AIR QUALITY & CLIMATE CHANGE IN THE NATIONAL CAPITAL REGION

Presentation to the Joint MWAQC/CEEPC Meeting

October 2, 2014

Steve Walz, Director, Department of Environmental Programs

Metropolitan Washington Council of Governments

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Air Quality & Climate Change in National Capital Region (NCR)

- Primary air quality problem in the NCR
- Climate change impacts & goals in the NCR
- Addressing sources of air and carbon emissions
  - Point sources
  - Area sources
  - Mobile (On-road; Non-road) sources
  - Multi-sector approach

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Air Quality in the NCR

- Ground level ozone – the region's most pervasive air pollution problem
  - Particularly a problem for children and the elderly
  - Linked to increased early mortality
  - Linked to respiratory disease
    - Contributor to asthma

- Asthma in Washington, DC
  - Higher childhood asthma rate than all 50 states
    - 18% compared to 8% in the US
  - High adult asthma rate
    - 10.4% compared to 8.2% in the US
  - 2009 hospitalization rate for asthma
    - 21.5 per 10,000 children & adults compared to 11.1in the US

Source: Dr. Janet Phoenix, George Washington University
May 21, 2014 presentation to MWAQC

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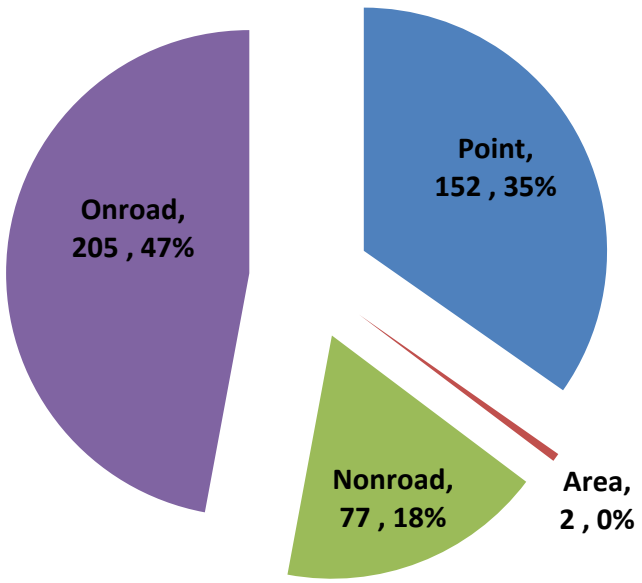
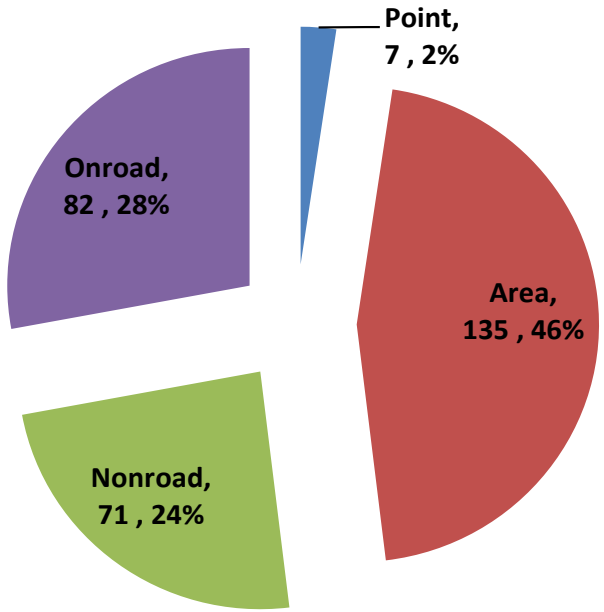
Ozone Precursors

Ozone: NOx dominant regime

2011 NOx Emission (tpd)
(Washington DC-MD-VA 2008 Ozone NAAQS NAA)



2011 VOC Emissions (tpd)
(Washington DC-MD-VA 2008 Ozone NAAQS NAA)



Source: COG Department of Environmental Programs
Does not reflect new CAFÉ or Tier 3 standards

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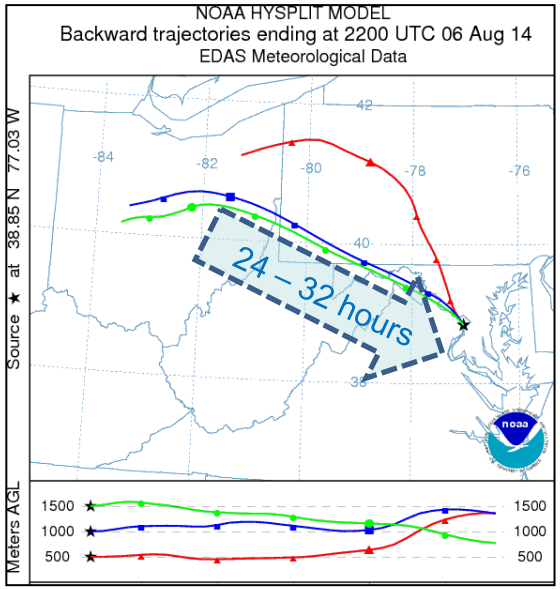
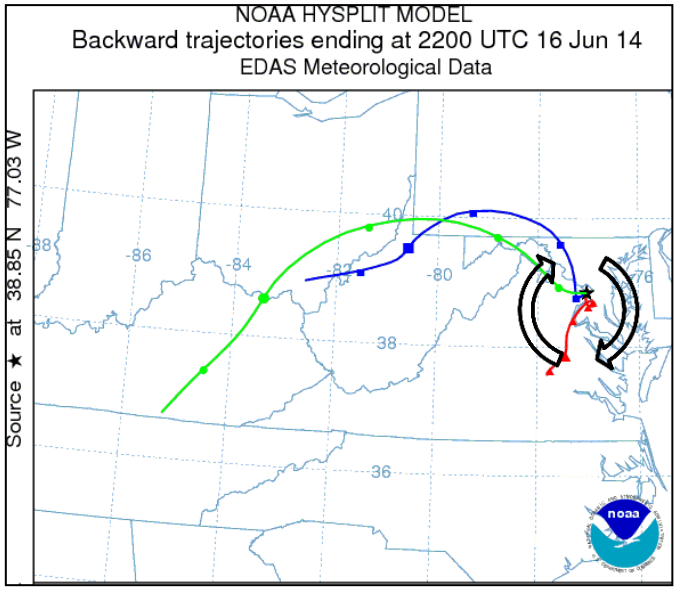
What Causes High Levels of Ozone in NCR?





Source: COG Department of Environmental Programs

- Hot sunny weather, low wind conditions
- Transport of ozone and its precursors (NOX, VOC) from upwind areas
- Recirculation of local emissions

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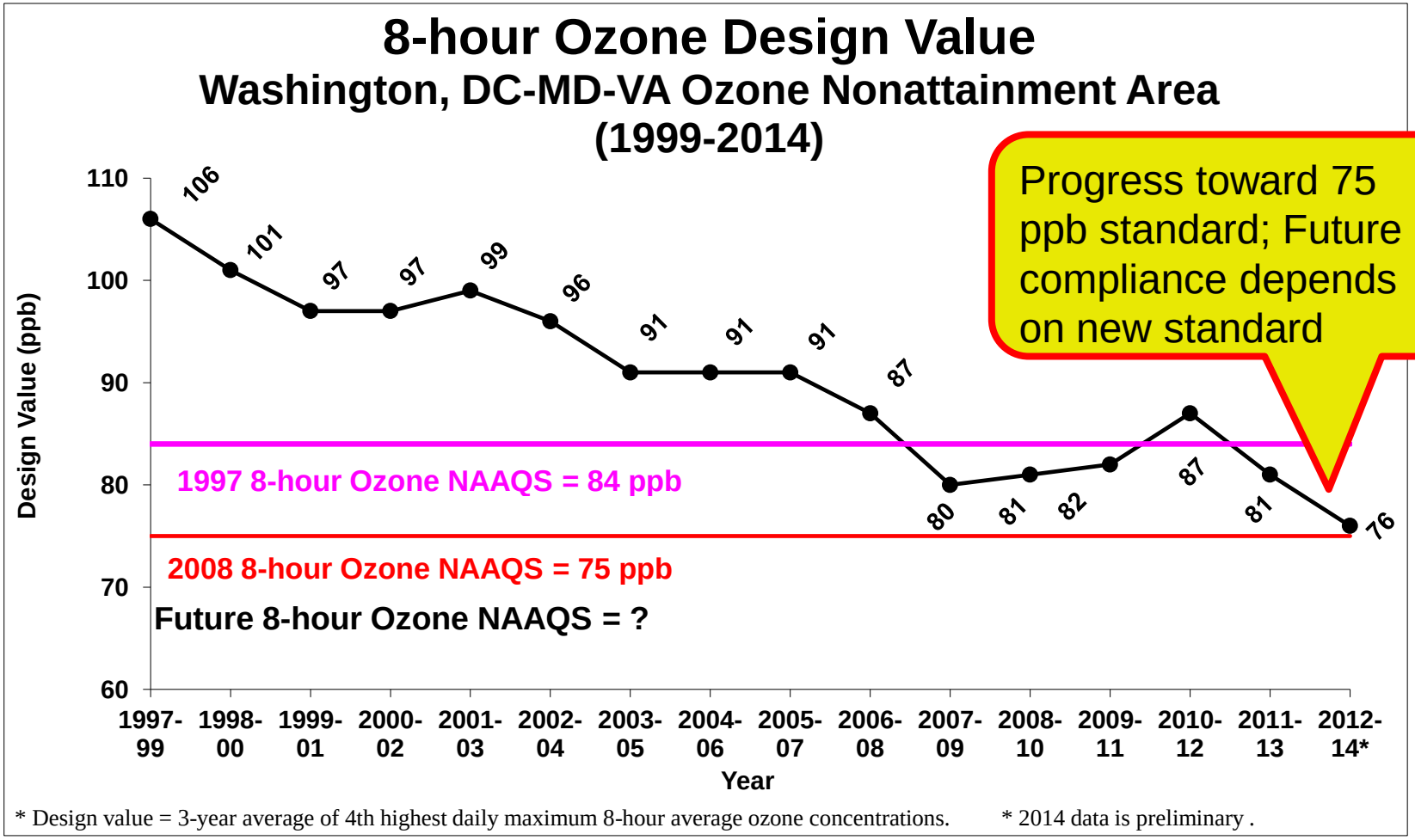
Ozone – Where We Are & Where We Need to Go



Source: COG Department of Environmental Programs
2014 analysis is based on draft data as of September 24, 2014. Subject to change.

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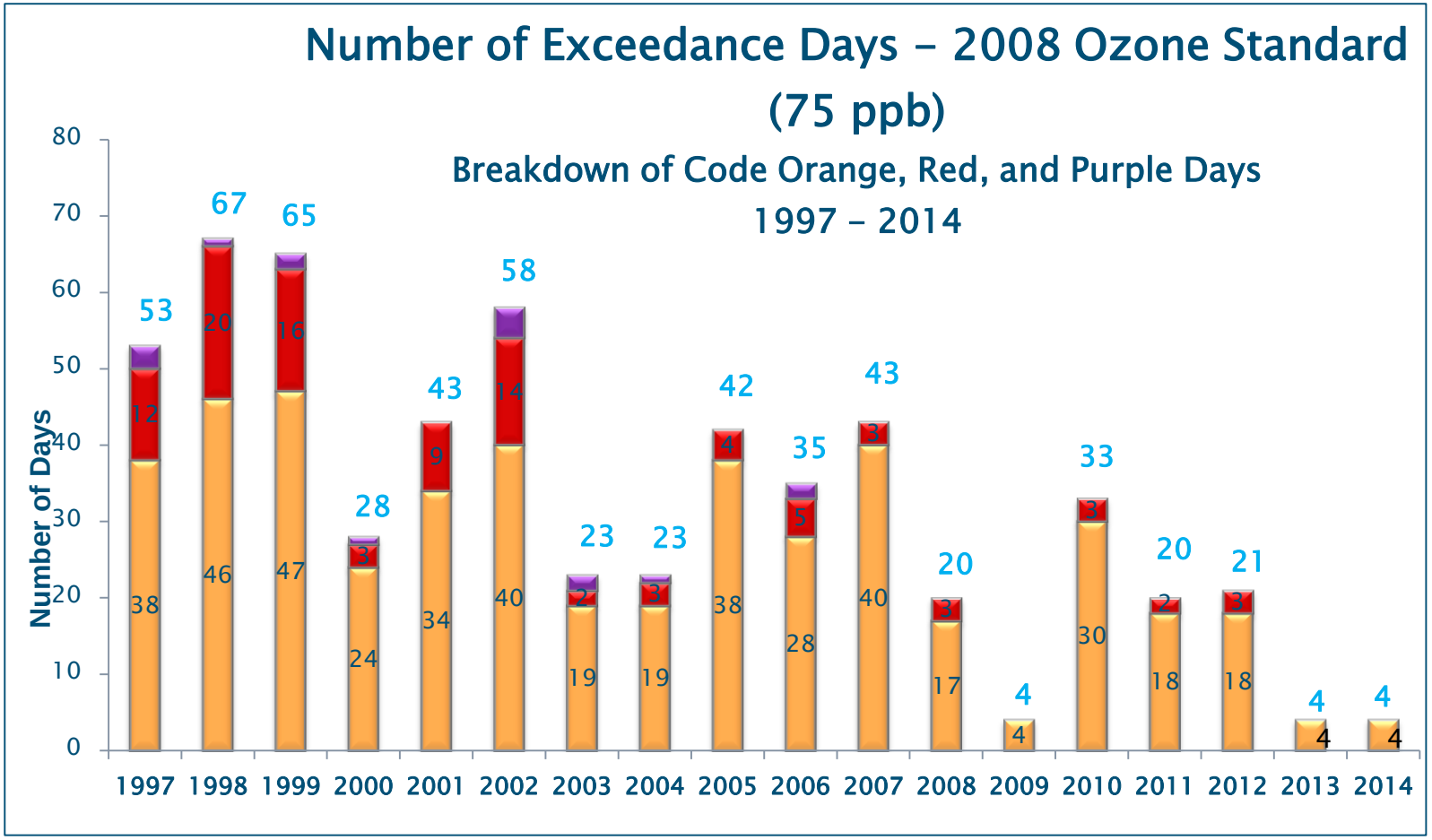
Ozone – Where We Are & Where We Need to Go



Source: COG Department of Environmental Programs
2014 analysis is based on draft data as of September 24, 2014. Subject to change.

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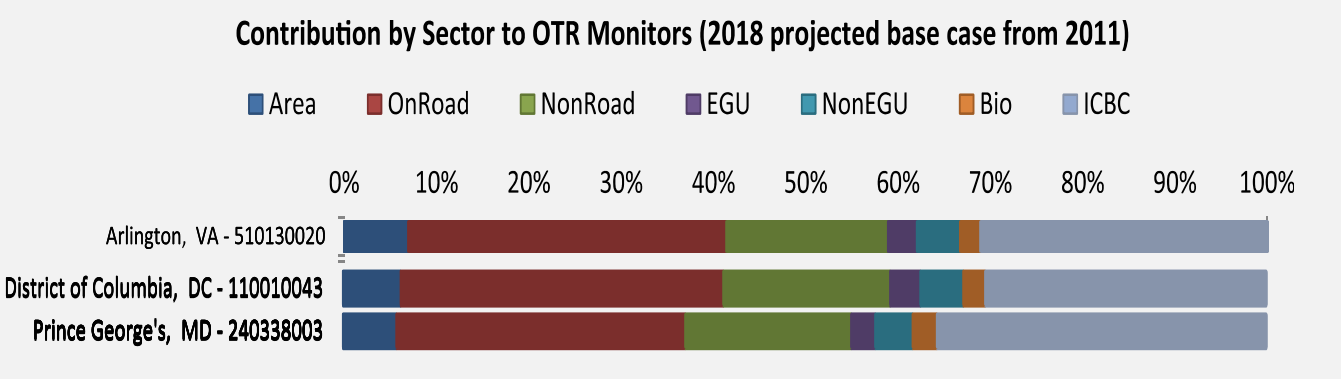
Ozone Assessment

- New tools
  - Ozone Source Apportionment Technology
  - How much is being contributed by which emission sources
- Preliminary studies using OSAT tool
  - ~35% contribution from On-Road sources (~50% of man-made)
  - ~20% contribution from Non-Road sources (~30% of man-made)
  - ~35% contribution from Background sources



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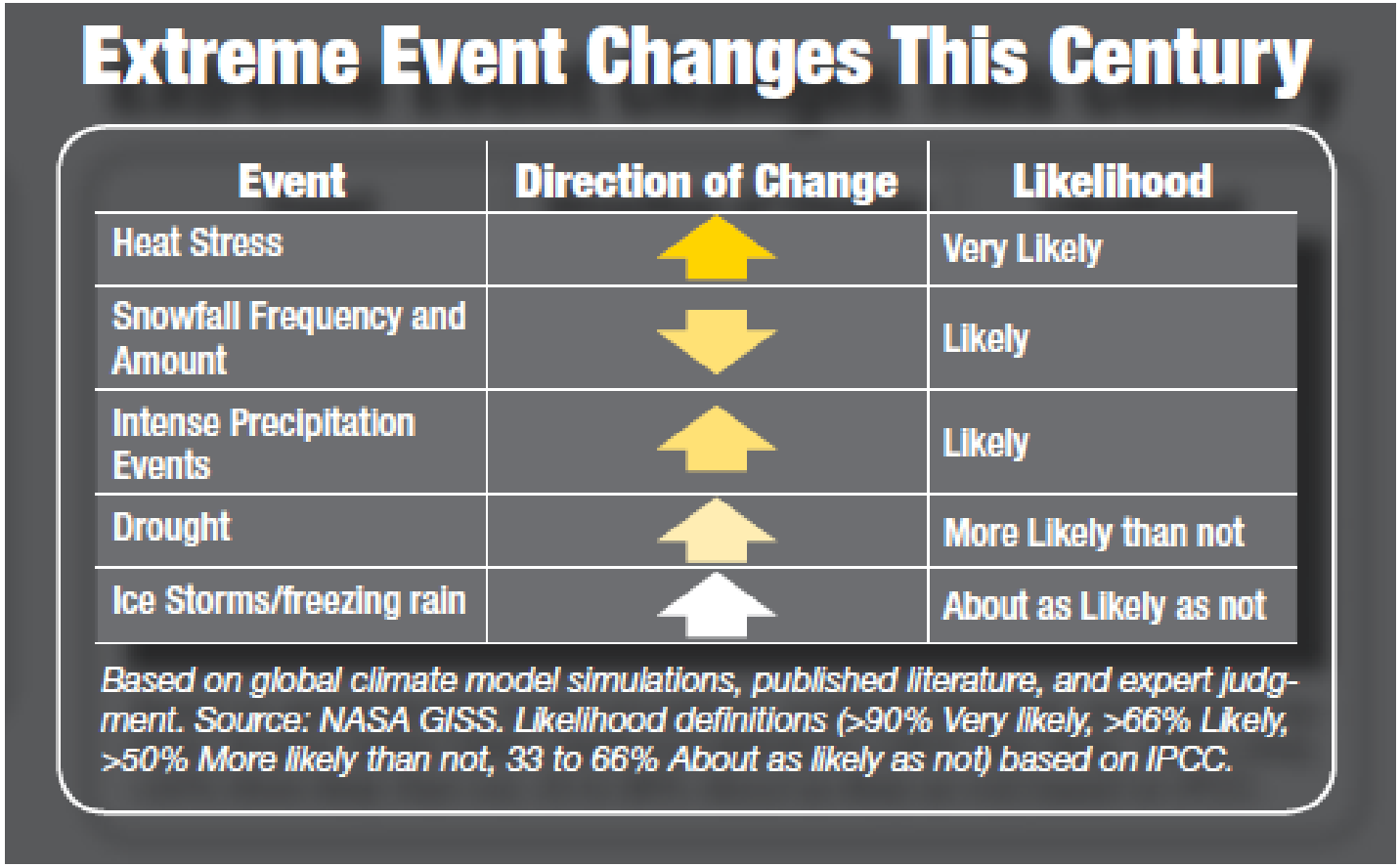
Climate Change Impacts in the NCR



Source: NASA - Adapting to Climate Change, DC Metro Area, 2014

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Energy & Climate Goals

- **TPB Vision Statement - 1998**
  - Enhance & protect natural environmental quality
    - Reduce 1999 levels of mobile source pollutants & VMT per capita
- **National Capital Region Climate Change Report - 2008**
  - Reduce Greenhouse Gas (GHG) emissions
    - 10% below BAU by 2012; 20% below 2005 by 2020; 80% by 2050
  - Reduce VMT
- **Virginia Climate Change Commission – 2008**
  - Reduce GHG emissions 30% below BAU by 2025
- **Maryland GHG Emission Reduction Act - 2009**
  - Reduce GHG emissions 25% by 2020 and 90% by 2050
- **Region Forward Coalition Targets - 2010**
  - Reduce VMT per capita & GHG emissions to COG goals
- **Sustainability DC - 2012**
  - Reduce GHG emissions 50% by 2032

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How Do We Reduce Ozone & Carbon Emissions

Address major emission sources

- Point Sources
  - Power plants, large industrial plants
- Area Sources
  - Buildings, portable fuel containers, paint, solvents
- Mobile Sources
  - On-Road: Motor vehicles
  - Non-Road: Lawn mowers, railroad, aircraft

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Addressing Point Sources

- Interstate transport
  - Subject to regulatory controls
  - Options being explored
- Upwind power plants - Invested $135 Billion since 2002
  - NO_X SIP Call: 28% NO_X reduction since 2003
  - CAIR Rule: 61% NO_X & 51% SO_2 reduction since 2003
- Regional Greenhouse Gas Initiative (Maryland)
- EPA Clean Power Plan
  - Reduce carbon emission rate
    - 38% in Virginia; 37% in Maryland by 2030
  - Secondary effect: reducing criteria pollutants

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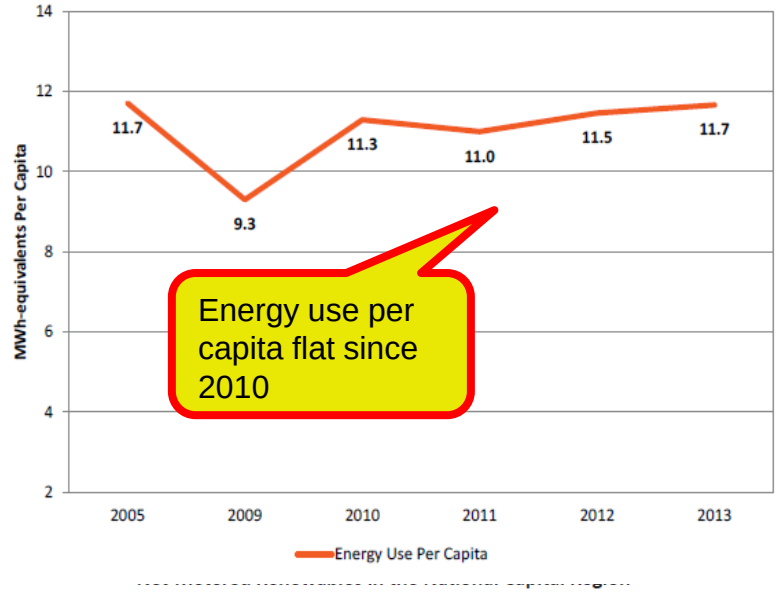
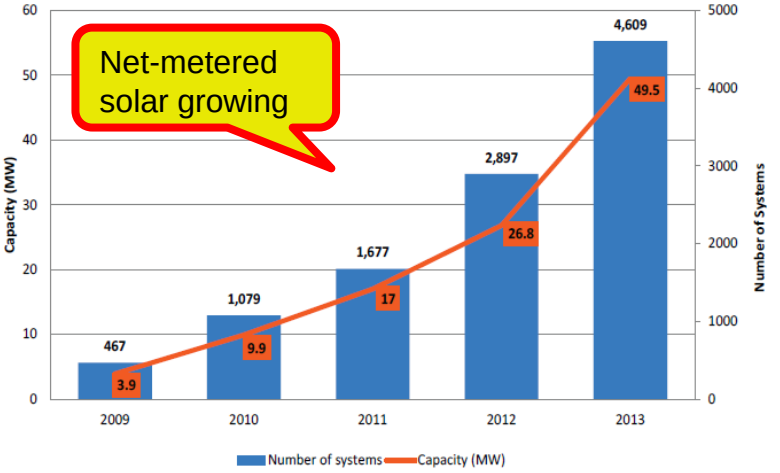
Addressing Area Sources





- 2013-16 Climate & Energy Action Plan
  - Meet GHG emission reduction goals
  - Reduce non-transportation energy use
    - 20% below 2005 by 2020
  - Increase renewable energy production
    - 10% of regional electric consumption by 2016
  - Increase resiliency and sustainability
  - Improve public understanding of climate change; promote behavior change
- Air quality actions
  - Portable fuel container rule
  - Consumer products rule

Source: COG, DEP
2014 Climate and Energy Progress Report

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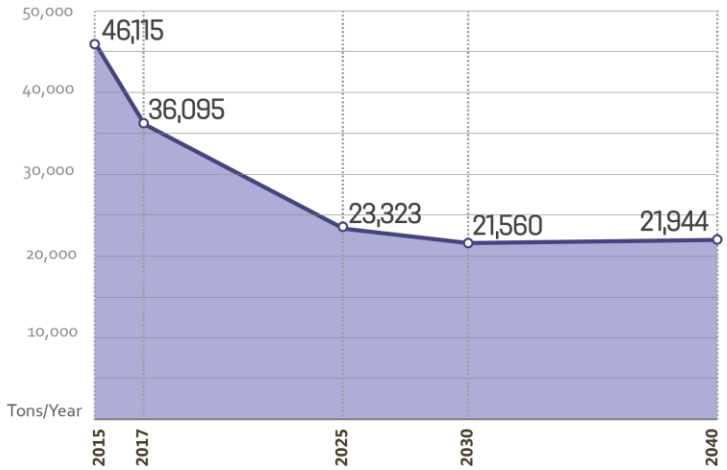
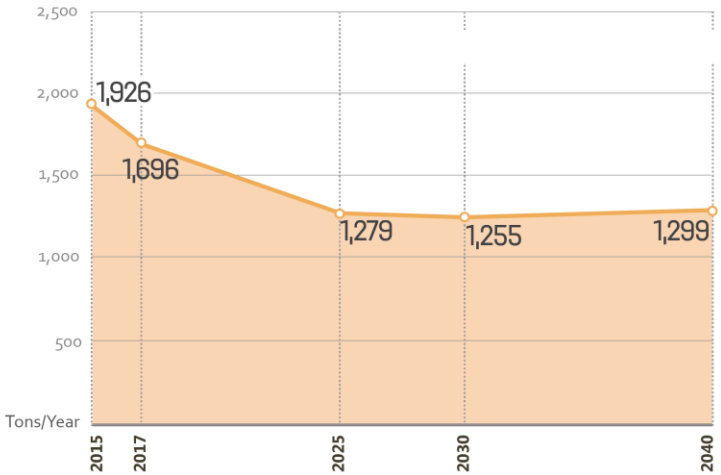
Mobile Sector Progress

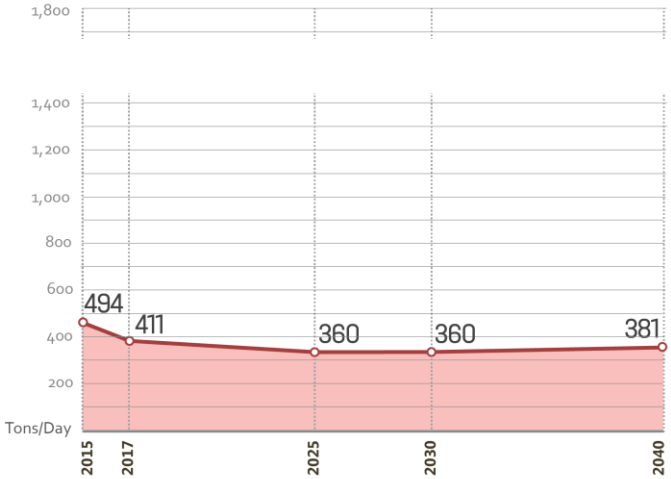
$PM_{2.5}$ Precursor NOx



$PM_{2.5}$ Direct



Wintertime CO



Source: 2014 CLRP Air Quality Conformity Analysis

Charts do not include reductions from new CAFÉ and Tier 3 rules

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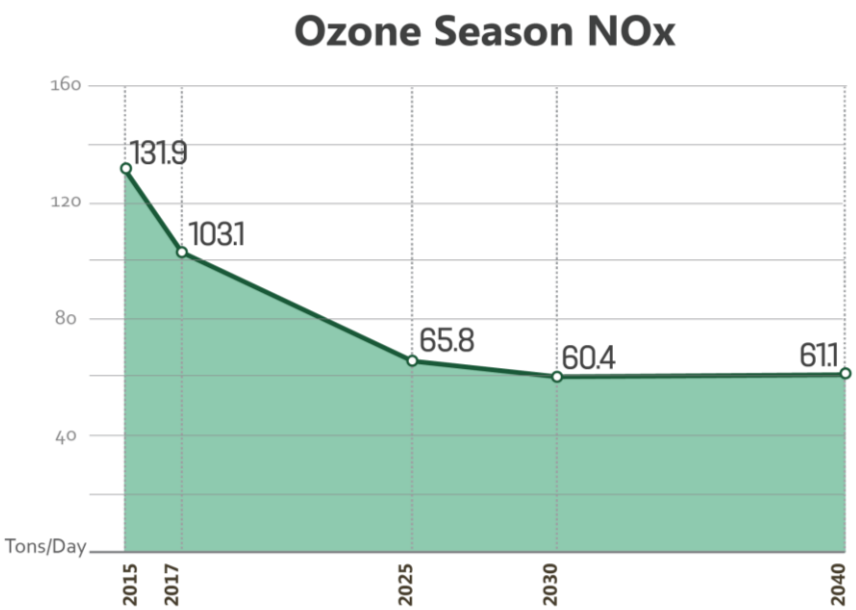
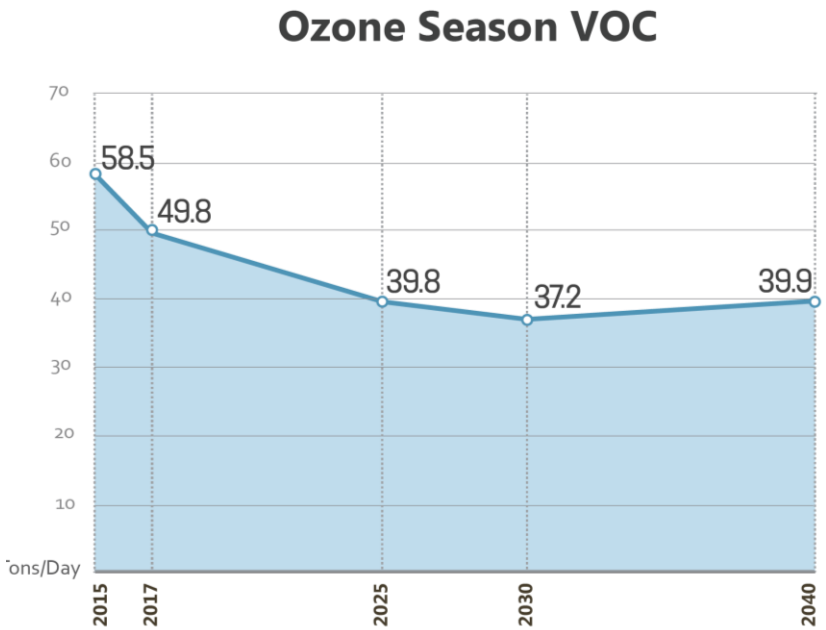
Mobile Sector Progress





Source: 2014 CLRP Air Quality Conformity Analysis

Charts do not include reductions from new CAFÉ and Tier 3 rules

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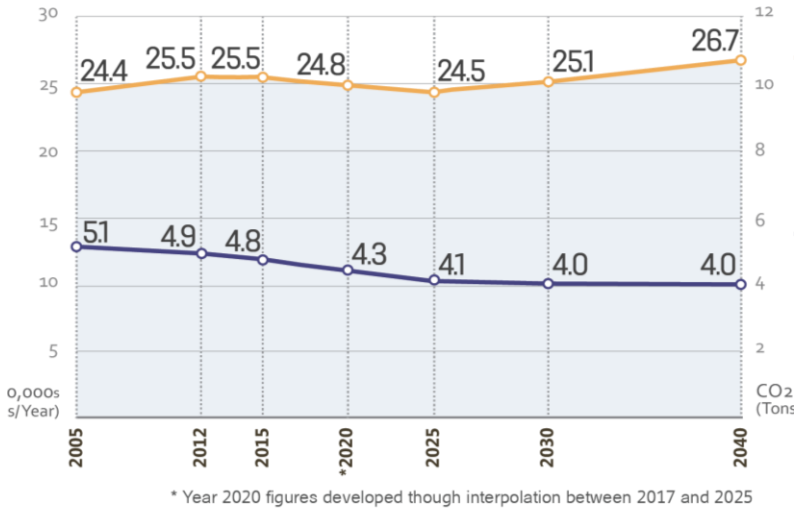
Addressing Mobile Sources

- Federal Actions
  - Tier 2, Heavy duty diesel vehicle regulations
  - New technology and clean fuel options (CAFE, Tier 3) being implemented
  - Reduced emissions per vehicle mile
  - Significant on-road emissions reductions to come after 2020 as fleet turns over
- Reduce vehicle miles traveled
  - Transportation alternatives
  - Transit oriented development
- Implement local and state best practices

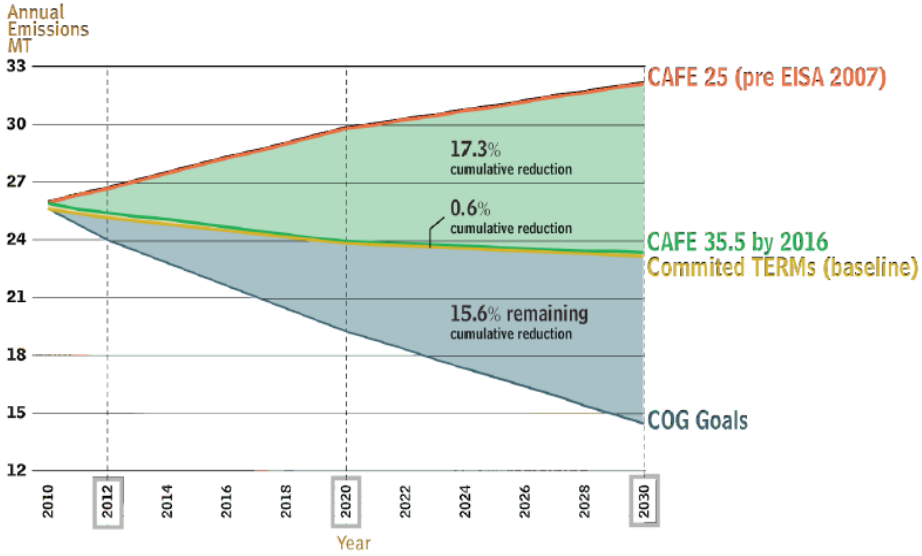
Regional CO2 Projections
Transportation Sector

2014 CLRP:
CO2 Projections



Source: 2014 CLRP Performance Analysis
NOTE: These measures do not include reductions from new CAFÉ and Tier 3 rules

"What Would It Take":
Possible CO2 Reductions



Source: What Would It Take: Transportation and Climate Change in the National Capital Region. 2010

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Don't We Already Address How Transportation Planning Impacts Air Quality?

- Sort of …
  - Transportation Conformity is the primary way to show that changes to transportation plans will protect air quality
    - Shows conformity with mobile emissions limits set in air quality plans
    - By itself, is not a control measure
    - Can lag behind recently modified standards
    - Does not address future standards that may be tougher
    - Does not require addressing GHG emissions
- So …
  - Need an enhanced long-term planning & visioning process addressing actions to
    - Further improve air quality
    - Reduce greenhouse gas emissions

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Opportunities

- Identify & share best practices
  - The 2014 *Gold Book: State and Local Government Initiatives to Clean the Air*
    - Climate, Energy & Sustainability Plans
    - Regional Partnerships
    - Green Power and Grid Modernization
    - Energy Efficiency
    - Transportation Demand Reduction
    - Transportation Options
    - Vehicle Emission Reduction
    - New Ideas

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Opportunities

- Identify & share best practices
  - 2013-16 Climate & Energy Action Plan
    - Energy efficiency in government operations
    - High performance buildings
      - US Department of Energy Better Buildings Challenge
      - Home Performance with Energy STAR
      - Energy efficiency financing – PACE, other
      - Energy use benchmarking & disclosure
    - Increased renewable energy
      - Green Power Partner
      - Green Power Community
    - Transportation policies & programs
      - Anti-Idling policies & education
      - Commute options programs
      - Complete & green streets policies

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Opportunities

- Identify & share best practices
  - 2013-16 Climate & Energy Action Plan (continued)
    - Comprehensive & land use plans & policies
      - Transit oriented development
      - Green building policies
    - Assess community & critical asset climate change vulnerability
    - Green infrastructure
    - Green purchasing policies
    - Waste diversion, reuse & recycling
    - Outreach & education
      - Green business challenges
      - Community education programs
    - Advocacy

Opportunities

- Identify & share best practices
  - TPB technical assistance planning grants
  - Alternate Fuel Vehicles
    - NCR Electric Vehicle Readiness Plan
    - Greater Washington Clean Cities Coalition
    - Local incentives
  - Financial & Technical assistance

Opportunities

- Multi-Sector Action Plan
  - New process – Next generation *What Would It Take*
  - Assess existing plans and actions at Federal, state and local levels
  - Identify gaps to meeting goals
  - Identify new options
    - Gold Book; Climate & Energy Action Plan; Appendix D Control Measures; Other
  - Assess costs and benefits
  - Create toolbox of state and local actions