Maintenance Plan
for the
Washington DC-MD-VA 2015 Ozone NAAQS
Nonattainment Area

DRAFT

Prepared by:

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for the

District Department of the Environment
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on behalf of the
Metropolitan Washington Air Quality Committee

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1. Introduction

The District of Columbia, the State of Maryland, and the Commonwealth of Virginia are submitting this maintenance plan for the Washington DC-MD-VA 2015 ozone national ambient air quality standard (NAAQS) moderate nonattainment area (hereinafter referred to as "area") to the United States Environmental Protection Agency (USEPA) in support of the redesignation request to attainment for that standard. This document demonstrates that ozone air quality in the area will remain compliant with the 2015 ozone NAAQS as verified through a monitoring network that meets all federal requirements. This plan includes motor vehicle emissions budgets (MVEBs) for the interim year 2032 and the out year 2038. It also contains contingency measures that will be implemented in the unlikely event that the area experiences a violation of the 2015 ozone NAAQS.

2. National Ambient Air Quality Standard for Ozone

When USEPA establishes a NAAQS, USEPA designates areas with regional air quality meeting the new standard as an attainment area. USEPA designates areas that do not meet the national standard as nonattainment areas.

Ground-level ozone is an extremely reactive gas comprised of three atoms of oxygen. Ozone is the primary constituent of smog, and unlike most other pollutants, ground-level ozone is not directly emitted into the atmosphere from a specific source. Instead, ground-level ozone forms when nitrogen oxides (NO_X) chemically react with volatile organic compounds (VOCs) through complex chemical reactions in the presence of strong sunshine.

Ozone formation is greatest when sunlight is most intense, so peak ozone levels typically occur during hot, dry, and stagnant summertime conditions. Peak ozone concentrations exhibit a clear seasonal cycle, with concentrations rising at the onset of warmer weather in the spring and declining again as autumn approaches. Changing weather patterns can significantly contribute to yearly differences in ozone concentrations. Years with summertime weather conditions that are hot and dry will generally result in more frequent days of poor air quality than cool and wet summers. In recent years, wildfire conditions also play a role in ozone formation. Summers where out of state wildfires burn large amounts of acreage typically also have poorer ozone air quality.

The formation of ozone is neither instantaneous nor geographically confined. While urban areas tend to have high ozone levels, rural areas may also experience elevated ozone levels because wind carries ozone, and its precursor pollutants, hundreds of miles from their original sources. Numerous studies and modeling data demonstrate that weather patterns frequently result in the transport of ozone and its precursor pollutants well beyond the localities that produced the emissions. In many cases, unhealthy air quality in the area is exacerbated by pollutants transported into the area from neighboring states.

Ground-level ozone can have significant impacts on human health, particularly people with existing respiratory disease, the elderly, and children. It also affects the environment and ecosystem health. Scientific evidence suggests that air pollution weakens the natural defenses of many types of vegetation and can cause significant crop damage.

3. Background

On October 1, 20215, USEPA strengthened the ozone NAAQS, setting the primary and secondary standards at 0.070 parts per million (ppm), or 70 parts per billion (ppb) (80 FR 65292, published October 26, 2015; effective December 28, 2015). USEPA designated the Washington, DC-MD-VA area as a marginal nonattainment area on August 3, 2018 (83 FR 25776) for the 2015 ozone NAAQS (83 FR 25775). After the area failed to attain the standard by the marginal attainment date of August 3, 2021, USEPA reclassified the area as a moderate nonattainment area effective November 7, 2022 (87 FR 60897).

Since this designation, ozone concentrations in the Washington DC-MD-VA nonattainment area have declined below the 2015 ozone NAAQS. Data from the area's federal reference monitors demonstrate compliance with the 0.070 ppm standard based upon complete, quality-assured, and certified ambient air quality monitoring data. Accordingly, USEPA determined on April 4, 2025, that the area attained the 2015 ozone standard by the applicable attainment date of August 3, 2024, and has clean data under the EPA's Clean Data Policy based on the 2021-2023 design value of 0.070 ppm (90 FR 14730).

These improvements in air quality are due to permanent and enforceable emissions reductions of VOC and NO_X, the precursors to ozone. This document provides a maintenance plan, as required under § 175A of the federal Clean Air Act (CAA), to ensure that the residents of the area continue to enjoy the benefits of air quality that complies with the 2015 ozone NAAQS for a minimum of 10 years, through 2038. This maintenance plan supports the redesignation request for the 2015 ozone NAAQS, which the District of Columbia, the State of Maryland, and the Commonwealth of Virginia are submitting concurrently with this document.

3.1 Health Effects from Elevated Concentrations of Ozone

Ozone is a highly reactive gas that affects living tissues as well as many synthetic substances. Ozone is absorbed in the respiratory tract, where it can injure airway tissues and contribute to adverse health effects. Exposure to ozone can result in both long-term and short-term health effects in people who work or exercise outdoors regularly, anyone with respiratory difficulties, and especially in children, asthmatics, and the elderly. Ozone's long-term effects include reduced lung function, scarring of lung tissue, and premature death.[1] Research suggests that repeated exposure to ozone causes damage to lung tissue, thereby reducing lung function.

Children are at greater risk for ozone-related respiratory problems because their lungs are still developing, they breathe more rapidly, and they play outside during the afternoons when ozone is at its highest levels. Children also inhale more air relative to their size; hence, they receive more pollution per pound of body weight than adults do.

Short-term effects of ozone exposure among healthy populations include impaired lung function and reduced ability to perform physical exercise. For example, healthy young people developed a significant reduction in lung function, additional coughing and breathing pains, and enhanced

[1] Bell ML, Dominici F, and Samet JM. *A Meta-Analysis of Time-Series Studies of Ozone and Mortality with Comparison to the National Morbidity, Mortality, and Air Pollution Study*. Epidemiology 2005; 16:436 445.

airway reactivity to irritants when exposed to ozone at concentrations of 80-120 ppb for 6.6 to 7.0 hours while exercising moderately.[2] [3] Among people who are especially sensitive to ozone pollution, short-term effects include increased hospital admissions and emergency room visits for respiratory diseases such as asthma. [4] [5]

In summary, health effects from exposure to ozone can include the following:

- Increased susceptibility to respiratory infection;
- Impaired lung function and reduced ability to perform physical exercise;
- Severe lung swelling and death, due to short-term exposures greater than 300 ppb; and
- Increased hospital admissions and emergency room visits for respiratory diseases.

3.2 Geographical Description of the Washington, DC-MD-VA 2015 Ozone Nonattainment Area

USEPA designated this area as a marginal nonattainment area on August 3, 2018 (83 FR 25776) and later reclassified it as a moderate nonattainment area effective November 7, 2022 (87 FR 60897). Table 3-1 provides the jurisdictions within the Washington DC-MD-VA 2015 ozone NAAQS nonattainment area as well as the Federal Information Processing Standards (FIPS) code for each jurisdiction.

Table 3-1: Washington DC-MD-VA Nonattainment Area with FIPS Codes

Washington DC-MD-VA Ozone Nonattainment Jurisdictions	FIPS[6]
District of Columbia	11-001
Calvert County	24-009
Charles County	24-017
Frederick County	24-021
Montgomery County	24-031
Prince George's County	24-033
Alexandria City	51-510
Arlington County	51-013
Fairfax County	51-059
Fairfax City	51-600
Falls Church City	51-610
Loudoun County	51-107
Prince William County	51-153
Manassas City	51-683
Manassas Park City	51-685

[2] Horstman D, Folinsbee L, Ives P, Abdul-Salaam, Said, and McDonnel W. *Ozone Concentration and Pulmonary Response Relationships for 6.6-Hour Exposures with Five Hours of Moderate Exercise to 0.08, 0.10 and 0.12 ppm,* American Review of Respiratory Disease, February 1990.
[3] Pulczinski JC, Kahle J, Case MW, Rappold AG, Diaz-Sanchez D, Dhingra R. Stress modifies pulmonary and inflammatory response to ozone: controlled human exposure study. *Environmental Research*. 2025; 286:122924.
[4] Bell ML, Dominici F, Samet JM. A meta-analysis of time-series studies of ozone and mortality with comparison to the National Morbidity, Mortality, and Air Pollution Study. *Epidemiology*. 2005;16(4):436–445.
[5] Domingo NGG, Fiore AM, Lamarque J-F, et al. Ozone-related acute excess mortality projected to increase in the absence of climate and air quality controls consistent with the Paris Agreement. *One Earth*. 2024; 7(2):325–335.
[6] [1]Federal Information Processing Standards code

4. Federal Redesignation and Maintenance Plan Requirements

An area designated as nonattainment for a pollutant can be redesignated to attainment if states meet specific conditions. The USEPA issued guidance dated September 4, 1992, on the redesignation request and maintenance plan process in the memorandum from John Calcagni, Director, Air Quality Management Division to Regional Air Directions entitled, *Procedures for Processing Requests to Redesignate Areas to Attainment* (redesignation guidance).[7] The memorandum provides guidance regarding the processing of redesignation requests for ozone, carbon monoxide (CO), particulate matter, sulfur dioxide, nitrogen dioxide (NO_2), and lead nonattainment areas. The District of Columbia, the State of Maryland, and the Commonwealth of Virginia followed the redesignation guidance while preparing this maintenance plan and associated redesignation request.

4.1 Redesignation Request

The CAA lists five obligations that USEPA must meet during the redesignation process. Section 107(d)(3)(E) states:

> The Administrator may not promulgate a redesignation of a nonattainment area (or portion thereof) to attainment unless –
>
> (i) the Administrator determines that the area has attained the national ambient air quality standard;
> (ii) the Administrator has fully approved the applicable implementation plan for the area under section 110(k);
> (iii) the Administrator determines that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the applicable implementation plan and applicable Federal air pollutant control regulations and other permanent and enforceable reductions;
> (iv) the Administrator has fully approved a maintenance plan for the area as meeting the requirements of section 175A; and
> (v) the State containing such area has met all requirements applicable to the area under section 110 and part D.

States must meet these five obligations and document this information in an approved redesignation request before USEPA may redesignate the area to attainment. Section 4.1.1 and Section 4.1.2 describe briefly the air quality improvements and emission reductions discussed within the redesignation request. The redesignation request is being submitted concurrently with this maintenance plan and is entitled, *Redesignation Request for the Washinton DC-MD-VA 2015 Ozone NAAQS Moderate Nonattainment Area.* This redesignation request supplies information to fully satisfy the requirements of § 107(d)(3)(E).

[7] See http://www.epa.gov/ttn/oarpg/t5/memoranda/redesignmem090492.pdf, accessed April 27, 2016.

4.1.1 Attainment of the Standard

A state requesting redesignation must show that the area is attaining the applicable NAAQS. The area complies with the 2015 ozone NAAQS if the design value based on the annual fourth-highest daily maximum concentration, averaged over three years, is less than or equal to 0.070 ppm. In the redesignation request, the District of Columbia, the State of Maryland, and the Commonwealth of Virginia present information that demonstrates that the Washington DC-MD-VA nonattainment area has attained the 2015 ozone NAAQS. This demonstration is based on three years of quality-assured monitoring data as specified in 40 CFR Part 58. The USEPA formally recognized that the area attained the 2015 ozone standard based on the 2021 to 2023 design value of 0.070 ppm by publishing a clean data determination under EPA's Clean Data Policy on April 4, 2025 (90 FR 14730). In addition, the area continues to attain the 2015 ozone NAAQS based on the 2022-2024 quality-assured ambient air quality data and on 2023-2025 data.

4.1.2 Permanent and Enforceable Improvement

States must show that the improvement in air quality between the years when the area was originally designated nonattainment (the base year) and when the area attained the standard (the attainment area) is attributed to permanent and enforceable emission reductions. The emission reductions may not be based on temporary shutdowns or adverse economic conditions and must be due to permanent and enforceable control measures. The redesignation request showed that between 2017, the base year for the 2015 ozone NAAQS, and 2022, the attainment year for the 2015 ozone NAAQS, NO_X and VOC emissions within the area decreased by 34.60% and 1.82% respectively. This maintenance plan includes a commitment to continue to enforce all applicable requirements of past revisions to the state implementation plan (SIP) after the ozone nonattainment area is redesignated to attainment.

4.2 Maintenance Plan

The redesignation process provides that states may petition USEPA to redesignate a nonattainment area as attainment and that USEPA may approve the redesignation if certain criteria are met. Section 107(d)(3)(D) states:

> (D) The Governor of any State may, on the Governor's own motion, submit to the Administrator a revised designation of any area or portion thereof within the State. Within 18 months of receipt of a complete State redesignation submittal, the Administrator shall approve or deny such redesignation. The submission of a redesignation by a Governor shall not affect the effectiveness or enforceability of the applicable implementation plan for the State.

Section 107(d)(3)(E) stipulates one of these criteria, that USEPA must fully approve a maintenance plan that meets the requirements of § 175A. States may submit both the redesignation request and the maintenance plan at the same time, and rulemaking on both may proceed on a parallel track. All applicable nonattainment area requirements must remain in place, and the maintenance plan constitutes a SIP revision. The maintenance plan must contain the following elements:

- A comprehensive "attainment year" emissions inventory of the ozone precursors NO_X

and VOC;

- A projection of the emissions inventory forward to a year at least 10 years after redesignation and a demonstration that the projected level of emissions is sufficient to maintain compliance with the ozone NAAQS;
- A demonstration of maintenance by showing that future emissions of a pollutant or its precursors will not exceed the level of the attainment inventory over the 10-year period following redesignation;
- A commitment that, once redesignated, the state will continue to operate an appropriate monitoring network to verify maintenance of the attainment status;
- A demonstration of legal authority to implement and enforce all control measures contained in the SIP;
- Provisions for future updates of the inventory to enable tracking of emissions levels, including an annual emissions statement from major sources;
- MVEBs for transportation conformity for the 10-year maintenance period;
- A commitment to submit a revised maintenance plan eight years after redesignation;
- A commitment to enact and implement additional contingency measures expeditiously in the event that future violations of the NAAQS occur; and
- A list of potential contingency measures that would be implemented in such an event.

The District of Columbia, the State of Maryland and the Commonwealth of Virginia have prepared this plan in accordance with the requirements specified in USEPA's guidance document and additional guidance received from USEPA staff. The following subsections of this document describe how the states have met USEPA's requirements for a maintenance plan.

4.3 Legal Authority to Implement and Enforce

The District Department of Energy and Environment, Maryland Department of the Environment, and the Virginia Department of the Environmental Quality have the legal authorities to develop, implement, and enforce regulations regarding air pollution including the requirements of this SIP submittal. Following are the details supporting the legal authorities of states to implement and enforce those regulations.

Virginia

Section 10.1-1308 of the Virginia Air Pollution Control Law (Title 10.1, Chapter 13 of the Code of Virginia) authorizes the State Air Pollution Control Board to promulgate regulations abating, controlling and prohibiting air pollution to protect public health and welfare.

Maryland

Following regulations demonstrate the legal authority of the Maryland Department of the Environment to develop, implement, and enforce regulations regarding air pollution including the

requirements of this SIP submittal.

- Legal Authority to Implement and Enforce – Maryland Annotated Code § 2-103.

- Authority for MDE to set emission standards and ambient air quality standards for each air quality control area in the State– Environment Article, §2-302 (a)-(d), Annotated Code of Maryland.

- Authority for MDE to enforce the standards and impose penalties– Environment Article, §§2-601-614, Annotated Code of Maryland.

Please also refer to the approved sections of Maryland's 110(a)(2) 2015 ozone SIP.

District of Columbia
The Air Pollution Control Act of 1984, as amended (D.C. Official Code §§ 8-101.05-101.06) provides authority to "develop a comprehensive program for the control and prevention of air pollution in the District that provides for the administration and enforcement of the requirements of [the Act] and the regulations promulgated pursuant to [the Act]." D.C. Official Code § 8-101.05.

Please also refer to 20 DCMR § 104 for Entry and Inspection; § 105 for Penalties, Cost Recovery, and Injunctive Relief; and 106 for Enforcement.

4.4 Commitment to Operate Air Quality Monitoring Network

Once an area has been redesignated, the states must continue to operate an appropriate air quality monitoring network in accordance with 40 CFR Part 58, to verify the area's attainment status. In cases where measured parameters (for example, vehicle miles traveled) have changed over time, the state may also need to perform a saturation monitoring study to determine the need for and location of additional permanent monitors.

There are currently 15 sites that monitor ozone levels in the area. The ozone monitoring sites are shown in Figure 4-1.

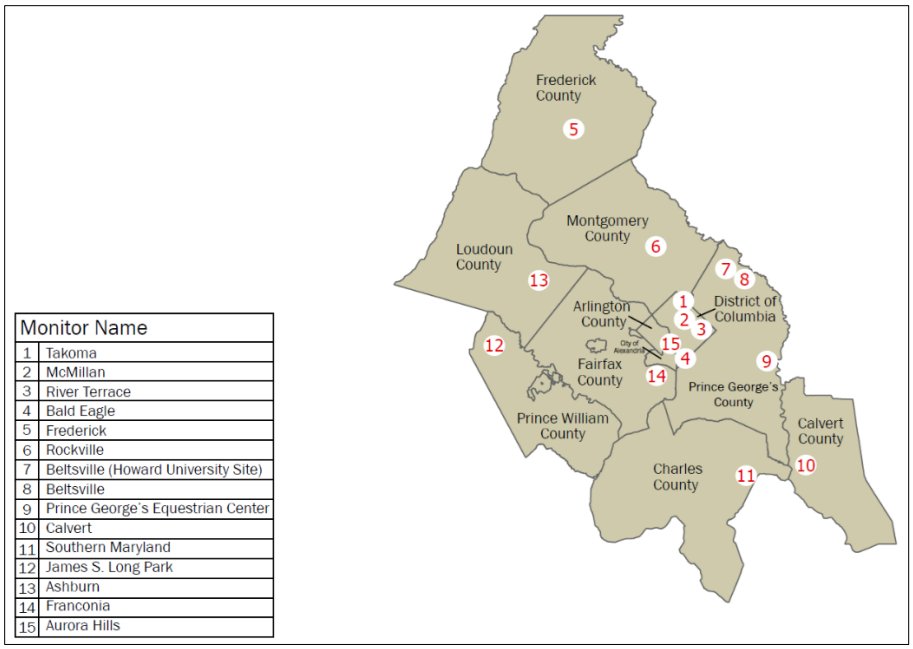

Figure 4-1: Washington DC-MD-VA 2015 Ozone NAAQS Nonattainment Area Ozone Monitoring Network

The Code of Federal Regulations requires four ozone sites for a metropolitan statistical area of greater than 10 million people for a 2015 ozone NAAQS nonattainment area (40 CFR Part 58 Appendix D). The area operates a robust network of ozone monitoring stations, which has enabled the collection of high-resolution ozone data.

Figure 4-2 shows the trend in the regional ozone design values in the area since it was first designated nonattainment for the 2015 ozone NAAQS. Over the period between 2016 to 2025, the ozone design value improved from 0.072 ppm in 2014-2016 to 0.069 ppm in 2023-2025, a decrease of about 4%.

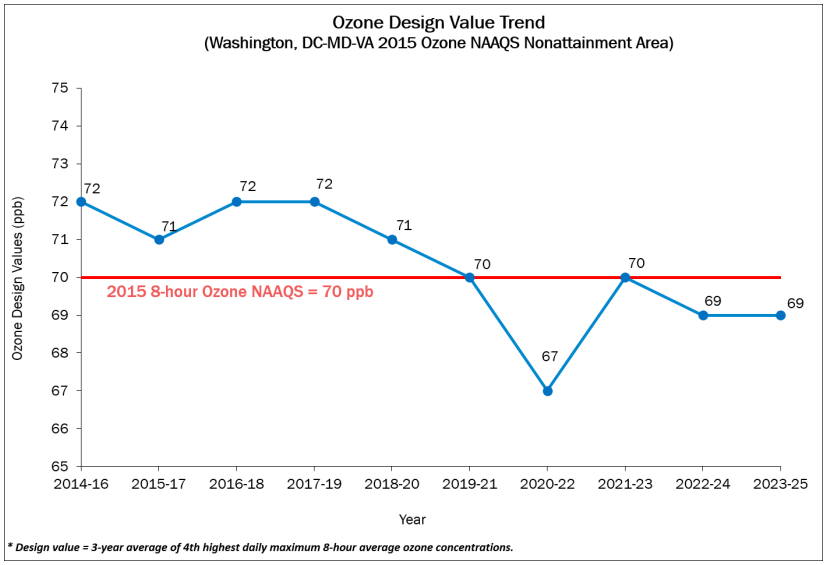

Figure 4-2: Washington DC-MD-VA 2015 Ozone NAAQS Nonattainment Area Ozone Design Value Trend

4.5 Legal Authority – Verify Continued Attainment

States must ensure that they have legal authority to implement and enforce all measures necessary to attain and maintain the NAAQS. Sections 110(a)(2)(B) and (F) of the CAA, and regulations promulgated in 40 CFR 51.110(k), suggest that one such measure is the acquisition of air quality and source emission data to demonstrate attainment and maintenance. The submittal must indicate how the states will track the progress of the maintenance plan. This is necessary since the emission projections made for the maintenance demonstration depend on assumptions of point, area, and mobile source growth.

One option for tracking the progress of the maintenance demonstration would be for the states to periodically update the emissions inventory. In this case, the maintenance plan should specify the frequency of any planned inventory updates. Such an update could be based, in part, on the annual update of the USEPA National Emissions Inventory (NEI) and could indicate new source growth and other changes from the attainment inventory (such as changes in vehicle miles traveled or in traffic patterns). As an alternative to a complete update of the inventory, states may choose to do a comprehensive review of the factors that were used in developing the attainment inventory to show no significant change. If this review does show a significant change, states should then perform an update of the inventory.

The District of Columbia, State of Maryland, and the Commonwealth of Virginia have the legal authority to implement and enforce specified measures necessary to attain and maintain the NAAQS. Key regulatory elements that each state will keep in place to maintain attainment are as follows:

- Shutdown requirements, permitting requirements, and compliance requirements
- Vehicle inspection and maintenance (I/M) program requirements; and
- Emission statement requirements

The above-mentioned requirements can be found in the following regulations.

Virginia

- Shutdown requirements: 9VAC5 Chapter 20 General Provisions Part II Air Quality Programs (9VAC5-20-220 Shutdown of a stationary source).
- Permitting requirements: 9VAC5 Chapter 80 Permits for Stationary Sources Part II Permit Procedures Article 6 Permits for New and Modified Stationary Sources, Article 8 Permits for Major Stationary Sources and Modifications – PSD areas, and Article 9 Permits for Major Stationary Sources and Modifications – Nonattainment Areas.
- I/M program requirements: 9VAC5 Chapter 91 Motor Vehicle Inspection & Maintenance Program for Northern Virginia.
- Emission statement requirements: 9VAC5 Chapter 20 General Provisions Part II Air Quality Programs (9VAC5-20-160.B. Registration).
- Various regulatory requirements may be found in 9VAC5 Chapter 40 Existing Stationary Sources, 9VAC5 Chapter 45 Consumer and Commercial Products, and 9VAC5Chapter 50 New and Modified Stationary Sources.

Maryland

- Emissions Statements: COMAR 26.11.01.05-1.
- I/M program requirements: COMAR 11.14.08.
- Permitting Requirements: COMAR 26.11.02 & COMAR 26.11.03.
- PSD Requirements: COMAR 26.11.06.14.
- Please also refer to the approved sections of MD's 110(a)(2) 2015 ozone SIP.

District of Columbia

- Shutdown requirements: 20 DCMR § 202 (Amendment, Suspension, Revocation, and Denial of Permits) and 20 DCMR § 303.8 (Procedures for Terminating or Revoking a Permit).
- Permitting requirements: 20 DCMR Chapter 2 (General and Non-Attainment Area Permits) and 20 DCMR Chapter 3 (Operating Permits and Acid Rain Programs).
- Regulatory requirements: 20 DCMR §§ 804 and 805, 899 (NOx—emission standards and Reasonably Available Control Technology for major stationary sources) and § 899 (Chapter 8 definitions), 20 DCMR Chapter 10 (NOx Emissions Budget), and 20 DCMR Chapter 7 (Volatile Organic Compounds).
- I/M program requirements: 18 DCMR Chapters 4, 6, 7, 11, 26, and 99 (Motor Vehicle Title and Registration; Inspection of Motor Vehicles; Motor Vehicle Equipment; Motor Vehicle Offenses and Penalties; Civil Fines for Moving and Non-Moving Infractions; and Definitions).
- Emission statement requirements: 20 DCMR Chapter 5 (Source Monitoring and Testing) and 20 DCMR § 302 (Permit Content), which establishes the monitoring, recordkeeping, and reporting requirements for Title V sources.

In addition to maintaining key elements of its regulatory program, the states will acquire ambient and source emission data to track attainment and maintenance. The states will track the progress of the maintenance demonstration by periodically updating the emissions inventory. This tracking will consist of annual and periodic evaluations as necessary. The annual evaluation may consist of checks on key emissions trend indicators such as the annual emissions update of stationary sources, the Highway Performance Monitoring System vehicle miles traveled data reported to the Federal Highway Administration, and other growth indicators. These indicators would be compared to the growth assumptions used in the plan to determine if the predicted versus the observed growth remains relatively constant. The states will also develop and submit to the USEPA comprehensive tracking inventories (NEI) every three years or as required by federal regulation during the maintenance plan period.

5. Maintenance Demonstration Development

The District of Columbia, the State of Maryland, and the Commonwealth of Virginia have developed a maintenance plan that meets all USEPA requirements and demonstrates that because of permanent and enforceable measures, emissions over the 10 years following redesignation approval will remain below the 2022 attainment year levels while allowing for growth in population and vehicle miles traveled. The period covered by this maintenance plan is 2022 through 2038.

The District of Columbia, the State of Maryland, and the Commonwealth of Virginia have developed an emissions inventory, in accordance with USEPA guidance, that identifies the level of emissions sufficient to achieve the 2015 ozone NAAQS. This attainment inventory consists of the actual emissions for a year, during the three-year period associated with the compliant monitoring data, showing attainment of the 2015 ozone NAAQS. The attainment year for this maintenance demonstration is 2022. The plan includes a demonstration that emissions will remain beneath the 2022 level for at least a 10-year period by keeping in place key elements of the current federal and state regulatory programs.

In addition to maintaining key elements of regulatory programs, the District of Columbia, the State of Maryland, and the Commonwealth of Virginia will acquire air quality and source emissions data to track attainment and maintenance as required by their respective SIPs.

The maintenance plan includes contingency measures, as necessary, to promptly correct any NAAQS violation that occurs after redesignation of the area.

The following sections provide details on each of the requirements, and the approach of the District of Columbia, State of Maryland, and the Commonwealth of Virginia to meet each requirement.

5.1 Attainment Inventory

The District of Columbia, State of Maryland, and the Commonwealth of Virginia developed an attainment year emissions inventory to identify the level of emissions sufficient to achieve the 2015 ozone NAAQS. The attainment inventory consists of the actual emissions for the year during the three-year period associated with the monitoring data showing attainment of the 2015 ozone NAAQS. In this case, the year is 2022. The 2022 inventory is appropriate to use because it represents the typical inventory for the three-year period demonstrating attainment of the standard and because 2022 is being used by USEPA for its modeling efforts.

The 2022 inventory is based on daily emissions of NOx and VOCs during 2022 and contains a list of sources and emissions in ozone season tons per day (tpd). The ozone season coincides with the summer season. Under 40 CFR 51 Subpart CC *Provisions for Implementation of the 2015 Ozone National Ambient Air Quality Standard*, summer day (ozone season day) emissions are defined in 40 CFR 51.1300(q):

> … an average day's emissions for a typical summer work weekday. The state shall select, subject to EPA approval, the particular month(s) in the ozone season and the day(s) in the work week to be represented, considering the conditions assumed in the development of reasonable further progress (RFP) plans and/or emissions budgets for transportation conformity.

This regulation also requires that states must report ozone NAAQS inventories as summer day emissions of NOx and VOC (40 CFR 51.1315(c)). For this effort, average daily metrics for the weekdays in July were included as inputs to calculate onroad and nonroad daily emissions. For EGU emissions, nonEGU point emissions, nonpoint sector emissions, and marine, air, and railway locomotive (MAR) emissions, daily emissions were estimated based on available data

for each sector and standard inventory practices. These are described in various appendices of the redesignation request and maintenance plan.

A summary of the 2022 attainment year inventory is presented in Table 5-1. A more detailed accounting of the inventory and its development methodology is contained in the appendices.

Table 5-1: 2022 Washington DC-MD-VA Nonattainment Area Attainment Year Inventory

Source Category	NOx (tpd)	VOC (tpd)
Point	57.0	5.0
Nonpoint	21.4	137.1
Marine, Air, Rail	5.5	0.4
Nonroad Model	22.0	38.1
Onroad Mobile	60.5	33.9
Quasi-Point	6.5	1.4
TOTAL	172.9	215.9

5.2 Projection Inventory

A maintenance plan must contain a demonstration that the levels of emissions projected for the 10-year period following redesignation are sufficient to maintain the NAAQS. Accordingly, the District of Columbia, the State of Maryland, and the Commonwealth of Virginia have projected NO_X and VOC emissions for the area for 2038, as well as an interim year of 2032. To satisfy federal guidance, emissions for these projection years must be equivalent to or lower than emissions levels in 2022 to ensure that air quality continues to meet the 2015 ozone NAAQS during this period.

The projected inventories are derived by applying the appropriate growth factors to the 2022 attainment year emissions inventory. The USEPA guidance describes four typical indicators of growth. Four indicators of growth are product output, value added, earnings, and employment. Surrogate indicators of activity, such as population growth, are also acceptable methods.

The State of Maryland and the Commonwealth of Virginia based projected emissions for electric generating unit (EGU) point sources on results from the ERTAC EGU tool, using C3.0CONUSv22.0 reference case information for 2032 and 2038. Growth factors within the tool rely on AEO2023 high oil and gas future year generation estimates. For the Virginia area, alternative coal growth rates were used that reflect information in the October 2024 Dominion integrated resource plan. The District of Columbia projected EGU emissions for 2032 and 2038 primarily by carrying forward ozone-season tons-per-day values from 2022, rather than by applying a broad sector-wide growth methodology. Most SCC-level emissions remain unchanged across 2032 and 2038, and only selected units were adjusted where known future changes were assumed, such as retirement, replacement with non-RACT units, or alternative RACT-related changes.

States projected emissions for non-EGU unit point sources using state-level employment projections by NAICS code (unless employment growth rate is negative, in which case states

made a "no growth" assumption), other state-specific emission projection data, or growth estimates based on the Metropolitan Washington Council of Governments (MWCOG) Cooperative Forecast version 10.0. The District of Columbia projected 2032 and 2028 emissions for non-EGU SCCs using the above general method. Values were mostly held constant from 2022 to 2032 and 2038 only specific SCCs show reductions or zeroing out where unit changes were assumed. Virginia projected point source non-EGU facility emissions using the approach applied by USEPA in the draft 2032 and 2038 projection inventories. This approach relied upon economic indicators to develop a conservative estimate of future year emissions and activity. In some instances, where indicators projected growth well beyond permitted limitations or physical capacities, future year projections were capped at permit limits.

The National Capitol Region Transportation Planning Board (TPB) projected emissions for onroad mobile sources using USEPA's MOVES5 mobile source inventory model. These estimates use vehicle-specific registration data obtained from each jurisdiction. Mobile source emission projections included the National Low Emission Vehicle Program (NLEV); the 2004 Tier 2 and Low Sulfur Gasoline Rule; the 2004 and 2007 Heavy-Duty Diesel Vehicle (HDDV) Rules; and the 2006 Low Sulfur Diesel Rule. Inputs included Phase II Reformulated Gasoline (RFG) and an enhanced I/M program for all analysis years for all jurisdictions. The model also accounts for the Tier 3 Vehicle Emissions and Fuel Standards Program, beginning in 2017, the Heavy-Duty Engine and Vehicle Standards (Clean Trucks Plan) starting in 2027, and the Multi-Pollutant Emissions Standards for Light- and Medium-Duty Vehicles rule starting in 2029 (recently proposed to be delayed by 2 years compared to what provided in the original rule[8]).

Given current and future uncertainties in federal rules regarding onroad sources, the following two approaches were adopted in the development of MOVES5 onroad emissions and (MVEBs to address those uncertainties.

First, MOVES5 inputs for electric vehicle shares (and shares for other technologies) were frozen at the 2025 levels so that future projections are based on the most current data and do not reflect the forecasted growth in electric vehicles between today and the future years included in the MOVES default data. State air agencies had initially provided local data for Alternative Vehicle Fuel Technology (AVFT), developed using a MOVES-based tool to estimate future-year shares of vehicles by each vehicle category. However, as a result of extensive discussions at the Metropolitan Washington Air Quality Committee – Technical Advisory Committee meetings (November 2025 and January 2026[9]), to account for the latest developments and trends related to vehicle electrification that have emerged since these inputs were originally

[8] USEPA, Proposed Rule: Revision of Tier 4 Criteria Pollutant Standards, Part 1: Amendments to Phase-In Schedule for Light-Duty and Medium-Duty Vehicles, 91 Fed. Reg. [28463] (May. 18, 2026). https://www.govinfo.gov/content/pkg/FR-2026-05-18/pdf/2026-09905.pdf.

[9] Dusan Vuksan & Jinchul Park, MWCOG, 2015 National Ambient Air Quality Standards for Ozone: Redesignation Request and Maintenance Plan Inventory: Alternate Vehicle Fuel and Technologies (AVFT) Inputs (presentation to the Metropolitan Washington Air Quality Committee – Technical Advisory Committee, Jan. 13, 2026).

prepared, particularly at the federal level, [10,11] the committee decided that a less aggressive pace of vehicle electrification that is now reflected in the AVFT inputs would be more appropriate for future modeled years. This was accomplished by making relevant modifications to the Alternate Vehicle Fuel Technology (AVFT) Table to freeze electric vehicle shares at the 2025 level, in which for each source type and model year, users can define the fraction of vehicles that run on gasoline, diesel, E-85, compressed natural gas (CNG), battery electric (BEV), and fuel cell electric (FCEV). The Metropolitan Washington Air Quality Committee–Technical Advisory Committee (MWAQC-TAC) deemed that this less aggressive pace of vehicle electrification that is now reflected in the AVFT inputs would be more appropriate for future modeled years in light of the "Rescission of the Greenhouse Gas Endangerment Finding and Motor Vehicle Greenhouse Gas Emission Standards Under the Clean Air Act"[12] and the proposed "Revision of Tier 4 Criteria Pollutant Standards , Part 1: Amendments to Phase-In Schedule for Light-Duty and Medium-Duty Vehicles".[13] Specifically, these input assumptions are reflected as follows:

- Assume MOVES5.0.0 default AVFT data shares for each respective year up to and including vehicle model year 2025 (e.g., 2022 default AVFT shares are assumed for vehicle model year 2022)
- Assume MOVES5.0.0 default AVFT data shares from vehicle model year 2025 for every year after 2025 (e.g., 2025 default AVFT shares are assumed for vehicle model year 2038)

Second, in support of development of motor vehicle emissions budgets (MVEBs), the area agreed to use safety margins (transportation buffers) to account for "uncertainties," or elements outside of the planners' control, that can lead to mobile budgets exceedances. These uncertainties can come from several sources, but typically, vehicle fleet changes, changes in federal regulations, and modifications to the EPA MOVES model have resulted in most significant changes to emissions, with other potential sources of uncertainty including changes to the regional travel demand forecasting model and the socioeconomic data inputs to the model.

These safety margins (transportation buffers) were provided for VOC (20%) and NOx (40%), as seen in Table 5-5 and Table 5-6. A larger safety margin for NOx is provided because prior testing and research have shown that NOx emissions have increased by more than 50% solely due to the implementation of a new MOVES model, with other inputs being held constant. Differences in

[10] USEPA, Final Rule: Rescission of the Greenhouse Gas Endangerment Finding and Motor Vehicle Greenhouse Gas Emission Standards Under the Clean Air Act, 91 Fed. Reg. [7686] (Feb. 18, 2026). https://www.govinfo.gov/content/pkg/FR-2026-02-18/pdf/2026-03157.pdf.
[11] USEPA, Proposed Rule: Revision of Tier 4 Criteria Pollutant Standards, Part 1: Amendments to Phase-In Schedule for Light-Duty and Medium-Duty Vehicles, 91 Fed. Reg. [28463] (May. 18, 2026). https://www.govinfo.gov/content/pkg/FR-2026-05-18/pdf/2026-09905.pdf.
[12] USEPA, Final Rule: Rescission of the Greenhouse Gas Endangerment Finding and Motor Vehicle Greenhouse Gas Emission Standards Under the Clean Air Act, 91 Fed. Reg. [7686] (Feb. 18, 2026). https://www.govinfo.gov/content/pkg/FR-2026-02-18/pdf/2026-03157.pdf.
[13] USEPA, Proposed Rule: Revision of Tier 4 Criteria Pollutant Standards, Part 1: Amendments to Phase-In Schedule for Light-Duty and Medium-Duty Vehicles, 91 Fed. Reg. [28463] (May. 18, 2026). https://www.govinfo.gov/content/pkg/FR-2026-05-18/pdf/2026-09905.pdf.

NOx rates in the past were mainly due to new measurement data and compliance testing data.[14] Additionally, a larger margin was available for NOx. As seen in the two tables referenced, additional safety margins are available even after emissions from all sources and safety margins for onroad sources have been included

Projected emissions for nonroad vehicles and equipment, except for marine, air, and railway locomotives, were developed using MOVES5 nonroad model. This version of MOVES is USEPA's most recently approved emissions estimation tool for the above-mentioned nonroad sources.

States calculated projected emissions for nonpoint as well as MAR sources using the most updated practices and inputs available, such as the demographic forecasts (population, household, and employment projections) provided in the MWCOG Cooperative Forecast. Table 5-2 provides a summary of growth assumptions.

Table 5-2: Growth Assumptions Used in Emission Inventory Projections

Category	Level of Detail	Source
Stationary/Industrial Source Growth	Source/Unit/Process Specific	AEO State/Federal Requirements
Nonpoint and Nonroad Mobile Source Growth	Category Specific	COG Cooperative Forecast, VMT, Lane Miles, and Gas Sales
Vehicle Miles Traveled Growth	Jurisdiction-Specific	National Capital Region Transportation Planning Board

A more detailed accounting of the 2032 and 2038 projection inventories is contained in Appendix A1, B2, C1, and D1.

5.3 Demonstration of Maintenance

Table 5-3 demonstrates how future emissions of NO_X and VOCs will not exceed the levels of the 2022 attainment year inventory for a minimum of 10 years following redesignation. The projected emissions reflect the expected daily emissions based on the best available growth rates and projections, as noted in Table 5-3.

[14] Dusan Vuksan, Jinchul Park & Daniel Sun, Memorandum to the Metropolitan Washington Air Quality Committee – Technical Advisory Committee, MOVES3 Model Sensitivity Testing (Sept. 12, 2022). https://www.mwcog.org/file.aspx?&A=7NHjw%2bGI3oV3sUUKLXxlDCPNwOiKitzWUZE6GT4SGKg%3d.

Table 5-3: NO_X and VOC Emissions, 2022 to 2038

Source Category	NO_X (tpd)			VOC (tpd)		
	2022	2032	2038	2022	2032	2038
Point	57.0	64.5	66.7	5.0	5.2	5.4
Nonpoint	21.4	21.6	22.1	137.1	144.2	147.4
M-A-R	5.5	6.0	6.2	0.4	0.4	0.4
Nonroad Model	22.0	16.4	16.5	38.1	37.8	38.3
Onroad Mobile	60.5	23.6	15.9	33.9	21.4	17.8
Quasi-Point[1]	6.5	7.2	7.5	1.4	1.5	1.6
TOTAL	172.9	139.3	134.9	215.9	210.5	210.9
Δ (2022-2032)	33.6			5.4		
Δ (2022-2038)	38.0			5.0		

[1] Quasi-point sources are generally considered part of the nonpoint or nonroad emissions sectors but are included in the point source emissions inventory for a particular reason. Such reasons include, but are not limited to, federal guidance (such as in the case of certain airports) or to facilitate future general conformity determinations (such as in the case of military bases, ports, and other similar facilities).

5.4 Control Measures for Maintenance of Good Air Quality

Point, nonroad, and onroad emission projections for 2032 and 2038 include a variety of control strategies that will reduce emissions of NO_X and VOCs in the future years. Additionally, many control strategies are in place that are directionally correct but are not included in the 2032 and 2038 emissions estimates because the reductions from these types of programs are difficult to quantify. The sections below describe notable control programs in each emissions sector. Many of these programs are federal programs that are enforced on a regional or national level while other programs are delegated to states for compliance and enforcement purposes. Some programs are also implemented by individual jurisdictions. Many of these rules require reduced emissions from new products such as vehicles, trucks, and off-road engines. These types of control strategies provide benefits in the future as consumers replace old equipment with newer, better-controlled models.

5.4.1 Point Sector Controls

COMAR 26.11.38 - Control of NOx Emissions from Coal-Fired Electric Generating Units

This action established new NO_X emission standards and additional monitoring and reporting requirements for coal-fired EGUs in Maryland, resulting in NO_X emission reductions. This action impacted coal-fired EGUs in Maryland, which account for more than 80% of the State's power plant NO_X emissions. Affected EGUs include Brandon Shores (Units 1 and 2); C.P. Crane (Units 1 and 2), H.A. Wagner (Units 2 and 3) plants; Chalk Point (Units 1 and 2), Morgantown (Units 1 and 2), Dickerson (Units 1, 2 and 3); and AES Warrior Run.

2015 Ozone NAAQS Reasonably Available Control Technology Requirements

As part of the Ozone Transport Region, § 184 of the CAA requires the Washington DC-MD-VA 2015 ozone NAAQS nonattainment area to implement Reasonably Available Control Technology requirements in support of the 2015 ozone NAAQS. These requirements, once approved, will provide additional reductions of NO_X and VOC in the future from major stationary sources within the area.

5.4.2 Nonroad Emission Controls

Nonroad Small Gasoline Engines

On October 8, 2008 (73 FR 59034), USEPA published a rule entitled, *Control of Emissions from Nonroad Spark-Ignition Engines and Equipment.* This measure requires small gasoline-powered engine equipment, such as lawn and garden equipment to meet federal emissions standards beginning in 2011. Small gasoline-powered engine equipment includes, for example, lawn mowers, trimmers, generators, and compressors. The measure also applies to engines in marine vessels. This measure applies to equipment with engines of less than 19 kW. Emissions of NO_X and VOC result from combustion and evaporation of gasoline used to power this equipment.

Nonroad Diesel Engines Tier 1/2/3

The USEPA has published a series of regulations addressing emissions from nonroad diesel engines. The Tier 1 rule entitled, *Control of Air Pollution; Determination of Significance for Nonroad Sources and Emission Standards for New Nonroad Compression-Ignition Engines at or Above 37 Kilowatts,* was published June 17, 1994 (59 FR 31306). On October 23, 1998 (63 FR 56968), USEPA strengthened standards for these engines in the Tier 2 and Tier rule entitled, *Control of Emissions of Air Pollution from Nonroad Diesel Engines.* These regulations reduce NOx emissions nonroad compression-ignition (*i.e.*, diesel-powered) utility engines. The measure affects diesel-powered (or other compression-ignition) heavy-duty farm, construction equipment, industrial equipment, etc., rated at or above 37 kilowatts (37 kilowatts is approximately equal to 50 horsepower). Heavy-duty farm and construction equipment includes asphalt pavers, rollers, scrapers, rubber-tired dozers, agricultural tractors, combines, balers, and harvesters. This measure applies to all compression-ignition engines except engines used in aircraft, marine vessels, locomotives and underground mining activity.

Tier 4 Nonroad Diesel Engine Standards (2004)

On June 29, 2004 (69 FR 38958), USEPA published a rule entitled, *Control of Emissions of Air Pollution from Nonroad Diesel Engines and Fuels.* This regulation mandates a 90% reduction in NOx and particulate matter for newly manufactured non-road diesel engines used in heavy construction, agricultural, and industrial applications.

Locomotive and Marine Compression-Ignition Engine Tier 3 & Tier 4 Standards (2008)

On June 30, 2008 (73 FR 37096), USEPA published a rule entitled, *Control of Emissions of Air Pollution from Locomotive Engines and Marine Compression-Ignition Engines Less Than 30*

Liters per Cylinder, enforces advanced high-efficiency catalytic controls and engine design requirements on all newly manufactured and remanufactured locomotives and commercial marine vessels.

Emissions Standards for Large Spark Ignition Engines

On November 8, 2002 (67 FR 68242), USEPA published a rule entitled, *Control of Emissions from Nonroad Large Spark-Ignition Engines, and Recreational Engines (Marine and Land-Based.* This measure controls VOC and NOx emissions from several groups of previously unregulated nonroad engines, including large industrial spark-ignition engines, recreational vehicles, and marine engines.

Reformulated Gasoline Use in Nonroad Motor Vehicles and Equipment

Reformulated gasoline (RFG) is gasoline blended to burn more cleanly than conventional gasoline. Using this fuel reduces emissions of air pollutants. The CAA under § 211(k)(10)(D) mandated the use of RFG in certain large, metropolitan areas that had very poor air quality, including the Washington DC-MD-VA area. The lower vapor pressure of RFG as compared to conventional gasoline reduces VOC emissions from nonroad engines.

Railroad Engine Standards

On April 16, 1998 (63 FR 18978), USEPA published a rule entitled, *Emission Standards for Locomotive and Locomotive* Engines. This measure establishes emission standards for oxides of nitrogen, hydrocarbons, carbon monoxide, particulate matter, and smoke for newly manufactured and remanufactured diesel-powered locomotives and locomotive engines, which were previously unregulated. This regulation took effect in 2000 and affects railroad manufacturers and locomotive re-manufacturers and includes three separate sets of emission standards with applicability dependent on the date a locomotive is first manufactured.

5.4.3 Onroad Emission Controls

Tier 3 Vehicle Emissions and Fuel Standards Program

On April 28, 2014 (79 FR 23414), USEPA published a rule entitled, *Control of Air Pollution From Motor Vehicles: Tier 3 Motor Vehicle Emissions and Fuel Standards,* designed to reduce air pollution from passenger cars and trucks. The Tier 3 program is part of a comprehensive approach to reducing the impacts of motor vehicles on air quality and public health. The program considers the vehicle and its fuel as an integrated system, setting new vehicle emissions standards and lowering the sulfur content of gasoline beginning in 2017. The vehicle standards reduce both tailpipe and evaporative emissions from passenger cars, light-duty trucks, medium-duty passenger vehicles, and some heavy-duty vehicles. The gasoline sulfur standard facilitates more stringent vehicle emissions standards and increases the effectiveness of existing control systems. The vehicle emission standards combined with the reduction of gasoline sulfur content significantly reduce motor vehicle emissions, including NO_X, VOC, fine particulate matter ($PM_{2.5}$), CO, and air toxics.

Multi-Pollutant Emissions Standards for Light- and Medium-Duty Vehicles

On April 18, 2024 (89 FR 27842), USEPA published a rule entitled, *Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles.* This measure is designed to further reduce emissions from passenger cars, light trucks, and delivery vans.

Transportation Emission Reduction Measures

The TPB employs many strategies to reduce emissions from mobile sources either by reducing the number of vehicle trips, the vehicle miles traveled, or both. Such strategies include, but are not limited to, ridesharing programs, telecommuting programs, improved transit and bicycling facilities, and clean fuel vehicle programs. TPB provides a summary of such measures in their transportation conformity analyses. These strategies to reduce trips and miles traveled are directionally correct but calculating year-by-year emission reductions from these strategies is labor intensive. Therefore, the emission reductions from these strategies were not included in the 2032 and 2038 emission inventories.

Inspection and Maintenance Programs

The District of Columbia, the State of Maryland, and the Commonwealth of Virginia operate enhanced I/M programs to ensure that motorists are driving vehicles that meet federal requirements. Owners of vehicles that do not meet requirements, shown by either tail pipe testing or On-Board Diagnostic (OBD) testing must repair the dirty vehicles or show that repairs have totaled costs more than waiver limitations.

5.5 Transportation Conformity and Motor Vehicle Emissions Budgets

Transportation conformity is required under § 176(c) to ensure that transportation plans, transportation improvement programs (TIPs), and federally-supported highway and transit project activities are consistent with ("conform to") the purpose of the state SIP. These requirements ensure that transportation activities will not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant NAAQS or any interim milestones. Transportation conformity requirements discussed in this document pertain specifically to the 2015 ozone NAAQS. Transportation conformity requirements are found in § 176(c)(B)(i), (ii), and (iii), which states:

> Conformity to an implementation plan means—That such activities will not cause or contribute to any new violation of any standard in any area; increase the frequency or severity of any existing violation of any standard in any area; or delay timely attainment of any standard or any required interim emissions reductions or other milestones in any area.

The federal Transportation Conformity Rule is codified in 40 CFR Part 93, Subpart A, entitled *Determining Conformity of Federal Actions to State or Federal Implementation Plans*. Transportation conformity applies to areas that are designated nonattainment and those areas redesignated to attainment after 1990 (*i.e.*, "maintenance areas") for transportation-related criteria pollutants: CO, ozone, NO_2, and particulate matter ($PM_{2.5}$ and PM_{10}).

The responsible metropolitan planning organization addressing transportation planning for the

Washington DC-MD-VA 2015 ozone NAAQS nonattainment area is the TPB. In the transportation conformity process, overall emissions estimates by analysis year, including future traffic activity and projects expected to be completed, are compared to a base year scenario, a no build scenario, or MVEBs. The MVEBs are used in this determination only if USEPA has approved or found adequate the emission budgets that have been submitted as a SIP revision. Prior to this maintenance plan, the most recently approved ozone season emission budgets originated in the plan update for the 2008 ozone NAAQS maintenance plan approved by USEPA on October 4, 2024 (89 FR 80745: effective November 4, 2024).

As required by the Transportation Conformity Rule, this maintenance plan addressing the 2015 ozone NAAQS establishes MVEBs for VOC and NO_X, which are precursors for ozone. These budgets represent the level of mobile source emissions that can be emitted in the area while supporting the air quality plan. Table 5-4 provides the estimated onroad emissions for years 2022, 2032, and 2038 based on the projected emissions for those years as calculated using the most current USEPA onroad motor vehicle emissions model (MOVES5.0.0) as well as the current regional travel demand forecasting model.

Table 5-4: Washington DC-MD-VA Maintenance Plan Onroad Emission Estimates

Year	NO_X Onroad Emissions (tpd)	VOC Onroad Emissions (tpd)
Attainment Year 2022 Emissions	**60.5**	**33.9**
Intermediate Year 2032 Emissions	**23.6**	**21.4**
Final Year 2038 Emissions	**15.9**	**17.8**

The estimates in Table 5-4 were augmented with a 20% transportation buffer for VOC and a 40% transportation buffer for NOx.[15]. A transportation buffer or safety margin is the amount by which the total projected emissions from all sources of a given pollutant are less than the total emission needed for Reasonable Further Progress (RFP), attainment, or maintenance. The SIP demonstrates that the region attained the standard in 2022 and can therefore emit up to the attainment year emission levels. Table 5-3 shows the differences in total emissions for VOC and NOx from all sources between the attainment year 2022 and the intermediate year 2032 and the attainment year 2022 and the final maintenance year 2038. These differences in emissions provide estimates of the total available transportation buffers for VOC for 2032 (5.4 tpd) and 2038 (5.0 tpd) and for NOx for 2032 (33.5 tpd) and 2038 (38.1 tpd). All or a portion of these transportation buffers can be allotted to mobile source inventories to develop MVEBs. Only portions of the total available conformity buffers for VOC and NOx were used to develop the MVEBs for 2032 and 2038 in this maintenance plan.

The MVEBs provided in Table 5-5 show the values after adding a 20% transportation buffer to the mobile emissions inventory projections for VOC and 40% transportation buffer to the emissions inventory projections for NO_X in 2032 and 2038. The buffers will add 4.3 tpd of VOC

[15] Section 93.124(a) of the Code of Federal Regulations (CFR) allows for the use of transportation buffers (or safety margins) in setting motor vehicle emissions budgets.

and 9.4 tpd of NO_X to the 2032 emission inventories, and 3.6 tpd of VOC and 6.4 tpd of NO_X to the 2038 emission inventories.

The MVEBs and the overall emission inventories, even with these transportation buffers, remain below the maintenance year caps for both pollutants (See Table 5-6). Such buffers may aid in situations where the conformity analysis must be based on different data, models, or planning assumptions than were used to create the first set of MVEBs in the maintenance plan. Changes to assumptions may include, but are not limited to, updates to demographic, land use, or project-related assumptions as well as updates to MOVES.

Table 5-5: Washington DC-MD-VA Maintenance Plan MVEBs

Year	NO_X Onroad Emissions (tpd)	VOC Onroad Emissions (tpd)
Attainment Year 2022 Emission & Budget	**60.5**	**33.9**
Predicted 2032 Emission	23.6	21.4
Transportation Buffer	9.4	4.3
Intermediate Year 2032 Budget	**33.0**	**25.7**
Predicted 2038 Emission	15.9	17.8
Transportation Buffer	6.4	3.6
Final Year 2038 Budget	**22.3**	**21.4**

Table 5-6: Washington DC-MD-VA Maintenance Plan NOx and VOC Emissions, 2022 to 2038, Including MVEBs

Source Category	NO_X (tpd)			VOC (tpd)		
	2022	2032	2038	2022	2032	2038
Point	57.0	64.7	66.7	5.0	5.2	5.4
Nonpoint	21.4	21.6	22.1	137.1	144.2	147.4
M-A-R	5.5	6.0	6.2	0.4	0.4	0.4
Nonroad Model	22.0	16.4	16.5	38.1	37.8	38.3
Onroad/MVEBs	60.5	33.0	22.3	33.9	25.7	21.4
Quasi-Point	6.5	7.2	7.5	1.4	1.5	1.6
TOTAL	172.9	148.9	141.3	215.9	214.8	214.5
Δ (2022-2032)		24.0			1.1	
Δ (2022-2038)		31.7			1.4	

Regulations governing the interagency consultation process adopted by the District of Columbia, the State of Maryland, the Commonwealth of Virginia, and the Transportation Planning Board are identified below.[16]

- District of Columbia: Title 20 Environment, Chapter 20-15 General and Transportation Conformity, Rule Numbers 20-1503, 20-1504, 20-1505, 20-1506, 20-1507

- Maryland: Title 26 Department of Environment, Subtitle 11 Air Quality, Chapter 26 Conformity, Regulation Numbers 26.11.26.04, 26.11.26.05, 26.11.26.06, 26.11.26.07, 26.11.26.08

- Virginia: 9VAC5 Chapter 151 Regulation for Transportation Conformity Section 70 Consultation (9VAC5-151-70)

- Transportation Planning Board: Report titled "*Transportation Planning Board Consultation Procedures with respect to Transportation Conformity Regulations Governing TPB Plans and Programs"*, May 20, 1998

If necessary, the MVEBs will be re-evaluated in case there is a roll-back of federal emissions control programs and/or changes to USEPA's emissions estimation model that result in significant changes in emissions inventories or to accommodate transportation planning issues when the region's federally required metropolitan transportation plan horizon year is extended beyond 2050.

6. Contingency Measures

Section 175A of the CAA requires that the maintenance plan must include a list of contingency measures to provide additional NO_X or VOC reductions to help correct any violation of the 2015 ozone NAAQS after redesignation to attainment. These measures do not need to be fully adopted by the District of Columbia, the State of Maryland, and the Commonwealth of Virginia prior to the occurrence of a NAAQS violation. Instead, contingency measures are expected to be implemented as expeditiously as possible once a triggering event occurs. The maintenance plan must identify the triggers that determine when contingency measures will be adopted and the measures that the state will consider.

The maintenance plan must include contingency measures to promptly correct two future situations. The first situation is an inventory estimate that indicates the Washington DC-MD-VA region had actual emissions of either NO_X or VOC in any future year that were greater than that of the attainment year inventories listed in Table 5-1. The second situation is any NAAQS violation that occurs after the redesignation of an area. The plan should include specific triggers for measures to be adopted, a schedule, and procedures for adoption and implementation, and a

[16] District of Columbia: http://www.dcregs.dc.gov/Gateway/ChapterHome.aspx?ChapterNumber=20-15
Maryland: https://www.epa.gov/sites/default/files/2017-07/documents/md_conformity_comar_26_11_26.pdf
Virginia: https://law.lis.virginia.gov/admincode/title9/agency5/chapter151/section70/ (9VAC5-151-70)
Transportation Planning Board: https://www.mwcog.org/assets/1/6/AQC_Appendix_E_2025.pdf

specific time limit for action. The maintenance plan must ensure that the contingency measures are adopted explicitly once they are triggered.

6.1 Exceedance of the Attainment Year Emissions Inventory

The ability of the area to stay in compliance with the 2015 ozone NAAQS depends partially on the level of NO_X and VOC emissions in the region. Emissions are projected to stay well below the 2022 attainment year levels through 2038. However, if emissions increase, the area may experience an ozone violation. Should any future year emissions inventory data indicate that the area's total emissions of NOx or VOCs exceed the levels in Table 5-1, the District of Columbia, the State of Maryland, and the Commonwealth of Virginia would first undertake an audit to determine whether inventory refinements were needed. This audit may include, but would not be limited to, a determination that appropriate models, control strategies, monitoring strategies, planning assumptions, industrial throughput, and production data were used in the attainment year and future year estimates. If this audit does not reconcile the originally estimated emissions exceedances, then the District of Columbia, the State of Maryland, and the Commonwealth of Virginia commit to evaluating the circumstances surrounding the exceedance of the inventory.

6.2 Contingency Measures for Long Term Air Quality Exceedances

If any monitor registers a violation of the 2015 ozone NAAQS after approval of this maintenance plan, the District of Columbia, the State of Maryland, and the Commonwealth of Virginia commit to implementing one or more programs listed in Section 6.3 or any other measures available. Should additional contingency measures be needed, they will be included in subsequent SIP revisions.

6.3 Contingency Measures for Possible Implementation

This listing provides a non-exhaustive list of possible contingency measures for consideration:

- Ozone Transport Commission (OTC) 2009-2014 model rule for VOC for consumer products (VA)
- OTC 2009-2014 rule for VOC for architectural and industrial maintenance coatings (DC, VA)
- OTC Phase 4 model rule for consumer products (VA)
- OTC Phase 5 model rule for consumer products (DC, MD, VA)
- OTC Solvent Degreasing Rule (DC, VA)
- Low Permeation Hoses (DC, MD, VA)
- Drip-less nozzles (MD)
- Ultra Low NOx Burners for Small Boilers (DC, VA)

6.4 Contingency Measure Implementation Schedule

The District of Columbia, the State of Maryland, and the Commonwealth of Virginia commit to the implementation of any contingency measure on the following schedule:

- Schedule onset: notification received from USEPA that a contingency measure must be implemented, or three months after quality assured data determines that an exceedance or violation of a 3-year design value occurred within the previous year.
- Applicable regulation or program to be developed, adopted, and implemented within 24 months after this date.

7. Conclusion

Air quality monitoring data show that the Washington DC-MD-VA 2015 ozone NAAQS nonattainment area complies with the 2015 ozone NAAQS. Inventory data show that emissions of VOC and NOx, the predominant ozone precursors, will continue to go down through 2038, even when using conservative and robust growth rates in the emissions inventory development process. Therefore, the area should remain compliance with the 2015 ozone NAAQS and will most likely experience better ozone air quality going into the future.