

AIR QUALITY IN TRANSPORTATION PLANNING

An Introduction to Transportation Conformity

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Purpose of Presentation

- Give an overview of some air quality planning concepts
- Explain what a State Implementation Plan is
- Explain what a Motor Vehicle Emissions Budget is
- Define transportation conformity
- Explain how the transportation conformity analysis is undertaken
- Next steps



The Clean Air Act

- The Clean Air Act (CAA) is a comprehensive federal law designed to protect and improve the nation's air quality. It establishes national air quality standards and requires states to develop plans to meet those standards. The Act also regulates emissions from various sources, including industrial facilities and motor vehicles.
- The overall goal is to protect human health and the environment



The Clean Air Act

- Initially enacted in 1963, most recently amended in 1990
- Requires EPA to set National Ambient Air Quality Standards (NAAQS) for 6 common air pollutants: carbon monoxide (CO), lead, nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM), and sulfur dioxide (SO₂) - known as “Criteria Air Pollutants”
- Requires EPA to review those standards at least every 5 years, considering new scientific data and public health
- Requires EPA to designate areas as meeting or not meeting the standards (known as “attainment” or “nonattainment”)
- Allows EPA to define boundaries of “nonattainment” areas
- Requires states to establish a network of air monitoring stations to monitor and report on pollutant levels



The DC-MD-VA Ozone Nonattainment Area and Monitor Locations



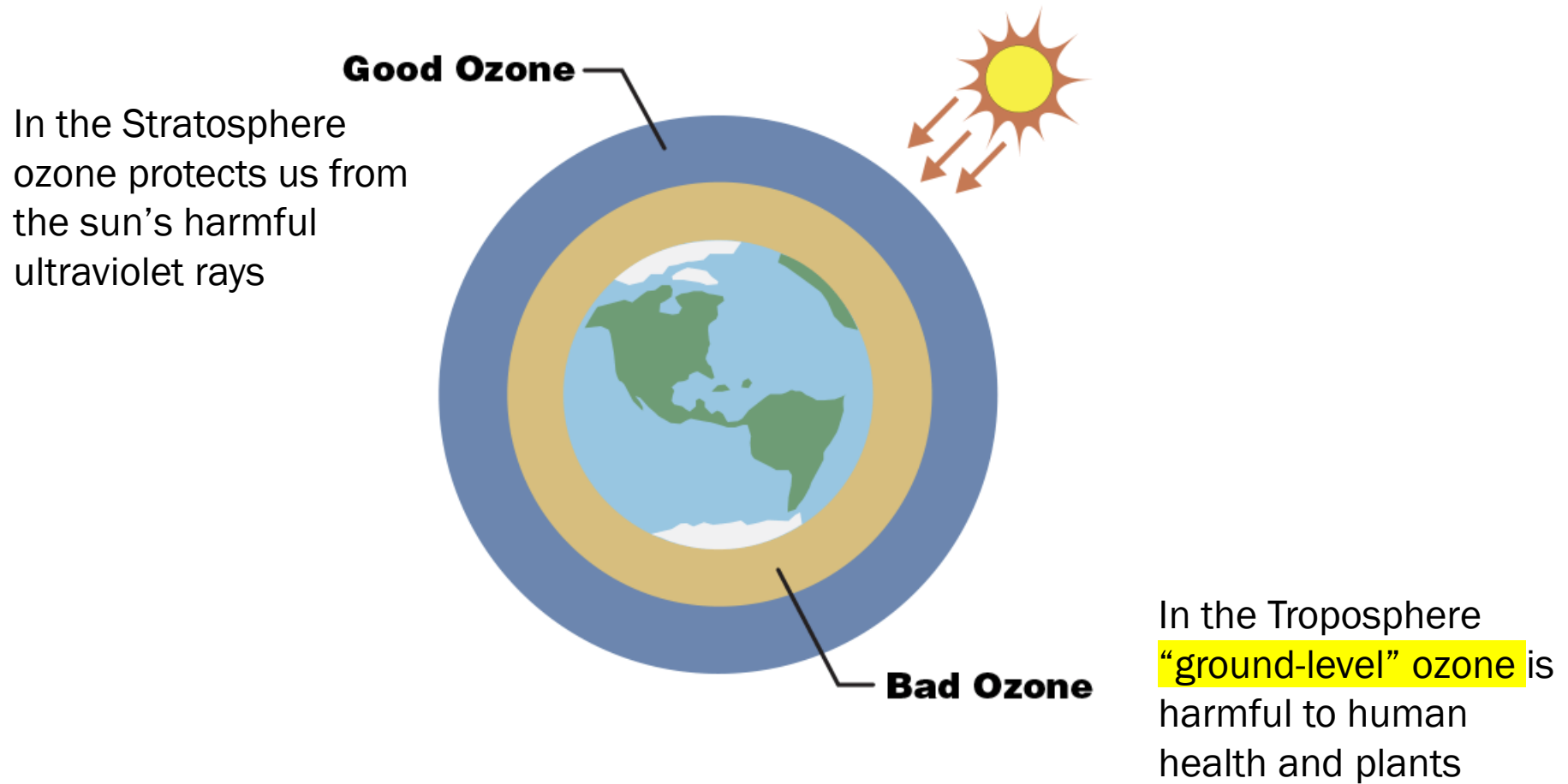
Air Quality in the Region

Of the six criteria pollutants, the region only has federal requirements associated with ground-level ozone

Previously, the region was nonattainment for fine particle pollution (PM_{2.5}) and Winter Carbon Monoxide (CO), but the region has since attained those standards



Good Ozone vs Bad Ozone



Credit: NASA/JPL-Caltech



Ground Level Ozone Formation



Volatile Organic Compounds (VOCs) and Nitrogen Oxides (NO_x) 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 (NO_x) emissions.



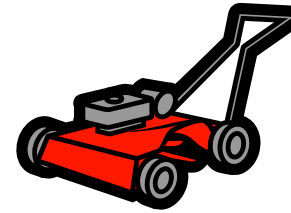
Point
Source

+



Mobile
Source

+



Area
Source

+



Non-road
source



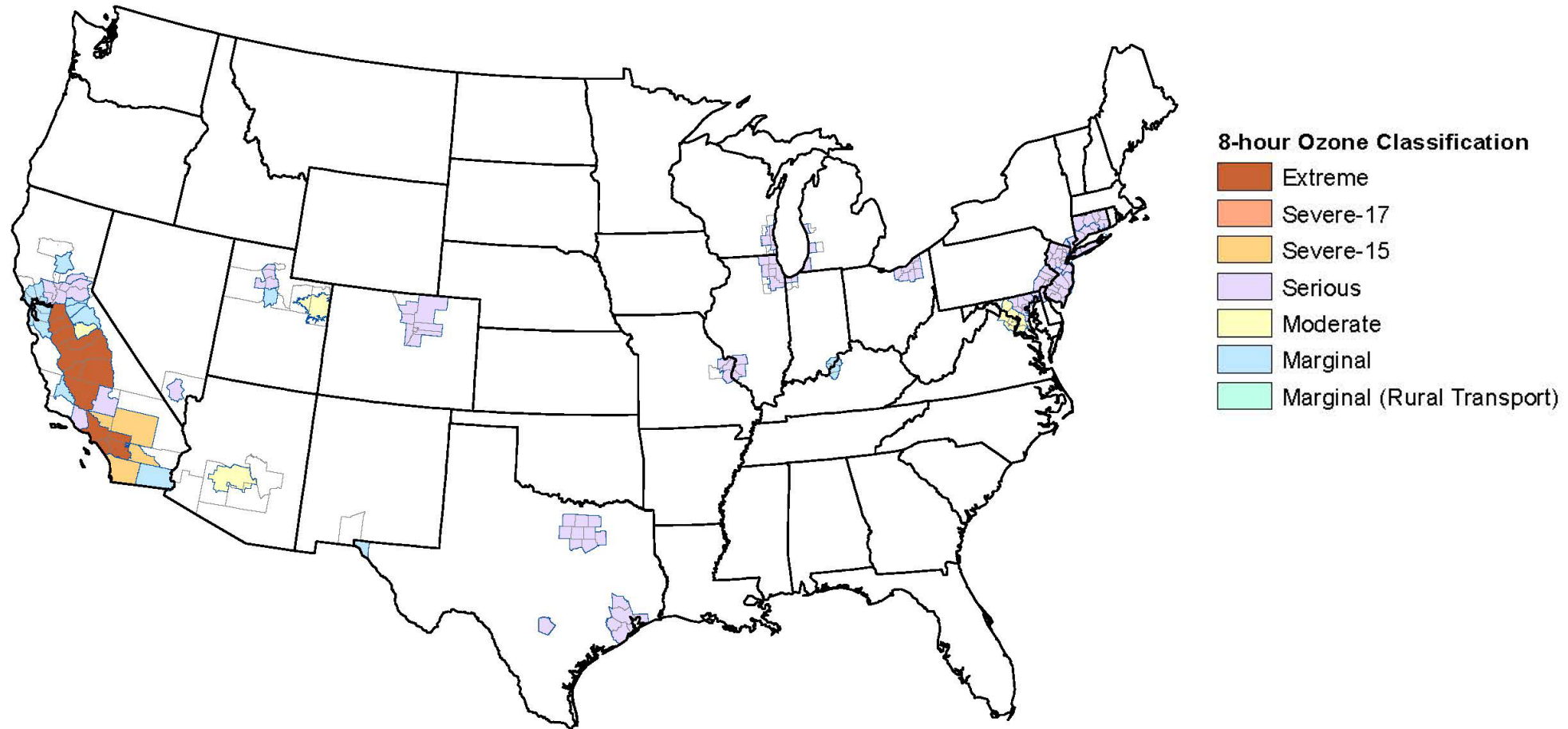
2015 Ozone NAAQS

- The current 2015 Ozone Standard is 70 parts per billion (ppb)
- Based on measured ozone levels, nonattainment areas were designated based on the severity of exceedance of the current standard:
 - Marginal
 - Moderate
 - Serious
 - Severe
 - Extreme
- Each designation includes specific requirements and an allotted time to attain the Standard with higher pollution areas receiving a longer time period



2015 Ozone NAAQS

8-Hour Ozone Nonattainment Areas (2015 Standard)

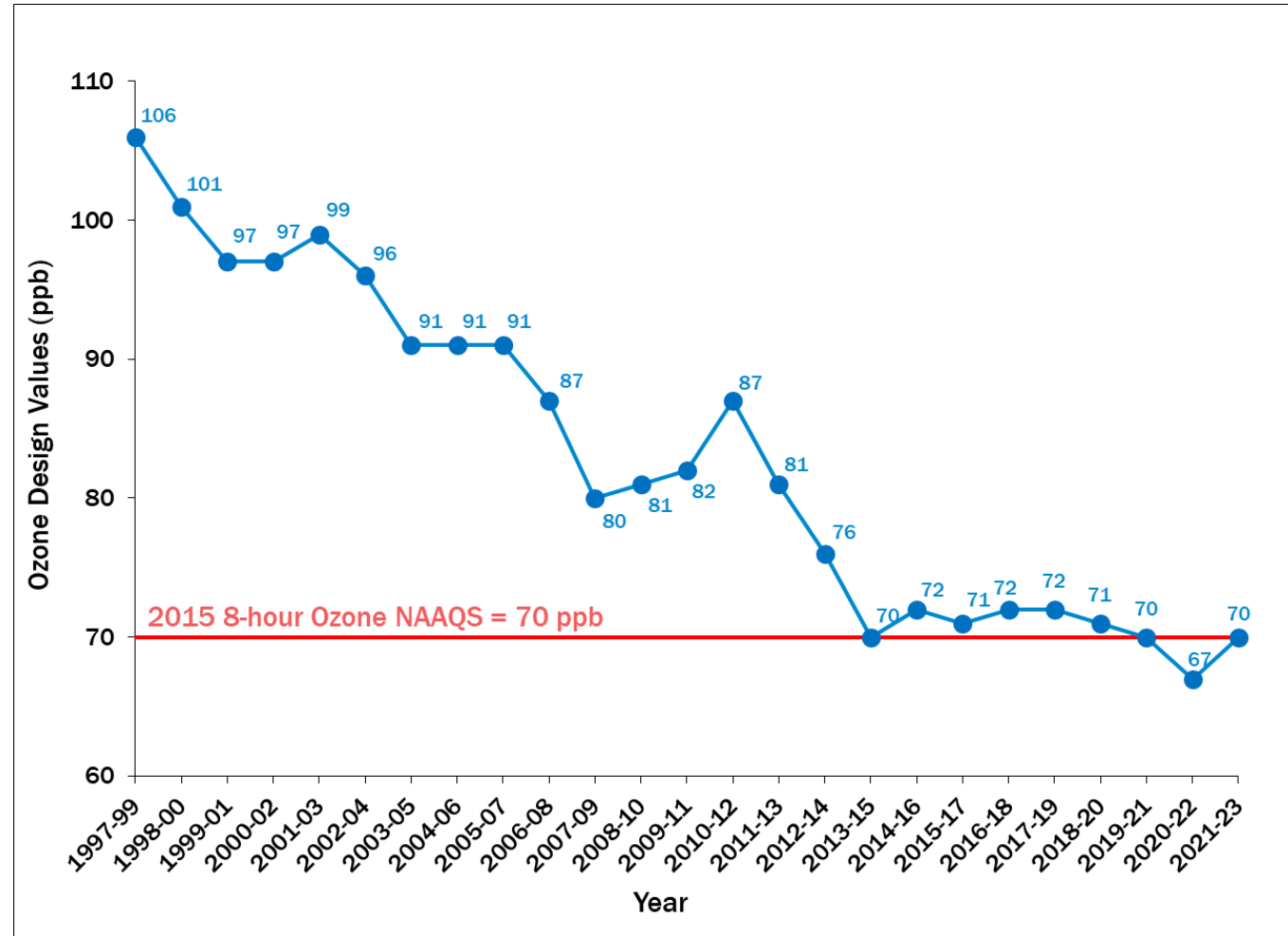


Washington DC-MD-VA

- The Washington DC-MD-VA Region is classified as a “moderate” nonattainment area for ground-level Ozone
- Good News: The region has achieved the 2015 Ozone NAAQS starting in 2021 and every year since
- After meeting the standard, several procedural steps must be taken to reclassify the region
- The region will be reclassified as “Maintenance” for the 2015 Ozone standard
 - Many analytical requirements remain in place
 - Lasts up to 20+ years



Observed Ozone Levels Over Time



GOOD NEWS:

Air quality in the region is significantly better than it was 25 years ago.



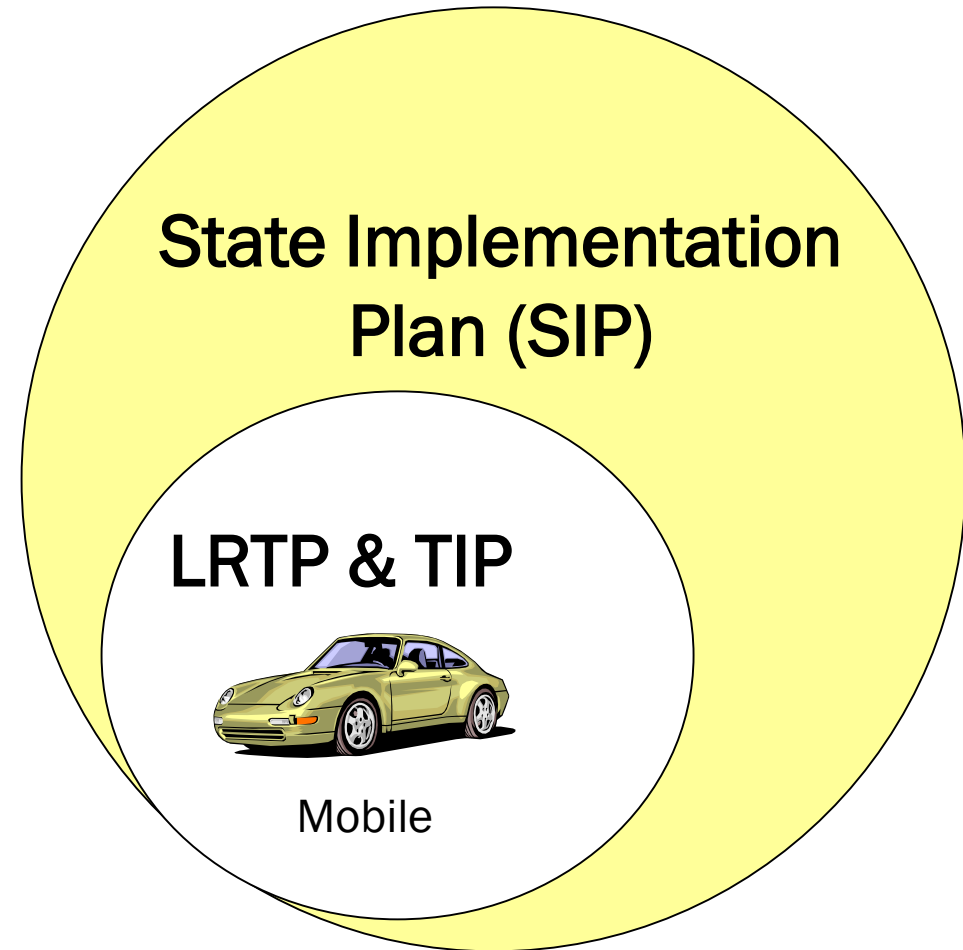
State Implementation Plans and MWAQC

- A State Implementation Plan is a collection of regulations and documents used by a state, territory, or local air district to implement, maintain, and enforce the NAAQS and/or fulfill other Clean Air Act requirements
 - A plan for how the region will either attain or maintain the NAAQS
- Metropolitan Washington Air Quality Committee (MWAQC)
 - Entity certified by the mayor of the District of Columbia and the governors of Maryland and Virginia to prepare State Implementation Plans (SIPs) for the DC-MD-VA Metropolitan Statistical Area



Mobile Emissions Budgets

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



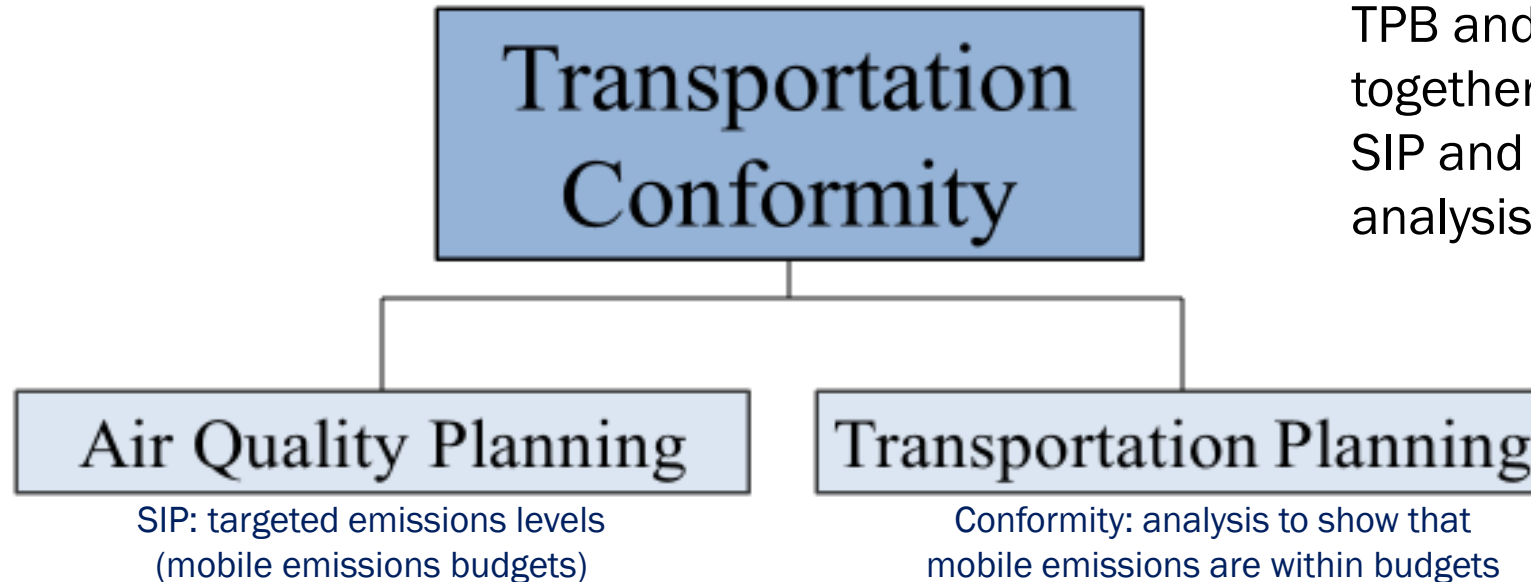
Transportation Air Quality Conformity

- Required by Clean Air Act (CAA) Section 176(c)
- The LRTP/TIP/Projects must generate VOC and NOX emissions below the Motor Vehicle Emission Budgets in the latest SIP to ensure or continue federal funding
- Ensures that Federal (FHWA/FTA) funding and approval are given to transportation (transit/highway) activities that are consistent with air quality plans



Transportation Air Quality Conformity

Transportation Conformity: A link between Air Quality and Transportation Planning

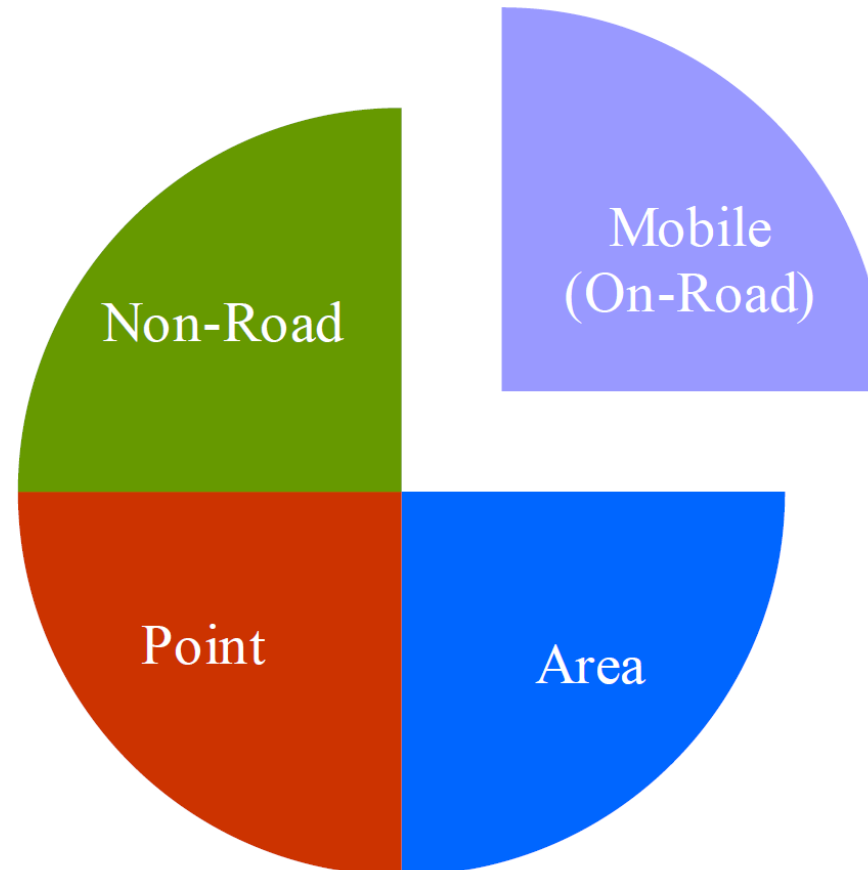


TPB and MWAQC work together to develop the SIP and the conformity analysis



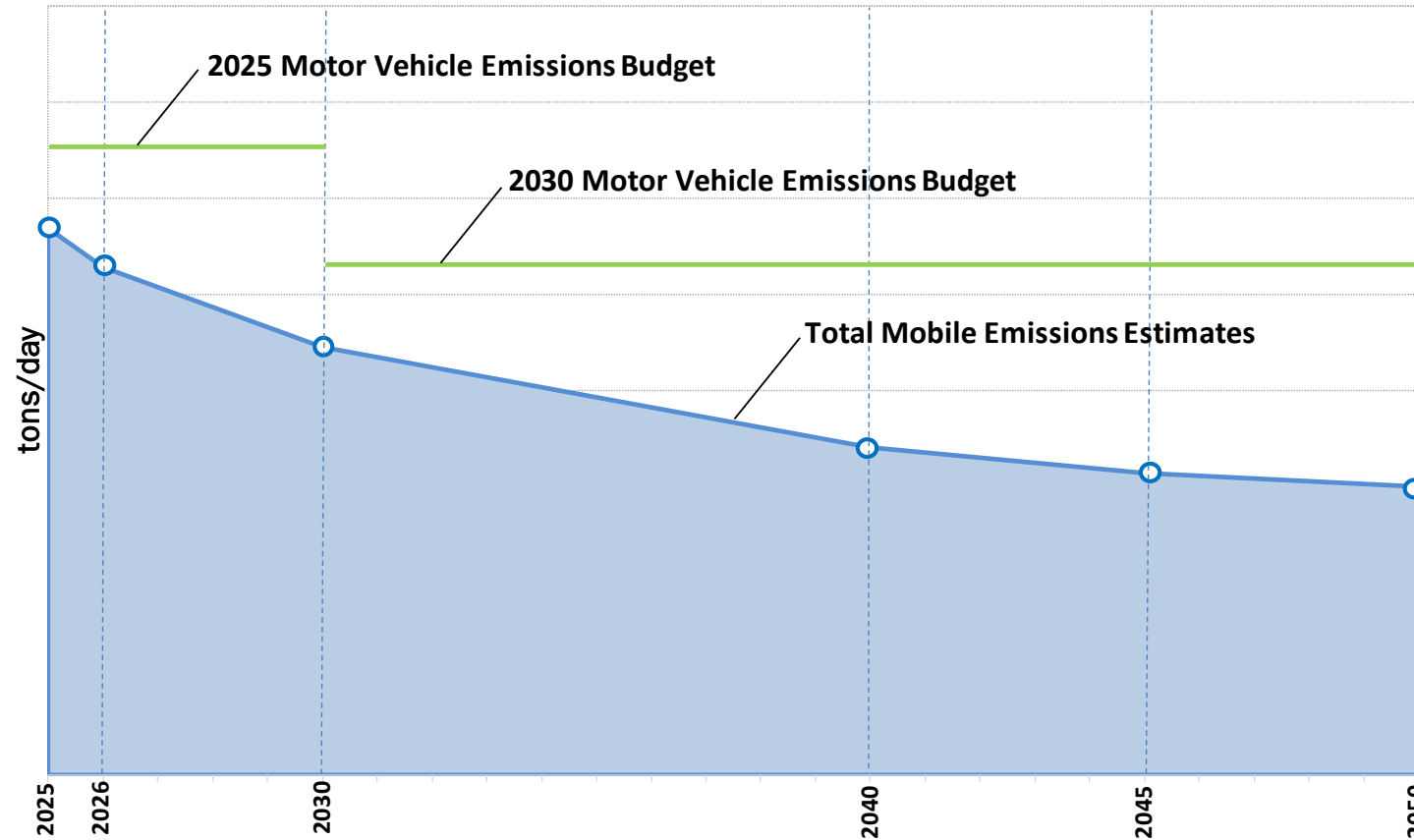
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Only On-Road Mobile Source Emissions are Subject to Transportation Conformity Requirements



Transportation Air Quality Conformity

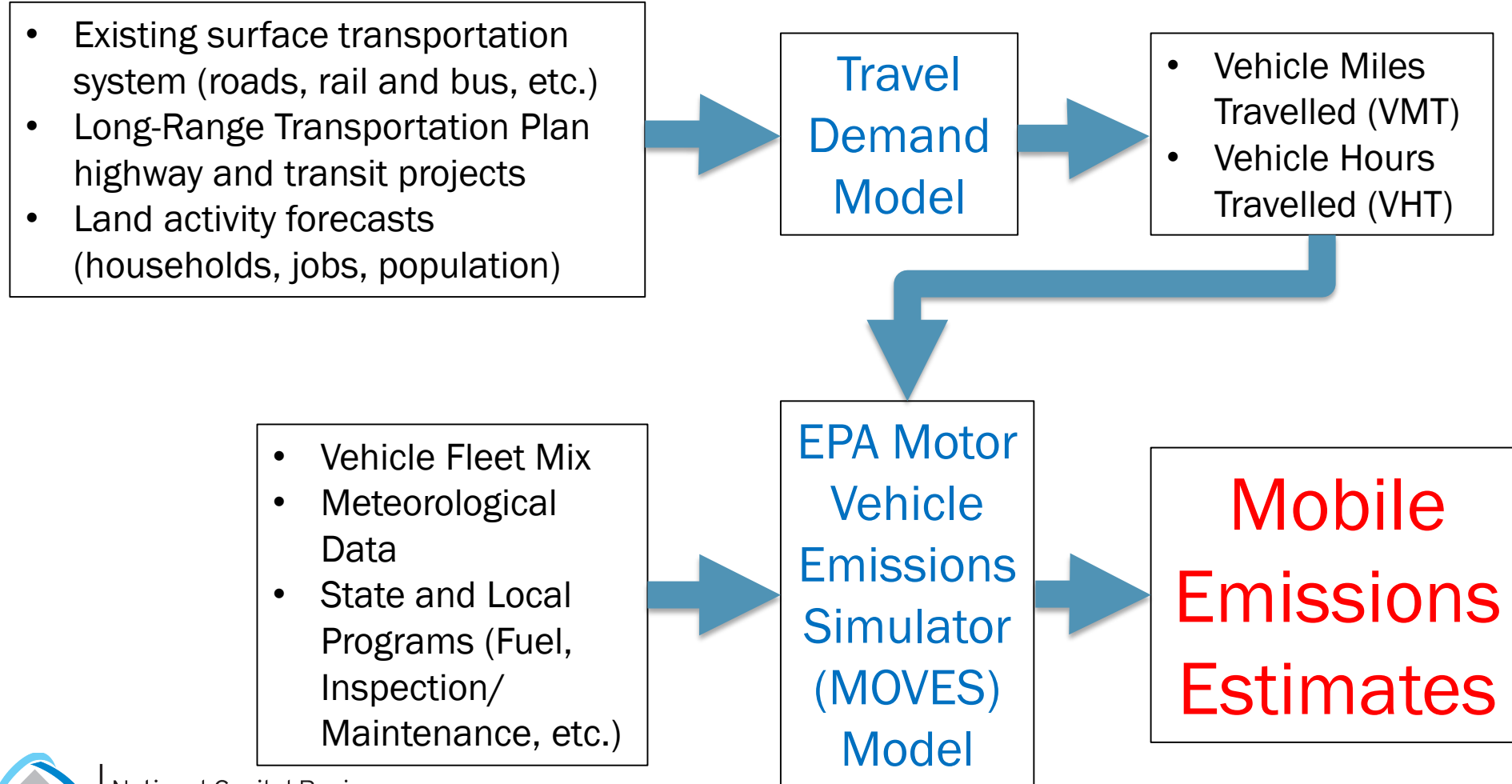
Mobile Source Emissions and Motor Vehicle Emissions Budgets



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



Transportation Air Quality Conformity



Why Do Mobile Emissions Decrease?

- Most reductions reflect federal programs such as Tier 1, Tier 2, and Tier 3 Engine Standards, and Corporate Average Fuel Economy (CAFE) Standards
- As people buy new cars, an ever-increasing percentage of the vehicle fleet reflects these more recent federal standards
- Some reductions come from state and local programs such as vehicle inspection/maintenance requirements, ozone transport rules, and VRE/MARC locomotive idling reductions (limiting the amount of time that the locomotives idle unnecessarily)



Takeaways

- TPB transportation planners and MWAQC environmental planners work together to improve the region's air quality
- Emissions from transportation plans must meet federal air quality requirements to secure federal funding for transportation projects
- The region's air quality has improved significantly over the last 25 years, although there is always room for improvement



What's Next For Our Region?

- Air Quality Conformity Analysis of Visualize 2050 and the FY 2026-2029 TIP
 - Decision on the I-495 Southside Express Lanes (September 2025)
 - Public Comment Period on the conformity analysis/documentation - October 4 – November 2, 2025
 - TPB Action on Visualize 2050 and conformity analysis (December 2025)



What Can You Do?

- Public Comment Period October 4 – November 2
 - Provide input on air quality conformity findings and any concerns that you may have with air quality in the region
- Get involved early at the local level to comment on projects that may be included in future transportation plans
- Please be aware that greenhouse gas emissions are NOT a part of air quality conformity as per federal regulations



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