west virginia department of environmental protection

Maintenance Plan Revision for the Huntington, West Virginia 1997 8-hour Ozone NAAQS, Comprising Cabell and Wayne Counties

DRAFT
August 23, 2019

West Virginia Division of Air Quality
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Charleston, WV 25304

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I. Request

The State of West Virginia is requesting that the United States Environmental Protection Agency (EPA) approve the *Maintenance Plan Revision for the 1997 8-hour Ozone NAAQS for the Huntington Area Comprising Cabell and Wayne Counties*, as a revision to the State Implementation Plan (SIP) meeting the requirements of Clean Air Act (CAA) Section 175(A)(b).

II. Background

The Federal Clean Air Act, 42 U.S.C.A. 7401 et seq. as amended by the Clean Air Act Amendments of 1990, P.L. 101-549, November 15, 1990 (CAA or the Act) requires all areas of the nation to attain and maintain compliance with the federal ambient air quality standards. These federal standards are designed to protect the public health and welfare from airborne pollutants and are referred to as the National Ambient Air Quality Standards (NAAQS). Pursuant to CAA Section 107(d)(1)(A), pollutant standards are established by the EPA and areas are designated as nonattainment (not meeting the standard), attainment (meeting the standard), or Unclassifiable (cannot be classified based on available information). States are required to comply with these NAAQS. When a nonattainment area becomes attainment, states must demonstrate and seek the EPA's approval to redesignate the area.

Pursuant to CAA Section 107(d)(3)(E), as amended, the EPA Administrator may not promulgate a redesignation of a nonattainment area (or portion thereof) to attainment unless states meet five (5) requirements. With regards to the redesignation or designation of West Virginia's ozone areas to attainment, and as discussed in the following narratives, West Virginia has met all five (5) of the following requirements:

1. the Administrator determines that the area has attained the applicable NAAQS;
2. the Administrator has fully approved the applicable implementation plan for the area under CAA Section 110(k);
3. 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 pollution control regulations and other permanent and enforceable reductions;
4. the Administrator has fully approved a maintenance plan for the area as meeting the requirements of Section 175A; and
5. the state containing such area has met all requirements applicable to the areas under Section 110, Part D.

On July 18, 1997 (62 FR 38856) the EPA established a new 8-hour ozone NAAQS (1997 ozone NAAQS). This standard was the result of a review of the available scientific evidence linking exposures to ambient ozone to adverse health and welfare effects at levels allowed by the older 1-hour standard. The 1-hour standard was replaced by an 8-hour standard at a level of 0.080 parts per million (ppm) with a form based on the 3-year average of the annual fourth-highest daily maximum 8-hour average ozone concentration measured at each monitor within an area.

Pursuant to the Clean Air Act Amendments of 1990 (CAAA), the EPA in the April 30, 2004 Federal Register (69 FR 23858), designated eleven (11) West Virginia counties as Subpart 1 or "basic" nonattainment areas with respect to the 1997 8-hour ozone NAAQS. The effective date of designation for Cabell, Wayne, Kanawha, Putnam, Wood, Marshall, Ohio, Brooke and Hancock counties was June 15, 2004. Berkeley and Jefferson Counties voluntarily entered into an Early Action Compact. Under this compact, the effective date of designation for Berkeley and Jefferson counties was initially deferred until September 30, 2005 (later deferred to December 31, 2006) with a final designation of attainment effective April 15, 2008. These designations were based on air quality data collected during 2001 - 2003 at state-operated and EPA-approved monitoring stations located in the Huntington-Ashland, WV-KY, Charleston, WV, Parkersburg-Marietta, WV-OH, Wheeling, WV-OH, Steubenville-Weirton, OH-WV, and Berkeley & Jefferson Counties, WV. Subpart 1 (basic) nonattainment areas were required to attain the standard within five (5) years of designation or by June 15, 2009.

The EPA published two (2) separate rules to set forth the planning and control requirements which apply to nonattainment areas for this standard. Phase 1, published on April 30, 2004 (69 FR 23951), addressed: classifications for the 8-hour NAAQS; revocation of the 1-hour NAAQS; how anti-backsliding principles will ensure continued progress toward attainment of the 8-hour ozone NAAQS; attainment dates; and the timing of emissions reductions needed for attainment. On November 29, 2005, the EPA published Phase 2 (70 FR 71612) addressing: reasonably available control technology and measures (RACT and RACM), reasonable further progress (RFP), modeling and attainment demonstrations, and new source review (NSR).

In May 2006, the State of West Virginia submitted a redesignation request and associated maintenance plan affirming completion of all five (5) of the required elements detailed above for the Huntington area. The Huntington-Ashland, WV-KY ozone maintenance area consists of Cabell and Wayne counties in West Virginia (40CFR, §81.349 Table for "West Virginia—1997 8-Hour Ozone NAAQS (Primary and Secondary)") and Boyd county in Kentucky (40CFR, §81.318 Table for "Kentucky - 1997 8-Hour Ozone NAAQS (Primary and Secondary)"). The EPA approved West Virginia's redesignation request and maintenance plan for this area, effective October 16, 2006 (71 FR 54421). The EPA revised the ozone NAAQS in 2008.

The 2008 8-hour ozone NAAQS was promulgated by the EPA on March 12, 2008 (80 FR 12264) and became effective on May 27, 2008 (73 FR 16436). This final rule reduced the ozone standard from 0.080 ppm to 0.075 ppm. In a December 14, 2009 letter from the WVDEP to the EPA, West Virginia provided certified ambient air quality design value data with all site monitoring attainment and recommended all counties be designated as attainment/unclassifiable.

On May 21, 2012 (77 FR 30088), the EPA designated all West Virginia Counties as attainment/unclassifiable with the 2008 ozone NAAQS. On March 6, 2015, the EPA established a final SIP rule for implementing the 2008 ozone NAAQS. In addition to the final rule addressing a range of nonattainment area State Implementation Plans (SIP) requirements for the 2008 NAAQS, the rule also addressed the revocation of the 1997 ozone NAAQS and anti-backsliding requirements that apply when the 1997 ozone NAAQS was revoked. This action revoked listed states' obligation for further complying with 1997 ozone NAAQS requirements and the need to conduct quantifiable regional air quality emission analyses under the Transportation Conformity requirements in 40CFR, §93.122.

On October 26, 2015 (80 FR 65292), the EPA strengthened the 8-hour ozone standard by promulgating the 2015 NAAQS. This standard reduced the ground level ozone from 0.075 ppm to 0.070 ppm based on extensive scientific evidence regarding the effects of ozone on public health and welfare.

In a September 29, 2016 letter to the EPA, the WVDEP recommended all West Virginia Counties be designated attainment/unclassifiable with the 2015 Ozone NAAQS based on certified ambient air monitoring design value data for 2013-2015. On June 4, 2018 (83 FR 25776), the EPA designated all areas in West Virginia as attainment/unclassifiable stating all West Virginia Counties meet the 2015 8-Hour Ozone NAAQS.

Environmental groups filed a petition for judicial review of EPA's regulation, challenging certain aspects of EPA's decision to revoke the 1997 NAAQS. On February 16, 2018, the D.C. Circuit Court issued a decision in *South Coast Air Quality Management District v. EPA (South Coast II)* that, among other things, granted the petition on this point. The Court held that "orphan maintenance areas" are required to submit second maintenance plans under Clean Air Act (CAA) Section 175A(b). These areas, therefore, must submit a second maintenance SIP revision to ensure maintenance through the full 20-year period following the effective date of redesignation. For Huntington, the end of the 20-year maintenance period would be at least 2026 (2006 plus 20 years).

The Court decision affects the following five (5) areas in West Virginia: Charleston, Huntington, Parkersburg, Weirton, and Wheeling. As defined by the EPA, these sites are considered orphan maintenance areas. It is worth noting that all five (5) of these areas have continued to maintain attainment for the 1997 8-hour Ozone NAAQS following the approval of the 1997 8-hour Ozone Maintenance Plan by the EPA. Furthermore, these areas have demonstrated attainment under the more stringent 2008 and 2015 8-hour Ozone NAAQS. Ambient air quality monitoring data for these areas indicates ozone concentrations in these areas are continuing a downward trend.

On November 20, 2018, the EPA issued a guidance document titled *Resource Document For 1997 Ozone NAAQS Areas: Supporting Information for States Developing Maintenance Plans*. The document provides technical information that may be helpful for a state wishing to develop and submit a revision of its SIP to ensure maintenance of the 1997 ozone NAAQS. The document also includes information addressing ambient air quality monitoring data, air quality modeling, and emissions inventory data. Additionally, it also provides information that may be useful for states wishing to pursue a Limited Maintenance Plan (LMP) option. A copy of this guidance in provided in ***Appendix A***.

III. Limited Maintenance Plan

Section 107(d)(3)(e) of the CAA stipulates that for an area to be redesignated to attainment, the EPA must approve a maintenance plan that meets the requirements of Section 175A. Section 175A of the CAA defines the general framework of a maintenance plan. The maintenance plan must constitute a SIP revision and provide for maintenance of the relevant NAAQS in the affected areas. Section 175A further states that the plan must include the following:

1. *A SIP revision providing for the maintenance of the NAAQS in the area.*
2. *The initial maintenance plan must provide for maintenance of the NAAQS in the area for 10 years after redesignation.*
3. *Eight (8) years after redesignation, the state must submit a second SIP revision for maintaining the NAAQS through the end of the second 10-year period beyond redesignation.*
4. *Additional measures as necessary to ensure maintenance of the NAAQS in the area during this period.*
5. *A contingency plan assuring that the state will promptly correct any violation of the standard which occurs after the redesignation of the area to attainment.*
6. *The contingency plan shall include a requirement that the state will continue to implement all measures with respect to the control of the pollutant for the area that were contained in the SIP prior to the redesignation.*

In the November 20, 2018 guidance document, the EPA referenced three (3) past guidance documents describing "Limited Maintenance Plans," (LMPs) where the EPA has interpreted Section 175A to indicate that an area can provide for maintenance of the NAAQS if it meets certain air quality-related criteria. Specifically, the key criteria outlined in these documents are that the current air quality levels for ambient monitoring sites in the area should be substantially below the NAAQS (e.g., below 85% of the level of the standard), and that air quality levels have not been highly variable during preceding years.

Although these documents cite specific NAAQS pollutants, states have also developed, and the EPA has approved, LMPs for other NAAQS pollutants when those NAAQS were under active

implementation planning. Accordingly, the EPA has taken the position that in appropriate cases, states can apply the principles outlined in these existing guidance documents in developing LMPs for certain 1997 ozone NAAQS maintenance areas, and 1997 ozone NAAQS nonattainment areas that are eligible for redesignation to attainment.

The three (3) documents listed in the EPA's guidance are as follows:

- *Limited Maintenance Plan Option for Nonclassifiable Ozone Nonattainment Areas. November 16, 1994.* This document addressed the LMP option available for the 1979 1-hour ozone NAAQS.
- *Limited Maintenance Plan Option for Nonclassifiable Carbon Monoxide Nonattainment Areas. October 6, 1995.* This document addressed the LMP option available for the 1971 carbon monoxide NAAQS.
- *Limited Maintenance Plan Option for Moderate PM10 Nonattainment Areas. August 9, 2001.* This document addressed the LMP option for the 1987 PM10 NAAQS.

Of the three (3) LMPs offered by the EPA, the qualifying criteria cited in the August 9, 2001 guidance document is the most stringent with regard to justification a state can present in their selection of LMP provisions. West Virginia meets the specified qualifications outlined in the August 9, 2001 document and has elected to use elements of this guidance as a basis for the development of our LMP for the second 8-hour 1997 Ozone Maintenance Plan. A copy of the August 9, 2001 LMP document is contained in ***Appendix B.***

Each limited maintenance plan submission will be evaluated by the EPA on a case-by-case basis, taking into consideration the weight of evidence of the information presented in the SIP submission. Qualification for this LMP is discussed in the following section.

1. LMP Requirements

To qualify for the LMP option, an area should meet the following applicability criteria:

- The area should be attaining the 8-hour ozone NAAQS at all monitors in the area, at or below 85% of the NAAQS.
- The area should have a low risk of future exceedances as shown by a stable or improving air quality trend.

For the purposes of demonstrating a stable or improving air quality trend, West Virginia opted to take a more conservative approach and use a weighted design value of the most recent five (5) design values. As stated in 40CFR, §50.15, the ozone design value for a monitoring site is the 3-year average of the annual fourth-highest daily maximum 8-hour average ozone concentration. For our weighted design value, the five (5) most recent design values available cover the 2012-2018 ambient air monitoring data. This includes 3-year design values for 2012-2014, 2013-2015, 2014-2016, 2015-2017, and 2016-2018. Data from 2014, 2015, and 2016 is included in three (3) out of five (5) design values. Therefore, the 2012-2018 average design value is commonly referred to as a 5-year weighted average design value since data from 2014, 2015, and 2016 is given more weight. With overall ambient ozone concentrations levels trending downward, using a weighted average design value, which amplifies typically older and higher values, provides the most conservative approach at demonstrating area ozone levels are equal to or less than 85% of the 8-hour NAAQS.

An important criterion is related to mobile source emissions. West Virginia will demonstrate that the area should expect only limited growth in on-road motor vehicle nitrogen oxides (NOx) and volatile organic compound (VOC) emissions and has passed a motor vehicle regional air emissions analysis test.

The EPA's guidance describes that states may satisfy the Section 175A requirements applied to the 1997 ozone NAAQS to "provide for maintenance of the NAAQS" with an LMP according to the following criteria:

> *Current air quality levels significantly below the level of the standard:* As indicated in prior documentation, the EPA believes that an ambient air quality design value at or below 85% of the NAAQS (i.e., an ozone design value of 0.071 ppm as compared to a level of 0.084 ppm, which is considered to be in compliance with the 1997 ozone standard to three (3) digits) could be considered significantly below the standard and may be a good indicator that air quality is not likely to deteriorate to a level that would violate the NAAQS over the next 10 year period.
>
> *Stable or improving air quality trend:* Several kinds of analyses can be performed to assess whether an area has had relatively stable or consistently improving air quality levels over the long term, such that the probability of the area violating the standard in the future would be considered low. One basic approach would be to take the most recent design value for the area and add the maximum design value increase (over

one or more consecutive years) that has been observed in the area over the past several years. A sum that does not exceed the level of the 1997 ozone standard may be a good indicator of expected continued attainment. This type of metric should be considered on a case-by-case basis.

When the LMP option is selected, it is expected that the state will recalculate the average design value annually to ensure that the qualifying criteria continue to be met.

2. LMP Qualification

Based on the LMP requirements established by the EPA in their August 9, 2001 documentation, WVDEP has concluded that the Huntington area qualifies for an LMP based on our analysis of air quality data. Support for this position is provided in the following discussion where several deciding factors are evaluated.

The 1997 8-hour ozone NAAQS is 0.08 ppm. The EPA has made the determination that a design value of 0.084 ppm would meet the NAAQS, following standard rounding procedure. Therefore, the LMP qualifying threshold value of 85% of the NAAQS equates to 0.071 ppm.

The WVDEP evaluated the most recent five (5) years of ambient ozone air quality 3-year design values. Certified area design values, as provided to the EPA and included in EPA's Air Quality System (AQS), were used in this evaluation. Design values for 2012-2014, 2013-2015, 2014-2016, 2015-2017, and 2016-2018 were used in this evaluation. Based on these values, the 5-year weighted average design value for the Huntington area was calculated to be 0.064 ppm, which is below the 0.071 ppm threshold level and 75% of the NAAQS. This evaluation demonstrates that 8-hour ozone air quality levels are significantly below the level of the standard. *Table* 1 below summarizes these values. The table also includes a projected 2023 design value provided by the EPA. A more comprehensive discussion regarding this projection can be found in Section 3 *EPA 2023 Projections*.

Table 1. *Huntington area 8-Hour design values in part per million (ppm).*

Site	2012-14	2013-15	2014-16	2015-17	2016-18	5-Year Weighted	Projected 2023
Huntington	0.065	0.062	0.064	0.064	0.064	**0.064**	0.058

The EPA redesignated the area from nonattainment to attainment for the 1997 8-hour ozone NAAQS on October 16, 2006. *Figure 1* shows the historical 3-year ozone design values

beginning with year 2006. The values are shown compared to the 1997, 2008, and 2015 NAAQSs. The EPA's projected 2023 design value is also included to illustrate predicted future data trends. As the chart depicts, ozone levels for the area have been relatively stable and on a downward trend over this period. Values have also continuously remained below the NAAQS. Ozone levels in the area are expected to continue to decrease, as supported by the EPA's 2023 design value projection.

Emissions in general have been decreasing in West Virginia following the redesignation of the 1997 standard. These decreases are primarily due to more stringent air pollution regulations, the shutdown or conversion of coal-fired equipment, and attrition of older facilities and processes.

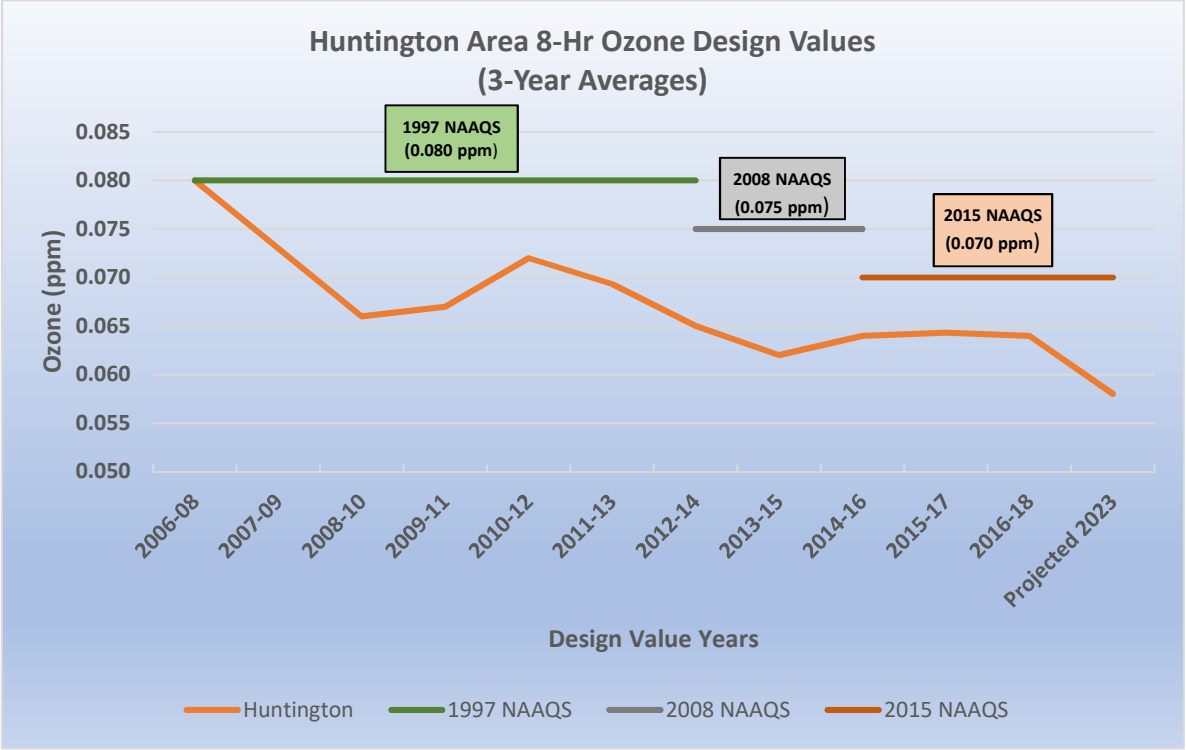

Figure 1. *Historical 3-Year ozone design values for the Huntington area.*

West Virginia's certified design value data, both as a 5-year weighted average presented in *Table 1* and as illustrated over time in *Figure 1*, verifies that ozone levels in the Huntington area are significantly below the 1997 8-hour NAAQS. Additionally, this data also demonstrates that ozone levels for the area are stable or decreasing. Therefore, West Virginia has met the requirement to qualify for the LMP option.

3. EPA 2023 Projections

In June 2018, the EPA issued their "*Air Quality Modeling Technical Support Document for the Updated 2023 Projected Ozone Design Values*". This technical support document (TSD) describes the air quality modeling the EPA performed to projected ozone design values at individual monitoring sites to 2023.

For the 2023 projections, the EPA used a 2011-based air quality modeling platform, which includes emissions, meteorology, and other inputs for 2011 as the base year and emissions for 2023 as the future analytic year base case. Specifically, the modeling platform included a variety of data that contained information pertaining to the modeling domain and simulation period. These include gridded, hourly emissions estimates and meteorological data, and boundary concentrations. Separate emissions inventories were prepared for the 2011 base year and the 2023 base case. All other inputs (i.e. meteorological fields, initial concentrations, and boundary concentrations) were specified for the 2011 base year model application and remained unchanged for the future-year model simulations. The 2011 modeling platform and projected 2023 emissions were used to drive the 2011 base year and 2023 future case air quality model simulations.

IV. Attainment Year Emissions Inventory

In the resource document, EPA provides emissions inventory data for 2014. These data represent annual and summer season NOx and VOC emissions. EPA includes annual emissions in units of tons per year (tpy), ozone season emissions in units of tons per ozone season (tpOS), and daily summertime emissions in units of tons per day (tpd). These data are from the EPA 2014 modeling platform and are based on the most recently available National Emissions Inventory (2014 NEI version 2). The 2014 emissions inventory information is from the EPA 2014 version 7.0 modeling platform. The inventory documentation for this platform can be found here: https://www.epa.gov/air-emissions-modeling/2014-version-70-platform.

Table 3 provides the 2014 anthropogenic NOx emissions inventory for the jurisdictions located within the Huntington, WV maintenance area. Emissions from each jurisdiction are broken down by emissions sector. *Table 4* provides the 2014 anthropogenic VOC emissions inventory for the jurisdictions located within the maintenance area. The VOC emissions from each jurisdiction are broken down by emissions sector. The fire emissions sector includes emissions from agricultural burning, prescribed fires, wildfires, and other types of fires. The nonpoint

emissions sector includes emissions from equipment, operations, and activities that are numerous and in total have significant emissions. Examples include emissions from commercial and consumer products, portable fuel containers, home heating, repair and refinishing operations, and crematories. The non-road emissions sector includes emissions from engines that are not primarily used to propel transportation equipment, such as generators, forklifts, and marine pleasure craft. The on-road emissions sector includes emissions from engines used primarily to propel equipment on highways and other roads, including passenger vehicles, motorcycles, and heavy-duty diesel trucks. The point source sector includes large industrial operations that are relatively few in number but have large emissions, such as kraft mills, electrical generating units, and pharmaceutical factories.

The annual and summertime, daily emissions were excerpted from: https://www.epa.gov/sites/production/files/2018-11/ozone_1997_naaqs_emiss_inv_data_nov_19_2018_0.xlsx ("2014 2028 area emiss by sector" tab) posted at https://www.epa.gov/ground-level-ozone-pollution/1997-ozone-national-ambient-air-quality-standards-naaqs-nonattainment.

***Table 3**: 2014 Attainment Year Anthropogenic NO_X Emissions Inventory, Huntington-Ashland, WV-KY Maintenance Area*

Jurisdiction	*Emissions Sector*	*2014 Annual NOx Emissions (tpy)*	*2014 Summertime Daily NOx Emissions (tpd)*
Cabell Co, WV	Fire	8	0
	Nonpoint	1,386	3.6
	Nonroad	214	0.7
	Onroad	1,727	4.7
	Point	282	0.8
	Total	***3,617***	***9.7***
Wayne Co, WV	Fire	235	0
	Nonpoint	1,373	3.7
	Nonroad	91	0.3
	Onroad	586	1.6
	Point	1,089	2.8
	Total	***3,374***	***8.5***
Boyd Co, KY	Fire	9	0
	Nonpoint	431	1.1
	Nonroad	104	0.3
	Onroad	1,033	2.8
	Point	2,802	7.6
	Total	***4,379***	***11.9***
Huntington-Ashland Area, WV-KY Total		***11,370***	***30.1***

Table 4: *2014 Attainment Year VOC Anthropogenic Emissions Inventory, Huntington-Ashland, WV-KY Maintenance Area*

Jurisdiction	*Emissions Sector*	*2014 Annual VOC Emissions (tpy)*	*2014 Summertime Daily VOC Emissions (tpd)*
Cabell Co, WV	Fire	77	0
	Nonpoint	1,782	4.6
	Nonroad	551	2
	Onroad	745	2
	Point	197	0.5
	Total	***3,351***	***9.2***
Wayne Co, WV	Fire	4,221	0.3
	Nonpoint	1,778	4.6
	Nonroad	135	0.5
	Onroad	270	0.7
	Point	205	0.6
	Total	***6,610***	***6.7***
Boyd Co, KY	Fire	103	0.1
	Nonpoint	826	2.1
	Nonroad	89	0.3
	Onroad	528	1.5
	Point	852	2.3
	Total	***2,398***	***6.3***
Huntington-Ashland Area, WV-KY Total		***12,358***	***22.3***

V. Maintenance Plan

In May of 2006, West Virginia submitted the initial Maintenance Plan for the Huntington, West Virginia 1997 8-hour Ozone Area, comprising Cabell and Wayne Counties. The Plan was successfully employed resulting in the decrease in ozone levels for the area, as indicated by the historical ambient air quality ozone design value This Limited Maintenance Plan will serve as the required second 10-year maintenance plan and will ensure continued compliance with 1997 8-hour ozone NAAQS.

In accordance with the CAA, areas seeking to be redesignated to attainment under the LMP policy must have an attainment plan that has been approved by the EPA, pursuant to Section

107(d)(3)(E). The plan must include all control measures that were relied on by the state to demonstrate attainment of the NAAQS. The state must also ensure that the CAA requirements for ozone pursuant to Section 110, Part D of the Act have been satisfied. To comply with the statute, the LMP should clearly indicate that all controls that were relied on to demonstrate attainment will remain in place. If a state wishes to roll back or eliminate controls, the area can no longer qualify for the LMP and the area will become subject to full maintenance plan requirements within 18 months of the determination that the LMP is no longer in effect. West Virginia is, at this time, not seeking to remove any control measures and will continue to implement all control measures in the ozone applicable SIP for the Huntington area.

Section 175A of the CAA defines the general framework of a maintenance plan. The maintenance plan must constitute a SIP revision and provide for maintenance of the relevant NAAQS in the affected areas for at least 10 years after redesignation. Section 175A further states that the plan must contain such additional measures, if any, as may be necessary to ensure such maintenance. The start date for the initial 10-year Maintenance Plan began when the EPA approved the redesignation request in 2006. Since a maintenance plan must ensure attainment for a minimum of 10 years, 2016 was the earliest year a plan could end. A second and final 10-year Maintenance Plan would be submitted to the EPA for their review and approval eight (8) years after redesignation and two (2) years prior to the expiration of the initial plan. The second plan would have been due to the EPA in 2014. However, with the EPA's revocation of the 1997 8-hour ozone NAAQS in 2012, a second maintenance plan was not required. With the D.C. Court's *South Coast Air Quality Management District v. EPA* decision, a second maintenance plan is now required and is being included as part of this request.

1. Maintenance Tracking Measures

West Virginia proposes to fully update its point, nonpoint, and mobile source emission inventories at 3-year intervals as required by the Consolidated Emissions Reporting Rule (CERR). These inventories ensure that projected area emission growth is sufficiently accurate and ongoing attainment with the NAAQS is maintained. The WVDEP will review annual point source NOx and VOC emissions per 45CSR30, "*Requirements for Operating Permits*" (the Title V operating program) and by annually updating West Virginia's point source emission inventories. The nonpoint source inventory will be updated at least triennially using the same or similar techniques and methodologies as developed by the EPA. However, West Virginia may substitute the EPA nonpoint source categories default values with West Virginia specific values. The mobile source inventory will be updated at least

triennially using the current approved Motor Vehicle Emission Simulator (MOVES) model. Like the nonpoint inventory, West Virginia may substitute actual West Virginia mobile data for the EPA's default values. Mobile emissions data may also be obtained in consultation with the area's Metropolitan Planning Organization (MPO) and using appropriate data and methodology similar used for Transportation Conformity purposes.

Pursuant to Section 110, Part D of the CAA, WV has operated under the rules of Clean Air Interstate Rule (CAIR) following the approval of our 2005 maintenance plan. When CAIR was replaced by the Cross-State Air Pollution Rule (CSAPR), WV began implementation of the revised regulation. In June 2019, the federal CSAPR rules were adopted by the WVDEP and codified in 45CSR43. These control measures were one of the mechanisms relied on to demonstrate attainment and will remain in place to ensure that the CAA requirements continue to be fulfilled.

2. Monitoring Network

West Virginia will continue to conduct ambient ozone air quality monitoring in the area throughout the term of this Maintenance Plan to verify continued attainment with the 1997 8-hour ozone NAAQS and to protect any applicable Prevention of Significant Deterioration (PSD) increments. Air quality measurements will be performed in accordance with appropriate regulations and guidance documents along with EPA quality assurance requirements. Monitoring procedures will be determined in accordance with 40CFR, Part 58. Quality-assured ozone data will be submitted to the EPA through the AQS and ultimately certified by the WVDEP.

Pursuant to Section 103 of the CAA, WVDEP operates and maintains a network of ambient ozone air quality monitoring stations throughout the State. The stations serve to assess air quality levels based on population exposure, industry emissions, determine compliance with the National Ambient Air Quality Standards (NAAQS), background levels and other special purposes. Provision for the continued operation of the air monitoring network is provided for through federal grant funding.

3. Permanent and Enforceable Improvements

West Virginia has adopted permanent and federally enforceable control measures in order to regulate emission growth. These area control measures have been approved by the EPA.

These include the permitting regulations Permits for Construction, Modification, Relocation, and Operation of Stationary Sources of Air Pollutants (45CSR13) and PSD (45CSR14) permitting requirements will remain in effect through the maintenance plan period. Air permits issued will incorporate applicable PSD (45CSR14), New Source Performance Standards (45CSR16), and National Emission Standards for Hazardous Air Pollutants (45CSR34) requirements. In appropriate cases, Consent Orders and their specific requirements also may be used as a control measure.

Major emission sources proposing to construct new facilities or make a major modification to existing facilities within the area are required to obtain an NSR PSD permit through State Regulation 45CSR14. An engineering evaluation and analysis of information pertaining to the source is performed prior to issuance of any permit. The PSD program requires a modeling demonstration to be performed in order to ensure ongoing NAAQS compliance and applicable PSD increments are not exceeded.

Permanent and enforceable control measures implemented through air permits and Consent Orders are designed to maintain ambient air quality ozone levels.

VI. Contingency Measures

Section 175A of the CAA states that a maintenance plan must include contingency provisions, as necessary, to promptly correct any violation of the NAAQS which may occur after redesignation of the area to attainment. A contingency plan is considered an enforceable part of the SIP. States must ensure that the contingency measures are adopted as soon as possible once they are triggered by a specific event. The contingency plan identifies the measures to be adopted and provides a schedule and procedures for adoption and implementation of the measures if they are required. Normally, the implementation of contingency measures is triggered by a violation of the NAAQS, but the state may establish other triggers to prevent a violation of the NAAQS.

A limited maintenance plan also requires contingency measures to correct NAAQS violations. West Virginia proposes to retain the existing Contingency Plan that follows, which was previously approved by the EPA for the initial Huntington area Maintenance Plan.

If the design value for the 1997 8-hour ozone NAAQS is above 0.084 ppm at any of the ambient air quality ozone monitors in the area, West Virginia will accordingly select and adopt one or more of the following measures to assure continued attainment:

1. Extend the applicability of 45CSR21 (VOC/RACT rule) to include source categories previously excluded (e.g., wastewater treatment facilities).
2. Revise permitting requirements establishing more stringent emissions control measures and/or emissions offsets.
3. Implement NO_x RACT requirements if necessary.
4. Develop regulations to establish plant-wide emission caps (potentially with emissions trading provisions).
5. Implement Stage II Vapor Recovery regulations.
6. Establish a Public Awareness/Ozone Action Days Program, a two-pronged program focusing on increasing the public's understanding of air quality issues in the region and increasing support for actions to improve the air quality, resulting in reduced emissions on days when the ozone levels are likely to be high.
7. Initiate one or more of the following voluntary local control measures:
   i. Bicycle and Pedestrian Measures - A series of measures designed to promote bicycling and walking including both promotional activities and enhancing the environment for these activities.
   ii. Reduce Engine Idling - Voluntary program to restrict heavy duty diesel engine idling times for both trucks and school buses.
   iii. Voluntary Partnership with Ground Freight Industry - A voluntary program using incentives to encourage the ground freight industry to reduce emissions.
   iv. Increase Compliance with Open Burning Restrictions - Increase public awareness of the existing open burning restrictions and work with communities to increase compliance.
   v. School Bus Engine Retrofit Program - Have existing school bus engines retrofitted to lower emissions.

One or more of these regulatory revisions or voluntary measures would be selected within three (3) months after verification of a monitored ozone standard violation. Quality assurance procedures must confirm the monitored violation within 45 days of occurrence. For each regulatory revision selected, a draft rule would be developed by the WVDEP. The WVDEP will

adopt the selected control measure(s) as emergency rule(s) which will be implemented within six (6) months after adoption and will file the rule(s) as legislative rule(s) for permanent authorization by the legislature. For each voluntary measure selected, the WVDEP will initiate program development with local governments within the area by the start of the following ozone season.

Furthermore, if the triennial inventories indicate emissions growth in excess of 10% of the 2011 base-year inventory or if a monitored ozone air quality exceedance pattern indicates that an ozone NAAQS violation may be imminent, then the WVDEP will evaluate existing control measures to ascertain if additional regulatory revisions are necessary to maintain the ozone standards. Such an exceedance pattern would include, but is not limited to, the measurement of three (3) exceedances or more occurring at the same monitor during a calendar year.

Based on the 2011 inventory data and calculation methodology, it is expected that area and mobile source emissions would not exhibit substantial increases between consecutive periodic year inventories. Therefore, if significant unanticipated emissions growth occurs, it is expected that point sources would be the cause. Regulation 45CSR30 requires major point source emitters to submit annual air emission inventories and Certified Emission Statements (CES), which contain VOC and NOx emission totals. Any significant increases that occur can be identified from these inventories or statements without waiting for a triennial emissions inventory. This gives West Virginia the capability to identify needed regulations by source, source category, and pollutant and to begin the rule promulgation process, if necessary, in an expeditious manner.

Control measures from the initial Maintenance Plan have aided in the continual improvement of the area's ambient ozone air quality. Implementation of Contingency Plan measures have not been necessary during the initial Plan's performance period.

VII. Conformity:

The Transportation Conformity Rule (40CFR, Parts 51 and 93) and the General Conformity Rule (58 FR 63214; November 30, 1993) apply to areas operating under maintenance plans. Under either conformity rule one means of demonstrating conformity of Federal actions is to indicate that expected emissions from planned actions are consistent with the emissions budget for the area. Per EPA policy, emissions budgets in an LMP area may be treated as essentially not constraining for the length of the maintenance period on the grounds that growth during that

time is not expected to trigger a violation of the 8-hour ozone NAAQS. While this policy does not exempt an area from the need to affirm conformity, it does allow the area to demonstrate conformity without undertaking certain requirements of these rules. For transportation conformity purposes, the EPA would conclude that emission caps or motor vehicle emission budgets (MVEB) for highway vehicles in these areas are not constraining for the length of the maintenance period of the LMP because one can reasonably expect emissions growth in the area will not result in a violation of the ozone NAAQS; therefore, a regional emissions analysis would not be required under 40CFR, §93.109. In addition, the 1997 ozone NAAQS is a revoked standard, and the federal regulations specifically sunset the regional emissions analysis provisions on the effective date of a NAAQS revocation as explained in "Transportation Conformity Guidance for the South Coast II Court Decision", EPA-420-B-18-050 November 2018. Similarly, Federal actions subject to the general conformity rule could be considered to satisfy the "budget test" specified in Section 93.158 (a)(5)(i)(A) of the rule (incorporated by reference by §45-35-4). Adoption of Requirements, for the same reasons that the budgets are essentially considered to be unlimited.

To comply with the 1997 8-hour ozone NAAQS requirements, West Virginia established VOC and NOx MVEB for the five (5) areas mentioned above. MVEB were established for future years, which extended to 2018. In March 2011, West Virginia requested the EPA approve revisions to the 8-hour ozone Maintenance Plans for the five (5) West Virginia 1997 8-hour ozone maintenance areas, including Charleston, Huntington, Parkersburg, Weirton, and Wheeling. These revisions also reallocated emissions from the existing "safety margins" in each of the maintenance plans to increase the available MVEB for highway vehicles. The MVEBs were being increased in anticipation of mandatory use of the EPA's most recently approved highway vehicle emissions model, MOVES10, in future transportation conformity determinations. It was anticipated the MOVES10 model would result in higher mobile NOx emissions as compared to the MOBILE6 model originally used to calculate the MVEB. The EPA took direct final action to approve this SIP revision on September 15, 2011 (76 FR 56975).

The EPA's approval of an LMP will provide that if the LMP criteria are no longer satisfied and a full maintenance plan must be developed to meet CAA requirements, the approval of the LMP would remain applicable for conformity purposes only until a full maintenance plan is submitted and the EPA has found the motor vehicle emissions budgets adequate for conformity purposes under 40CFR, Parts 51 and 93. The EPA will condition its approval of all LMPs in this fashion because in the case where the LMP criteria are not met and a full maintenance plan is required

the EPA believes that LMPs would no longer be an appropriate mechanism for assuring maintenance of the standards.

As a result of the February 16, 2018 D.C. Circuit Court decision in *South Coast Air Quality Management District v. EPA*, West Virginia had regional air quality conformity analysis conducted for the Huntington area, which includes Cabell and Wayne Counties. Michael Baker International was contracted to perform the analysis for this area. Baker's resulting report is provided in ***Appendix C***.

Baker consulted with the local Metropolitan Planning Organization (MPO), West Virginia Department of Transportation (WVDOT), and the WVDEP to project future travel demands for the area using known future projects that could impact mobile VOC and NOx emissions. The MOVES2014a model was used to estimate future year emissions. These years included 2018, 2025 and 2030 to cover the performance period of the second Maintenance Plan. To compare the area's emissions to the previously established 2018 MVEB, 2018 emissions were estimated. *Table 2* below summarizes the modeling results and shows, as compared to the 2018 MVEB, future VOC and NOx emissions are well below the 2018 established MVEB. Therefore, based upon this analysis by Baker, West Virginia concludes that it is reasonable to expect that the area will not experience enough motor vehicle emissions growth for a violation of the 1997 8-hour ozone NAAQs to occur through 2026.

Table 2. *Projected motor vehicle emissions in short tons per day.*

	2018 Budget		*2018*		*2025*		*2030*	
Area	*VOC*	*NOx*	*VOC*	*NOx*	*VOC*	*NOx*	*VOC*	*NOx*
Cabell County			1.40	2.60	0.90	1.40	0.60	0.96
Wayne County			0.52	1.24	0.33	0.63	0.22	0.44
Total	**6.6**	**13.5**	**1.91**	**3.84**	**1.23**	**2.03**	**0.82**	**1.40**

VIII. Public Review

WVDEP published notification for the public review and comment period concerning the draft second maintenance plan in the Herald Dispatch, widely distributed newspaper serving the Huntington area. This maintenance plan was also available for public download at: https://dep.wv.gov/daq/publicnoticeandcomment/Pages/default.aspx

Results of the public review may be found in ***Appendix D***.

IX. Conclusion

As discussed, qualification for a limited maintenance plan requires that the area should be attaining the 8-hour ozone NAAQS. The average design value for the area, based upon the most recent five (5) years of ambient air quality data at all monitors in the area, should be at or below 85% of the NAAQS. WV elected to take a conservative approach and use a 5-year weighted design value rather than simply averaging the most recent five (5) years. Even subject to this more stringent analysis, the Huntington area 5-year weighted design value is 0.064 ppm. This falls under the maximum design value of 0.071 prescribed by the EPA and fulfills this requirement to qualify for an LMP.

Qualification for an LMP further requires that the area should have no NAAQS violations at any ambient air monitor in the area. The Huntington area has not had any NAAQS violations after the approval of the initial Maintenance Plan and has consistently had design values below the 1997, 2008, and 2015 NAAQS. The consistent achievement of decreasing ozone NAAQS fulfills this requirement to qualify for an LMP.

Finally, qualification for an LMP requires that the area should have a low risk of future exceedances. The historic data presented in *Figure* 1 demonstrates a downward trend in ozone levels in the area. With regulatory controls currently in place, this trend is expected to continue in the future. This expectation is supported by the 2023 projection produced by the EPA presented in *Table 1*.

Furthermore, a transportation conformity analysis conducted by Michael Baker International indicates that the 2018 VOC and NOx emissions fall below our budget for the Huntington area and future VOC and NOx emissions are projected to be on the decline.

Under consideration of the information presented, West Virginia requests that the EPA approve this limited maintenance plan as meeting the requirements of CAA Section 175(A) with respect to the 8-hour standard. This plan is effective until October 16, 2026.

Appendix A

EPA's Resource Document For 1997 Ozone NAAQS Areas: Supporting Information for States Developing Maintenance Plans

November 20, 2018

RESOURCE DOCUMENT FOR 1997 OZONE NAAQS AREAS: SUPPORTING INFORMATION FOR STATES DEVELOPING MAINTENANCE PLANS

PURPOSE

The purpose of this resource document is to provide technical information that may be helpful for a state wishing to develop and submit a revision of its state implementation plan (SIP) to ensure maintenance of the 1997 ozone National Ambient Air Quality Standards (NAAQS). This document includes information addressing ambient air quality monitoring data, air quality modeling, and emissions inventory data. Note that this resource document also provides information that may be useful for states wishing to pursue the limited maintenance plan (LMP) option.

BACKGROUND

- The EPA revoked the 1997 ozone NAAQS effective April 5, 2015. Under the EPA's regulations implementing the ozone NAAQS,[1] states were no longer responsible, under certain conditions, for developing and submitting maintenance plans for former 1997 ozone NAAQS nonattainment areas. See 40 Code of Federal Register (CFR) 51.1105(d). Environmental groups filed a petition for judicial review of the EPA's regulation, challenging certain aspects of the decision. Among other things, the groups challenged the Agency's rule that excused "orphan maintenance areas," i.e., areas that had been redesignated to attainment for the 1997 ozone NAAQS and were initially designated attainment for the 2008 ozone NAAQS, from submitting a second maintenance plan for the 1997 ozone NAAQS.

- On February 16, 2018, the D.C. Circuit Court issued a decision in *South Coast Air Quality Management District v. EPA* (*South Coast II*) that, among other things, granted the petition on this point. 882 F.3d 1138. The Court held that "orphan maintenance areas" are required to submit second maintenance plans under Clean Air Act (CAA) section 175A(b). These areas, therefore, must submit a second maintenance SIP revision to ensure maintenance through the full 20-year period following the effective date of redesignation. (Note that depending on when an area received its redesignation, the area may only need to submit a second maintenance plan that covers the remainder of the second 10-year maintenance period.) The Court's decision also addressed the EPA's longstanding interpretation that, once a NAAQS was revoked, the EPA does not have authority to issue new designations or redesignations for that standard. The Court vacated the "redesignation substitute," one of the Agency's procedural mechanisms for removing antibacksliding requirements for the revoked 1997 NAAQS. In so doing, the *South Coast II* court decision held that the EPA could only lift those antibacksliding requirements with a full statutory redesignation under CAA

[1] 80 Federal Register (FR) 12264 (March 6, 2015).

section 107(d)(3)(E), suggesting that the Agency's prior interpretation of its lack of authority to redesignate areas under a revoked NAAQS was incorrect. Therefore, under the Court's decision, areas that were designated nonattainment for the 1997 ozone NAAQS at the time of revocation may request full redesignation under CAA section 107(d)(3) in order to remove antibacksliding requirements for the revoked 1997 standard, such as nonattainment new source review (NNSR).

- The EPA also notes that this resource document does not cover requirements for other CAA programs that apply in nonattainment and maintenance areas following the *South Coast II* decision. For example, guidance implementing transportation conformity requirements following the *South Coast II* decision is being developed by the EPA's Office of Transportation and Air Quality and will be available at: https://www.epa.gov/state-and-local-transportation/policy-and-technical-guidance-state-and-local-transportation.
- At the time the 1997 ozone NAAQS were revoked in 2015, 35 areas remained designated as nonattainment for that NAAQS, and 80 former nonattainment areas had been redesignated to attainment and were also initially designated attainment for the newer 2008 ozone NAAQS. (See table 1 for a list of these areas.)

LIMITED MAINTENANCE PLAN

- CAA section 175A(a) requires that areas seeking redesignation to attainment submit "a revision of the applicable state implementation plan to provide for the maintenance of the [NAAQS] for such air pollutant in the area concerned for at least 10 years after the redesignation." Section 175A(b) requires the state to submit a second plan for maintaining the NAAQS for another 10 years (i.e., 20 years after redesignation). In most cases, the EPA guidance instructs states to "provide for the maintenance of the [NAAQS]" using projected emissions inventories or air quality modeling showing continued maintenance until the end of the relevant maintenance period.[2]

- In three past guidance documents describing "limited maintenance plans," the EPA has interpreted section 175A to indicate that an area can "provide for maintenance of the NAAQS" if it meets certain air quality-related criteria. Specifically, the key criteria outlined in these documents are that the current air quality levels for ambient monitoring sites in the area should be substantially below the level of the standard (e.g., below 85% of the level of the standard), and that air quality levels had not been highly variable during preceding years.

- The three previously-issued limited maintenance plan memoranda are the following:

[2] See memorandum dated September 4, 1992, from John Calcagni, Director of OAQPS Air Quality Management Division, to the EPA Regional Office Air Division Directors, "Procedures for Processing Requests to Redesignate Areas to Attainment," pages 9-11.

A. *"Limited Maintenance Plan Option for Nonclassifiable Ozone Nonattainment Areas." November 16, 1994.* This document addressed the LMP option available for the 1979 1-hour ozone NAAQS.

B. *"Limited Maintenance Plan Option for Nonclassifiable Carbon Monoxide Nonattainment Areas." October 6, 1995*. This document addressed the LMP option available for the 1971 carbon monoxide NAAQS.

C. *"Limited Maintenance Plan Option for Moderate PM_{10} Nonattainment Areas." August 9, 2001*. This document addressed the LMP option for the 1987 PM_{10} NAAQS.

- These memoranda cite specific NAAQS, but states have also developed – and the EPA has also approved – LMPs for other specific NAAQS when those NAAQS were under active implementation planning.[3] Accordingly, the EPA believes that in appropriate cases states can apply the principles outlined in these existing guidance documents in developing LMPs for certain 1997 ozone NAAQS maintenance areas, and 1997 ozone NAAQS nonattainment areas that are eligible for redesignation to attainment.

- As compared to developing a regular maintenance plan, development of an approvable LMP generally should be less resource intensive for local, state, and federal air quality and transportation agencies. A LMP submission may primarily rely on air quality data to demonstrate that the area is not expected to experience a future NAAQS violation, and it does not need to include projected future year emissions inventories or air quality modeling to make that demonstration, though including such information could further support the maintenance demonstration.

STATUTORY REQUIREMENTS FOR AREA REDESIGNATIONS AND MAINTENANCE PLANS

- A nonattainment area can be redesignated to attainment only if it satisfies the requirements of CAA section 107(d)(3)(E) of the CAA. The EPA's general guidelines for redesignation requests and maintenance plan SIP revisions are found in the 1992 the EPA guidance "Procedures for Processing Requests to Redesignate Areas to Attainment,'' Memorandum from John Calcagni, USEPA Office of Air Quality Planning and Standards, Director, Air Quality Management Division, September 4, 1992.

    1. The EPA has determined that the NAAQS for the applicable pollutant has been attained.

        a. An area that is designated nonattainment for the 1997 ozone NAAQS would be eligible to be redesignated to attainment for that NAAQS if its most recent ozone design value is less than 0.085 parts per million (ppm). Areas with

[3] See, e.g., 79 FR 41900 (July 18, 2014). Approval and Promulgation of Air Quality Implementation Plans; New Mexico; Grant County Sulfur Dioxide Limited Maintenance Plan.

design values of 0.085 ppm or greater are not eligible to redesignate to attainment for the 1997 ozone NAAQS.

2. The EPA has fully approved the applicable implementation plan under CAA section 110(k).

3. The EPA has determined that the improvement in air quality is due to permanent and enforceable reductions in emissions.

4. The state has met all applicable requirements for the area under CAA section 110 and the part D nonattainment area requirement (CAA sections 171-193).

5. The EPA has fully approved a maintenance plan, including a contingency plan, for the area under CAA section 175A.

- A maintenance plan must satisfy the requirements of CAA section 175A, including:

    1. A SIP revision providing for the maintenance of the NAAQS in the area.

        a. The initial maintenance plan must provide for maintenance of the NAAQS in the area for 10 years after redesignation.

        b. Eight (8) years after redesignation, the state must submit a second SIP revision for maintaining the NAAQS through the end of the second 10-year period beyond redesignation.

    2. Additional measures as necessary to ensure maintenance of the NAAQS in the area during this period.

    3. A contingency plan assuring that the state will promptly correct any violation of the standard which occurs after the redesignation of the area to attainment.

    4. The contingency plan shall include a requirement that the state will continue to implement all measures with respect to the control of the pollutant for the area that were contained in the SIP prior to the redesignation.

- Each limited maintenance plan submission will be evaluated by the EPA on a case-by-case basis, taking into consideration the weight of evidence of the information presented in the SIP submission.

<u>SUPPORTING INFORMATION</u>

The information described below may be helpful for a state interested in developing a regular maintenance plan or a limited maintenance plan SIP submission for a 1997 ozone NAAQS nonattainment or maintenance area.

1. AMBIENT AIR QUALITY DATA

The spreadsheet provided on the EPA website includes ozone ambient air quality monitoring data for the 115 areas that were initially designated as nonattainment for the 1997 ozone NAAQS beginning in 2004. The spreadsheet includes the following information for each 1997 ozone NAAQS area:

- Current designation status as of July 2018 (nonattainment or maintenance)
- Current area classification as of July 2018 (e.g., Marginal, Moderate, Serious)
- Three (3) year design values for 15 design value periods, from the 2001-2003 period to the 2015-2017 period.

2. AIR QUALITY MODELING DATA

The spreadsheet provided on the EPA website contains projected 2023 design values (based on projected emissions inventory data and air quality modeling performed by EPA in support of interstate ozone transport actions by the EPA and/or states for the 2008 and/or 2015 ozone NAAQS). Projected air quality values below the level of the standard for the area for one or more years during the maintenance plan period can be useful supporting information in a demonstration to show that the area is expected to continue to attain the standard during the maintenance period.

- More information on the EPA 2023 air quality modeling is available at:

  https://www.epa.gov/airmarkets/october-2017-memo-and-supplemental-information-interstate-transport-sips-2008-ozone-naaqs

  https://www.epa.gov/sites/production/files/2018-06/documents/aq_modelingtsd_updated_2023_modeling_o3_dvs.pdf

3. EMISSIONS INVENTORY DATA

Consistent with the EPA guidance, maintenance plans often use a projection of the attainment year emissions inventory to demonstrate that an area will maintain the NAAQS for 10 years. That is, state submissions provide a showing that nonattainment area emissions of nitrogen oxides (NOx) and volatile organic compounds (VOC) are projected to remain at or below a level that is consistent with demonstrated attainment throughout the maintenance plan period. While past guidance documents have indicated that areas eligible for a limited maintenance plan need not demonstrate maintenance using emission inventory projections, we include this information to the extent it is helpful.

The spreadsheet provided on the the EPA website contains NOx and VOC emissions data for two years for the 115 areas that were initially designated as nonattainment for the 1997 ozone NAAQS in 2004. The spreadsheet includes the following information for each area:

- Emissions Inventory data for 2014: Summer season NOx and VOC emissions (tons/season). These data are from the the EPA 2014 modeling platform and are based on the most recently available National Emissions Inventory (2014 NEI version 2).
    - The 2014 emissions inventory information is from the the EPA 2014 version 7.0 modeling platform. The inventory documentation for this platform can be found here: https://www.epa.gov/air-emissions-modeling/2014-version-70-platform.
- Projected emissions inventory for 2028: Summer season NOx and VOC emissions (tons/season), which may help support a conclusion that emissions will not increase in the future and the improvement in air quality is due to permanent and enforceable reductions in emissions.

- The 2028 emissions inventory is projected from the EPA 2011 version 6.3 modeling platform. The inventory documentation for this platform can be found here: https://www.epa.gov/air-emissions-modeling/2011-version-63-platform.

The relevant inventory scenario names are "2014fd" and "2028el." The 2028 scenario was used to support past air quality modeling to support the regional haze program.

Due to the limited availability of emissions modeling information, the EPA is not able to provide a completely consistent set of emissions estimates for multiple projection years. In general, the emissions of NOx and VOC are going down over time in most areas. But there may be some methodological inconsistencies between the emissions scenarios noted above, which could lead to unexpected projected emissions increases. Therefore, emissions trends should be carefully examined for each area, especially where an emissions increase is projected.

PAST CRITERIA SUPPORTING LIMITED MAINTENANCE PLANS

As noted, the EPA's prior guidance describes that states may satisfy the section 175A requirement to "provide for maintenance of the NAAQS" with a LMP according to the following criteria:

- Current air quality levels significantly below the level of the standard: As indicated in prior memoranda, the EPA believes that an air quality design value below 85% of the level of the standard (i.e., a design value of 0.071 ppm as compared to a level of 0.084 ppm, which is considered to be in compliance with the 1997 ozone standard to three digits) could be considered significantly below the standard and may be a good indicator that air quality is not likely to deteriorate to a level that would violate the NAAQS over the next 10 year period.

- Stable or improving air quality trend: Several kinds of analyses can be performed to assess whether an area has had relatively stable or consistently improving air quality

levels over the long term such that the probability of the area violating the standard in the future would be considered low. One basic approach would be to take the most recent design value for the area and add the maximum design value increase (over one or more consecutive years) that has been observed in the area over the past several years. A sum that does not exceed the level of the 1997 ozone standard may be a good indicator of expected continued attainment. This type of metric should be considered on a case-by-case basis.

TABLE 1
1997 OZONE NAAQS AREAS WITH MAINTENANCE AND NONATTAINMENT STATUS
AT THE TIME THE NAAQS WERE REVOKED IN 2015
AND THAT WERE ALSO DESIGNATED ATTAINMENT FOR THE 2008 OZONE NAAQS

State	1997 Ozone NAAQS Area Name	1997 Ozone NAAQS Status
AL	Birmingham Area	Maintenance
GA	Atlanta	Maintenance*
GA	Macon Area	Maintenance
GA	Murray County (Chattahoochee Nat Forest) Area	Maintenance
IN	Evansville Area	Maintenance
IN	Fort Wayne Area	Maintenance
IN	Greene County Area (IN)	Maintenance
IN	Indianapolis Area	Maintenance
IN	Jackson County Area	Maintenance
IN	La Porte County Area	Maintenance
IN	Muncie Area	Maintenance
IN	South Bend-Elkhart Area	Maintenance
IN	Terre Haute Area	Maintenance
KY-IN	Louisville Area	Maintenance
MA-NH	Boston-Manchester-Portsmouth (SE) Area	Maintenance
MD	Kent and Queen Anne's Counties Area	Maintenance
ME	Hancock, Knox, Lincoln and Waldo Counties (Central Maine Coast) Area	Maintenance
ME	Portland Area	Maintenance
MI	Allegan County Area	Maintenance
MI	Benton Harbor Area	Maintenance
MI	Benzie County Area	Maintenance
MI	Cass County Area	Maintenance
MI	Detroit-Ann Arbor Area	Maintenance
MI	Flint Area	Maintenance
MI	Grand Rapids Area	Maintenance
MI	Huron County Area	Maintenance
MI	Kalamazoo-Battle Creek Area	Maintenance
MI	Lansing-East Lansing Area	Maintenance
MI	Mason County Area	Maintenance
MI	Muskegon Area	Maintenance
MO-IL	St. Louis Area	Maintenance*
NC-SC	Charlotte-Gastonia-Rock Hill Area	Maintenance*
NC	Haywood and Swain Counties (Great Smoky NP) Area	Maintenance
NC	Raleigh-Durham-Chapel Hill Area	Maintenance
NC	Rocky Mount Area	Maintenance

State	1997 Ozone NAAQS Area Name	1997 Ozone NAAQS Status
NV	Las Vegas	Maintenance
OH	Canton-Massillon Area	Maintenance
OH	Cincinnati-Hamilton Area	Maintenance*
OH	Dayton-Springfield Area	Maintenance
OH	Lima Area	Maintenance
OH	Toledo Area	Maintenance
OH-PA	Youngstown-Warren-Sharon Area	Maintenance
OH-WV	Steubenville-Weirton Area	Maintenance
PA	Altoona Area	Maintenance
PA	Clearfield and Indiana Counties Area	Maintenance
PA	Erie Area	Maintenance
PA	Franklin County Area	Maintenance
PA	Greene County Area (PA)	Maintenance
PA	Harrisburg-Lebanon-Carlisle Area	Maintenance
PA	Johnstown Area	Maintenance
PA	Scranton-Wilkes-Barre Area	Maintenance
PA	State College Area	Maintenance
PA	Tioga County Area	Maintenance
PA	York Area	Maintenance
TN-KY	Clarksville-Hopkinsville Area	Maintenance
TN	Knoxville Area	Maintenance*
TX	Beaumont-Port Arthur Area	Maintenance
VA	Fredericksburg Area	Maintenance
VA	Madison and Page Counties (Shenandoah NP) Area	Maintenance
VA	Norfolk-Virginia Beach-Newport News (Hampton Roads) Area	Maintenance
VA	Richmond-Petersburg Area	Maintenance
WI	Door County Area	Maintenance
WI	Kewaunee County Area	Maintenance
WI	Manitowoc County Area	Maintenance
WI	Milwaukee-Racine Area	Maintenance
WV	Charleston Area	Maintenance
WV-KY-OH	Huntington-Ashland Area	Maintenance
WV-OH	Parkersburg-Marietta Area	Maintenance
WV-OH	Wheeling Area	Maintenance
CA	Sutter County (part) (Sutter Buttes)	Nonattainment
MA	Springfield (W. Mass) Area	Nonattainment
NY	Albany-Schenectady-Troy	Nonattainment
NY	Buffalo-Niagara Falls	Nonattainment
NY	Essex County (Whiteface Mtn.)	Nonattainment

State	1997 Ozone NAAQS Area Name	1997 Ozone NAAQS Status
NY	Jefferson County Area	Nonattainment
NY	Poughkeepsie Area	Nonattainment
NY	Rochester	Nonattainment
RI	Providence (all of RI) Area	Nonattainment

* The 2008 ozone NAAQS nonattainment area did not include all portions of the 1997 ozone NAAQS area. Thus, the remaining portion of the 1997 ozone NAAQS area should be addressed in a second maintenance plan.

Appendix B

Limited Maintenance Plan Option for Moderate PM10 Nonattainment Areas. August 9, 2001

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

AUG 09 2001

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

MEMORANDUM

SUBJECT: Limited Maintenance Plan Option for Moderate PM_{10} Nonattainment Areas

FROM: for John O. Edwardson
Lydia Wegman, Director
AQSSD (MD-15)

TO: Director, Office of Ecosystem Protection, Region I
Director, Division of Environmental Planning & Protection, Region II
Director, Air Protection Division, Region III
Director, Air, Pesticides & Toxics Management Division, Region IV
Director, Air and Radiation Division, Region V
Director, Air Pesticides & Toxics, Region VI
Director, Air and Toxics Division, Regions VII, IX
Director, Air Program, Region VIII
Director, Office of Air Quality, Region X

I. What is a Limited Maintenance Plan?

This memorandum sets forth new guidance[1] on maintenance plan submissions for certain moderate particulate matter (PM_{10}) nonattainment areas seeking redesignation to attainment (see section IV for further details on qualifying for the policy). If the area meets the criteria listed in this policy the State may submit a maintenance plan at the time it is requesting redesignation that is more streamlined than would ordinarily be permitted. This new option is being termed a limited maintenance plan (LMP)[2].

II. Why is there a need for a limited maintenance plan policy?

Before the U.S. Court of Appeals for the District of Columbia handed down its decision vacating the 1997 PM_{10} national ambient air quality standards (NAAQS)(see American Trucking Associations, et al. v. Environmental Protection Agency (EPA), 175 F.3d 1027 (D.C. Cir. 1999),

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[1] This memorandum is intended to provide EPA's preliminary views on how certain moderate PM10 nonattainment areas may qualify to submit a maintenance plan that meets certain limited requirements. Since it represents only the Agency's preliminary thinking that is subject to modification, this guidance is not binding on States, Tribes, the public, or EPA. Issues concerning the applicability of the limited maintenance plan policy will be addressed in actions to redesignate moderate PM10 nonattainment areas under § 107 of the CAA. It is only when EPA promulgates redesignations applying this policy that those determinations will become binding on States, Tribes, the public, and EPA as a matter of law.

[2] Moderate PM_{10} areas that do not meet the applicability criteria of this policy, and all serious PM_{10} nonattainment areas, should submit maintenance plans that meet our guidance for submission of a full maintenance plan as described in the September 4, 1992 memorandum, "Procedures for Processing Requests to Redesignate Areas to Attainment," from John Calcagni, former Director of the Office of Air Quality Planning and Standards (OAQPS) Air Quality management Division to the Regional Air Division Directors (hereafter known as the Calcagni Memo).

we were prepared to make case-by-case determinations that would make the 1987 PM_{10} NAAQS no longer applicable in any area meeting the standards. In taking actions to remove the applicability of the 1987 NAAQS, we would have removed, as well, the nonattainment designation and Clean Air Act (CAA) part D requirements from qualifying areas. As a result of the D.C. Circuit's decision, for areas subject to the 1987 NAAQS, the only route to recognized attainment of the NAAQS and removal of nonattainment status and requirements is formal redesignation to attainment, including submittal of a maintenance plan. Since many areas have been meeting the PM_{10} NAAQS for 5 years or more and have a low risk of future exceedances, we believe a policy that would allow both the States and EPA to redesignate speedily areas that are at little risk of PM_{10} violations would be useful.

III. <u>How did EPA develop the approach used in the LMP option?</u>

The EPA has studied PM_{10} air quality data information for the entire country over the past eleven years (1989-1999) and has determined that some moderate PM_{10} nonattainment areas have had a history of low PM10 design values with very little inter-annual variation. When we looked at all the monitoring sites reporting data for those years, the data indicate that most of the average design values fall below 2 levels, 98 :g/m^3 for the 24-hr PM_{10} NAAQS and 40 :g/m^3 for the annual PM_{10} NAAQS. For most monitoring sites these levels are also below their individual site-specific critical design values (CDV). The CDV is an indicator of the likelihood of future violations of the NAAQS given the current average design value and its variability. The CDV is the highest average design value an area could have before it may experience a future exceedance of the NAAQS with a certain probability. A detailed explanation of the CDV is found in Attachment A[3] to this policy which, because of its length, is a separate document accompanying this memorandum.

We believe that the very small amount of variation between the peaks and means in most of the data indicates a very stable relationship that can be reasonably expected to continue in the future absent any significant changes in emissions. The period we assessed provides a fairly long historical record and the data could therefore be expected to have been affected by a full range of meteorological conditions over the period. Therefore, the amount of emissions should be the only variable that could affect the stability in the air quality data. We believe we can reliably make estimates about the future variability of PM_{10} concentrations across the country based on our statistical analysis of this data record, especially in areas where the amount of emissions is not expected to change.

IV. <u>How do I qualify for the LMP option ?</u>

To qualify for the limited maintenance plan option, an area should meet the following applicability criteria. The area should be attaining the NAAQS and the average PM_{10} design

[3] Dr. Shao-Hang Chu's paper entitled "Critical Design Value and Its Applications" explains the CDV approach and is included in its entirety in Attachment A. This paper has been accepted for publication and presentation at the 94th Air and Waste Management Association (A&WMA) Annual Conference in June 2001 in Orlando, Florida.

value[4] for the area, based upon the most recent 5 years of air quality data at all monitors in the area, should be at or below 40 :g/m^3 for the annual and 98 :g/m^3 for the 24-hr PM_{10} NAAQS with no violations at any monitor in the nonattainment area[5]. If an area cannot meet this test it may still be able to qualify for the LMP option if the average design values of the site are less than their respective site-specific CDV.

We believe it is appropriate to offer this second method of qualifying for the LMP because, based on the air quality data we have studied, we believe there are some monitoring sites with average design values above 40 :g/m^3 or 98 :g/m^3, depending on the NAAQS in question, that have experienced little variability in the data over the years. When the CDV calculation was performed for these sites we discovered that their average design values are less than their CDVs, indicating that the areas have a very low probability (1 in 10) of exceeding the NAAQS in the future. We believe it is appropriate to provide these areas the opportunity to qualify for the LMP in this circumstance since the 40 :g/m^3 or 98 :g/m^3 criteria are based on a national analysis and don't take into account each local situation.

The final criterion is related to mobile source emissions. The area should expect only limited growth in on-road motor vehicle PM_{10} emissions (including fugitive dust) and should have passed a motor vehicle regional emissions analysis test. It is important to consider the impact of future transportation growth in the LMP, since the level of PM-10 emissions (especially from fugitive dust) is related to the level of growth in vehicle miles traveled (VMT). Attachment B (below) should be used for making the motor vehicle regional emissions analysis demonstration.

If the State determines that the area in question meets the above criteria, it may select the LMP option for the first 10 year maintenance period. Any area that does not meet these criteria should plan to submit a full maintenance plan that is consistent with our guidance in the Calcagni Memo in order to be redesignated to attainment. If the LMP option is selected, the State should continue to meet the qualifying criteria until EPA has redesignated the area to attainment. If an area no longer qualifies for the LMP option because a change in air quality affects the average design values before the redesignation takes effect, the area will be expected to submit a full maintenance plan.

Once an area selects the LMP option and it is in effect, the State will be expected to recalculate the average design value for the area annually and determine if the criteria used to qualify for the LMP will still be met. If, after performing the annual recalculation of the area's average design value in a given year, the State determines that the area no longer qualifies for the LMP, the State should take action to attempt to reduce PM_{10} concentrations enough to requalify for the LMP. One possible approach the State could take is to implement a contingency measure

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[4]The methods for calculating design values for PM_{10} are presented in a document entitled the "PM_{10} SIP Development Guideline", EPA-450/2-86-001, June 1987. The State should determine the most appropriate method to use from this Guideline in consultation with the appropriate EPA Regional office staff.

[5]If the EPA determines that the meteorology was not representative during the most recent five-year period, we may reject the State's request to use the LMP option and request, instead, submission of a full maintenance demonstration.

or measures found in its SIP. If, in the next annual recalculation the State is able to re-qualify for the LMP, then the LMP will go back into effect. If the attempt to reduce PM_{10} concentrations fails, or if it succeeds but in future years it becomes necessary again to address increasing PM_{10} concentrations in the area, that area no longer qualifies for the LMP. We believe that repeated increases in PM_{10} concentrations indicate that the initial conditions that govern air quality and that were relied on to determine the area's qualification for the LMP have changed, and that maintenance of the NAAQS can no longer be assumed. Therefore, the LMP cannot be reinstated by further recalculations of the design values at this point. Once the LMP is determined to no longer be in effect, a full maintenance plan should be developed and submitted within 18 months of the determination.

Treatment of data used to calculate the design values.

Flagged Particulate Matter Data:

Three policies allow PM-10 data to be flagged for special consideration:

- Exceptional Events Policy (1986) for data affected by infrequent events such as industrial accidents or structural fires near a monitoring site;
- Natural Events Policy (1996) for data affected by wildfires, high winds, and volcanic and seismic activities, and;
- Interim Air Quality Policy on Wildland and Prescribed Fires for data affected by wildland fires that are managed to achieve resource benefits.

We will treat data affected by these events consistently with these previously-issued policies. We expect States to consider all data (unflagged and flagged) when determining the design value. The EPA Regional offices will work with the State to determine the validity of flagged data. Flagged data may be excluded on a case-by-case basis depending on State documentation of the circumstances justifying flags. Data flagged as affected by exceptional or natural events will generally not be used when determining the design value. However, in order for data affected by a natural event to be excluded, an adequate Natural Events Action Plan is required as described in the Natural Events policy.

Data flagged as affected by wildland and prescribed fires will be used in determining the design value. If the State is addressing wildland and prescribed fire use with the application of smoke management programs, the State may submit an LMP if the design value is too high only as a result of the fire-affected data.

We are in the process of developing a policy to address agricultural burning. When it is finalized we will amend the LMP option to account

for the new policy.

V. What should an LMP consist of?

Under the LMP, we will continue to satisfy the requirements of Section 107(d)(3)(E) of the Act which provides that a nonattainment area can be redesignated to attainment only if the following criteria are met:

1. The EPA has determined that the NAAQS for the applicable pollutant has been attained.
2. The EPA has fully approved the applicable implementation plan under section 110(k).
3. The EPA has determined that the improvement in air quality is due to permanent and enforceable reductions in emissions.
4. The State has met all applicable requirements for the area under section 110 and part D.
5. The EPA has fully approved a maintenance plan, including a contingency plan, for the area under section 175A.

However, there are some differences between what our previous guidance (the Calcagni memo) recommends that States include in a maintenance plan submission and what we are recommending under this policy for areas that qualify for the LMP. The most important difference is that under the LMP the demonstration of maintenance is presumed to be satisfied. The following is a list of core provisions which should be included in an LMP submission. Note that any final EPA determination regarding the adequacy of an LMP will be made following review of the plan submitted in light of the particular circumstances facing the area proposed for redesignation and based upon all available information.

a. Attainment Plan

The State's approved attainment plan should include an emissions inventory (attainment inventory) which can be used to demonstrate attainment of the NAAQS. The inventory should represent emissions during the same five-year period associated with the air quality data used to determine whether the area meets the applicability requirements of this policy (i.e., the most recent five years of air quality data). If the attainment inventory year is not one of the most recent five years, but the State can show that the attainment inventory did not change significantly during that five-year period, it may still be used to satisfy the policy. If the attainment inventory is determined to not be representative of the most recent 5 years, a new inventory must be developed. The State should review its inventory every three years to ensure emissions growth is incorporated in the attainment inventory if necessary.

b. Maintenance Demonstration

The maintenance demonstration requirement of the Act will be considered to be satisfied for the moderate PM_{10} nonattainment areas meeting the air quality criteria discussed above. If

the tests described in Section IV are met, we will treat that as a demonstration that the area will maintain the NAAQS. Consequently, there is no need to project emissions over the maintenance period.

c. Important elements that should be contained within the redesignation request

1. Monitoring Network Verification of Continued Attainment

To verify the attainment status of the area over the maintenance period, the maintenance plan should contain a provision to assure continued operation of an appropriate, EPA-approved air quality monitoring network, in accordance with 40 CFR part 58. This is particularly important for areas using an LMP because there will be no cap on emissions.

2. Contingency Plan

Section 175A of the Act states that a maintenance plan must include contingency provisions, as necessary, to promptly correct any violation of the NAAQS which may occur after redesignation of the area to attainment. These contingency measures do not have to be fully adopted at the time of redesignation. However, the contingency plan is considered to be an enforceable part of the SIP and the State should ensure that the contingency measures are adopted as soon as possible once they are triggered by a specific event. The contingency plan should identify the measures to be adopted, and provide a schedule and procedure for adoption and implementation of the measures if they are required. Normally, the implementation of contingency measures is triggered by a violation of the NAAQS but the State may wish to establish other triggers to prevent a violation of the NAAQS, such as an exceedance of the NAAQS.

3. Approved attainment plan and section 110 and part D CAA requirements:

In accordance with the CAA, areas seeking to be redesignated to attainment under the LMP policy must have an attainment plan that has been approved by EPA, pursuant to section 107(d)(3)(E). The plan must include all control measures that were relied on by the State to demonstrate attainment of the NAAQS. The State must also ensure that the CAA requirements for PM_{10} pursuant to section 110 and part D of the Act have been satisfied. To comply with the statute, the LMP should clearly indicate that all controls that were relied on to demonstrate attainment will remain in place. If a State wishes to roll back or eliminate controls, the area can no longer qualify for the LMP and the area will become subject to full maintenance plan requirements within 18 months of the determination that the LMP is no longer in effect.

V. How is Conformity treated under the LMP option?

The transportation conformity rule (40 CFR parts 51 and 93) and the general conformity rule (58 FR 63214; November 30, 1993) apply to nonattainment areas and maintenance areas operating under maintenance plans. Under either conformity rule one means of demonstrating conformity of Federal actions is to indicate that expected emissions from planned actions are consistent with the emissions budget for the area. Emissions budgets in LMP areas may be treated as essentially not constraining for the length of the maintenance period because it is unreasonable to expect that an area satisfying the LMP criteria will experience so much growth during that period of time such that a violation of the PM_{10} NAAQS would result. While this policy does not exempt an area from the need to affirm conformity, it does allow the area to demonstrate conformity without undertaking certain requirements of these rules. For transportation conformity purposes, EPA would be concluding that emissions in these areas need not be capped for the maintenance period, and, therefore, a regional emissions analysis would not be required. Similarly, Federal actions subject to the general conformity rule could be considered to satisfy the "budget test" specified in section 93.158 (a)(5)(i)(A) of the rule, for the same reasons that the budgets are essentially considered to be unlimited.

EPA approval of an LMP will provide that if the LMP criteria are no longer satisfied and a full maintenance plan must be developed to meet CAA requirements (see Calcagni Memo referenced in footnote #2 for full maintenance plan guidance), the approval of the LMP would remain applicable for conformity purposes only until the full maintenance plan is submitted and EPA has found its motor vehicle emissions budgets adequate for conformity purposes under 40 CFR parts 51 and 93. EPA will condition its approval of all LMPs in this fashion because in the case where the LMP criteria are not met and a full maintenance plan is required EPA believes that LMPs would no longer be an appropriate mechanism for assuring maintenance of the standards.

For further information concerning the LMP option for moderate PM_{10} areas please

contact Gary Blais at (919) 541-3223, or for questions about the CDV approach contact Dr. Shao-Hang Chu at (919) 541-5382. For information concerning transportation conformity requirements, please contact Meg Patulski of the Office of Transportation and Air Quality at (734) 214-4842.

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ATTACHMENT B:
MOTOR VEHICLE REGIONAL ANALYSIS METHODOLOGY

The following methodology is used to determine whether increased emissions from on-road mobile sources could, in the next 10 years, increase concentrations in the area and threaten the assumption of maintenance that underlies the LMP policy. This analysis must be submitted and approved in order to be eligible for the LMP option.

The following equation should be used:

$DV + (VMT_{pi} \times DV_{mv})$ # MOS

Where:

DV	=	the area's design value based on the most recent 5 years of quality assured data in :g/m^3
VMT_{pi}	=	the projected % increase in vehicle miles traveled (VMT) over the next 10 years
DV_{mv}	=	motor vehicle design value based on on-road mobile portion of the attainment year inventory in :g/m^3
MOS	=	margin of safety for the relevant PM-10 standard for a given area: 40 :g/m^3 for the annual standard or 98 :g/m^3 for the 24-hour standard

Please note that DV_{mv} is derived by multiplying DV by the percentage of the attainment year inventory represented by on-road mobile sources. This variable should be based on both primary and secondary PM_{10} emissions of the on-road mobile portion of the attainment year inventory, including re-entrained road dust.

States should consult with EPA regarding the three inputs used in the above calculation, and all EPA comments and concerns regarding inputs and results should be addressed prior to submitting a limited maintenance plan and redesignation request.

The VMT growth rate (VMT_{pi}) should be calculated through the following methods:

1) an extrapolation of the most recent 10 years of Highway Performance Monitoring System (HPMS) data over the 10-year period to be addressed by the limited maintenance plan; and

2) a projection of VMT over the 10-year period that would be covered by the limited maintenance plan, using whatever method is in practice in the area (if different than #1).

Areas where method #1 is the current practice for calculating VMT do not also have to do calculation #2, although this is encouraged. All other areas should use methods #1 and #2, and VMT_{pi} is whichever growth rate produced by methods #1 and #2 is highest. Areas will be expected to use transportation models for method #2, if transportation models are available.

Areas without transportation models should use reasonable professional practice.

Examples

1. DV = 80 :g/m^3
   VMT_{pi} = 36%
   DV_{mv} = 30 :g/m^3
   MOS = 98 :g/m^3 for 24-hour PM-10 standard

   80 + (.36 * 30) = 91

   Less than 98 – Area passes regional analysis criterion.

2. DV = 35 :g/m^3
   VMT_{pi} = 25%
   DV_{mv} = 6 :g/m^3
   MOS = 40 :g/m^3 for annual PM-10 standard

   35 + (.25 * 6) = 37

   Less than 40 – Area passes regional analysis criterion.

3. DV = 115 :g/m^3
   VMT_{pi} = 25%
   DV_{mv} = 60 :g/m^3
   MOS = 98 :g/m^3 for 24-hour PM-10 standard

   115 + (.25 * 60) = 130

   More than 98 – Area does not pass criterion. Full section 175A maintenance plan required.

Appendix C

On-Road Mobile Source Emissions Inventory
1997 8-Hour Ozone Maintenance Plan
West Virginia Portion of the Huntington-Ashland, WV-KY Area

On-Road Mobile Source Emissions Inventory

1997 8-Hour Ozone Maintenance Plan
West Virginia Portion of the Huntington-Ashland, WV-KY Area

Prepared For:

Division of Air Quality
West Virginia Department of Environmental Protection

Prepared By:

Michael Baker International

October 2018

Overview

This document provides the on-road (highway) mobile source emissions inventory for the West Virginia portion of the *Huntington-Ashland, WV-KY* ozone maintenance area under the 1997 8-hour ozone National Ambient Air Quality Standard (NAAQS). The maintenance area includes:

- Cabell County, WV
- Wayne County, WV

To meet emission inventory requirements of section 172(c)(3) of the Clean Air Act, a regional mobile source highway inventory has been prepared for VOC and NOx emissions. Emissions are estimated for a summer weekday for the 2018, 2025 and 2030 analysis years.

This document includes a summary of the methodology and data assumptions used for the analysis, which are consistent with the recent transportation conformity determination conducted for the region. As shown in **Exhibit 1**, attachments containing additional detail have been provided with the document.

EXHIBIT 1: SUMMARY OF ATTACHMENTS

Attachment	Title	Description
A	Detailed Emission Results	Provides a detailed summary of VOC and NOx emissions by roadway type, source type and emission process for 2018, 2025 and 2030.
B	Air Quality Interagency Consultation and Data Checklist	Provides consultation meeting minutes and an air quality data checklist
C	MOVES Sample Run Specification	Provides example MOVES data importer (XML) and run specification (MRS) files.

Emissions Inventory

A summary of the motor vehicle emissions for the West Virginia portion of the *Huntington-Ashland, WV-KY* maintenance area is provided in **Exhibit 2**. The emission estimates for all pollutants have been developed using the MOVES2014a emission model and latest planning assumptions. Emissions have been estimated for the 2018, 2025 and 2030 analysis years.

EXHIBIT 2: MOTOR VEHICLE EMISSIONS USING MOVES2014A
(*Short Tons/Day*)

	2018 Budget		*2018*		*2025*		*2030*	
Area	*VOC*	*NOx*	*VOC*	*NOx*	*VOC*	*NOx*	*VOC*	*NOx*
Cabell County			*1.40*	*2.60*	*0.90*	*1.40*	*0.60*	*0.96*
Wayne County			*0.52*	*1.24*	*0.33*	*0.63*	*0.22*	*0.44*
Total	***6.6***	***13.5***	***1.91***	***3.84***	***1.23***	***2.03***	***0.82***	***1.40***

Analysis Methodology and Data

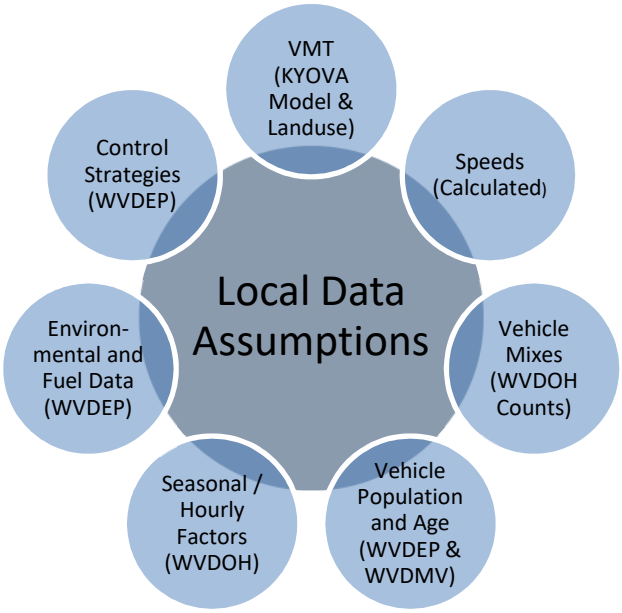
This mobile source emissions inventory was conducted using MOVES, EPA's official model for estimating emissions from highway vehicles for SIP emission inventories and transportation conformity (75 FR 9411), effective March 2, 2010. MOVES2014a is the latest approved model version for SIP and transportation conformity purposes (79 FR 60343).

Planning assumptions are updated following EPA and FHWA joint guidance (EPA420-B-08-901) that clarifies the implementation of the latest planning assumption requirements in 40 CFR 92.110. This analysis utilizes the latest available traffic, vehicle fleet and environmental data to estimate regional highway emissions. The analysis methodology and data inputs for this analysis were developed through interagency consultation and used available EPA guidance documents that included:

- *Policy Guidance on the Use of MOVES2014 for State Implementation Plan Development, Transportation Conformity, and Other Purposes*, US EPA Office of Air and Radiation, EPA-420-B-14-008, July 2014.
- *MOVES2014 and MOVES2014a Technical Guidance: Using MOVES to Prepare Emission Inventories in State Implementation Plans and Transportation Conformity.* US EPA Office of Air and Radiation, and Office of Transportation and Air Quality, EPA-420-B-15-093, November 2015.
- *MOVES2014a User Guide*, US EPA Office of Transportation and Air Quality, EPA-420-B-15-095, November 2015.

A mix of local and national default (internal to MOVES) data is used in the analysis. As illustrated in **Exhibit 3**, local data has been used for data items that have a significant impact on emissions, including: vehicle miles of travel (VMT), vehicle population, congested speeds, and vehicle type mix, as well as environmental and fuel assumptions.

EXHIBIT 3: LOCAL DATA INPUTS USED FOR CONFORMITY RUNS



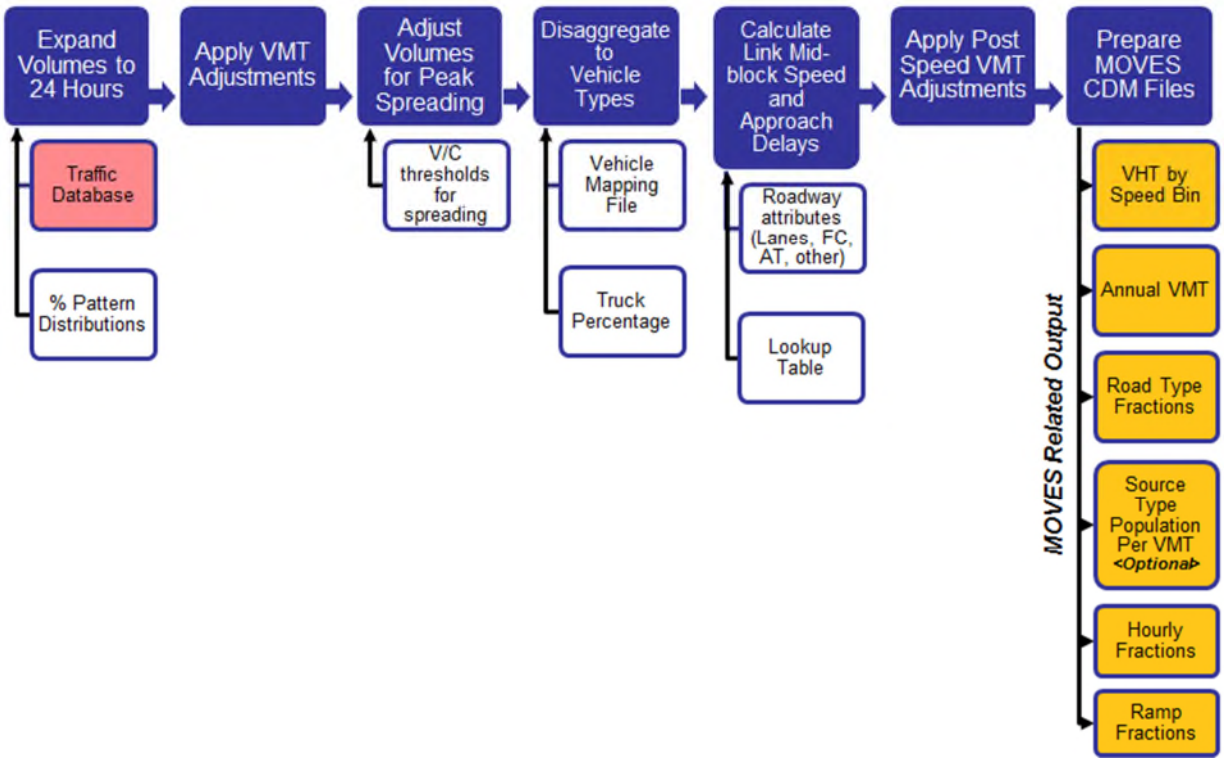
Local data inputs to the analysis process reflect the latest available planning assumptions using information obtained from the WVDOH, WVDEP, KYOVA and other local/national sources.

The methodology used for this analysis is consistent with resources used for past transportation conformity determinations. This includes the use of the regional travel demand model and custom post-processing software (PPSUITE) to calculate hourly speeds and prepare key traffic input files to the MOVES2014a emission model. PPSUITE consists of a set of programs that perform the following functions:

- Analyzes highway operating conditions.
- Calculates highway speeds.
- Compiles VMT and vehicle type mix data.
- Prepares MOVES runs and processes MOVES outputs.

PPSUITE is a widely used and accepted tool for estimating speeds and processing emissions rates. The PPSUITE tool has been used for developing on-highway mobile source inventories in SIP revisions, control strategy analyses, and conformity analyses in other states. The software was developed to utilize accepted transportation engineering methodologies. The PPSUITE process is integral to producing traffic-related input files to the MOVES emission model. **Exhibit 4** summarizes the key functions of PPSUITE within the emission calculation process. Other MOVES input files are prepared externally to the PPSUITE software, including vehicle population, vehicle age, environmental and fuel input files.

EXHIBIT 4: EMISSION CALCULATION PROCESS



The CENTRAL software is also used in this analysis. CENTRAL is a menu-driven software platform that executes the PPSUITE and MOVES processes in batch mode. The CENTRAL software allows users to

execute runs for a variety of input options and integrates custom MySQL steps into the process. CENTRAL provides important quality control and assurance steps, including file naming and storage automation.

Description of Emission Modeling Input Data and Sources

A large number of inputs to MOVES are needed to fully account for the numerous vehicle and environmental parameters that affect emissions. These inputs include traffic flow characteristics, vehicle descriptions, fuel parameters, I/M program parameters and environmental variables. The MOVES model includes a default national database of meteorology, vehicle fleet, vehicle activity, fuel and emission control program data for every county. However, EPA cannot certify that the default data is the most current or best available information for any specific area. As a result, local data, where available, is recommended for use when conducting a regional emissions inventory analysis. A mix of local and default data is used for this analysis. These data items are discussed in the following sections.

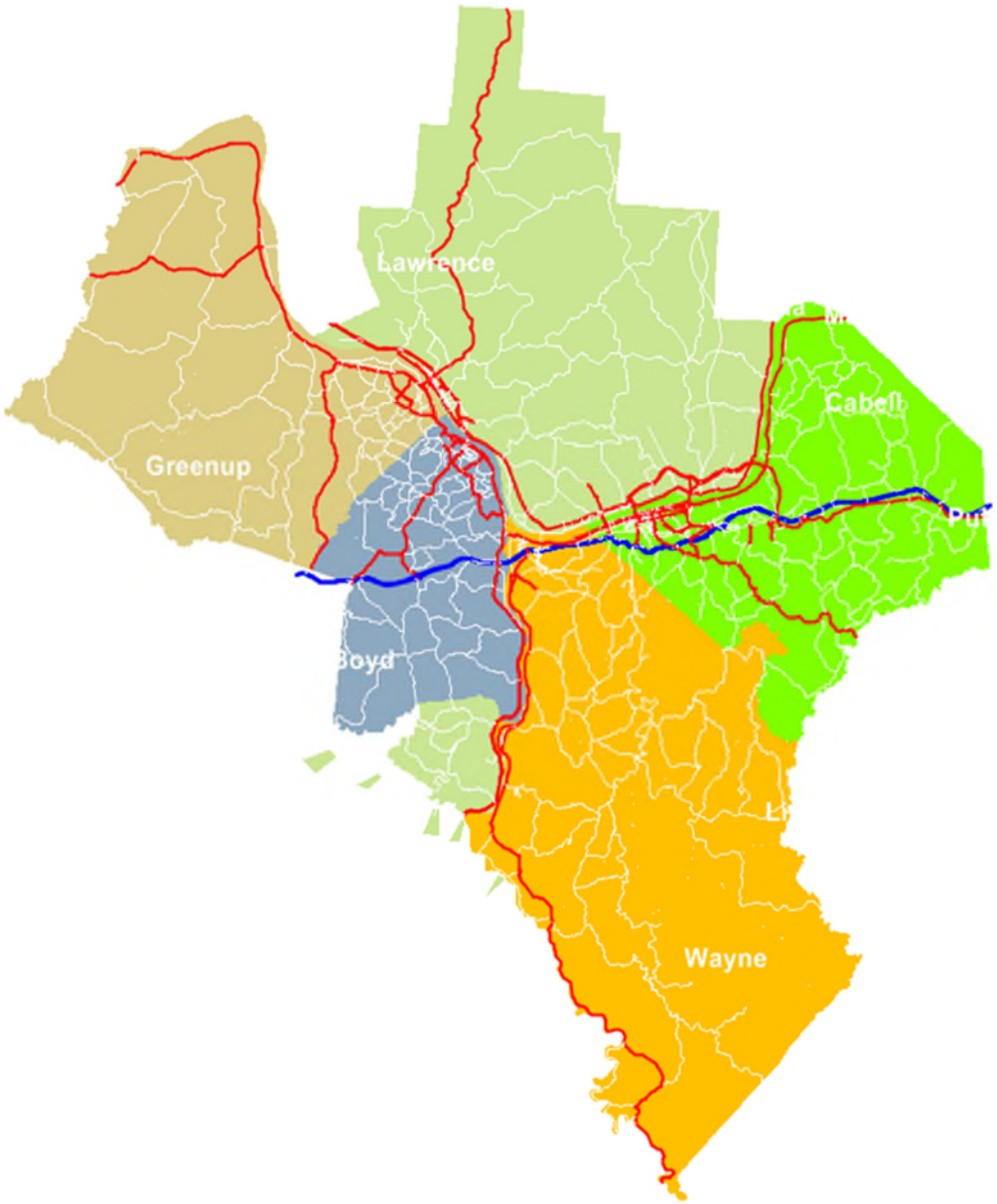
Roadway Data

The roadway data input to emissions calculations for this analysis is based on information from the KYOVA regional travel demand model. The travel model estimates roadway volumes based on input demographic forecasts and expected changes to the transportation roadway network. As part of the KYOVA 2040 Integrated Metropolitan Transportation Plan (MTP), the KYOVA travel demand model was updated to have a validated base year of 2015 and a horizon year of 2040. The enhanced travel demand model reflects the current socioeconomic and employment data and traffic count data. KYOVA has adopted a new software platform (TransCAD) for developing and running the travel demand model. This new software platform enables KYOVA to integrate and leverage the GIS capabilities of the region more seamlessly and permits application of a much broader range of modeling tools than previous version of the model.

The model, developed for a base year of 2015, represents a more recent snapshot of the roadway inventory and demographic characteristics for the KYOVA region. The KYOVA model boundary includes Lawrence county in Ohio, Cabell and Wayne counties in West Virginia, and Greenup, Boyd, and part of Lawrence counties in Kentucky. The model is calibrated to observed traffic flow data collected for 2015 and was used to forecast future traffic patterns and system deficiencies based on socioeconomic and employment projections and network characteristics for the future years. The model follows the basic "four-step" travel demand forecasting process of trip generation, trip distribution, mode split, and trip assignment. The model and validation results are documented in a July 31, 2017 technical report available from KYOVA.

Transportation network data, as illustrated in **Exhibit 5**, includes facility type, length, and speed limit for each of the highway links in the region. The networks are comprised of link segments representing freeways, principle arterials, minor arterials, and collectors within the nonattainment region. Links in the network are coded with attributes that portray individual roadway segment capacities and travel speeds. For the horizon years, projects from the MTP are coded onto the networks by adding links for new construction projects and adjusting the link capacities for projects that add lanes to existing roadways. The primary products of the model used in the air quality analysis are estimated volumes, link distances, free-flow speeds, and link capacities.

EXHIBIT 5: KYOVA REGIONAL TRAVEL DEMAND MODEL



Socioeconomic Forecasts

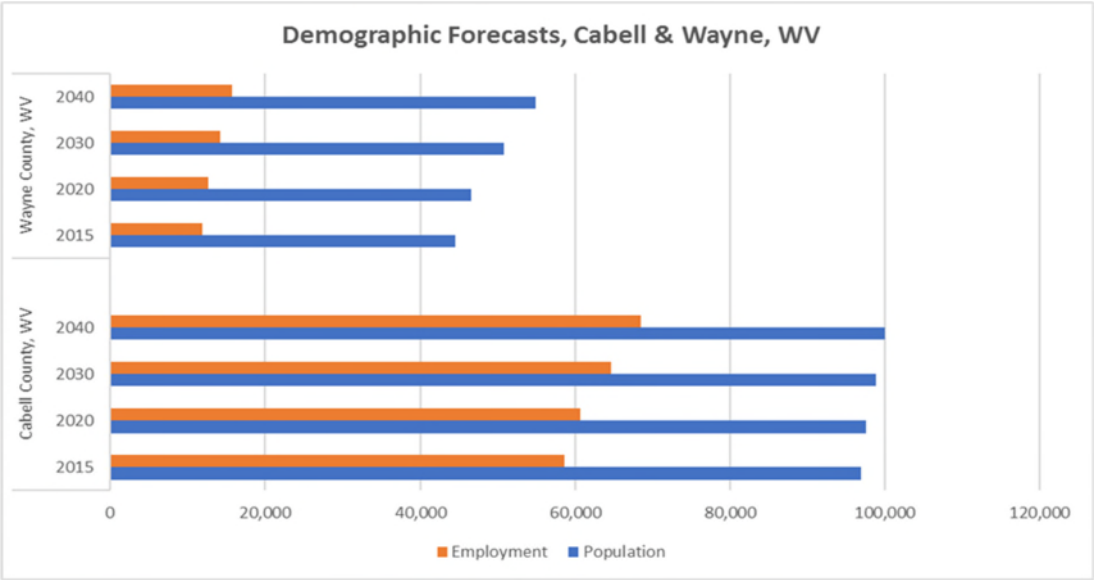
Forecast traffic volumes from the regional travel model are based on the socioeconomic inputs to the model. Socioeconomic data for the KYOVA model was obtained from several sources, including the U.S. Census, and InfoUSA (a commercial provider of employment data), and KYOVA staff forecasts. **Exhibit 6** summarizes the socioeconomic data for the counties in the regional travel model.

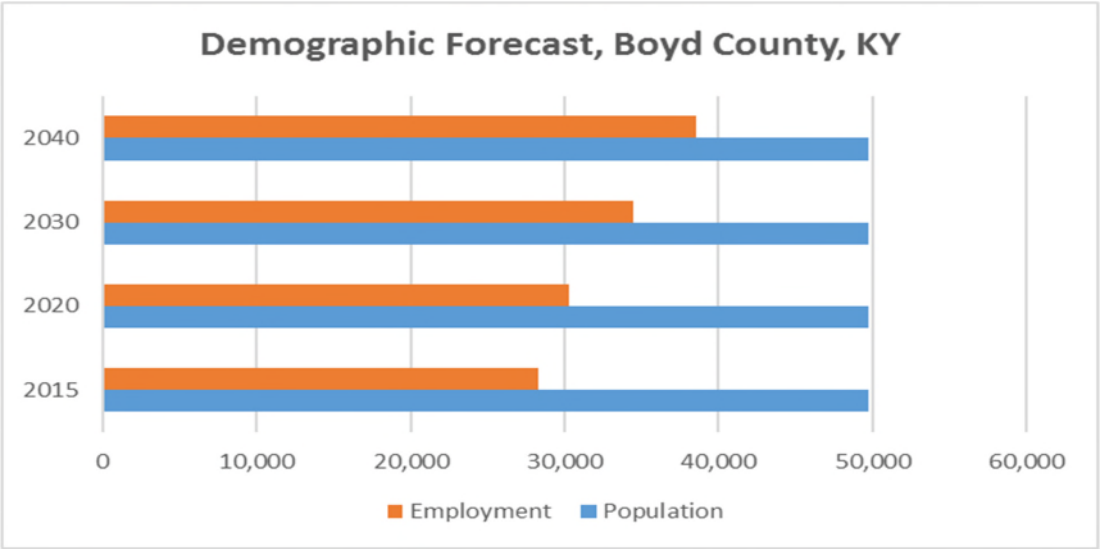
EXHIBIT 6: SOCIOECONOMIC GROWTH ASSUMPTIONS TO THE TRAVEL MODEL

County	Year	Population	Employment
Cabell County, WV	2015	96,937	58,644
	2020	97,549	60,622
	2030	98,779	64,582
	2040	100,003	68,542
Wayne County, WV	2015	44,556	11,868
	2020	46,627	12,641
	2030	50,767	14,185
	2040	54,911	15,729
Boyd County, KY	2015	49,715	28,252
	2020	49,715	30,320
	2030	49,715	34,442
	2040	49,715	38,581

Exhibit 7 illustrates the socioeconomic trends in the model region. The two West Virginia counties are forecasted to have higher population and employment in future. In contrast, population levels in Boyd County are anticipated to remain consistent over the life of the Metropolitan Transportation Plan, while employment levels are anticipated to increase.

EXHIBIT 7: SOCIOECONOMIC TRENDS





The travel model network and assigned traffic volumes are processed by the PPSUITE post processor to prepare the traffic inputs needed to the MOVES emission model. The following information is extracted from the model for emission calculations:

- lanes
- roadway capacity
- distance
- weekday traffic volume
- area type code
- facility class code

The lane values, capacities, area type, and facility class are important inputs for determining the congestion and speeds for individual highway segments. The PPSUITE processing software allows for many additional variables other than those available in the regional travel model. Using these variables improves the calculation of congested speeds. Such variables include information regarding free-flow speeds, traffic signal and control parameters, and volume-delay functions. This data is determined from lookup tables based on the model link's area type and facility class. Much of the lookup table data was developed from information contained in the Highway Capacity Manual.

Other Supporting Traffic Data

Other traffic data is used to adjust and disaggregate traffic volumes. Key sources used in these processes include the following:

- *Highway Performance Monitoring System (HPMS VMT)*: According to EPA guidance, baseline inventory VMT computed from the regional model must be adjusted to be consistent with HPMS VMT totals. The VMT contained in the HPMS reports are considered to represent average annual daily traffic (AADT), an average of all days in the year, including weekends and holidays. Adjustment factors were calculated for 2017 as part of the model's validation process. These factors are used to adjust locally modeled roadway data VMT to be consistent with the reported HPMS totals and are applied to all county and facility group combinations within the region. These adjustments are important for accounting for missing local roadway VMT that is not represented within the regional travel model.
- *Seasonal Factors*: The traffic volumes estimated from the regional travel demand model are adjusted to summer condition, using seasonal adjustment factors. July weekday seasonal factors were applied to the AADT for ozone analyses. Seasonal adjustment factors were obtained from the WVDOH. The factors are based on data processing of West Virginia's permanent traffic count stations. The seasonal factors are also used to develop the MOVES daily and monthly VMT fraction files, allowing MOVES to determine the portion of annual VMT that occurs in each month of the year.
- *Hourly Patterns*: Speeds and emissions vary considerably depending on the time of day. Therefore, it is important to estimate the pattern by which roadway volume varies by hour of the day. Pattern data is in the form of a percentage of the daily volumes for each hour. Distributions are provided for all the counties within the region and by each facility type grouping. This data was not directly available from WVDOH but was determined through an assessment of available data in other states. The same factors are also used to develop the MOVES hourly fraction file.

Vehicle Class Data

Emission rates within MOVES also vary significantly by vehicle type. The MOVES model produces emission rates for thirteen MOVES vehicle source input types. VMT, however, is input to MOVES by five HPMS vehicle groups (note that passenger cars and light trucks are grouped for input to MOVES2014a). **Exhibit 8** summarizes the distinction between each classification scheme.

EXHIBIT 8: MOVES SOURCE TYPES AND HPMS VEHICLE GROUPS

SOURCE TYPES		HPMS Class Groups	
11	Motorcycle	10	Motorcycle
21	Passenger Car	25	Passenger Car
31	Passenger Truck	25	Passenger/Light Truck
32	Light Commercial Truck	40	Buses
41	Intercity Bus	50	Single Unit Trucks
42	Transit Bus	60	Combination Trucks
43	School bus		
51	Refuse Truck		
52	Single Unit Short-haul Truck		
53	Single Unit Long-haul Truck		
54	Motor Home		
61	Combination Short-haul Truck		
62	Combination Long-haul Truck		

For this regional inventory, vehicle type pattern data was developed for each county and facility class combination based on WVDOH classification counts and internal MOVES defaults. As the first step, WVDOH truck count data was used to develop percentage splits of the total volume to the following vehicle groups: (1) autos and (2) heavy trucks and buses. MOVES default VMT by HPMS vehicle type (by county) were then used to split the vehicle groups (autos and trucks) into the HPMS vehicle classes needed by MOVES. The vehicle type percentages are also provided to the capacity analysis section of PPSUITE to adjust the speeds in response to trucks. That is, a given number of larger trucks take up more roadway space than a given number of cars, and this is accounted for in the speed estimation process by adjusting capacity using information from the Highway Capacity Manual.

Vehicle Ages

Vehicle age distributions are input to MOVES for each county by the thirteen source types. The distributions reflect the percentage of vehicles in the fleet up to 31 years old. The vehicle age distributions were prepared by WVDEP based on information obtained from West Virginia Division of Motor Vehicle (WVDMV) 2016 registration data. MOVES default values were used for source types 41, 42, 43, 51, 52, 53, 61, and 62, which includes all heavy trucks and buses.

Vehicle Population

The information on the vehicle fleet including the number and age of vehicles impacts forecasted start and evaporative emissions within MOVES. The MOVES model requires the population of vehicles by the thirteen source type categories. The vehicle population data was prepared by WVDEP for year 2016. Since regional population and households are not forecast to increase, the base year vehicle population data was also used for all future analysis years.

Environmental and Fuel Characteristics

Information on environmental, fuel, vehicle technology and other control strategy assumptions were determined based on a review of MOVES2014a default information and other available local data. MOVES2014a default temperature and humidity values as well as MOVES2014a default fuel assumptions were used for the region. Key fuel assumptions include:

- RVP=9.7 for E10 fuel; RVP=8.7 for E15 fuel.
- A 95.7% market share of E10 and a 4.3% market share of E15 in 2018.
- A 90.2% market share of E10 and a 9.8% market share of E15 in 2025.
- A 79.1% market share of E10 and a 20.9% market share of E15 in 2030.

Other Vehicle Technology and Control Strategies

West Virginia does not have a vehicle inspection maintenance program and there are no state vehicle technology strategies included in the highway emissions inventory. Current federal vehicle emissions control and fuel programs are incorporated into the MOVES2014a software. These include the National Program standards covering model year vehicles through 2025. Modifications of default emission rates are required to reflect the early implementation of the National Low Emission Vehicle Program (NLEV) program in West Virginia. To reflect these impacts, EPA has released instructions and input files that can be used to model these impacts. This inventory utilized the October 2014 version of the files (https://www.epa.gov/moves/tools-develop-or-convert-moves-inputs).

Analysis Process Details

The previous sections have summarized the input data used for computing speeds and emission rates for this analysis. This section explains how PPSUITE and MOVES use that input data to produce emission estimates. **Exhibit 9** provides a more detailed overview of the PPSUITE analysis procedure using the available traffic data information described in the previous section.

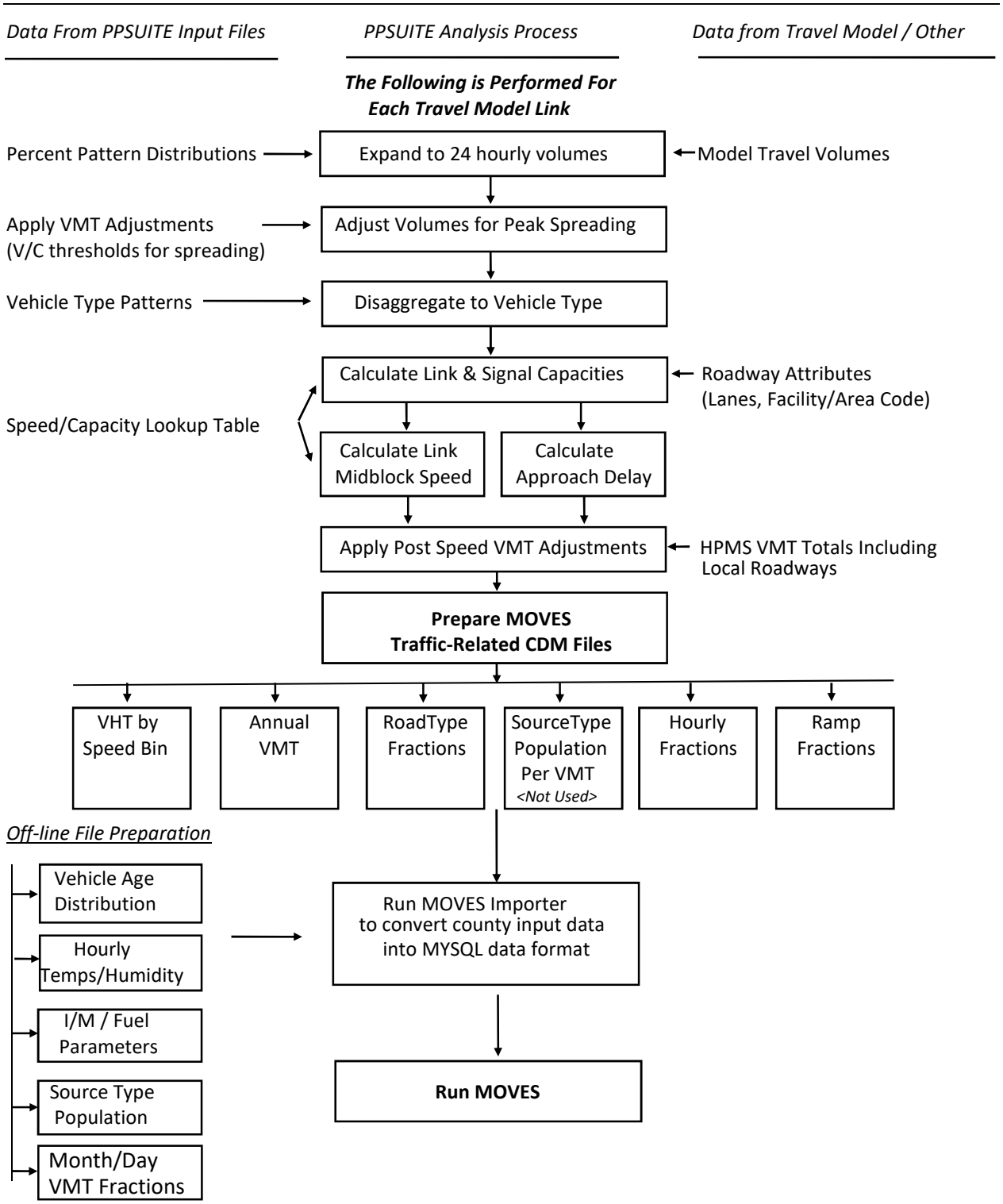
VMT Preparation

Producing an emissions inventory with PPSUITE requires a process of disaggregation and aggregation. Data is available and used on a very small scale – individual travel model roadway segments for each of the 24 hours of the day. This data needs to be processed individually to determine the distribution of vehicle hours of travel (VHT) by speed and then aggregated by vehicle class to determine the input VMT to the MOVES emission model. Key steps in the preparation of VMT include:

- *Assemble Travel Model Link VMT* - The KYOVA regional travel model contains the roadway links, distances and travel volumes needed to estimate VMT. The PPSUITE software processes each link by simply multiplying the assigned travel volume by the distance to obtain VMT.
- *Disaggregate to Hours* - The traffic volumes are distributed to each hour of the day. This allows for more accurate speed calculations (effects of congested hours) and allows PPSUITE to prepare the hourly VMT and speeds for input to MOVES.

- *Peak Spreading* - After dividing the daily volumes to each hour of the day, PPSUITE identifies hours that are unreasonably congested. For those hours, PPSUITE then spreads a portion of the volume to other hours within the same peak period, thereby approximating the "peak spreading" that normally occurs in such over-capacity conditions. This process also helps prevent hours with unreasonably congested speeds that may impact emission calculations.
- *Disaggregation to Vehicle Types* - EPA requires VMT estimates to be prepared by source type, reflecting specific local characteristics. The hourly volumes are disaggregated to the HPMS MOVES vehicle groupings based on WVDOH vehicle classification count data in combination with MOVES defaults as described in the previous section.
- *Apply HPMS VMT Adjustments* - Volumes must also be adjusted to account for differences with the HPMS VMT totals, as described previously. VMT adjustments are provided as input to PPSUITE and are applied to each of the roadway segment volumes. These adjustments were developed from reported HPMS VMT totals for 2017. The VMT adjustments are applied to all analysis year runs. The VMT added or subtracted to the travel model links assume the speeds calculated using the original volumes for each roadway segment for each hour of the day.
- *Apply Seasonal Adjustments* – PPSUITE adjusts the traffic volumes to the appropriate analysis season. These traffic volumes are assembled by PPSUITE and extrapolated over the course of a year to produce the annual VMT file input to MOVES.

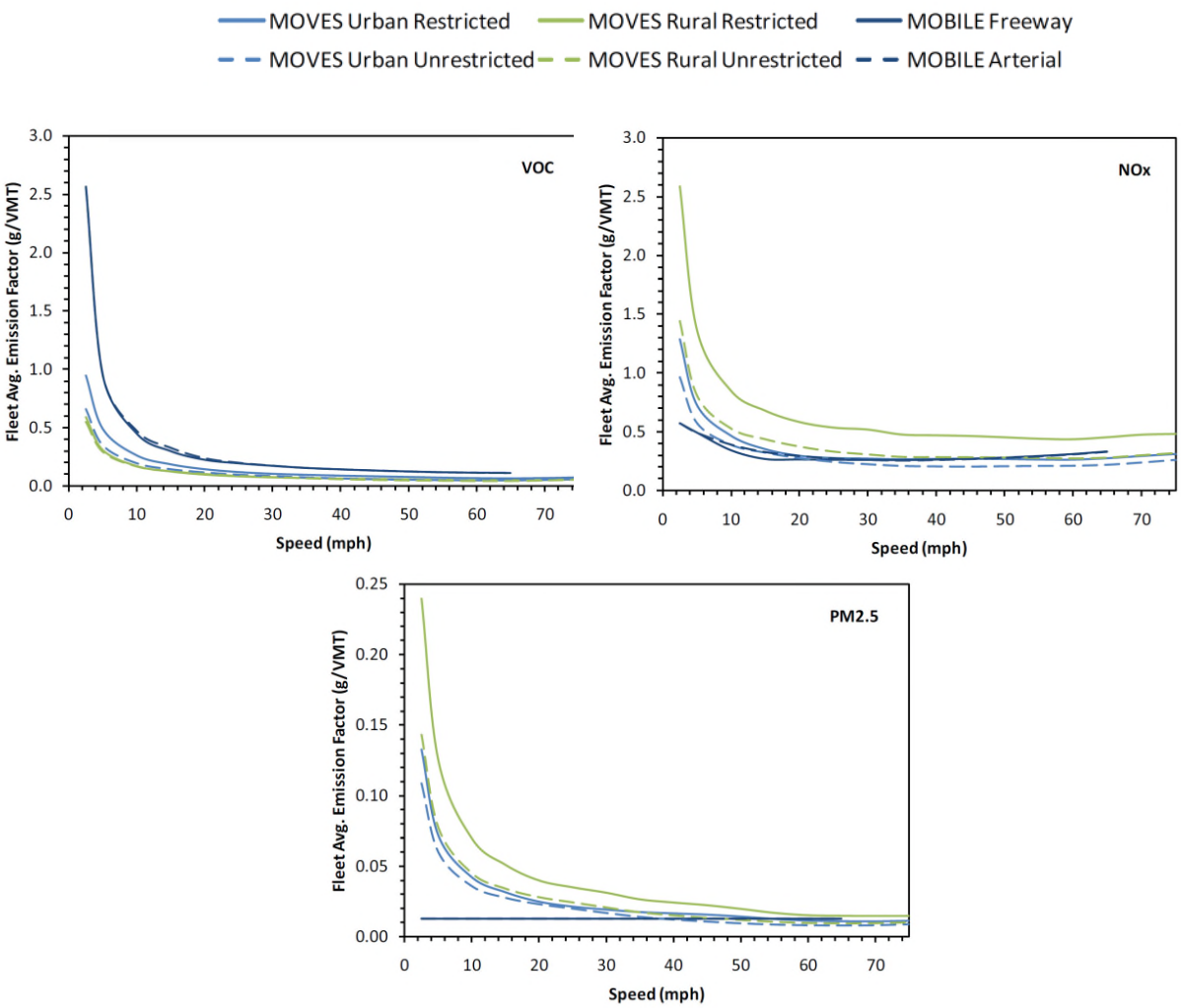
EXHIBIT 9: PPSUITE SPEED/EMISSION ESTIMATION PROCEDURE



Speed Estimation

Emissions for many pollutants (including VOC and NO_X) vary significantly with travel speed. VOC emissions generally decrease as speed increases, while NO_X emissions decrease at low speeds and increases at higher speeds, as illustrated in **Exhibit 10**. Because emissions are so sensitive to speed changes, EPA recommends special attention be given to developing reasonable and consistent speed estimates. EPA also recommends that VMT be disaggregated into subsets that have roughly equal speeds, with separate emission factors for each subset. At a minimum, speeds should be estimated separately by road type.

EXHIBIT 10: EMISSION FACTOR VS. SPEED VARIANCES (VOC, NOX, AND $PM_{2.5}$)



Source: Figure 3 from Implications of the MOVES2010 Model on Mobile Source Emission Estimates, Air & Waste Management Association, July 2010.

The computational framework used for this analysis meets and exceeds the recommendation above relating to speed estimates. Speeds are individually calculated for each roadway segment and hour. Rather than accumulating the roadway segments into a particular road type and calculating an average speed, each individual link hourly speed is represented in the MOVES vehicle hours of travel (VHT) by a

speed bin file. This MOVES input file allows the specification of a distribution of hourly speeds. For example, if 5% of a county's arterial VHT operates at 5 mph during the AM peak hour and the remaining 95% operates at 65 mph, this can be represented in the MOVES speed input file. For the roadway vehicle emissions calculations, speed distributions are input to MOVES by road type and source type for each hour of the day.

To calculate speeds, PPSUITE first obtains initial capacities (i.e., how much volume the roadway can serve before heavy congestion) and free-flow speeds (speeds assuming no congestion) from a speed/capacity lookup table. As described previously, this data contains default roadway information indexed by the area and facility type codes. For areas with known characteristics, values can be directly coded to the database and the speed/capacity default values can be overridden. For most areas where known information is unavailable, the speed/capacity lookup tables provide valuable default information regarding speeds, capacities, signal characteristics, and other capacity adjustment information used for calculating congested delays and speeds. The result of this process is an estimated average travel time for each hour of the day for each highway segment. The average travel time multiplied by traffic volume produces vehicle hours of travel (VHT).

Developing the MOVES Traffic Input Files

The PPSUITE software is responsible for producing the following MOVES input files during any analysis run: VMT by HPMS vehicle class; VHT by speed bin; Road type distributions; Hourly VMT fractions; and Ramp fractions. These files are text formatted files with a *.csv extension. The files are provided as inputs within the MOVES County Data Manager (CDM) and are described below:

- *VMT Input File*: VMT is the primary traffic input affecting emission results. The roadway segment distances and traffic volumes are used to prepare estimates of VMT. PPSUITE performs these calculations and outputs the MOVES annual VMT input file to the County Data Manager (CDM). The annual VMT is computed by multiplying the travel model adjusted VMT by 365 days (366 days in a leap year).
- *VHT by Speed Bin File*: As described in the previous section, the PPSUITE software prepares the MOVES VHT by speed bin file, which summarizes the distribution of speeds across all links into each of the 16 MOVES speed bins for each hour of the day by road type. This robust process is consistent with the methods and recommendations provided in EPA's technical guidance for the MOVES2014a model (http://www.epa.gov/otaq/models/moves/) and ensures that MOVES emission rates are used to the fullest extent.
- *Road Type Distributions*: Within MOVES, typical drive cycles and associated operating conditions vary by roadway type. The MOVES model defines five different roadway types as follows:

  1 Off-Network
  2 Rural Restricted Access
  3 Rural Unrestricted Access
  4 Urban Restricted Access
  5 Urban Unrestricted Access

For this analysis, the MOVES road type distribution file is automatically generated by PPSUITE using defined equivalencies. The off-network road type includes emissions from vehicle starts, extended idling, and evaporative emissions. Off-network activity in MOVES is primarily determined by the Source Type Population input.

- *Ramp Fractions*: The KYOVA regional travel model has separate facility classes (urban and rural) for ramps. As a result, PPSUITE assembles ramp VMT for these links and prepares the Ramp Fraction file for input to MOVES.

MOVES Runs

After computing speeds and aggregating VMT and VHT, PPSUITE prepares traffic-related inputs needed to run EPA's MOVES software. Additional required MOVES inputs are prepared externally from the processing software and include temperatures, I/M program parameters, fuel characteristics, vehicle fleet age distributions, and source type population. The MOVES county importer is run in batch mode. This program converts all data files into the MySQL format used by the MOVES model. At that point, a MOVES run specification file (*.mrs) is created which specifies options and key data locations for the run. The MOVES run is then executed in batch mode. A summary of key MOVES run specification settings is shown in **Exhibit 11**. MOVES can be executed using either an inventory or rate-based approach. For this analysis, MOVES is applied using the *inventory-based* approach. Using this approach, actual VMT and population are provided as inputs to the model; MOVES is responsible for producing the total emissions for the region.

EXHIBIT 11: MOVES RUN SPECIFICATION FILE PARAMETER SETTINGS

Parameter	Setting
MOVES Default Database Version	MOVES2014a - 11/17/2017
Scale	COUNTY
Analysis Mode	Inventory
Time Span	July month, Weekday, 24 hours
Time Aggregation	Hour
Geographic Selection	54011 – Cabell County; 54099 – Wayne County
Vehicle Selection	All source types: Gasoline, Diesel, CNG, E85
Road Type	All road types including off-network
Pollutants and Processes	VOC, NOx
Database selection	Early NLEV database
General Output	Units: Emission = grams; Distance = miles; Time = hours; Energy = Million BTU
Output Emissions	Time = Hour, Emissions by Process ID, Source Type and Road Type

Resources

MOVES model

Modeling Page within EPA's Office of Mobile Sources Website (http://www.epa.gov/omswww/models.htm) contains a downloadable model, MOVES users guide and other information.

Policy Guidance on the Use of MOVES2014 for State Implementation Plan Development, Transportation Conformity, and Other Purposes, US EPA Office of Air and Radiation, EPA-420-B-14-008, July 2014.

MOVES2014 and MOVES2014a Technical Guidance: Using MOVES to Prepare Emission Inventories in State Implementation Plans and Transportation Conformity. US EPA Office of Air and Radiation, and Office of Transportation and Air Quality, EPA-420-B-15-093, November 2015.

MOVES2014a User Guide, US EPA Office of Transportation and Air Quality, EPA-420-B-15-095, November 2015.

Traffic Engineering

Highway Capacity Manual, Transportation Research Board, presents current knowledge and techniques for analyzing the transportation system.

Highway Vehicle Inventory Glossary

AADT: Average Annual Daily Traffic, average of ALL days.

County Data Manager (CDM): User interface developed to simplify importing specific local data for a single county or a user-defined custom domain without requiring direct interaction with the underlying MySQL database.

Emission rate or factor: Expresses the amount of pollution emitted per unit of activity. For highway vehicles, usually in grams of pollutant emitted per mile driven.

FC: Functional code, applied in data management to road segments to identify their type (freeway, local, etc.).

Growth factor: Factor used to convert volumes to future years.

HPMS: Highway Performance Monitoring System

I/M: Vehicle emissions inspection/maintenance programs ensure that vehicle emission controls are in good working order throughout the life of the vehicle. The programs require vehicles to be tested for emissions. Most vehicles that do not pass must be repaired.

MOVES: The latest model EPA has developed to estimate emissions from highway vehicles.

Pattern data: Extrapolations of traffic patterns (such as how traffic volume on road segment types varies by time of day, or what kinds of vehicles tend to use a road segment type) from segments with observed data to similar segments.

PPSUITE: Post-Processor for Air Quality, a set of programs that estimate speeds and processes MOBILE emission rates.

Road Type: Functional code, applied in data management to road segments to identify their type (rural/urban highways, rural/urban arterials, etc.)

Source Type: One of thirteen vehicle types used in MOVES modeling.

VHT: Vehicle hours traveled.

VMT: Vehicle miles traveled. In modeling terms, it is the simulated traffic volumes times link length.

ATTACHMENT A

Detailed Emission Results

Detailed Emission Results for Daily Ozone Analysis

2018 Daily Ozone by County

County	Summer Daily VMT	Emissoins (Tons/Day)	
		VOC	NOx
Cabell	2,493,817	1.40	2.60
Wayne	966,294	0.52	1.24
Off-Model Project Emission Benefits		0.00	0.00
Region Total	**3,460,111**	**1.91** **1,735**	**3.84** **3,484**

2025 Daily Ozone by County

County	Summer Daily VMT	Emissoins (Tons/Day)	
		VOC	NOx
Cabell	2,659,621	0.90	1.40
Wayne	1,077,850	0.33	0.63
Off-Model Project Emission Benefits		0.00	0.00
Region Total	**3,737,470**	**1.23** **1,118**	**2.03** **1,842**

2030 Daily Ozone by County

County	Summer Daily VMT	Emissoins (Tons/Day)	
		VOC	NOx
Cabell	2,783,647	0.60	0.96
Wayne	1,152,319	0.22	0.44
Off-Model Project Emission Benefits		0.00	0.00
Region Total	**3,935,966**	**0.82** **744**	**1.40** **1,268**

2018 Daily Ozone by Road Type

County	Road Type	Summer Daily VMT	Speed (mph)	Emissoins (Tons/Day)	
				VOC	NOx
Cabell	Off-Network	N/A	N/A	0.97	0.69
	Rural Restricted	602,870	59.9	0.07	0.42
	Rural UnRestricted	680,696	23.4	0.15	0.67
	Urban Restricted	412,452	54.9	0.05	0.33
	Urban UnRestricted	797,799	23.2	0.16	0.49
	Subtotal	*2,493,817*		*1.40*	*2.60*
Wayne	Off-Network	N/A	N/A	0.31	0.20
	Rural Restricted	108,608	60.0	0.01	0.08
	Rural UnRestricted	703,486	23.4	0.16	0.82
	Urban Restricted	78,718	55.0	0.01	0.09
	Urban UnRestricted	75,483	24.3	0.02	0.05
	Subtotal	*966,294*		*0.52*	*1.24*
Off-Model Project Emission Benefits				0.00	0.00
Region Total		**3,460,111**		**1.91**	**3.84**
			(Kg/Day)	**1,735**	**3,484**

2025 Daily Ozone by Road Type

County	Road Type	Summer Daily VMT	Speed (mph)	Emissoins (Tons/Day)	
				VOC	NOx
Cabell	Off-Network	N/A	N/A	0.67	0.47
	Rural Restricted	708,925	60.0	0.04	0.22
	Rural UnRestricted	676,863	23.3	0.08	0.32
	Urban Restricted	469,821	55.0	0.03	0.17
	Urban UnRestricted	804,011	23.0	0.09	0.22
	Subtotal	*2,659,621*		*0.90*	*1.40*
Wayne	Off-Network	N/A	N/A	0.21	0.12
	Rural Restricted	113,173	60.0	0.01	0.04
	Rural UnRestricted	806,166	24.3	0.09	0.41
	Urban Restricted	83,144	55.0	0.01	0.04
	Urban UnRestricted	75,367	24.3	0.01	0.02
	Subtotal	*1,077,850*		*0.33*	*0.63*
Off-Model Project Emission Benefits				0.00	0.00
Region Total		**3,737,470**		**1.23**	**2.03**
			(Kg/Day)	**1,118**	**1,842**

2030 Daily Ozone by Road Type

County	Road Type	Summer Daily VMT	Speed (mph)	Emissoins (Tons/Day)	
				VOC	NOx
Cabell	Off-Network	N/A	N/A	0.45	0.37
	Rural Restricted	749,975	60.0	0.03	0.14
	Rural UnRestricted	726,217	23.2	0.05	0.21
	Urban Restricted	493,725	55.0	0.02	0.11
	Urban UnRestricted	813,730	22.9	0.05	0.13
	Subtotal	*2,783,647*		*0.60*	*0.96*
Wayne	Off-Network	N/A	N/A	0.14	0.09
	Rural Restricted	115,198	60.0	0.00	0.02
	Rural UnRestricted	876,987	24.3	0.06	0.28
	Urban Restricted	84,717	55.0	0.00	0.03
	Urban UnRestricted	75,418	24.3	0.00	0.01
	Subtotal	*1,152,319*		*0.22*	*0.44*
Off-Model Project Emission Benefits				0.00	0.00
Region Total		**3,935,966**		**0.82**	**1.40**
			(Kg/Day)	**744**	**1,268**

2018 Daily Ozone by Source Type

County	Source Type	Summer Daily VMT	Emissoins (Tons/Day)	
			VOC	NOx
Cabell	Motorcycle	15,606	0.05	0.01
	Passenger Car	883,912	0.42	0.33
	Passenger Truck	1,301,878	0.74	0.85
	Light Commercial Truck	39,553	0.05	0.05
	Intercity Bus	393	0.00	0.00
	Transit Bus	12,151	0.01	0.07
	School Bus	239	0.00	0.00
	Refuse Truck	4,509	0.00	0.02
	Single Unit Short-haul Truck	30,727	0.01	0.06
	Single Unit Long-haul Truck	61,676	0.02	0.14
	Motor Home	2,952	0.01	0.01
	Combination Short-haul Truck	49,244	0.01	0.24
	Combination Long-haul Truck	90,977	0.08	0.80
	Subtotal	*2,493,817*	*1.40*	*2.60*
Wayne	Motorcycle	5,738	0.02	0.00
	Passenger Car	283,952	0.13	0.10
	Passenger Truck	521,211	0.28	0.33
	Light Commercial Truck	13,029	0.01	0.02
	Intercity Bus	308	0.00	0.00
	Transit Bus	6,659	0.00	0.04
	School Bus	230	0.00	0.00
	Refuse Truck	14,643	0.01	0.08
	Single Unit Short-haul Truck	12,957	0.01	0.03
	Single Unit Long-haul Truck	26,317	0.01	0.07
	Motor Home	2,307	0.00	0.01
	Combination Short-haul Truck	20,527	0.01	0.11
	Combination Long-haul Truck	58,417	0.03	0.45
	Subtotal	*966,294*	*0.52*	*1.24*
Region Total		**3,460,111 (Kg/Day)**	**1.91 1,735**	**3.84 3,484**

2025 Daily Ozone by Source Type

County	Source Type	Summer Daily VMT	Emissoins (Tons/Day)	
			VOC	NOx
Cabell	Motorcycle	16,583	0.04	0.01
	Passenger Car	939,225	0.30	0.17
	Passenger Truck	1,383,346	0.45	0.40
	Light Commercial Truck	42,028	0.03	0.03
	Intercity Bus	0	0.00	0.00
	Transit Bus	13,809	0.00	0.04
	School Bus	267	0.00	0.00
	Refuse Truck	4,727	0.00	0.01
	Single Unit Short-haul Truck	32,719	0.00	0.03
	Single Unit Long-haul Truck	69,626	0.01	0.07
	Motor Home	2,891	0.00	0.01
	Combination Short-haul Truck	61,873	0.01	0.13
	Combination Long-haul Truck	92,528	0.06	0.50
	Subtotal	*2,659,621*	*0.90*	*1.40*
Wayne	Motorcycle	6,395	0.02	0.00
	Passenger Car	316,472	0.09	0.06
	Passenger Truck	580,903	0.17	0.16
	Light Commercial Truck	14,521	0.01	0.01
	Intercity Bus	0	0.00	0.00
	Transit Bus	7,801	0.00	0.02
	School Bus	265	0.00	0.00
	Refuse Truck	0	0.00	0.00
	Single Unit Short-haul Truck	18,997	0.00	0.02
	Single Unit Long-haul Truck	40,906	0.01	0.05
	Motor Home	3,111	0.00	0.01
	Combination Short-haul Truck	26,783	0.00	0.06
	Combination Long-haul Truck	61,696	0.02	0.24
	Subtotal	*1,077,850*	*0.33*	*0.63*
Off-Model Project Emission Benefits			0.00	0.00
Region Total		**3,737,470 (Kg/Day)**	**1.23 1,118**	**2.03 1,842**

2030 Daily Ozone by Source Type

County	Source Type	Summer Daily VMT	Emissoins (Tons/Day)	
			VOC	NOx
Cabell	Motorcycle	17,336	0.04	0.01
	Passenger Car	981,904	0.21	0.10
	Passenger Truck	1,446,207	0.28	0.21
	Light Commercial Truck	43,937	0.02	0.01
	Intercity Bus	583	0.00	0.00
	Transit Bus	14,026	0.00	0.02
	School Bus	266	0.00	0.00
	Refuse Truck	5,058	0.00	0.01
	Single Unit Short-haul Truck	34,722	0.00	0.02
	Single Unit Long-haul Truck	73,465	0.01	0.06
	Motor Home	2,966	0.00	0.00
	Combination Short-haul Truck	66,900	0.00	0.10
	Combination Long-haul Truck	96,275	0.05	0.41
	Subtotal	*2,783,647*	*0.60*	*0.96*
Wayne	Motorcycle	6,838	0.02	0.00
	Passenger Car	338,416	0.06	0.03
	Passenger Truck	621,183	0.11	0.08
	Light Commercial Truck	15,528	0.00	0.00
	Intercity Bus	356	0.00	0.00
	Transit Bus	7,990	0.00	0.01
	School Bus	266	0.00	0.00
	Refuse Truck	19,498	0.00	0.03
	Single Unit Short-haul Truck	14,482	0.00	0.01
	Single Unit Long-haul Truck	31,005	0.00	0.03
	Motor Home	2,292	0.00	0.00
	Combination Short-haul Truck	29,367	0.00	0.05
	Combination Long-haul Truck	65,099	0.01	0.18
	Subtotal	*1,152,319*	*0.22*	*0.44*
Region Total		**3,935,966**	**0.82**	**1.40**
		(Kg/Day)	**744**	**1,268**

2018 Daily Ozone by Emission Process

County	Emission Process	Emissoins (Tons/Day)	
		VOC	NOx
Cabell	Running Exhaust	0.31	1.91
	Start Exhaust	0.51	0.45
	Brakewear	0.00	0.00
	Tirewear	0.00	0.00
	Evap Permeation	0.12	0.00
	Evap Fuel Vapor Venting	0.25	0.00
	Evap Fuel Leaks	0.15	0.00
	Crankcase Running Exhaust	0.01	0.00
	Crankcase Start Exhaust	0.01	0.00
	Crankcase Extended Idle Exhaust	0.00	0.00
	Extended Idle Exhaust	0.05	0.23
	Auxiliary Power Exhaust	0.00	0.01
	Subtotal	*1.40*	*2.60*
Wayne	Running Exhaust	0.15	1.04
	Start Exhaust	0.17	0.15
	Brakewear	0.00	0.00
	Tirewear	0.00	0.00
	Evap Permeation	0.04	0.00
	Evap Fuel Vapor Venting	0.09	0.00
	Evap Fuel Leaks	0.06	0.00
	Crankcase Running Exhaust	0.00	0.00
	Crankcase Start Exhaust	0.00	0.00
	Crankcase Extended Idle Exhaust	0.00	0.00
	Extended Idle Exhaust	0.01	0.05
	Auxiliary Power Exhaust	0.00	0.00
	Subtotal	*0.52*	*1.24*
Region Total		**1.91**	**3.84**
	(Kg/Day)	**1,735**	**3,484**

2025 Daily Ozone by Emission Process

County	Emission Process	Emissoins (Tons/Day)	
		VOC	NOx
Cabell	Running Exhaust	0.14	0.93
	Start Exhaust	0.32	0.24
	Brakewear	0.00	0.00
	Tirewear	0.00	0.00
	Evap Permeation	0.07	0.00
	Evap Fuel Vapor Venting	0.18	0.00
	Evap Fuel Leaks	0.15	0.00
	Crankcase Running Exhaust	0.00	0.00
	Crankcase Start Exhaust	0.00	0.00
	Crankcase Extended Idle Exhaust	0.00	0.00
	Extended Idle Exhaust	0.04	0.22
	Auxiliary Power Exhaust	0.00	0.01
	Subtotal	*0.90*	*1.40*
Wayne	Running Exhaust	0.07	0.51
	Start Exhaust	0.11	0.08
	Brakewear	0.00	0.00
	Tirewear	0.00	0.00
	Evap Permeation	0.02	0.00
	Evap Fuel Vapor Venting	0.06	0.00
	Evap Fuel Leaks	0.06	0.00
	Crankcase Running Exhaust	0.00	0.00
	Crankcase Start Exhaust	0.00	0.00
	Crankcase Extended Idle Exhaust	0.00	0.00
	Extended Idle Exhaust	0.01	0.04
	Auxiliary Power Exhaust	0.00	0.00
	Subtotal	*0.33*	*0.63*
Off-Model Project Emission Benefits		0.00	0.00
Region Total		**1.23**	**2.03**
	(Kg/Day)	**1,118**	**1,842**

2030 Daily Ozone by Emission Process

County	Emission Process	Emissoins (Tons/Day)	
		VOC	NOx
Cabell	Running Exhaust	0.07	0.59
	Start Exhaust	0.18	0.15
	Brakewear	0.00	0.00
	Tirewear	0.00	0.00
	Evap Permeation	0.03	0.00
	Evap Fuel Vapor Venting	0.13	0.00
	Evap Fuel Leaks	0.15	0.00
	Crankcase Running Exhaust	0.00	0.00
	Crankcase Start Exhaust	0.00	0.00
	Crankcase Extended Idle Exhaust	0.00	0.00
	Extended Idle Exhaust	0.03	0.22
	Auxiliary Power Exhaust	0.00	0.01
	Subtotal	*0.60*	*0.96*
Wayne	Running Exhaust	0.04	0.35
	Start Exhaust	0.06	0.05
	Brakewear	0.00	0.00
	Tirewear	0.00	0.00
	Evap Permeation	0.01	0.00
	Evap Fuel Vapor Venting	0.04	0.00
	Evap Fuel Leaks	0.06	0.00
	Crankcase Running Exhaust	0.00	0.00
	Crankcase Start Exhaust	0.00	0.00
	Crankcase Extended Idle Exhaust	0.00	0.00
	Extended Idle Exhaust	0.01	0.04
	Auxiliary Power Exhaust	0.00	0.00
	Subtotal	*0.22*	*0.44*
Region Total		**0.82**	**1.40**
	(Kg/Day)	**744**	**1,268**

ATTACHMENT B

Air Quality Data Checklist Summary

Air Quality Data Checklist Summary

Data Item	Inputs Assumptions
Long Range Plan	2040 Integrated Metropolitan Transportation Plan
Transportation Improvement Program	FY 2018-2021 TIP
MOVES RunSpec	
MOVES Version	MOVES2014a
MOVES Default Database	MOVESDB20161117
Scale/Calulation Type	County Scale Inventory Run
Analysis Counties	Cabell (FIPS:54011), Wayne (FIPS:54099)
Analysis Years	2018, 2025, 2030
Analysis Days/Months	July Weekday
Pollutants	VOC, NOx
Stage II Refueling Emissions	Not Included
Fuel Types	Gasoline, Diesel, CNG, E85
Traffic Data	
Highway Network	Use socio-economic forecast and latest network inputs updated for 2040 MTP
County HPMS VMT Adjustments	Calculate AADT HPMS adjustments for 2017 (Ensure VMT is consistent with reported HPMS)
Seasonal Adjustments	Use July weekday seasonal factors provided by DOT to convert AADT to average July weekday traffic
Vehicle Mixes	MOVES VMT required by 5 HPMS vehicle classes. Use DOT truck count data to split model traffic volumes into auto and trucks, and use MOVES2014a default VMT distributions for the region to divide the two vehicle groups (auto and trucks) into MOVES 13 source types, which are recombined to the 5 HPMS vehicle classes.
MOVES Inputs	
Annual VMT	Calculated by PPSUITE from model / seasonal factors / vehicle mapping
Avg. Hourly Speed Distribution	Calculated by PPSUITE (Minimum Speed = 2.5 mph)
Road Type Distribution	Calculated by PPSUITE; a RoadType field must be added to the travel model network based on FC.
Ramp Fraction	Calculated by PPSUITE (use ramp classes coded in model network) or use MOVES2014a defaults
Month VMT Fractions	Factors to convert AADT to an average day in each month (Local data or MOVES default). Calculated based on seasonal adjustment factors.
Day VMT Fractions	Calculated based on seasonal adjustment factors
Hour VMT Fractions	Factors to disaggregate daily traffic volumes by hour for different roadway functional classes. Borrow hourly distributions from other region.
Source Type Population	Use 2016 Inputs provided by WVDEP for all analysis year
Vehicle Age Distribution	Source Types 11, 21, 31, 32 & 54: based on 2016 WV DMV Registration Data for the region; Source Types 41, 42, 43, 51, 52, 53, 61 & 62: use MOVES National Defaults.
Fuel Parameters (Gasoline/Diesel/CNG/E85)	Use MOVES2014a defaults
I/M Parameters	No I/M programs
Temperatures/Humidity	Use MOVES2014a defaults
Control Programs	
Early NLEV	Include EPA provided MOVES override database for early NLEV implementation
AVFT	Not included
Stage II Refueling Parameters	Not Included

ATTACHMENT C

Sample MOVES Data Importer (XML) Input File
and
Run Specification (MRS) Input File

(Sample For 2018 July Weekday Runs: Cabell County)

MOVES County Data Manager Importer File – July Weekday Run (MOVESIMPORTER.XML)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MOVES Run Specification File – July Weekday Run (MOVESRUN.MRS)


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Appendix D

Public Review and Comment

NOTICE OF PUBLIC COMMENT AND HEARING

West Virginia Department of Environmental Protection
Second Maintenance Plan for the 1997 Ozone Nonattainment Areas
Huntington, WV (Comprising Cabell and Wayne Counties)

The West Virginia Department of Environmental Protection (DEP), Division of Air Quality (DAQ) is soliciting comment and will hold a public hearing on the proposed *West Virginia Department of Environmental Protection Second Maintenance Plan for the Huntington, WV 1997 Ozone NAAQS Maintenance Area (Comprising Cabell and Wayne Counties).*

The first Maintenance Plan for the Huntington area was approved by the United States Environmental Protection Agency (U.S. EPA) concurrent with the Huntington area redesignation to attainment with the 1997 Ozone National Ambient Air Quality Standard (NAAQS) effective October 16, 2006. Under Clean Air Act (CAA) section 175A(b), states must submit a revision to the first Maintenance Plan eight years after redesignation to attainment to provide for maintenance of the NAAQS for an additional ten years following the end of the first 10-year period. The second Maintenance Plan was delayed because the U.S. EPA's final implementation rule for the 2008 ozone NAAQS revoked the 1997 ozone NAAQS and removed the requirement for a second Maintenance Plan for areas that had been redesignated to attainment with the 1997 ozone NAAQS and were designated attainment with the 2008 ozone NAAQS. The D.C. Circuit (2018) in *South Coast Air Quality Management District v. EPA* vacated U.S. EPA's previous interpretation therefore, states must now submit Maintenance Plans for the second maintenance period.

Air quality monitoring data collected in this area continues to demonstrate attainment of the NAAQS. Historical and projected emissions show that existing state and federal requirements are sufficient to maintain the NAAQS in the Huntington area. The area has been designated attainment with both the 2008 and 2015 ozone NAAQS, which are more stringent than the 1997 ozone NAAQS.

The State of West Virginia is requesting that U.S. EPA approve a second 10-year Maintenance Plan for the Huntington area with respect to the 1997 8-hour ozone NAAQS. Once finalized the *Second Maintenance Plan for the Huntington, WV 1997 Ozone NAAQS Maintenance Area (Comprising Cabell and Wayne Counties)* will be submitted to U.S. EPA for approval and incorporation as a revision to the State Implementation Plan (SIP).

A public hearing will be held at 6 PM, November 7th, 2019 at the following location:

KYOVA Interstate Planning Commission
400 Third Ave.
Huntington, WV 25712

Written and oral comments will be accepted until the close of the hearing on November 7th, 2019 and will be made part of the formal record. Written comments will also be accepted for inclusion in the formal record by mail, facsimile, email or other delivery to the Division of Air Quality if postmarked or transmitted by 5:00 PM on November 7th, 2019. Please identify the document to which the comments apply, the commenter's name, address and telephone number. Send written comments to Laura M. Crowder, Director of the Division of Air Quality at the following address:

E-mail:	Sandra.K.Adkins@wv.gov
Mailing address:	West Virginia Department of Environmental Protection Division of Air Quality 601 57th Street SE Charleston, WV 25304
Fax:	(304) 926-0479

Copies of the proposed Maintenance Plan and documentation may be viewed on weekdays between 8:30 a.m. and 4:30 p.m. at the DEP Charleston office located at the above address, and may be viewed on the DAQ website under the Public Notice and Comment section: https://dep.wv.gov/daq/publicnoticeandcomment/Pages/default.aspx