

AIR QUALITY IN TRANSPORTATION PLANNING

Jane Posey
TPB Transportation Engineer

Metropolitan Washington Air Quality Committee
February 28, 2024

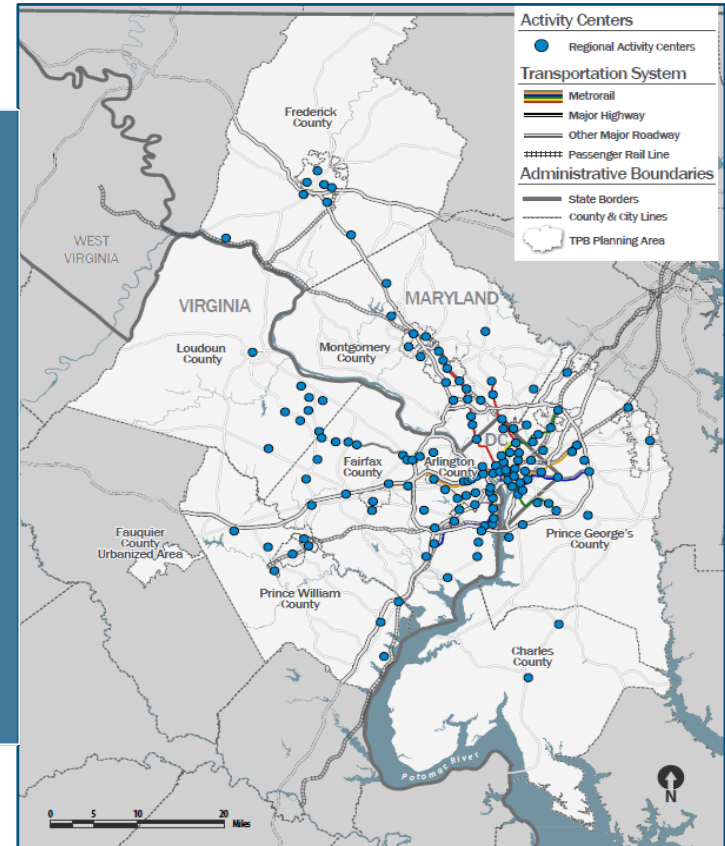
Agenda Item #7B



National Capital Region
Transportation Planning Board

TPB Planning Area

- Federally designated Metropolitan Planning Organization (MPO) for the Washington region
- District of Columbia, Northern Virginia, Suburban Maryland
 - 24 local jurisdictions and WMATA
 - 3,500 sq. mi.
 - 5.7M people / 3.3M jobs
 - 141 Activity Centers
- 45 members (Voting-39, Ex-Officio-6)
- Funded by feds (80%), state (10%), localities (10%)



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Transportation Planning Board

Federal Mandates for MPOs

- Carry out a “continuing, cooperative, comprehensive” (3C) planning process among local, state, regional, and federal transportation partners
- Develop and approve a financially constrained Long-Range Transportation Plan (LRTP) and Transportation Improvement Program (TIP)
- Develop plans and programs that consider all transportation modes and support metropolitan region and economic development
- In Non-Attainment or Maintenance areas:
 - MPO must coordinate development of the LRTP with the State Implementation Plans (SIPs)
 - Feds approve only those transportation plans or programs that conform with the SIPs and/or develop transportation control measures for the SIPs, as needed



TPB Process

TOP-DOWN/BOTTOM-UP PROCESS



Transportation Planning Board

- Transportation Planning Goals
- Regional Transportation Priorities Plan
- Scenario Analysis
- LRTP Performance Analysis
- Congestion Management Reports



State/Local Governments

- Land use, Economic, and Environmental Policies and Priorities
- Needs assessment
- Transportation Plans and Programs
- Capital Budget Priorities



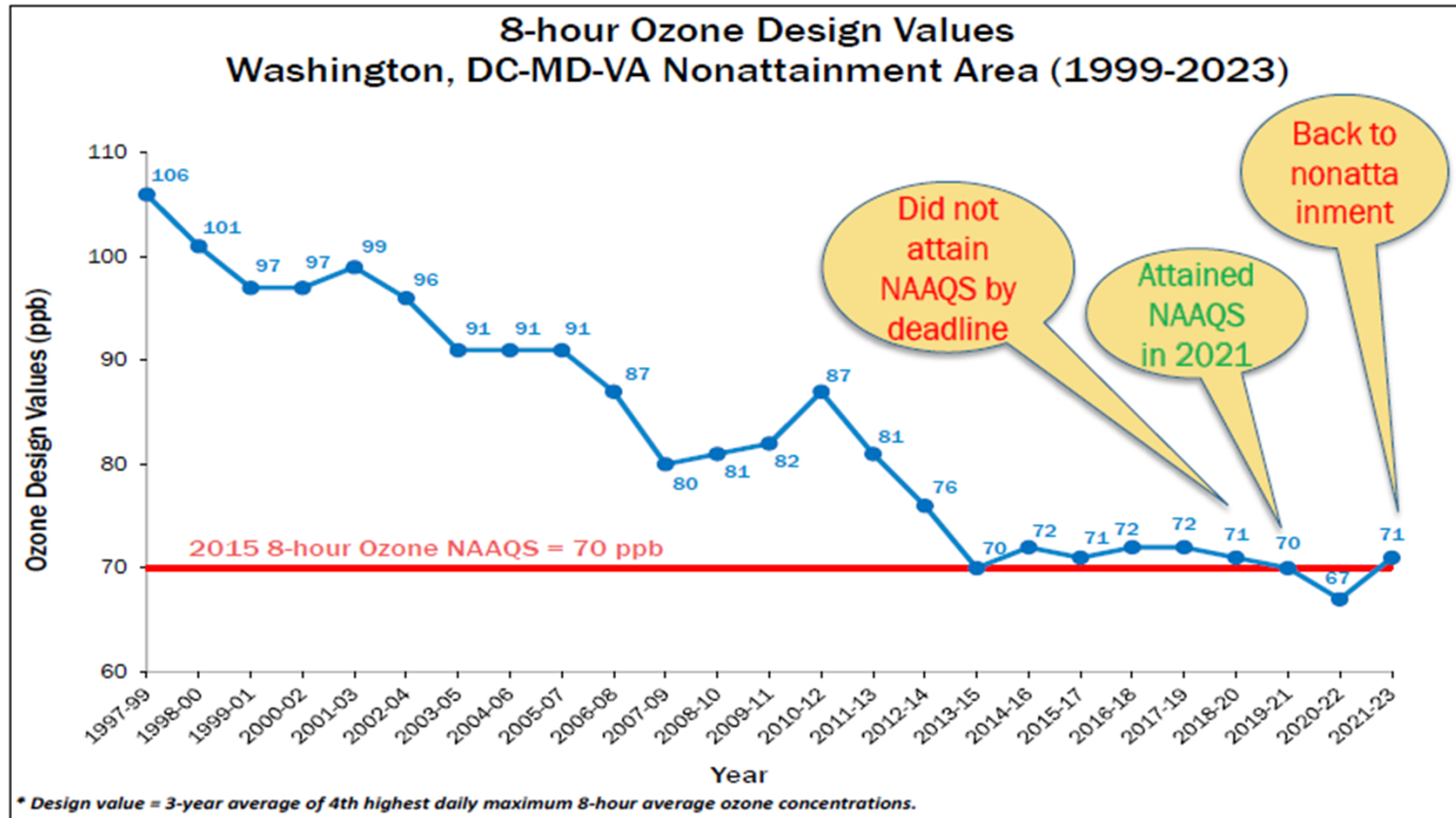
Washington DC-MD-VA

The Washington DC-MD-VA Region:

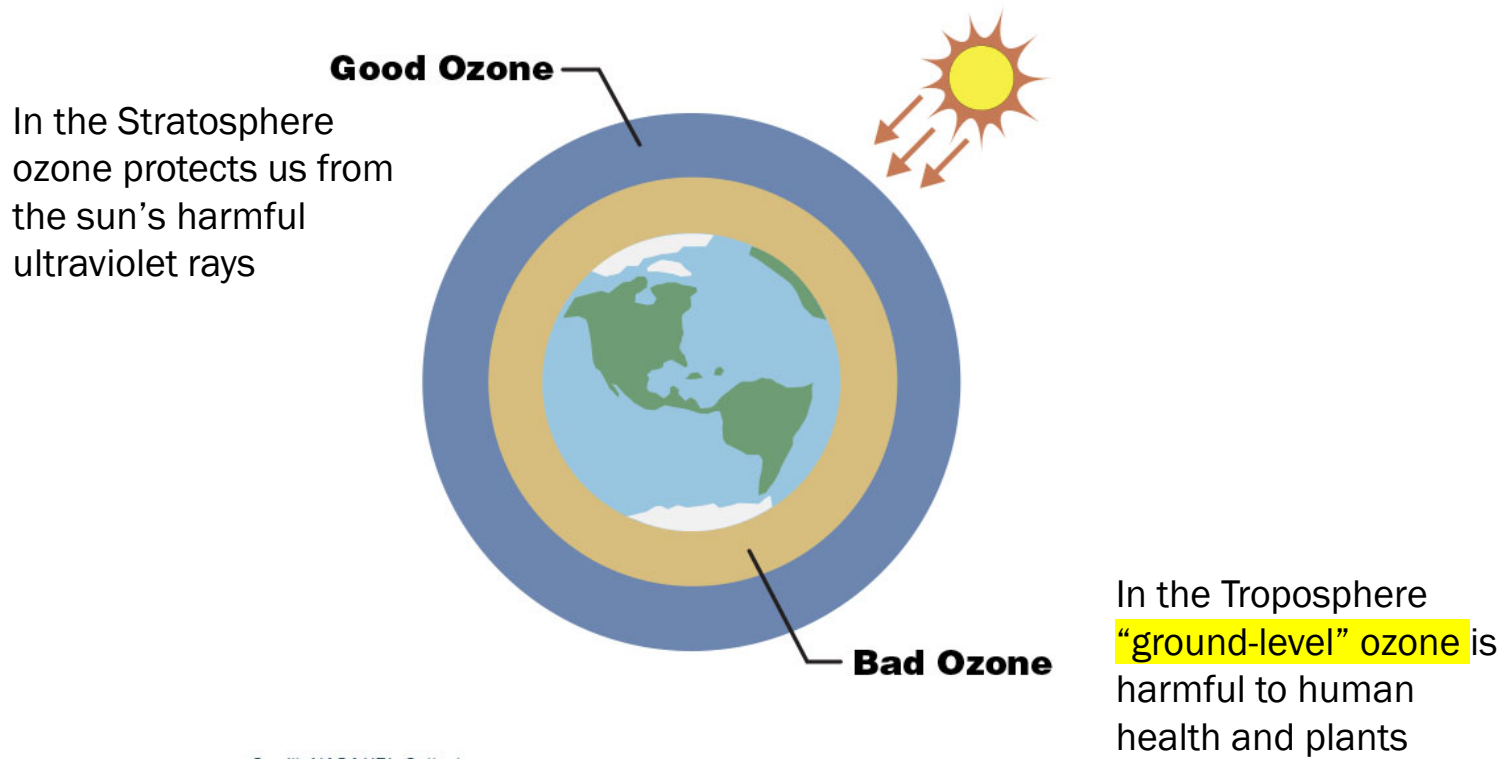
- Is classified as a “marginal” nonattainment area for Ozone
- Attained the 2015 Ozone NAAQS of 70 ppb in 2021, but levels increased to 71 ppb in 2023 in part due to wildfire pollution
- Previously was nonattainment for fine particle pollution (PM_{2.5}) and Winter Carbon Monoxide (CO), but has since attained those standards



Observed Ozone Levels Over Time



Good Ozone vs Bad Ozone



Credit: NASA/JPL-Caltech



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Ground Level Ozone Formation



Volatile Organic Compounds (VOCs) and Nitrogen Oxides (NOx) mix with sunlight to form ground-level ozone.



Sources of Ground-Level Ozone Pollution

Point, on-road mobile, area, and non-road mobile sources produce Volatile Organic Compounds (VOCs) and Nitrogen Oxides (NOx) emissions.



Point
Source

+



Mobile
Source

+



Area
Source

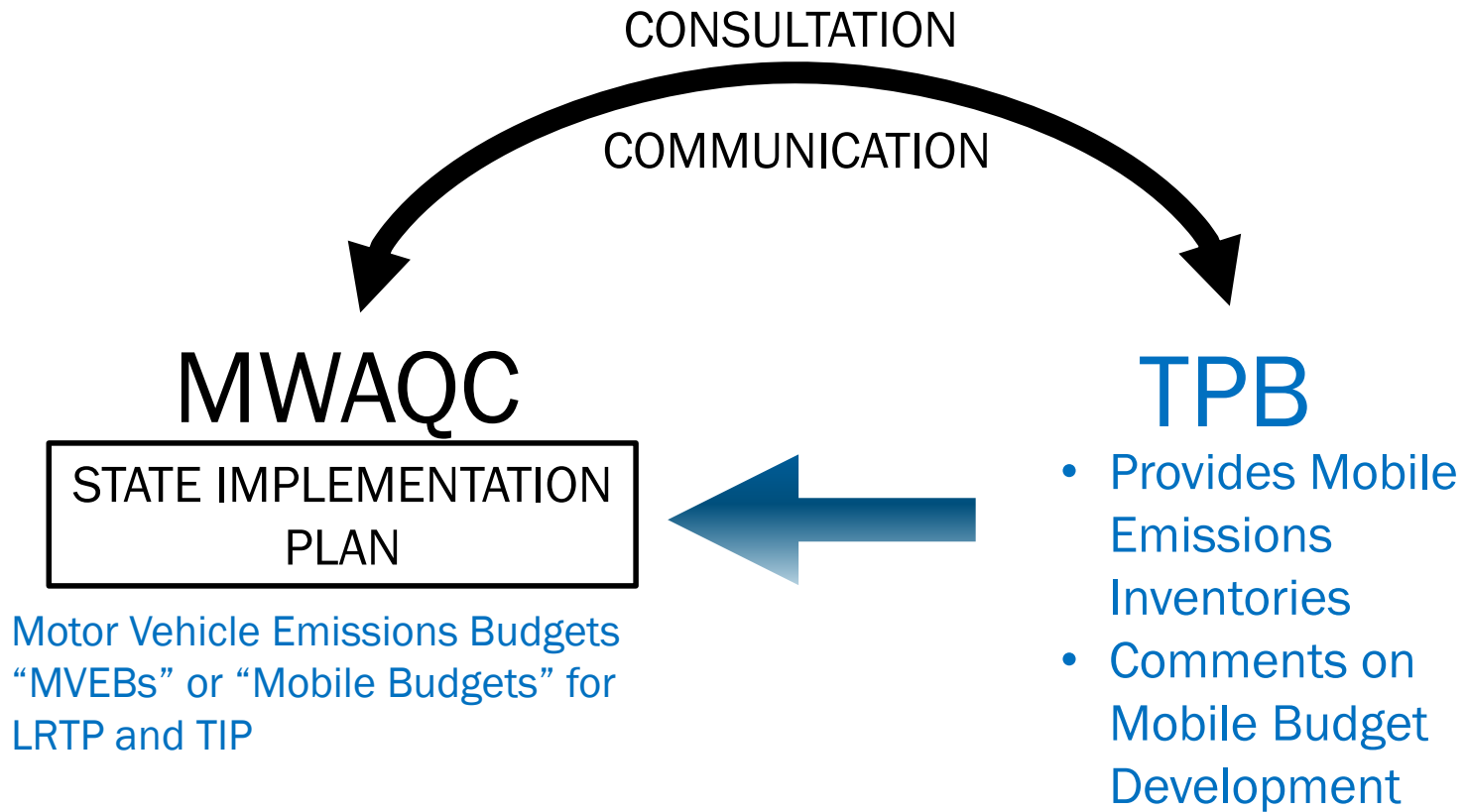
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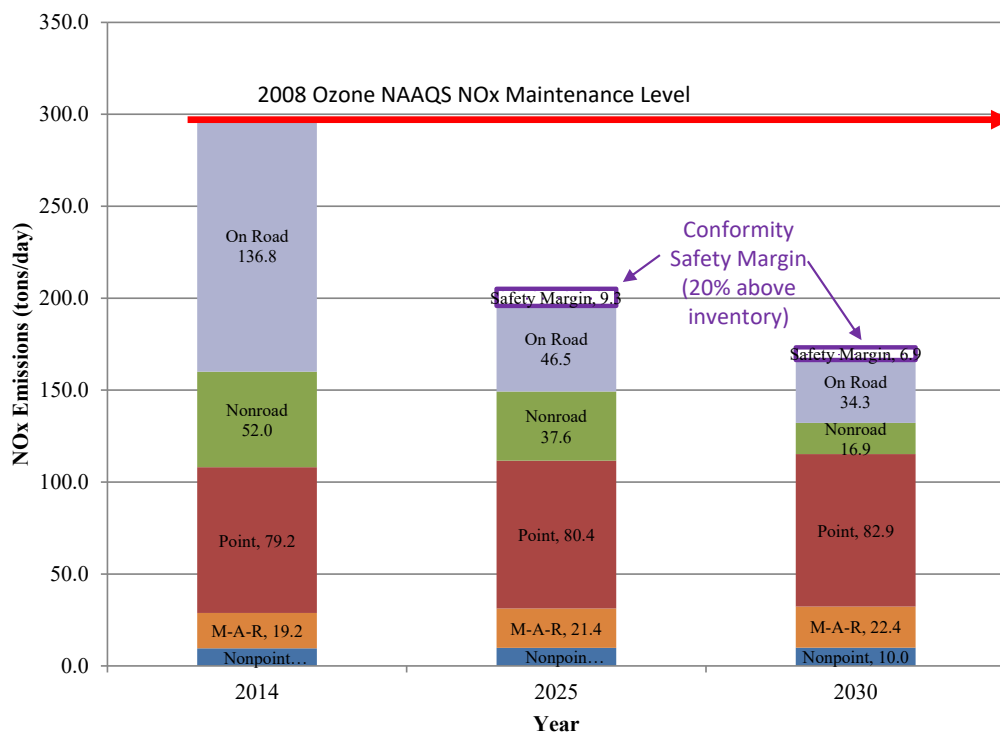
Non-road
source



State Implementation Plans



State Implementation Plans: NOx



- Nitrogen oxide (NOx) emissions inventories from all sectors
- On Road inventories are used to establish mobile budgets for the transportation sector
- Only the transportation sector is required to develop future plans and conform to mobile budgets

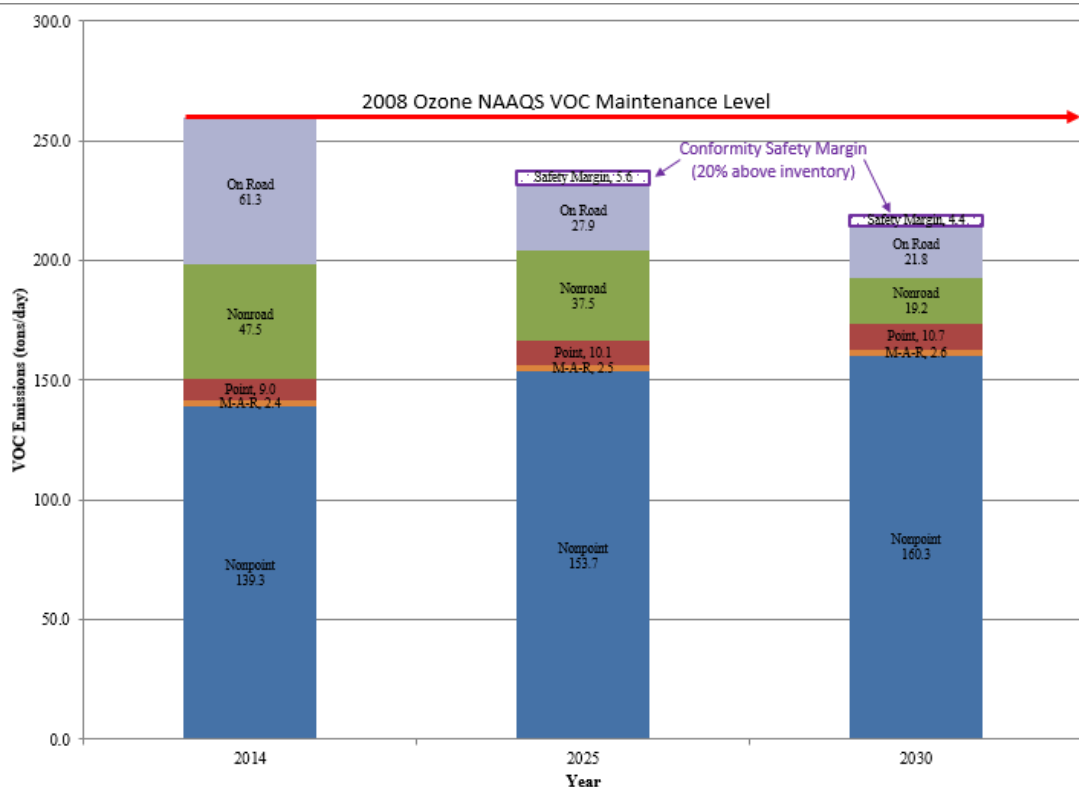
NOTE: M-A-R = marine, air, rail

SOURCE: 2025 and 2030 inventories were re-estimated using MOVES3.0.4 for the 2023 update of the 2008 ozone maintenance plan. The 2014 inventory is from the original 2008 ozone maintenance plan (December 20, 2017).



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State Implementation Plans: VOC



- Volatile Organic Compounds (VOC) emissions inventories from all sectors
- On Road inventories are used to establish mobile budgets for the transportation sector
- Only the transportation sector is required to develop future plans and conform to mobile budgets

NOTE: M-A-R = marine, air, rail

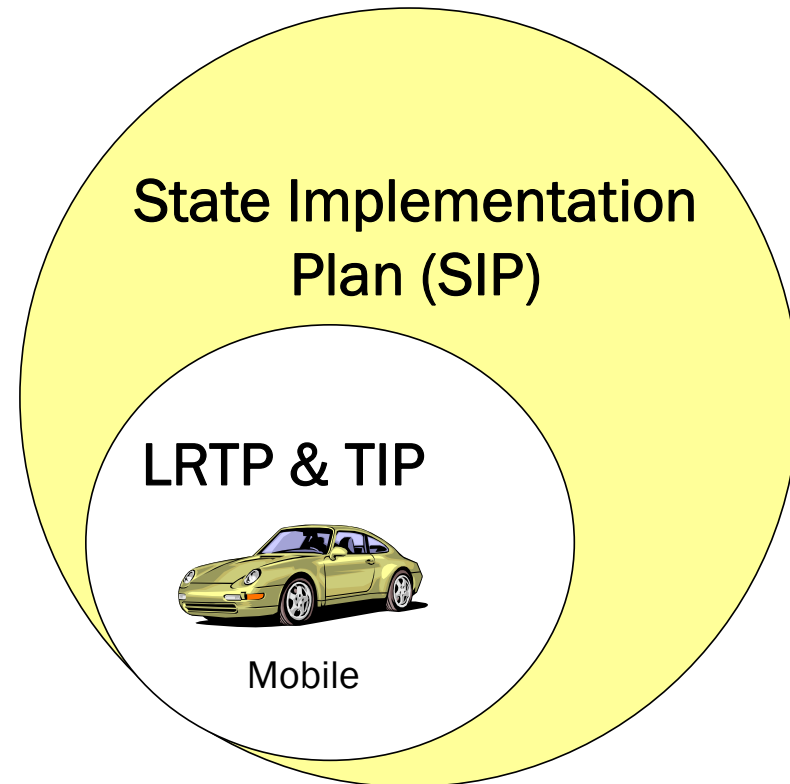
SOURCE: 2025 and 2030 inventories were re-estimated using MOVES3.0.4 for the 2023 update of the 2008 ozone maintenance plan. The 2014 inventory is from the original 2008 ozone maintenance plan (December 20, 2017).



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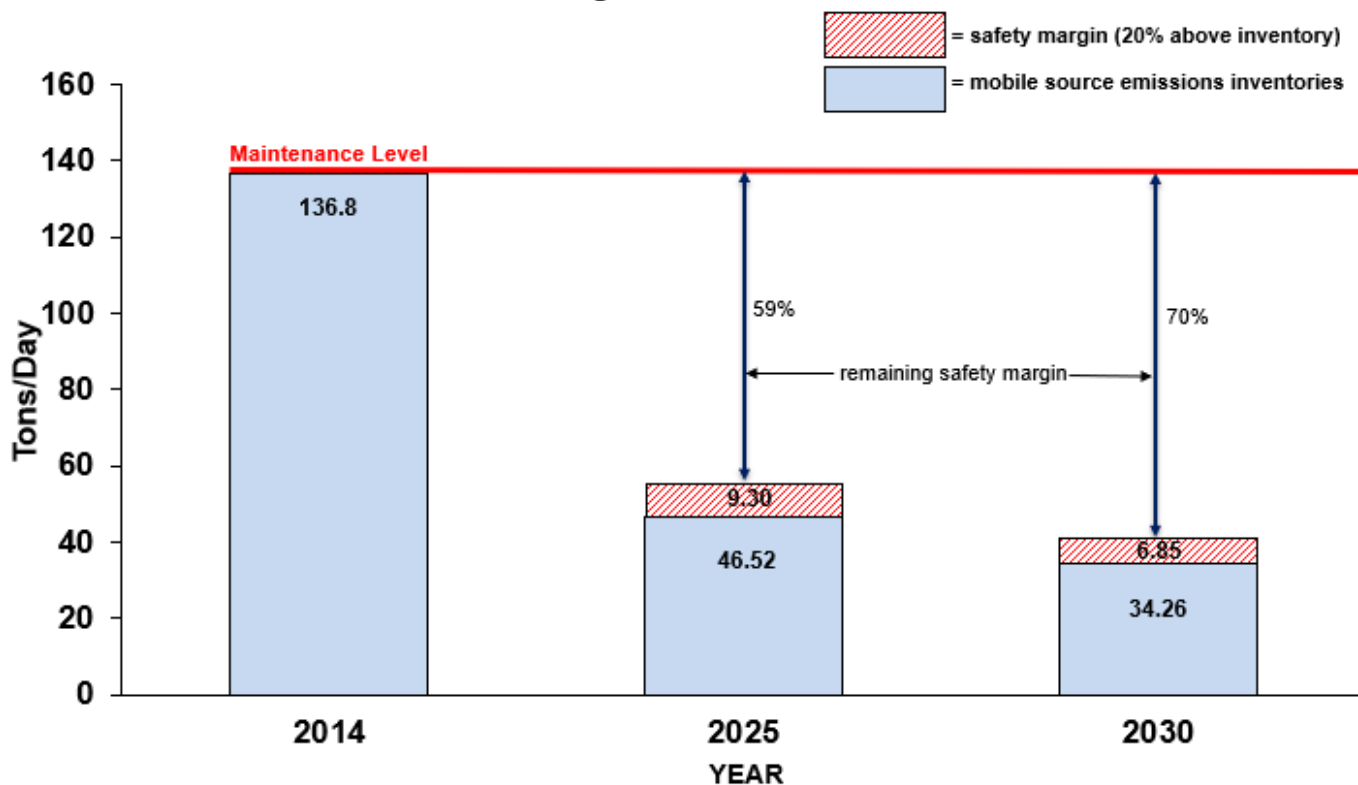
Mobile Emissions Budgets

- The SIP sets the *Motor Vehicle Emissions Budgets*, the maximum allowable emissions from vehicles.
- TPB must ensure that the regional LRTP and TIP do not result in emissions above this level.



SIP Development: Mobile Emissions Budgets

Nitrogen Oxides (NOx)

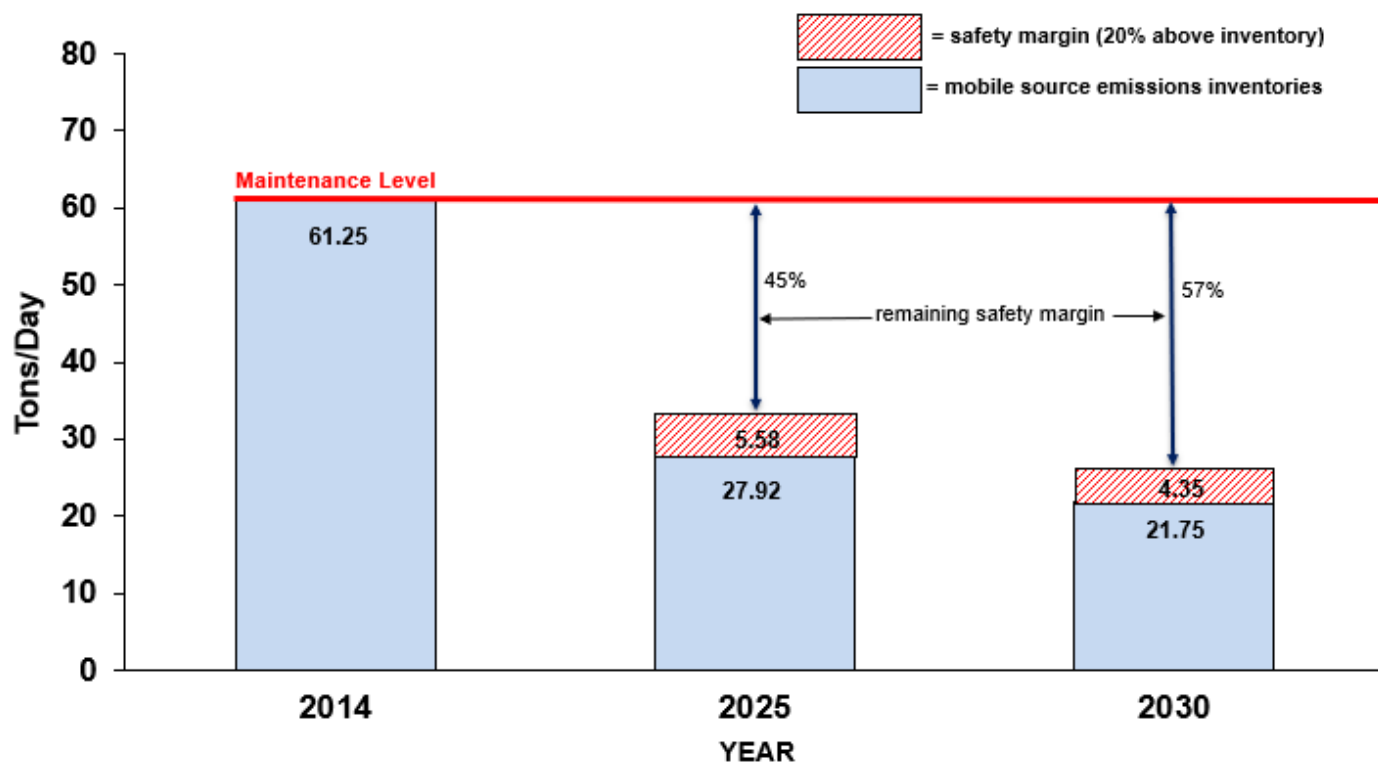


SOURCE: 2025 and 2030 inventories were re-estimated using MOVES3.0.4 for the 2023 update of the 2008 ozone maintenance plan. The 2014 inventory is from the original 2008 ozone maintenance plan (December 20, 2017).



SIP Development: Mobile Emissions Budgets

Volatile Organic Compounds (VOC)

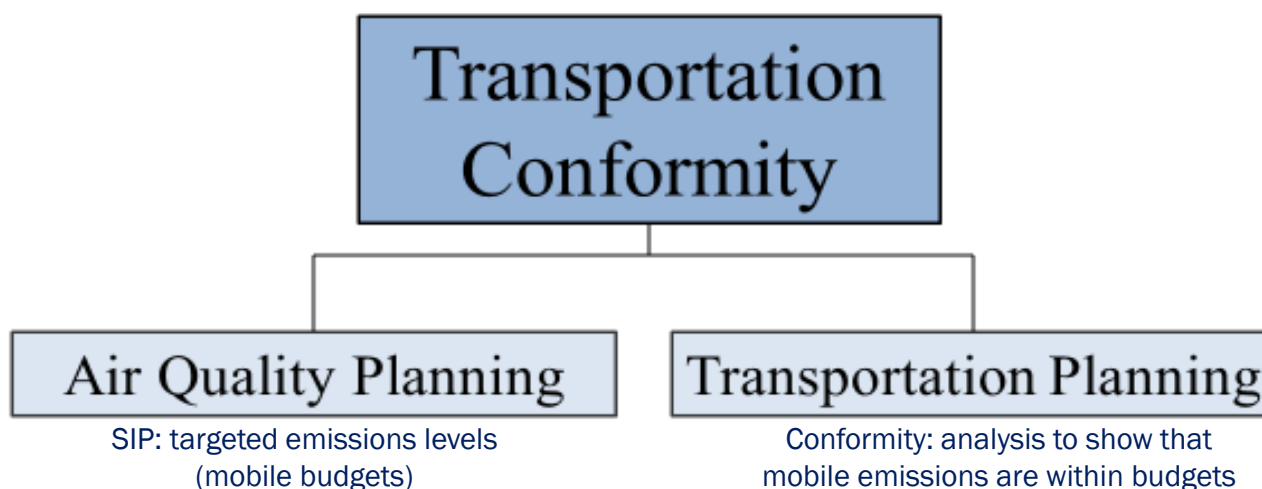


SOURCE: 2025 and 2030 inventories were re-estimated using MOVES3.04 for the 2023 update of the 2008 ozone maintenance plan. The 2014 inventory is from the original 2008 ozone maintenance plan (December 20, 2017).



Transportation Air Quality Conformity

Transportation Conformity: A link between
Air Quality and Transportation Planning

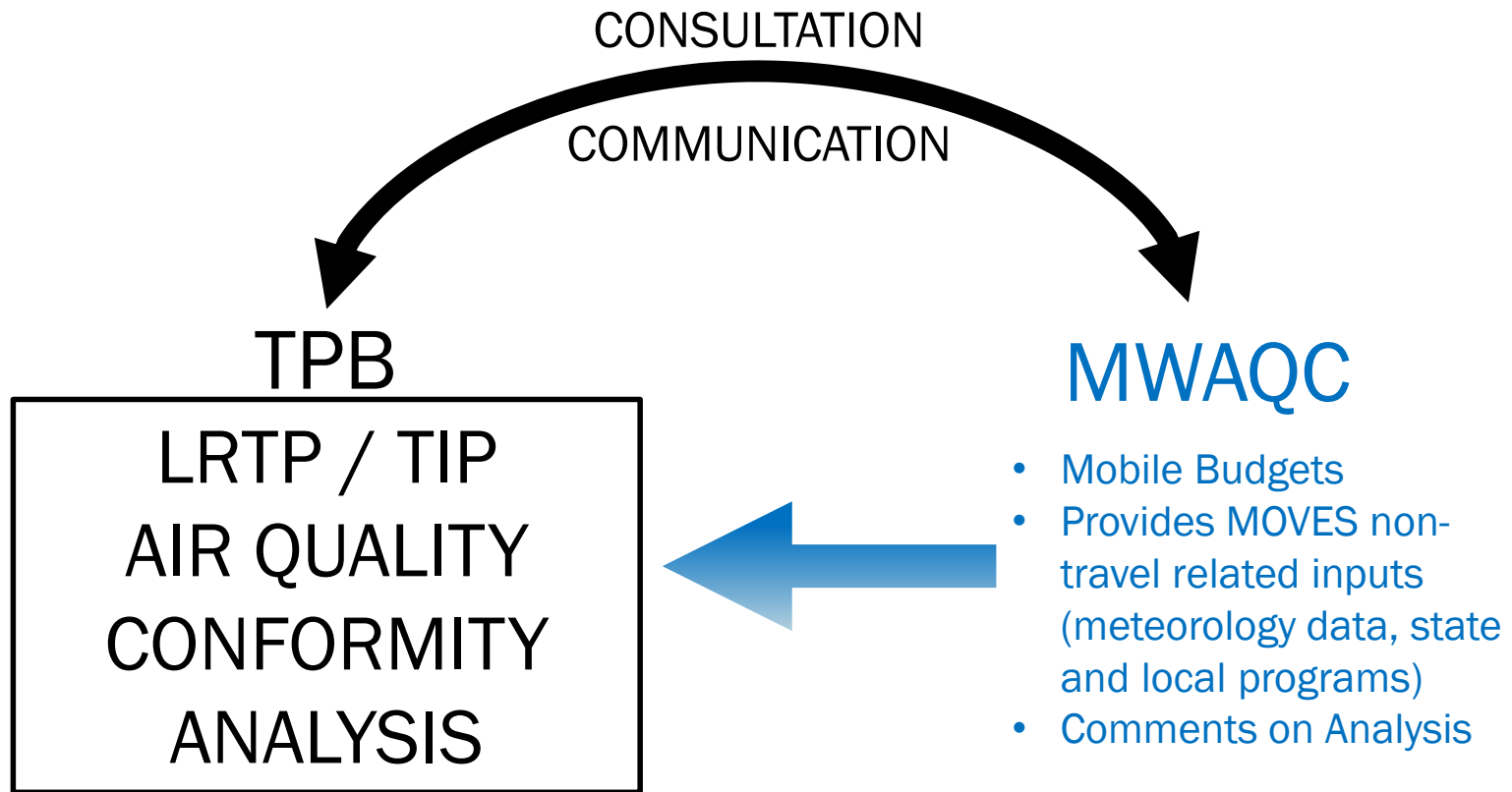


Air Quality Conformity

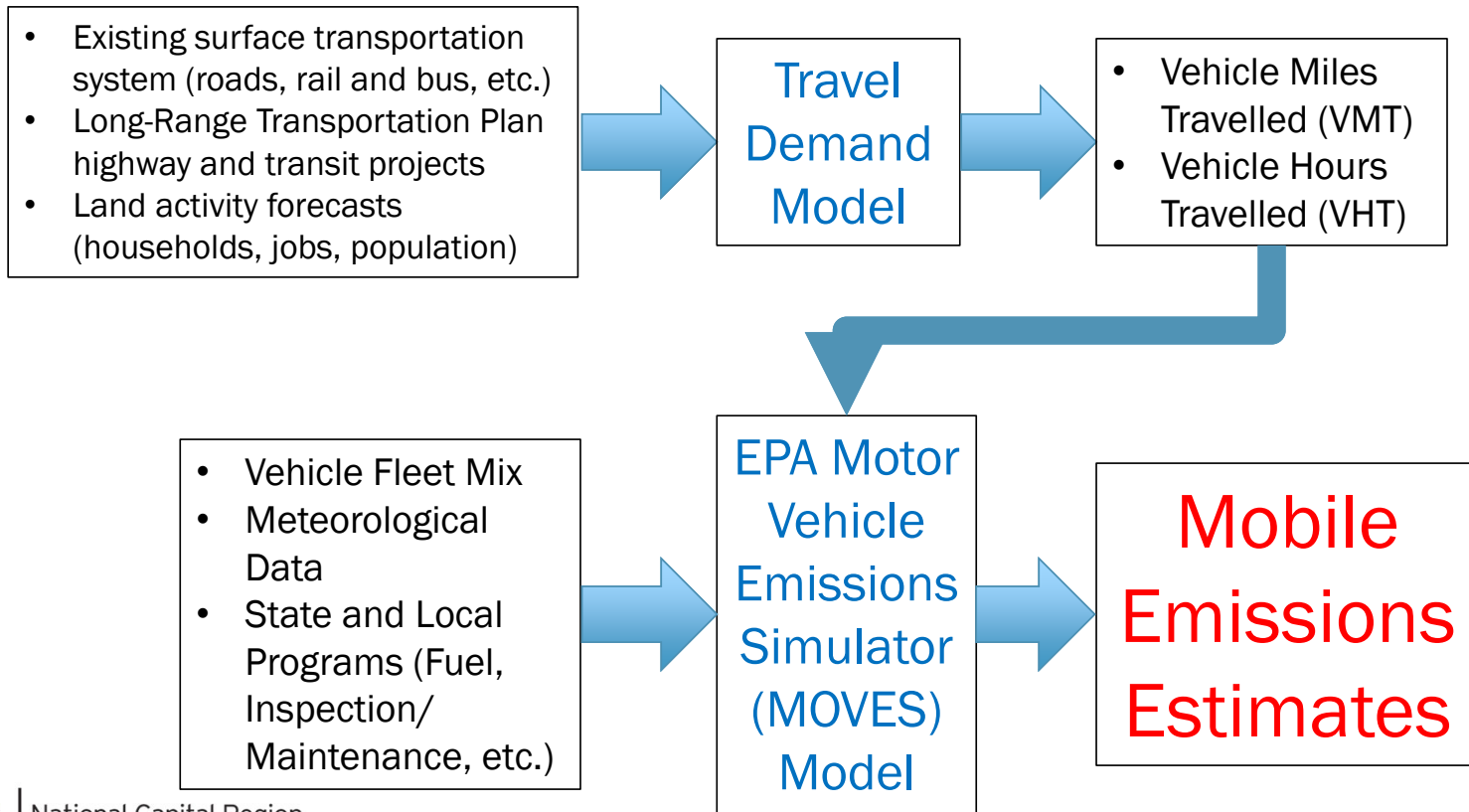
- Required by Clean Air Act (CAA) Section 176(c)
- Requires evaluation of emissions from fiscally constrained LRTP, TIP, and projects against the emissions budgets set in the SIP before the LRTP, TIP, and projects can be federally funded or approved
- Ensures that Federal (FHWA/FTA) funding and approval are given to transportation (transit/highway) activities that are consistent with air quality plans



Air Quality Conformity

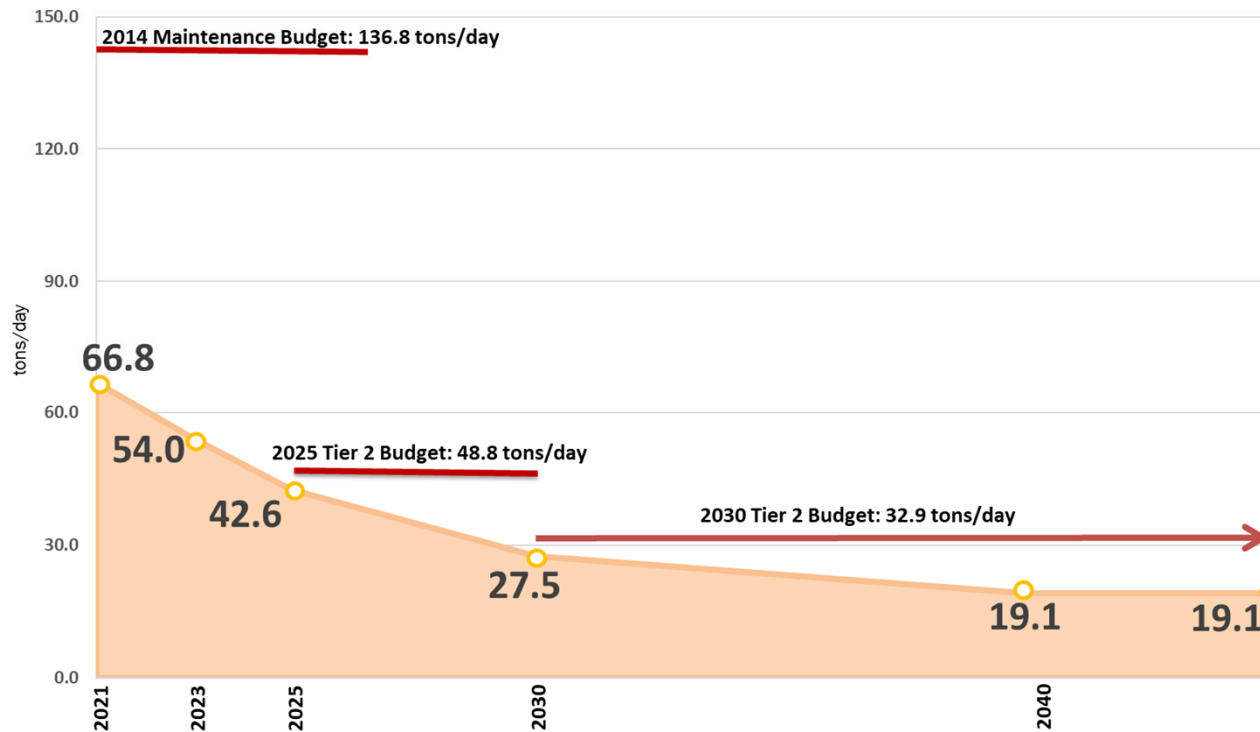


Air Quality Conformity



Air Quality Conformity

Mobile Source Emissions and Motor Vehicle Emissions Budgets: NOx



- MWAQC develops mobile emissions budgets during SIP planning
- TPB analyzes LRTP and TIP to demonstrate adherence to mobile emissions budgets for air quality conformity

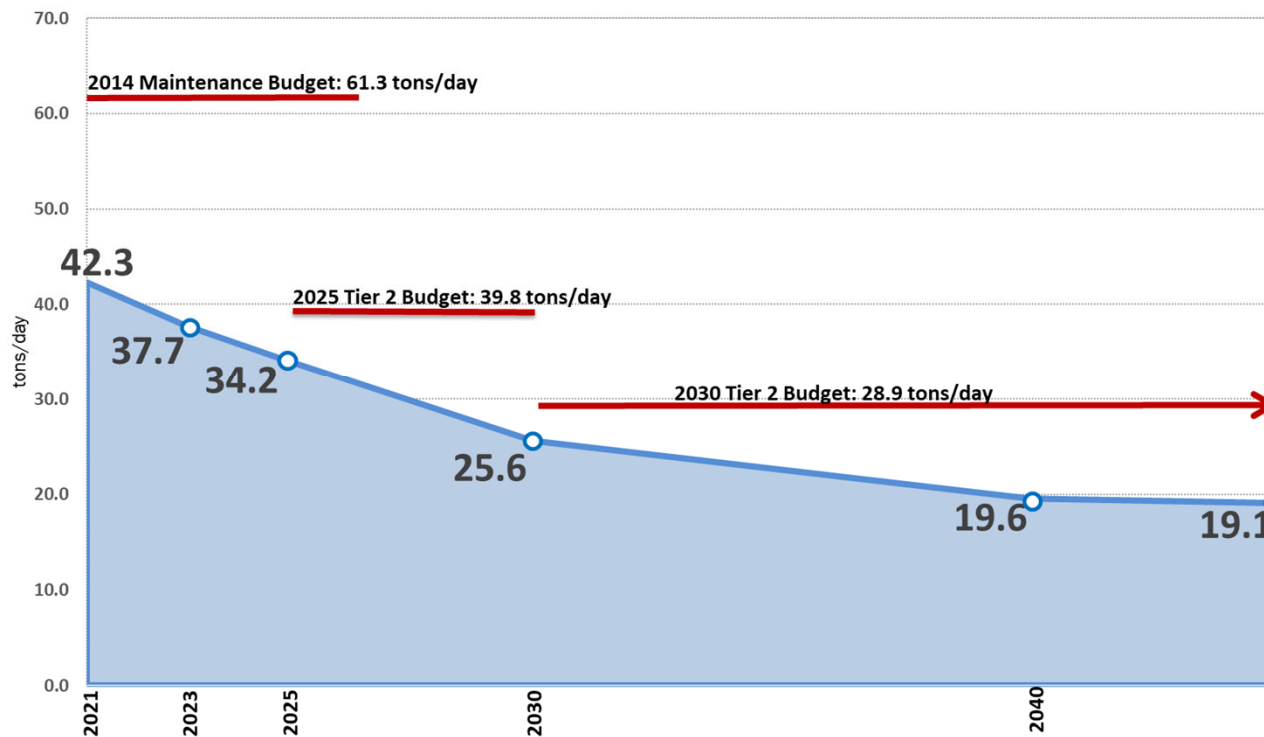
SOURCE: 2022 Update to Visualize 2045 Air Quality Conformity Analysis. June 15, 2022.



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Air Quality Conformity

Mobile Source Emissions and Motor Vehicle Emissions Budgets: VOC



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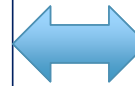


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Consultation: Transportation and Air Quality

TPB

- Updates to latest planning assumptions (land activity, vehicle fleet data, transportation projects, etc.)
- Air Quality Conformity Results
- Monthly Consultation Mailout (announcing updates to Transportation Plan, TIP, or Conformity)
- TCMs/TERMs (projects, programs, benefits, etc.)
- Public Comment Opportunities



MWAQC

- Mobile Budget Development
- Regional Monitor Data
- NAAQS Implications / Requirements
- State and Local Measures
- Public Comment Opportunities



What About Greenhouse Gases?

- Greenhouse gases (GHGs) are not included as an official part of air quality conformity analyses; however, TPB staff does estimate GHGs when the other pollutants are analyzed and reports the findings in support of climate change planning activities
- Both TPB and COG are working to address the challenges of climate change, via both mitigation and resiliency efforts, e.g.,
 - National Capital Region Climate Change Report (2008, COG)
 - COG establishes Climate Energy & Environment Policy Committee (2009, COG)
 - “What Would It Take?” Scenario Study (2010, TPB)
 - Multi-Sector Working Group Study (2016-2017, TPB,COG,MWAQC)
 - Long Range Plan Task Force (2017, TPB)
 - Metropolitan Washington 2030 Climate and Energy Action Plan (2020, COG)
 - TPB Resiliency Study (2021, TPB)
 - Climate Change Mitigation Study of 2021 (2021,TPB)
 - TPB Adopts On-Road Mobile GHG Reduction Goals with GHG Reduction Strategies (2022)
 - Carbon Reduction Program (CRP) Planning Work with State DOTs (2022-current, TPB)
 - Regional Electric Vehicle Deployment Group (2023–current, COG)
 - Regional Electric Vehicle Infrastructure Implementation (REVII) Strategy (2023-current, TPB,COG)
 - Performance Based Planning and Programming GHG Reduction Targets (2024-current, TPB)
 - Climate Pollution Reduction Grant Program Priority Climate Action Plan (2023-2024, COG)



What's Next For Our Region?

- Air Quality Conformity Analysis of Visualize 2050 and the FY 2026-2029 TIP
 - Public Comment Period on Inputs March 1 – March 30
 - Round 10 Cooperative Forecasts
 - Regionally Significant Highway and Transit Projects
 - 2023 Vehicle Fleet Data
 - EPA's Latest Emissions Model: Motor Vehicle Emissions Simulator (MOVES4)



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