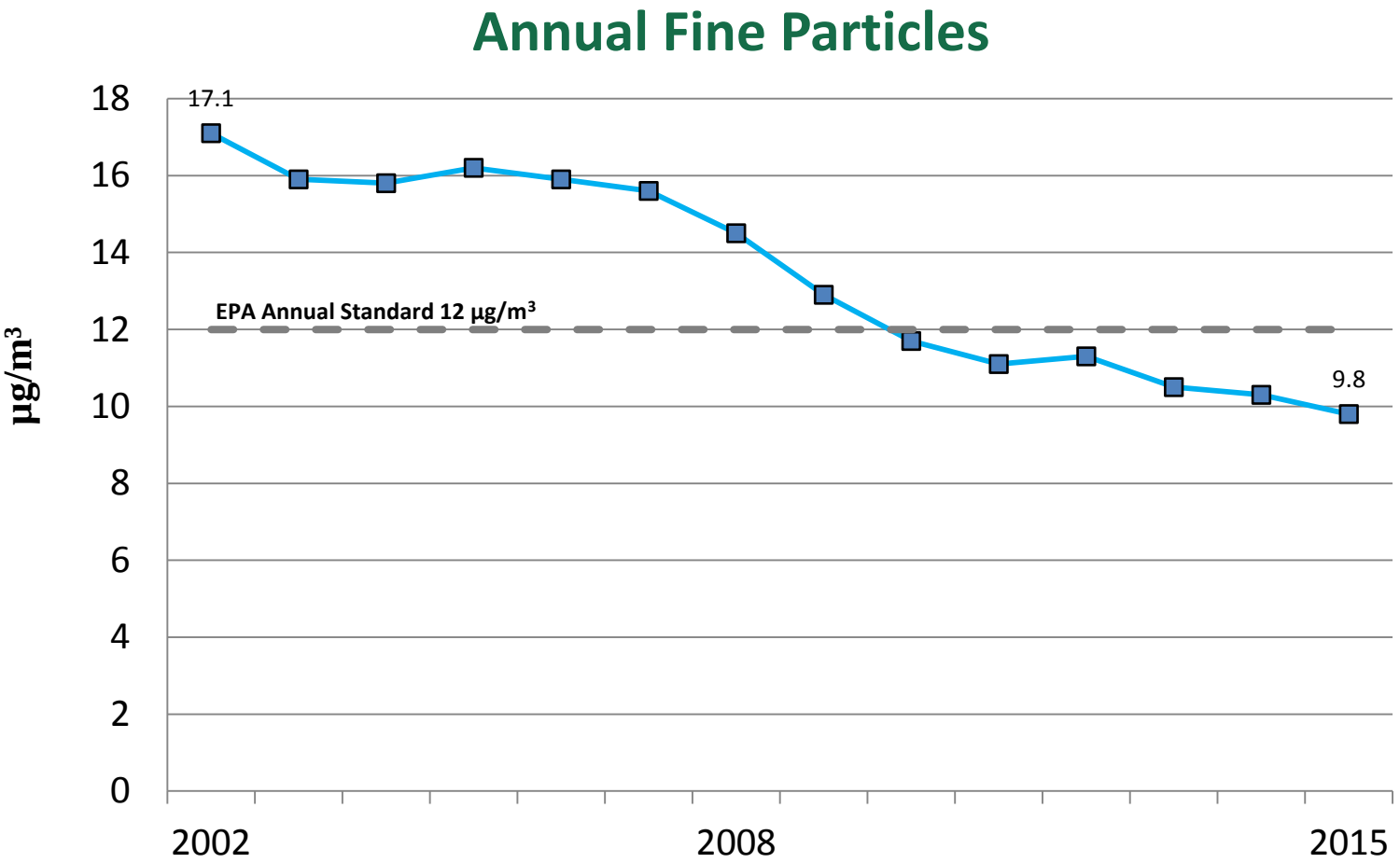
for Northern Maryland

*Preliminary Data

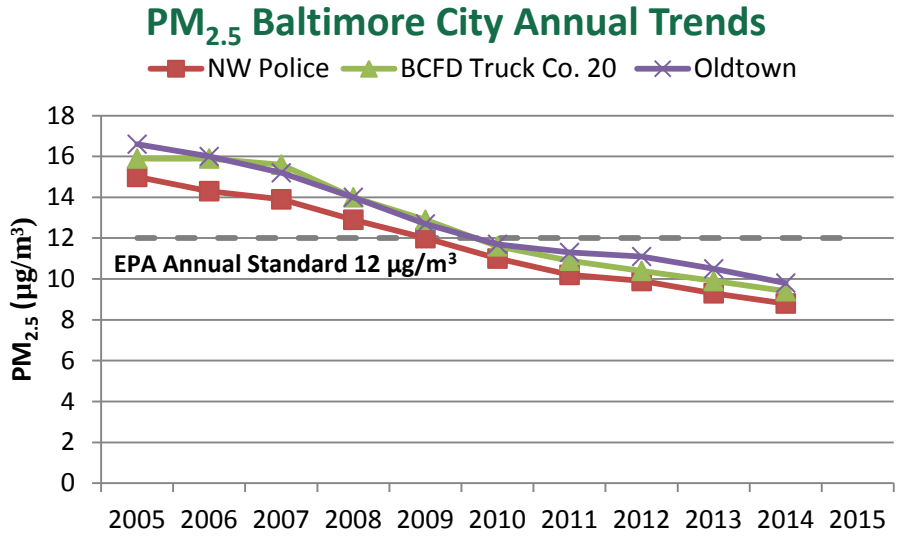
Progress Reducing Fine Particles

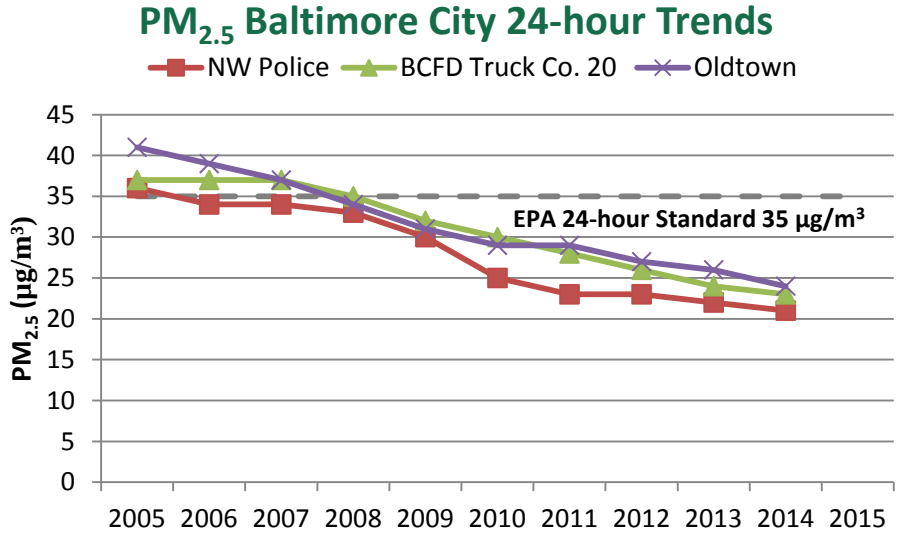
- Maryland is currently attaining the daily and annual fine particle standards across the state
- Fine particulate levels continue to trend down as SO_2 emission reductions continue
- This is a major success story as the health risks associated with fine particulate are very significant

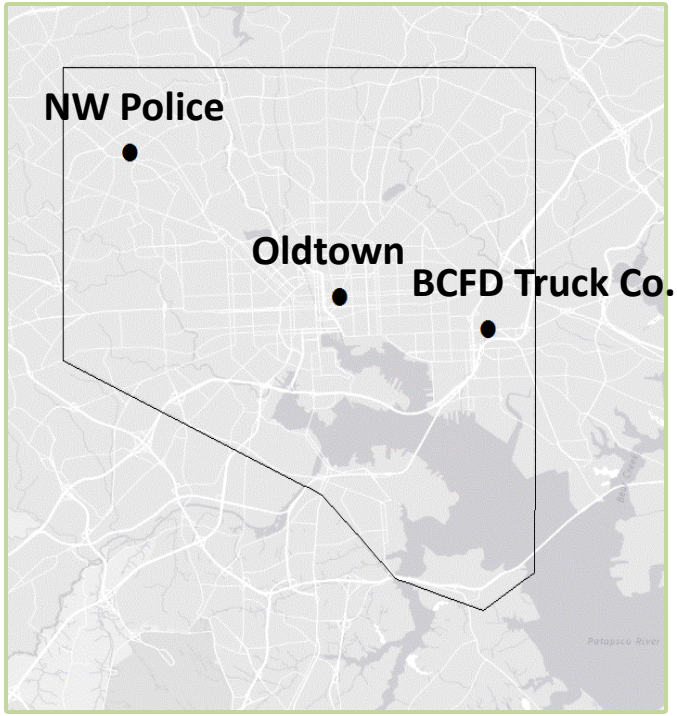
Fine Particle Air Pollution Lower Levels Across the State



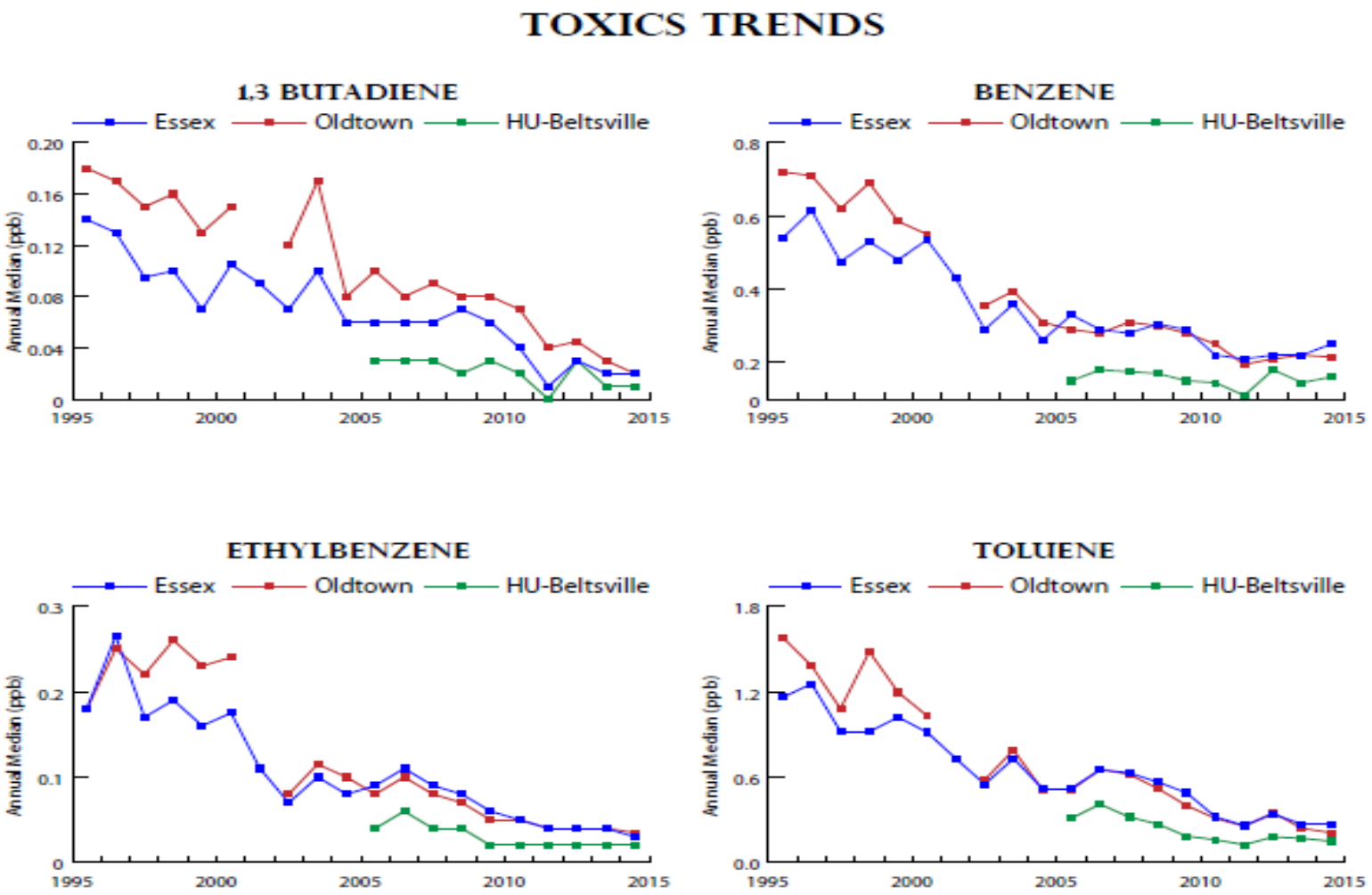
Fine Particles: Baltimore City Trends





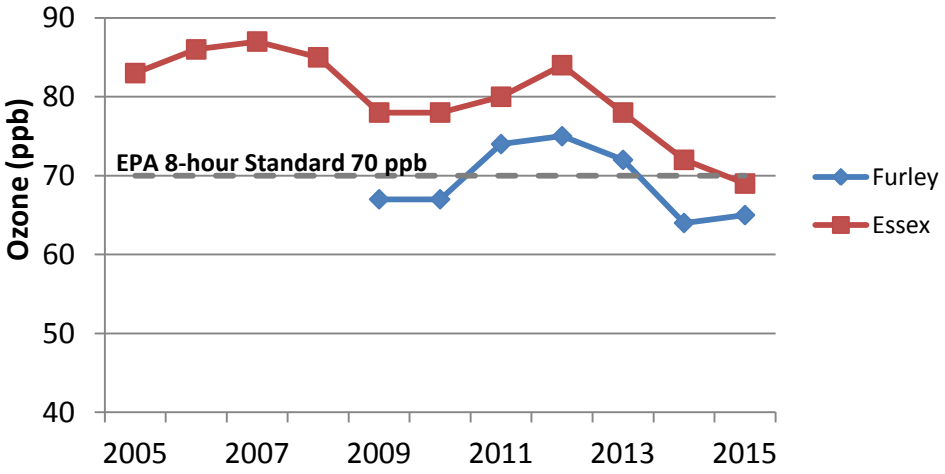


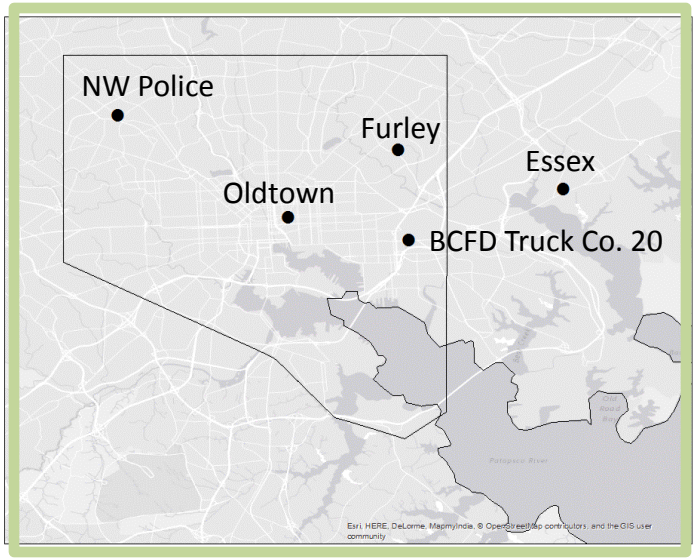
Maryland Air Toxics Trends



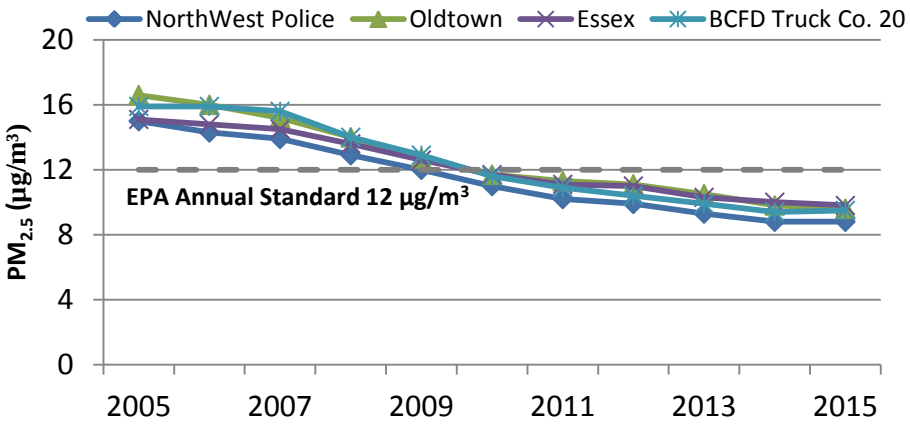
What About the City?

Area 8-Hour Ozone Trends

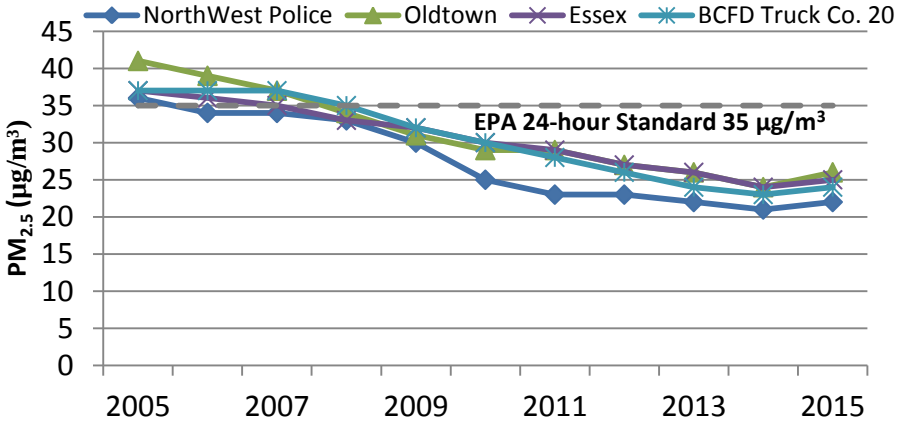




Annual Fine PM Trends



Daily Fine PM Trends



WHAT HAPPENED TO DRIVE CLEAN AIR?

Key Pollutants

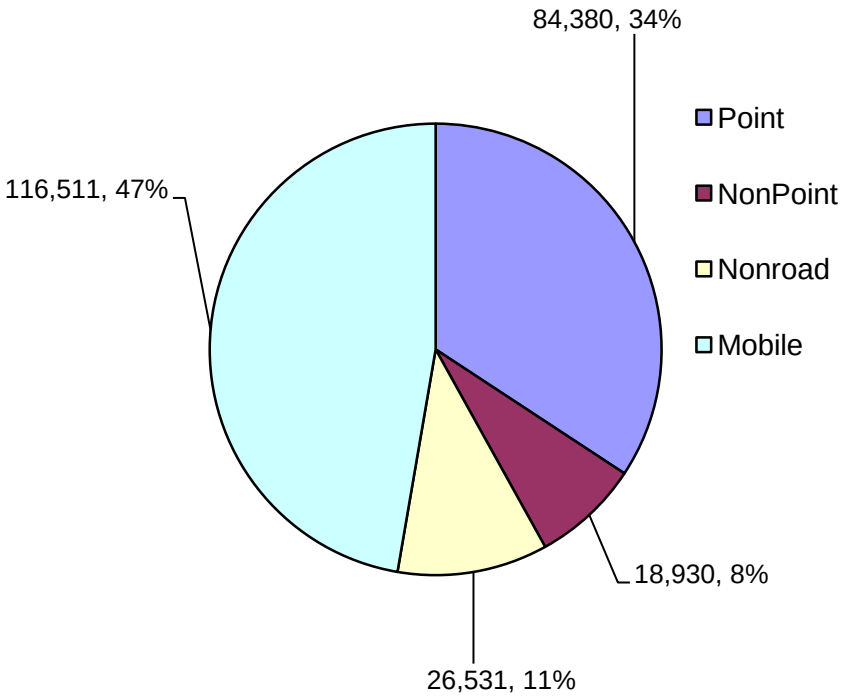
- Over the past 10 years, MDE has worked to reduce emissions of many pollutants. Six of the most critical pollutants include:
  - Nitrogen oxide or "NO_x" - the key pollutant to reduce to further lower ozone levels. Also contributes to fine particle pollution and regional haze
  - Sulfur dioxide or "SO_2" - the key pollutant to reduce for fine particulates and the new SO_2 standard. Also a major contributor to regional haze
  - Carbon dioxide or "CO_2" - the primary greenhouse gas that needs to be reduced to address climate change
  - Mercury (Hg) - a very important toxic air pollutant
  - Diesel particulate - diesel exhaust
  - Volatile Organic Compounds or "VOC" - also a contributor to ground level ozone. Many VOCs are also air toxics

Key Emission Reduction Programs

- Since around 2005, Maryland has implemented some of the countries most effective emission reduction programs
  - These efforts have worked
- Power Plants
- Cars and Trucks
- Other smaller sources
- Area specific initiatives

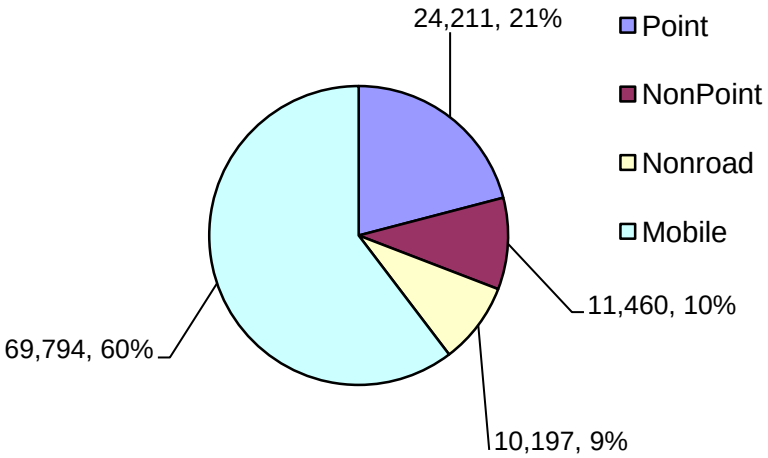
NO_x Emission Reductions 2005 – 2014

2005 Annual NO_x Emissions 246,000 tons per year



2014 Annual NO_x Emissions 115,000 tons per year

More than a 50% reduction



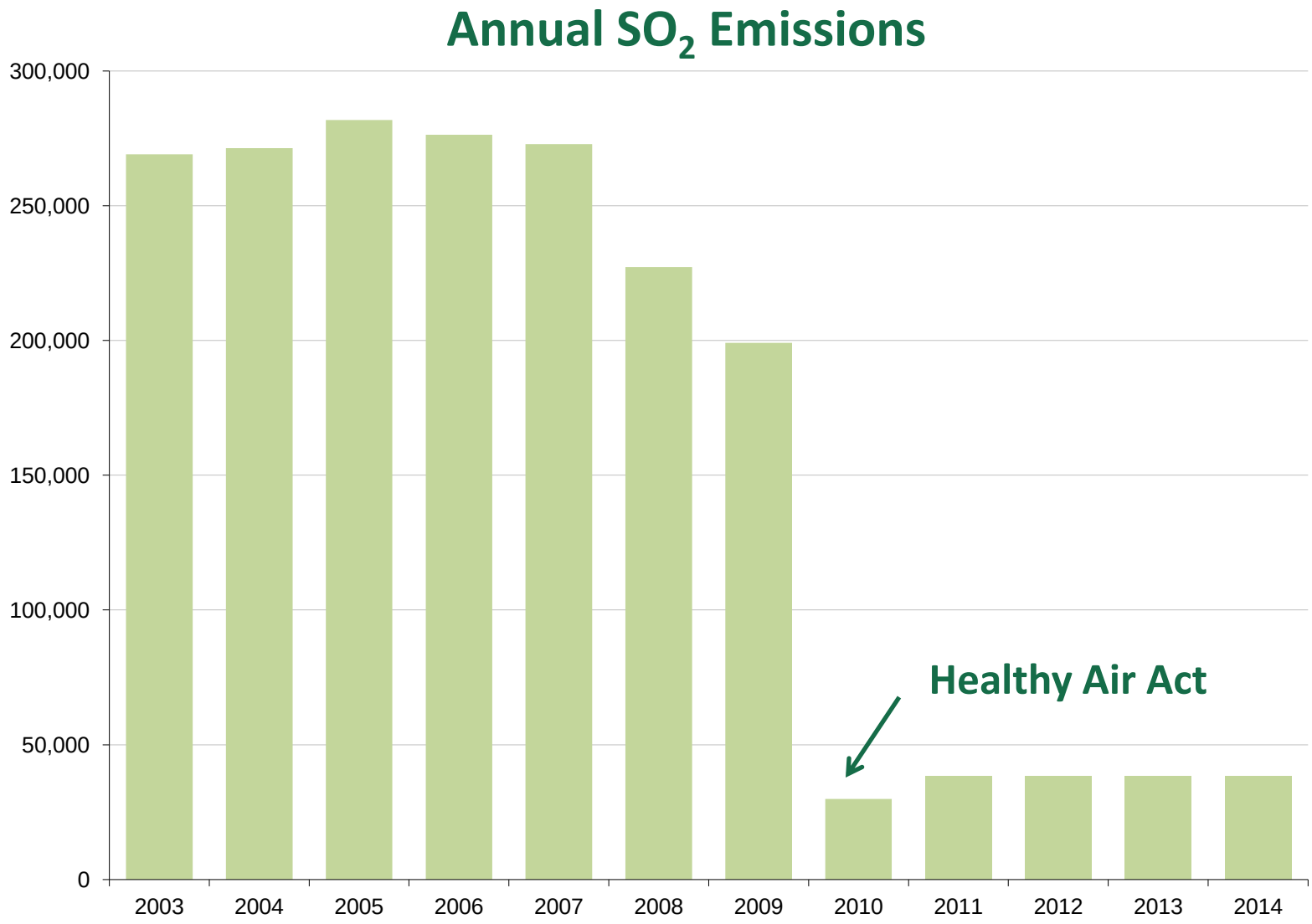
2005 to 2016 Control Programs

- Power Plants
  - The Maryland Healthy Air Act of 2006
  - 2015 NOx reductions for coal plants
- Cars and Small Trucks
  - The Maryland Clean Cars Act of 2007
- Diesel Trucks
  - Multiple Maryland initiatives
- Climate Change
  - The Greenhouse Gas Emission Reduction Acts of 2009 and 2015
- Area Specific Initiatives
  - The Port Partnership

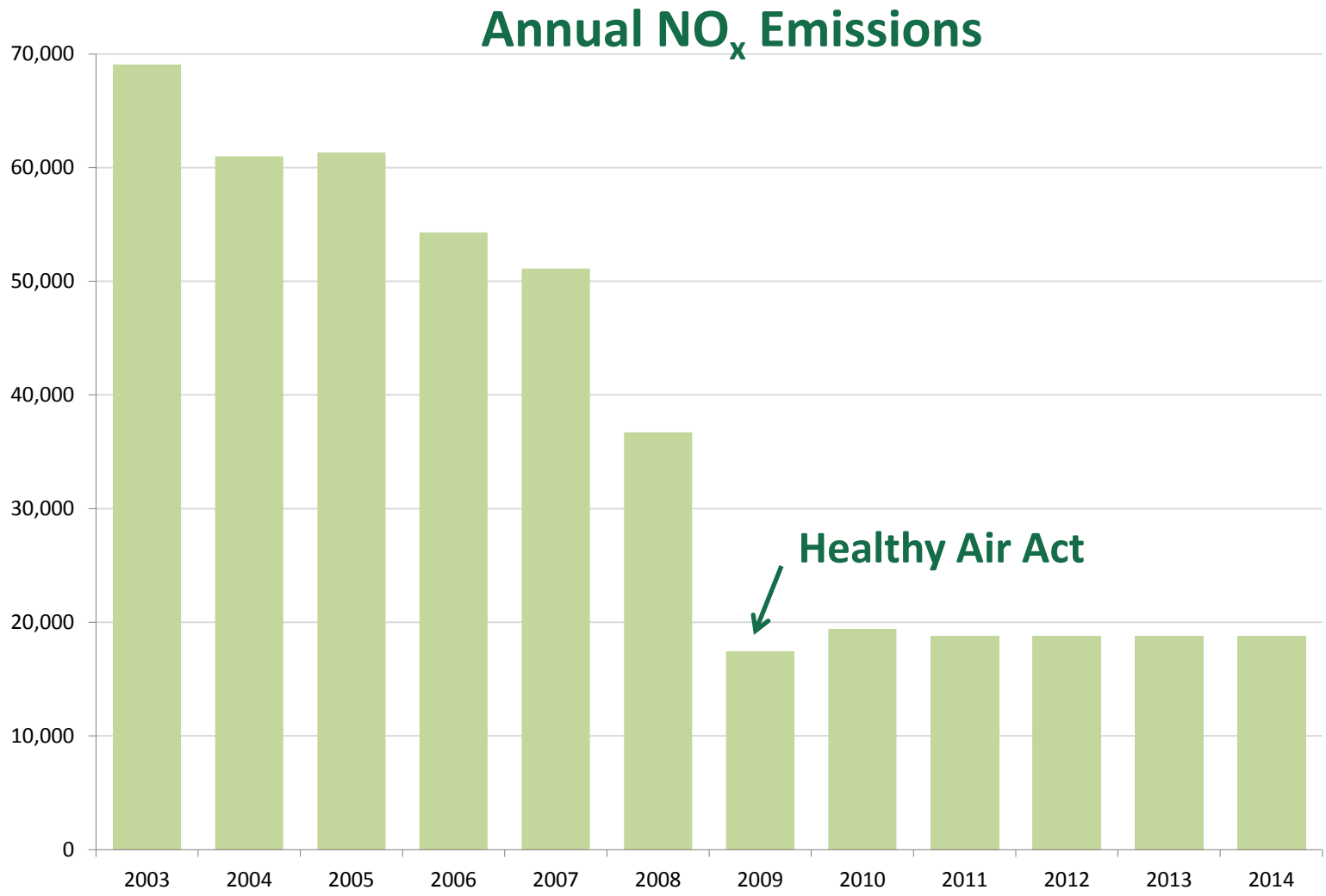
Maryland Healthy Air Act

- The most significant emission reducing program ever adopted and implemented in Maryland
- Widely applauded by the environmental community
- Environmental community & utilities worked with MDE as partners to design and implement the law
- Almost $2.6 Billion investment for clean air by Maryland utilities
- Helped to dramatically clean the air
  - Fine particle levels dropped dramatically
  - Ozone levels dropped dramatically
  - Mercury emissions dropped dramatically

Results: Sulfur Dioxide (SO_2)



Results: Nitrogen Oxides (NO_x)



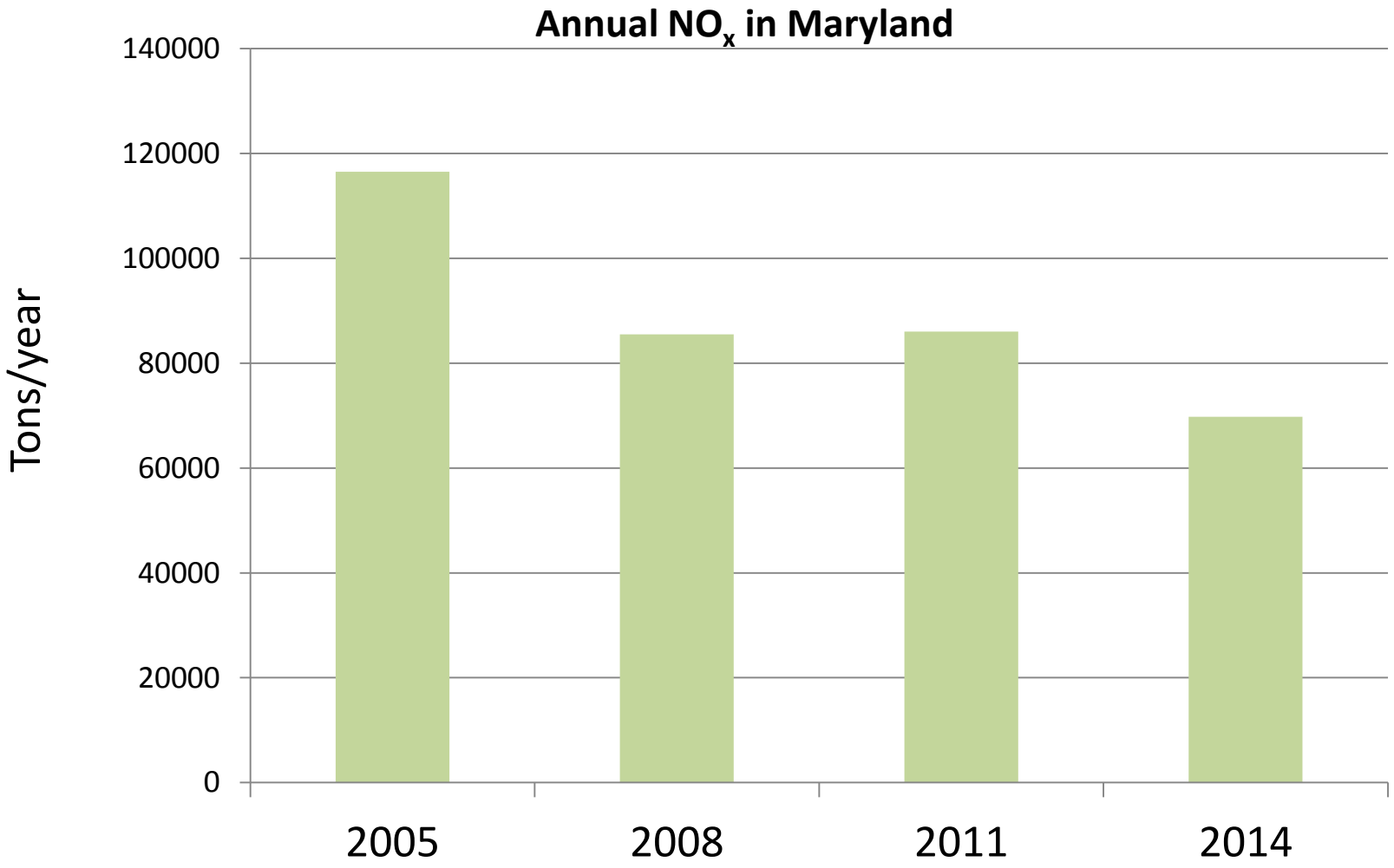
Results: Mercury & Other Air Toxics

- Mercury
  - Exceeded the 90% reduction requirement for 2012 in 2010
- Hydrogen Chloride (HCl) reduced 83%
- Direct particulate matter reduced 60%

Maryland Clean Cars Act 2007

- Requires Maryland cars to be the cleanest allowed by law
- Works in tandem with Federal vehicle and fuel standards
- Includes requirements to push manufacturers to develop and sell “Zero Emission” vehicles

Mobile Source NO_x Emissions



Reducing Diesel Emissions

- Since 2004, Maryland has invested over $6.7 Million to clean up diesel vehicles

- Projects include:
  - replacing older port dray trucks
  - retrofitting hundreds of public school buses
  - replacing engines on Baltimore harbor vessels
  - installing stop/start devices on locomotives
  - retrofitting emergency vehicles

The Port Partnership

- A Clean Air Partnership
- Signed by Port of Baltimore and Maryland Departments of the Environment and Transportation in 2015
- Agencies and communities working together to identify, develop and implement new, cost-effective, programs that reduce emissions and increase energy efficiency - also helps create jobs
- Accomplishments so far:
  - $1,090,000 invested to replace older dray trucks with cleaner, new vehicles
- More emission reductions on the way
  - $900,000 for dray trucks, locomotives, and cargo handling equipment
  - New projects on the way using Volkswagen settlement funds

Climate Change

- Maryland has been one of the most aggressive states in the Country in addressing climate change
- Fourth most vulnerable state to sea-level rise
- Greenhouse Gas Emission Reduction Acts of 2009 and 2016
  - 2009 - 25% reduction in Greenhouse Gas (GHG) Emissions by 2020
  - 2015 - Enhanced law now also requires a 40% reduction in GHG emissions by 2030
  - Reduction programs must also have a positive impact on Maryland's economy and jobs
- 2015 progress report shows that the State is on track to achieve and perhaps exceed the 25% reduction by 2020

NEW CHALLENGES

Continuing the Progress

- In 2015…
  - EPA strengthened the health based standards for ozone and SO_2
  - The Maryland General Assembly enhanced the GGRA
- This requires additional efforts to:
  - Reduce NO_x emissions … the key pollutant for reducing ozone levels
  - Reduce SO_2 emissions … the key pollutant for the SO_2 standard and continued progress in reducing fine particles
  - Reduce CO_2 and other GHG emissions to address climate change
- The good news is that new control programs are already on the way

Current Hot Topics Linked to Continued Progress

- Maryland's recent Petition under Section 126 of the Clean Air Act
  - Targets 36 Electric Generating Units (EGUs) in PA, WV, OH, KY and IN
  - Asks EPA to require these 36 EGUs to … in essence … comply with Maryland's 2015 NOx Regs
  - Will drive over 400 tons of NOx reductions on bad ozone days
  - Will reduce ozone from 2 to 4 ppb across much of the East
  - The most significant reduction effort left to help further clean up ozone in MD
  - If these reductions were required … all of Maryland could comply with the new 70 ppb ozone standard

- The VW Settlement
  - $71 Million to Maryland
  - All to be invested into pollution control projects to reduce NOx and other emissions
  - Will support electric vehicle implementation, diesel replacement and retrofit efforts and much more

New Ozone and SO_2 Challenges

- Ozone
  - Significant additional NOx emissions reductions between 2017 and 2020 from:
    - New power plant regulations adopted by the State in 2015
    - New federal controls on vehicles and fuels (adopted in 2015)
    - New federal controls on upwind power plants (adopted in 2016)
  - The new federal controls on vehicles and power plants are absolutely critical for Maryland. Approximately 70 percent of Maryland's air pollution problem originates in states that are upwind of Maryland

- SO_2
  - Lower sulfur coal and new "post-combustion" controls at several of the power plant units at the Wagner Station facility in Anne Arundel County
    - Required by federal rules
  - Crane station units that are also in the Wagner area and Wagner Unit #2 are scheduled for retirement

Climate Change Progress

- Maryland is on track to reduce GHG emissions by 25% in 2020 as required by the GGRA of 2009
  - Over 50 pollution control programs in the State plan
- Comprehensive effort now underway through the Maryland Climate Change Commission to achieve the 40% GHG reduction required by the 2016 enhancements to the GGRA
  - http://mde.maryland.gov/programs/Marylander/Pages/mccc.aspx
- Reduction programs must also support the States economy and create new jobs
- One of the major areas of focus for the Commission is to ensure that climate change programs benefit environmental justice areas and other underserved populations

Summary

- The air is getting cleaner every year
- Maryland has already implemented aggressive pollution controls on Maryland power plants, cars and trucks and many other sources
- These controls have been very effective and did what they were supposed to do
  - Maryland is measuring attainment for fine particulates and ozone and SO_2 levels have dropped dramatically since 2004
  - Still have work to do on ozone and SO_2
- New emission control programs are on the way
  - Vehicles, fuels, new power plant controls
- New opportunities - Partnerships and Multi-P benefits

Opportunities

- Partnerships with local communities, local government and the private sector
  - Maryland's Port Partnership as an example
- Multi-P Benefits
  - Climate benefits from ozone controls
  - Ozone benefits from climate change efforts
  - All helping reduce fine particles, sulfur dioxide, nitrogen dioxide, toxics and regional haze


QUESTIONS