CLEARING THE AIR

Air Quality Planning

Clearing the Air Workshop #4: August 10, 2021
Goals

• Understand what Air Planning is
• Learn when to get involved in Planning/Rules process
• Explore what emits pollution in the District
• Understand how much we are affected by upwind pollution
• Examine Covid-19 impact on Ozone in the District
Outline

• What is Air Quality?
• What are Criteria Pollutants?
• What is Planning?
• 4 Planning Areas
  – Emissions Inventory
  – Modeling
  – Regulations
  – State Implementation Plans (SIPs)
• Regional Collaboration
What is air quality? Why is it important?

Defined as a measure of how clean or polluted the air we breathe is

Why planning is important:
- Protect public health;
- Identify sources of pollution;
- Develop pollution control strategies.
What are the Criteria Pollutants?

EPA established health-based standards for these SIX harmful air pollutants, called the criteria air pollutants:

- Carbon Monoxide (CO)
- Sulfur Dioxide (SO₂)
- Ground-level Ozone (O₃)
- Lead (Pb)
- Nitrogen Dioxide (NO₂)
- Particulate Matter (PM₁₀ & PM₂.5)

*https://www.csusb.edu/ehs/occupational-health-and-safety/indoor-air-quality
### National Ambient Air Quality Standards (NAAQS)

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>NAAQS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ozone</td>
<td>70 ppb</td>
</tr>
<tr>
<td>Fine PM (PM$_{2.5}$)</td>
<td>35 µg/m$^3$ &amp; 12 µg/m$^3$</td>
</tr>
<tr>
<td>Coarse (PM$_{10}$)</td>
<td>150 µg/m$^3$</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>35 ppm &amp; 9 ppm</td>
</tr>
<tr>
<td>Nitrogen Dioxide</td>
<td>100 ppb &amp; 53 ppb</td>
</tr>
<tr>
<td>Sulfur Dioxide</td>
<td>75 ppb</td>
</tr>
<tr>
<td>Lead</td>
<td>0.15 µg/m$^3$</td>
</tr>
</tbody>
</table>

Source: [https://www.epa.gov/criteria-air-pollutants/naaqs-table](https://www.epa.gov/criteria-air-pollutants/naaqs-table)
What is Planning?

• Until everything is powered by renewable electricity, cleaning the air comes with great complexity
• The pollutants that persist as problems ozone, particulate matter, and toxics are not straightforward to control:
  – Numerous types and quantity of sources
  – Complex photochemistry
  – Impacts of natural world
  – Less straightforward regulations
• Focused on “District-wide” pollution
• To deal with all of this we need to use science to determine the best approaches and then write the regulations to solve the problems - that is “planning”
Planning Process

This is the process air agencies undertake, but explaining it makes more sense backwards. So we are going to start at the summit and work our way downhill.

We will also skip monitoring since that has been discussed in previous sessions. https://doee.dc.gov/event/clearing-air-community-workshop-series
Planning Area 4 – State Implementation Plans (SIPs)

• What goes in the SIP:

  Regulations  Source-Specific Controls  Inventories  Modeling Results  Negative Declarations

• The State Implementation Plan:
  – Does not get replaced, it just gets amended
  – Is federally enforceable
  – Does not allow for backsliding

• SIP amendments come with technical and legal analysis, often called a “certification”

• You can see what regulations are in DC’s SIP here: https://www.epa.gov/sips-dc
Planning Area 4 – SIP Process

1. Develop SIP Amendment
2. Share with EPA
3. 30-day Public Comment Period & Public Hearing
4. Make Changes
5. Submit to EPA

6. Acknowledge SIP Amendment
7. Review SIP Amendment
8. In FR, Proposes Approval, Disapproval, Partial Approval
9. Hold Public Comment Period
10. Finalize
Planning Area 3 – Regulations

• DOEE writes regulations to:
  – Benefit the health and welfare of District residents and visitors
  – Give clarity to sources as to what is required of them and how DOEE will enforce noncompliance
  – Implement legislation from the District Council
  – Comply with federal requirements

• Regulations that go into the SIP must be:
  
  Quantifiable  Surplus/Additional  Permanent  Enforceable
Planning Area 3 – Reg. Process

1. Determine Need & Authority
2. Draft Regulation*
3. Collab with Other Depts. & Agencies
4. Publish in DC Register
5. 30-day Public Comment Period**
6. Respond to Comments
7. Collab with Other Depts. & Agencies
8. Finalize Regulation in DCR

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* For some regulations we will hold public listening sessions prior to drafting
** If regulations is for a SIP a public hearing will be held, often in conjunction with the end of the comment period
Planning Area 2 – Modeling

- In planning we look at modeling for pollutants that are relatively well mixed
  - Ozone, secondary fine PM, visibility
  - Fine PM hot spots are very important, but are more often examined by Permitting
- Modeling is very resource intensive
  - DOEE relies on regional partners to run the models, but supplies in kind resources and review
- Source Apportionment Modeling is the most useful for planning purposes - will show a slide after the inventory
Planning Area 1 – Emission Inventories (EI)

- Many Inventories Required by CAA

- National Emissions Inventory (NEI)
- Base Year SIP Emissions Inventory (nonattainment areas)
- Rate of Progress Inventory (moderate + ozone areas)
- Photochemical Modeling Inventory (moderate + ozone areas)
- Maintenance Plan Inventory (re-designation)
- Toxics Release Inventory
- Greenhouse Gas Inventories
Planning Area 1 EI – About NEI

• Six non-ozone criteria pollutants + VOCs
• Submission schedule
  – Every year: large “Title V” sources (~45) to EPA
  – Every three years: all sources to EPA
• Working on submission of 2020 data
  – Due to EPA early 2022
  – Public could see summer 2022
• NEI heavily relied upon (EJScreen, researchers, etc)
• Data and more information here:
  https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei
Planning Area 1 EI – NEI Data

2017 NEI Emissions in the District

- NOX
- PM25-PRI
- VOC

Source Category:
- Airports
- Marine
- NonPoint
- Nonroad
- Onroad
- Point
- Rail NonPoint
- Rail Point

Annual Emissions (tons)
## Planning Area 1 EI - NEI Onroad Data

### 2017 NEI Onroad Emissions in the District

<table>
<thead>
<tr>
<th>Source Category</th>
<th>Annual Emissions (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOX</td>
<td></td>
</tr>
<tr>
<td>PM25-PRI</td>
<td></td>
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<tr>
<td>VOC</td>
<td></td>
</tr>
</tbody>
</table>

Source Category

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Planning Area 1 EI – NEI NonPoint Data

2017 NEI Nonpoint Emissions in the District (Categories > 50 tpy)

Source Category

Annual Emissions (tons)

- Natural Gas Use (Comm/Inst)
- Natural Gas Use (Res)
- Commercial Charbroiling
- Commercial Frying
- Road Dust
- All Adhesives and Sealants
- All Coatings and Related Products
- All FIFRA Related Products
- All Household Products
- All Personal Care Products
- Architectural Coatings
- Industrial Maintenance Coatings
- Solvents - Degreasing
- Solvents - Graphic Arts

NOX
PM25-PRI
VOC
## Planning Area 2 - Apportionment

Ozone contribution by US anthropogenic sector on 9 days by highest maximum 8-hr ozone

<table>
<thead>
<tr>
<th>Source Category</th>
<th>Ozone (ppb)</th>
<th>State</th>
<th>DC</th>
<th>MD</th>
<th>Other</th>
<th>PA</th>
<th>VA</th>
<th>WV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonpoint</td>
<td>67.022</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Nonroad - Airport</td>
<td>70.15</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Nonroad - Diesel (ex. M/A/R)</td>
<td>70.411</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Nonroad - Non-Diesel (ex. M/A/R)</td>
<td>70.195</td>
<td></td>
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<tr>
<td>Nonroad - Rail</td>
<td>72.096</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Onroad - Diesel</td>
<td>68.988</td>
<td></td>
<td></td>
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<tr>
<td>Onroad - Non-Diesel</td>
<td>72.275</td>
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<tr>
<td>Other</td>
<td>69.361</td>
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<td></td>
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<tr>
<td>Point - EGUs</td>
<td>73.368</td>
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<td></td>
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<tr>
<td>Point - Non-EGUs</td>
<td>73.361</td>
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<tr>
<td>Point - Oil &amp; Gas</td>
<td>69.368</td>
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</tbody>
</table>

Planning Area 2 – Apportionment
Regional Partnerships

• Air doesn’t stop at the District border
  – In fact, over 90% of our ozone pollution comes from outside of our borders
  – Necessary to plan regionally to an extent
• We work regionally to:
  – Ensure consistent regulations among states
  – Develop implementation plans with MD & VA
  – Share resources and learn best practices
  – Strive to reduce pollution from upwind states
Questions?

Contact:
Joseph Jakuta
Joseph.jakuta@dc.gov
# Planning Area 3 – Reg Status

<table>
<thead>
<tr>
<th>Intra-Agency</th>
<th>Inter-Agency</th>
<th>Published</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposing</td>
<td>Clean Air Zones</td>
<td>Stage II Removal</td>
</tr>
<tr>
<td>NSPS Updates</td>
<td>Odor Enforcement</td>
<td></td>
</tr>
<tr>
<td>Re-Proposing</td>
<td>Screen Printing</td>
<td></td>
</tr>
<tr>
<td>Finalizing</td>
<td>NOX RACT (Medium to Large Boilers, Combustion Turbines, Stationary Generators)</td>
<td>GHG Intensity</td>
</tr>
</tbody>
</table>

Red indicates required to comply with federal regulations/Clean Air Act