INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
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Eric J. Holcomb
Governor

Bruno L. Pigott
Commissioner

February 27, 2020

Mr. Kurt Thiede
Regional Administrator
U.S. EPA, Region 5
77 West Jackson Boulevard
Chicago, IL 60604-3950

Re: Request for Redesignation and Maintenance Plan for Ozone Attainment in Indiana's Portion (Lake and Porter Counties) of the Chicago-Naperville, IL-IN-WI, 2008 8-Hour Ozone Nonattainment Area

Dear Mr. Thiede:

The Indiana Department of Environmental Management (IDEM) submits a Request for Redesignation and Maintenance Plan for Attainment of Indiana's Portion (Lake and Porter counties) of the Chicago-Naperville, Illinois-Indiana-Wisconsin (IL-IN-WI), 2008 8-Hour Ozone Nonattainment Area.

The attached document consists of the following:

Redesignation Petition and Maintenance Plan

- A formal request that Indiana's portion of the Chicago-Naperville, IL-IN-WI, Nonattainment Area for the 2008 8-hour ozone standard be redesignated to "attainment" and reclassified as "maintenance". It contains and meets the requirements set forth in Section 107 of the Clean Air Act (CAA) and in United States Environmental Protection's (U.S. EPA's) Redesignation Guidance.

- The appendices of the document contain Air Quality System (AQS) monitoring data (Appendix A), and Classification and Regression Tree and Temperature Analyses (Appendix B) for the Chicago-Naperville, IL-IN-WI, 2008 8-Hour Ozone Nonattainment Area.

- A maintenance year of 2030 is established and 2025 is analyzed as an interim year.

Motor Vehicle Emissions Budgets

- Section 2.6.2.3.4 of the Request for Redesignation and Maintenance Plan contains a new Motor Vehicle Emissions Budget for 2025 and 2030 for Lake and Porter counties, Indiana. The Northwestern Indiana Regional Planning Commission's (NIRPC) travel demand forecasting model and U.S. EPA's Motor Vehicle Emissions Simulator (MOVES) 2014 software program were used to determine emissions for the 8-hour nonattainment area.

- A conservative margin of safety was applied to the 2025 and 2030 projected emissions.

- The travel demand model was updated with the best available assumptions.

Throughout the development of these submittals IDEM staff worked with U.S. EPA Region 5 to ensure that any potential concerns regarding this submission were addressed. We would appreciate U.S. EPA's continued efforts to communicate regularly with us as it reviews these submittals.

IDEM provided a 30-day public comment period and an opportunity for a public hearing concerning this submittal on the *Request for Redesignation and Maintenance Plan for Ozone Attainment in Indiana's Portion of the Chicago-Naperville, IL-IN-WI, 2008 8-Hour Ozone Nonattainment Area.* A public hearing was not requested and there were not any comments received. Please refer to the Supporting Document in Appendix D for further information and dates regarding the public participation process.

This submittal consists of one (1) hard copy of the required documentation. An electronic version of the submittal in PDF format that is identical to the hard copy has been sent to Doug Aburano, Chief of U.S. EPA Region 5's Attainment Planning and Maintenance Section and Chris Panos of U.S. EPA Region 5.

IDEM requests that U.S. EPA proceed with review and approval of this submittal. If you have any question or need additional information, please contact Brian Callahan, Section Chief, Air Quality Standards and Implementation, Office of Air Quality, IDEM, at (317) 232-8244 or bcallaha@idem.IN.gov.

Sincerely,

Matthew Stuckey
Deputy Assistant Commissioner
Office of Air Quality

MS/sd/bc/gf/mb
Enclosure:

Request for Redesignation and Maintenance Plan for Ozone Attainment in Indiana's Portion of the Chicago-Naperville, IL-IN-WI, 2008 8-Hour Ozone Nonattainment Area

cc: Doug Aburano U.S. EPA Region 5 (no enclosure)
Chris Panos, U.S. EPA Region 5 (no enclosure)
Michael Leslie, U.S. EPA Region 5 (no enclosure)
Katie Mullen, U.S. EPA Region 5 (no enclosure)
Keith Baugues, IDEM-OAQ (no enclosure)
Scott Deloney, IDEM-OAQ (no enclosure)
Brian Callahan, IDEM-OAQ (no enclosure)
Gale Ferris, IDEM-OAQ (w/ enclosure)
Michele Boner, IDEM-OAQ (w/ enclosure)
File Copy

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REQUEST FOR REDESIGNATION AND MAINTENANCE PLAN FOR ATTAINMENT OF INDIANA'S PORTION OF THE CHICAGO-NAPERVILLE, ILLINOIS-INDIANA-WISCONSIN (IL-IN-WI), 2008 8-HOUR OZONE NONATTAINMENT AREA

Lake and Porter Counties, Indiana

Prepared By:
The Indiana Department of Environmental Management

February 2020

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LAKE AND PORTER COUNTIES, INDIANA

1.0 INTRODUCTION

This document supports the Indiana Department of Environmental Management's (IDEM's) request that the Indiana portion (Lake and Porter counties in Northwest Indiana) of the Chicago-Naperville, Illinois (IL)-Indiana (IN)-Wisconsin (WI), serious nonattainment area be redesignated to attainment of the 2008 8-hour ozone standard. The states of Illinois and Wisconsin also intend to submit requests for their portions of the Chicago-Naperville, IL-IN-WI, serious nonattainment area to be redesignated to attainment of the 2008 8-hour ozone standard. The entire Chicago-Naperville, IL-IN-WI, serious nonattainment area has recorded three (3) years of complete, quality-assured ambient air quality monitoring data for the years 2017-2019 demonstrating attainment with the 2008 8-hour ozone standard.

Indiana's request is based on Section 107(d)(3)(D) of the Clean Air Act (CAA), which states:

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

Section 107(d)(3)(E) of the CAA establishes specific requirements to be met in order for an area to be considered for redesignation, including:

(a) A determination that the area (or a portion thereof) has attained the 2008 8-hour ozone National Ambient Air Quality Standard (NAAQS).

(b) A state implementation plan (SIP) for the area under Section 110(k) of the CAA that is fully approved.

(c) A determination that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the SIP or other federal requirements.

(d) A maintenance plan under Section 175A of the CAA that is fully approved.

(e) A determination that all Section 110 and Part D requirements of the CAA have been met.

Indiana is formally requesting a redesignation of Indiana's portion (Lake and Porter counties in Northwest Indiana) of the Chicago-Naperville, IL-IN-WI, serious nonattainment area to attainment.

This document addresses each of these requirements in Section 2.0 and provides additional information to support continued compliance with the 2008 8-hour ozone standard.

1.1 Ozone

Ground level ozone is not emitted directly into the air, but is created by chemical reactions with nitrogen oxides (NO_x) and volatile organic compounds (VOCs) in the presence of sunlight. Ozone formation is promoted by strong sunlight, warm temperatures, and light winds; elevated levels predominantly occur during the hot summer months. In accordance with Table D-3 of Appendix D of 40 Code of Federal Regulations (CFR) Part 58, for the 2008 8-hour standard, United States Environmental Protection Agency (U.S. EPA) mandates seasonal monitoring of ambient ozone concentrations in Indiana and Illinois from March 1st through October 31st, and in Wisconsin from March 1st through October 15th.

Due to the fact that ozone is formed in the ambient air, control of ozone focuses upon the reduction of precursor emissions (i.e. NO_x and VOCs). NO_x is formed from the high-temperature reaction of nitrogen and oxygen during combustion processes in sources such as electric utility boilers, industrial fuel-burning sources, and motor vehicles. VOCs include many industrial solvents and coatings, as well as the hydrocarbons (HCs) that are emitted by motor vehicles as evaporative losses from gasoline and tailpipe emissions of unburned hydrocarbon. Ground level ozone is associated with a number of adverse health and environmental impacts, including respiratory impairment and damage to crops and forests.

1.2 National Ambient Air Quality Standards

Ozone is one of the six criteria air pollutants that scientists have identified as being particularly harmful to humans and the environment. NAAQS have been developed for these six pollutants and are used as measurements of air quality. The CAA requires U.S. EPA to set primary standards at a level judged to be "requisite to protect the public health with an adequate margin of safety" and establish secondary standards that are requisite to protect public welfare from "any known or anticipated effects associated with the pollutant in the ambient air," including effects on crops, vegetation, wildlife, buildings and national monuments, and visibility.

The CAA requires areas designated nonattainment for the NAAQS for ozone to develop SIPs to expeditiously attain and maintain the standard. In 1997, U.S. EPA revised the air quality standards for ozone thus, replacing the 1979 1-hour standard with an 8-hour ozone standard set at 0.08 parts per million (ppm). The standard was challenged legally and upheld by the U.S. Supreme Court in February of 2001.

U.S. EPA designated areas under the 1997 8-hour ozone standard on April 15, 2004, as attainment, nonattainment, or unclassifiable. If a nonattainment area is classified as "serious", "severe", or "extreme", the CAA mandates that the presumptive nonattainment boundary include the entire Consolidated Metropolitan Statistical Area (CMSA), or Metropolitan Statistical Area (MSA) and all of its Metropolitan Divisions. U.S. EPA designated Lake and Porter counties nonattainment as a portion of the Chicago-Gary-Lake County, Illinois-Indiana, 1997 8-hour ozone nonattainment area and classified it "marginal" under Subpart 2 of Part D of the CAA. The Lake County-Kenosha County, Illinois-Wisconsin Metropolitan Division of the Chicago MSA was not included as part of the Chicago-Gary-Lake County, Illinois-Indiana nonattainment area. Therefore, U.S. EPA's designation of Lake and Porter counties, Indiana as part of this nonattainment area, and exclusion of other portions of the Chicago MSA like Kenosha County, Wisconsin, was discretionary rather than mandatory under the CAA.

The Chicago-Gary-Lake County, Illinois-Indiana area was subjected to nonattainment area rulemakings under the 1979 1-hour ozone standard, the 1997 8-hour ozone standard, and the 1997 annual standard for fine particles ($PM_{2.5}$). The 1-hour ozone standard was revoked on June 15, 2005. U.S. EPA approved Indiana's redesignation requests for attainment under the 1997 8-hour ozone standard on May 11, 2010 (75 FR 26113), and under the 1997 annual $PM_{2.5}$ standard on February 6, 2012 (76 FR 76302), respectively. This area remains classified as maintenance under both standards. Illinois' portion was also redesignated to attainment and classified as maintenance under the 1997 8-hour ozone standard on August 13, 2012 (77 FR 48062), and the 1997 annual $PM_{2.5}$ standard on October 2, 2013 (78 FR 60704), respectively.

On March 27, 2008, U.S. EPA significantly strengthened the 8-hour ozone standard to a level of 0.075 ppm, as shown in Table 1.1 (73 FR 16436). An exceedance of the 2008 8-hour ozone NAAQS occurs when a monitor measures ozone above 0.075 ppm on average for an 8-hour period. A violation occurs when the average of the annual fourth highest daily maximum 8-hour ozone values over three consecutive years is greater than 0.075 ppm. This three-year average is termed the "design value" for the monitor. The design value for a nonattainment area is the highest monitor design value in the area.

Table 1.1: National Ambient Air Quality Standards for Ozone

	Primary Standards		Secondary Standards	
	Level	**Averaging Time**	**Level**	**Averaging Time**
1997 Ozone Standards	0.08 ppm*	Three-year average of the fourth highest 8-hour ozone value recorded each year.	Same as primary	
2008 Ozone Standards	0.075 ppm	Three-year average of the fourth highest 8-hour ozone value recorded each year.	Same as primary	
2015 Ozone Standard	0.070 ppm	Three-year average of the fourth highest 8-hour ozone value recorded each year.	Same as primary	

*Based on U.S. EPA's published data handling guidelines, values above 0.084 ppm were deemed to be in violation of the 1997 8-hour ozone standard.

On December 5, 2012, Indiana submitted a request for redesignation petition and maintenance plan for attainment of the 2008 8-hour ozone NAAQS that would have designated Lake and Porter counties separately from the rest of the Chicago nonattainment area. This also included an ozone maintenance plan and motor vehicle emission budgets (MVEBs) for NO_x and VOCs. These requests were denied by U.S. EPA effective January 9, 2015.[1]

On June 15, 2016, Indiana submitted a request for redesignation petition and maintenance plan for the attainment of the 2008 8-hour ozone NAAQS but the request was withdrawn on November 30, 2017 for failure to meet the attainment date of July 15, 2015. On April 11, 2016, U.S. EPA reclassified the nonattainment area to "moderate" with an effective date of June 3, 2016 (81 FR 26697).

On February 28, 2017, Indiana submitted a SIP revision request to address the moderate area requirements for Indiana's Portion (Lake and Porter counties) of the Chicago-Naperville, IL-IN-WI, 2008 8-Hour Ozone Nonattainment Area. On February 13, 2019, U.S. EPA published approval of portions of Indiana's submission. Additional information regarding this submission can be found in Section 2.2.

[1] http://www.gpo.gov/fdsys/pkg/FR-2014-12-10/pdf/2014-28799.pdf

On August 7, 2019 (84 FR 44238), U.S. EPA finalized its determination that the Chicago nonattainment area failed to attain the 2008 8-hour ozone standard using 2015-2017 monitoring data by the attainment date of July 20, 2018. As required by Section 181(b)(2)(A) of the CAA, the area was reclassified to "serious" for the 2008 8-hour ozone NAAQS, effective September 23, 2019.[2] This final rule assigned a new attainment date of July 20, 2021.

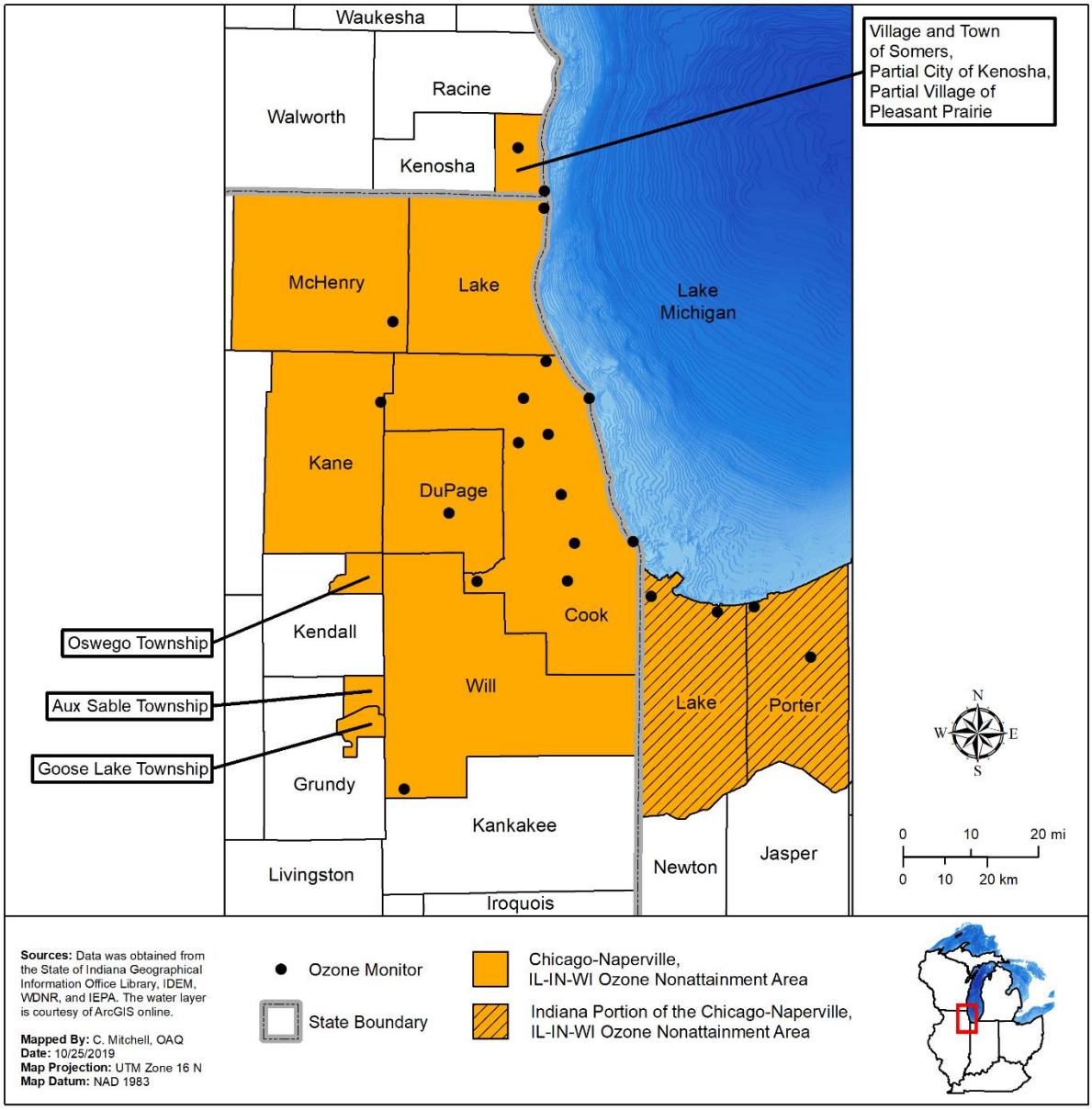
1.3 Geographical Description

The specific counties and partial counties that comprise the Chicago-Naperville, IL-IN-WI, nonattainment area as defined in 40 CFR 81.314, 40 CFR 81.315, and 40 CFR 81.350, include: Cook, DuPage, Grundy (partial), Kane, Kendall (partial), Lake, McHenry, and Will counties, Illinois; Kenosha County (partial), Wisconsin; and Lake and Porter counties, Indiana.

Lake and Porter counties are located in Northwest Indiana and contain such cities as Gary, Hammond, East Chicago, Portage, and Valparaiso. Lake and Porter counties are bordered by Lake Michigan to the north, the Indiana counties of Newton and Jasper to the south, and LaPorte to the east. The Illinois counties of Cook, Kankakee, and Will border Lake and Porter counties to the west. In Illinois and Wisconsin, the nonattainment area contains such cities as Chicago, Elgin, Aurora, and Joliet in Illinois, and the City of Kenosha and Village of Pleasant Prairie in Wisconsin.

[2] https://www.govinfo.gov/content/pkg/FR-2019-08-23/pdf/2019-17796.pdf

Figure 1.1: Map of the Chicago-Naperville, IL-IN-WI, 2008 8-Hour Ozone Nonattainment Area



IDEM, the Illinois Environmental Protection Agency (IEPA), and the Wisconsin Department of Natural Resources (WDNR) are responsible for assuring the nonattainment area for the 2008 8-hour ozone standard complies with the CAA requirements.

1.4 Status of Air Quality

There are currently twenty-one (21) Federal Reference Method monitors measuring ozone concentrations in the Chicago-Naperville, IL-IN-WI, nonattainment area. Four monitors are located in Indiana's portion of the nonattainment area and are operated by

IDEM's Office of Air Quality (OAQ). There are currently fifteen monitors located in Illinois' portion of the nonattainment area that are operated by the IEPA and two monitors located in Wisconsin's portion of the nonattainment area that are operated by the WDNR. The monitor readings from 2014–2019 are shown in Tables 2.1 and 2.2 as well as Appendix A. Graph 2.1 depicts the 2017–2019 design values for the monitors within Lake and Porter counties, Indiana, while Graph 2.3 displays the values from Illinois' and Wisconsin's monitors. Indiana's, Illinois's, and Wisconsin's monitor values were retrieved from U.S. EPA's Air Quality System (AQS) database. The data from all ozone monitoring sites meet U.S. EPA requirements for completeness (as described in Appendix P to 40 CFR Part 50) for the years 2017-2019. The locations of the monitoring sites for this nonattainment area are shown in Figure 1.1.

2.0 REQUIREMENTS FOR REDESIGNATION

Section 110 and Part D of the CAA lists a number of requirements that must be met by nonattainment areas prior to consideration for redesignation to attainment. In addition, U.S. EPA has published detailed guidance in a document titled *Procedures for Processing Requests to Redesignate Areas to Attainment*, issued September 4, 1992, to Regional Air Directors.[3] This document is hereafter referred to as "Redesignation Guidance". This request for redesignation and maintenance plan is based on the Redesignation Guidance and supplemented with additional guidance received from staff of the Attainment Planning and Maintenance Section of U.S. EPA Region V. The specific requirements for redesignation are listed below.

2.1 Attainment of the Ozone National Ambient Air Quality Standard (NAAQS)

1) A demonstration that the NAAQS for ozone, as published in 40 CFR 50.15, has been attained. Ozone monitoring data must show that violations of the ambient standard are no longer occurring.

2) Ambient monitoring data, quality assured in accordance with 40 CFR 58.15, have been recorded in the U.S. EPA AQS database and made available for public view.

2.1.1 Ambient Air Monitoring Data

As explained in 40 CFR Part 50, Appendix P, three (3) complete years of ozone monitoring data are required to demonstrate attainment at a monitoring site. The 8-hour primary and secondary ozone ambient air quality standards are met at an ambient air quality monitoring site when the three-year average of the annual fourth-highest daily maximum 8-hour average ozone concentration is less than or equal to 0.075 ppm. When this occurs the site is deemed to be in attainment. A maximum of three (3) significant digits are carried in the computations and digits to the right of the third

[3] https://www.epa.gov/sites/production/files/2016-03/documents/calcagni_memo_-_procedures_for_processing_requests_to_redesignate_areas_to_attainment_090492.pdf

decimal place are truncated (i.e. any computation greater than 0.075 ppm is truncated to 0.075 ppm. Values equal to or below 0.075 ppm meet the standard; values equal to or greater than 0.076 ppm exceed the standard. These data handling procedures are applied on an individual basis at each monitor in the area. An individual site's three-year average of the annual fourth highest daily maximum 8-hour average ozone concentration is called the site's design value. The air quality design value for the area is the highest design value among all sites in the area.

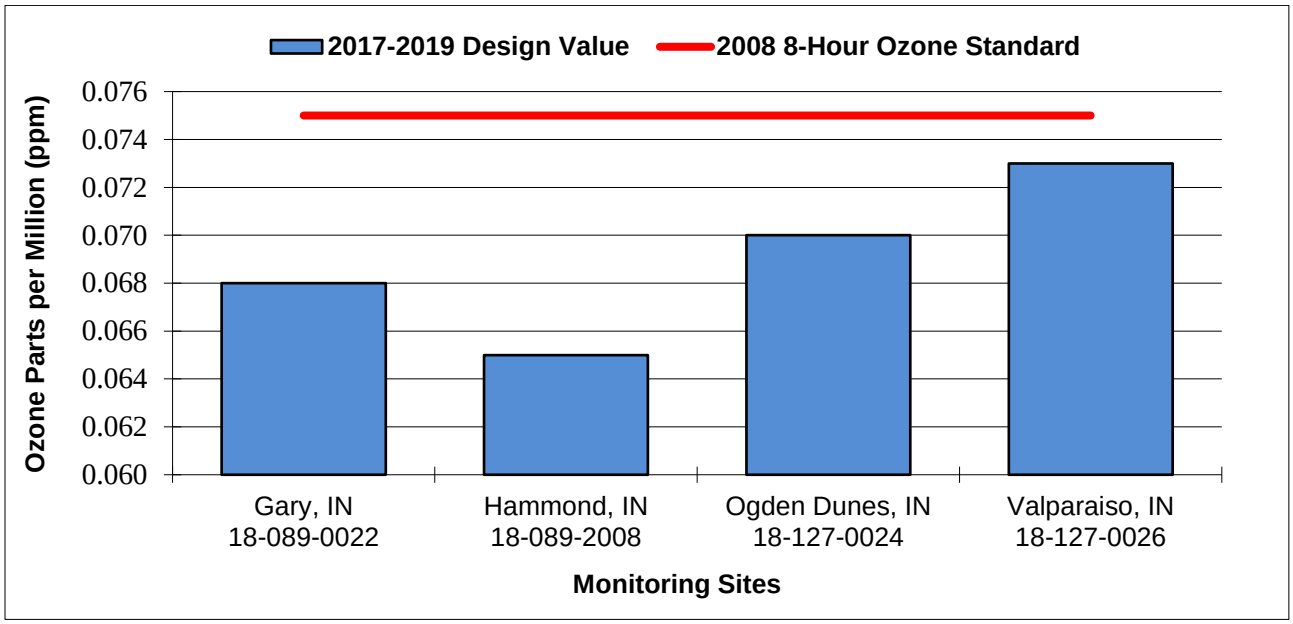
Table 2.1 outlines the annual fourth high values for 2014-2019 and the three-year design values for 2014-2016 through 2017-2019 for the four active monitoring sites in Indiana. During this period, the design values for Indiana's portion of the nonattainment area demonstrate that the 2008 8-hour NAAQS for ozone has been attained. For the most recent design value (2017-2019), all monitors measured less than or equal to 0.073 ppm. Graph 2.1 demonstrates that the 2017-2019 design values for Indiana's portion of the nonattainment area are well below the 2008 8-hour ozone NAAQS.

Table 2.1: Monitoring Sites' 2014-2019 Annual 4th Highs and Three-Year Design Values for 2014-2016 through 2017-2019 - Lake and Porter Counties, Indiana

	Annual 4th High (ppm)						Design Values (average of 4th highs) (ppm)			
AQS# Site County	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2014-2016**	**2015-2017**	**2016-2018**	**2017-2019**
18-089-0022 Gary-IITRI Lake	0.067	0.064	0.070	0.070	0.071	0.065	0.067	0.068	0.070	0.068
18-089-2008 Hammond Lake	0.067	0.060	0.068	0.069	0.062	0.065	0.065	0.065*	0.066	0.065
18-127-0024 Ogden Dunes Porter	0.071	0.066	0.070	0.072	0.071	0.068	0.069	0.069	0.071	0.070
18-127-0026 Valparaiso Porter	0.067	0.060	0.071	0.077	0.071	0.071	0.066	0.069	0.073	0.073

*Design value is flagged in AQS as "not valid".

Graph 2.1: Monitoring Sites' 2017-2019 Design Values - Lake and Porter Counties, Indiana



Graph 2.2 shows the trend in three-year design values in Lake and Porter counties, Indiana, from 2004-2006 through 2017-2019. A comprehensive list of the fourth-highest daily maximum 8-hour average ozone concentrations over this period is included in Appendix A. The area's design values trend downward as emissions have declined due to such programs as the Acid Rain program and cleaner automobiles and fuels both regionally and locally. U.S. EPA's rule to control nitrogen oxides from specific source categories (40 CFR Parts 51, 72, 75, and 96, published on October 17, 1998 and referred to as the "NO_x SIP Call") has significantly reduced emissions from large electric generating units (EGUs), industrial boilers, and cement kilns. Indiana's NO_x SIP Call Rule was approved on June 6, 2001 (326 Indiana Administrative Code (IAC) 10-3 and 10-4). EGUs are now regulated by the federal Cross-State Air Pollution Rule (CSAPR). The SIP submittals for NO_x reductions of other Midwest states were also approved in this timeframe.

Graph 2.2: Highest Monitor Design Values from 2004-2019 Compared to the 1997 and 2008 8-hour Ozone Standards - Lake and Porter Counties, Indiana

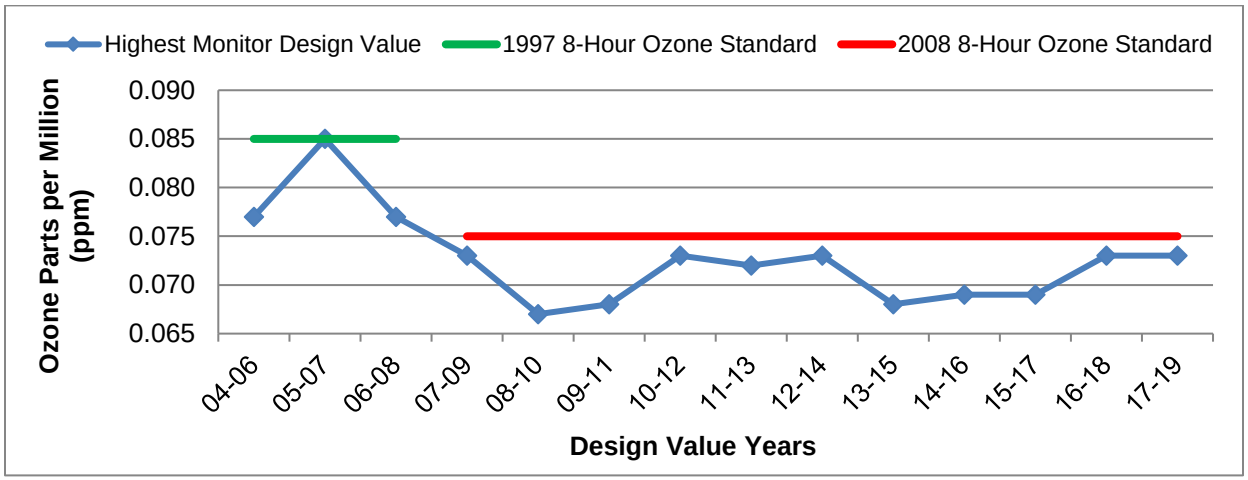
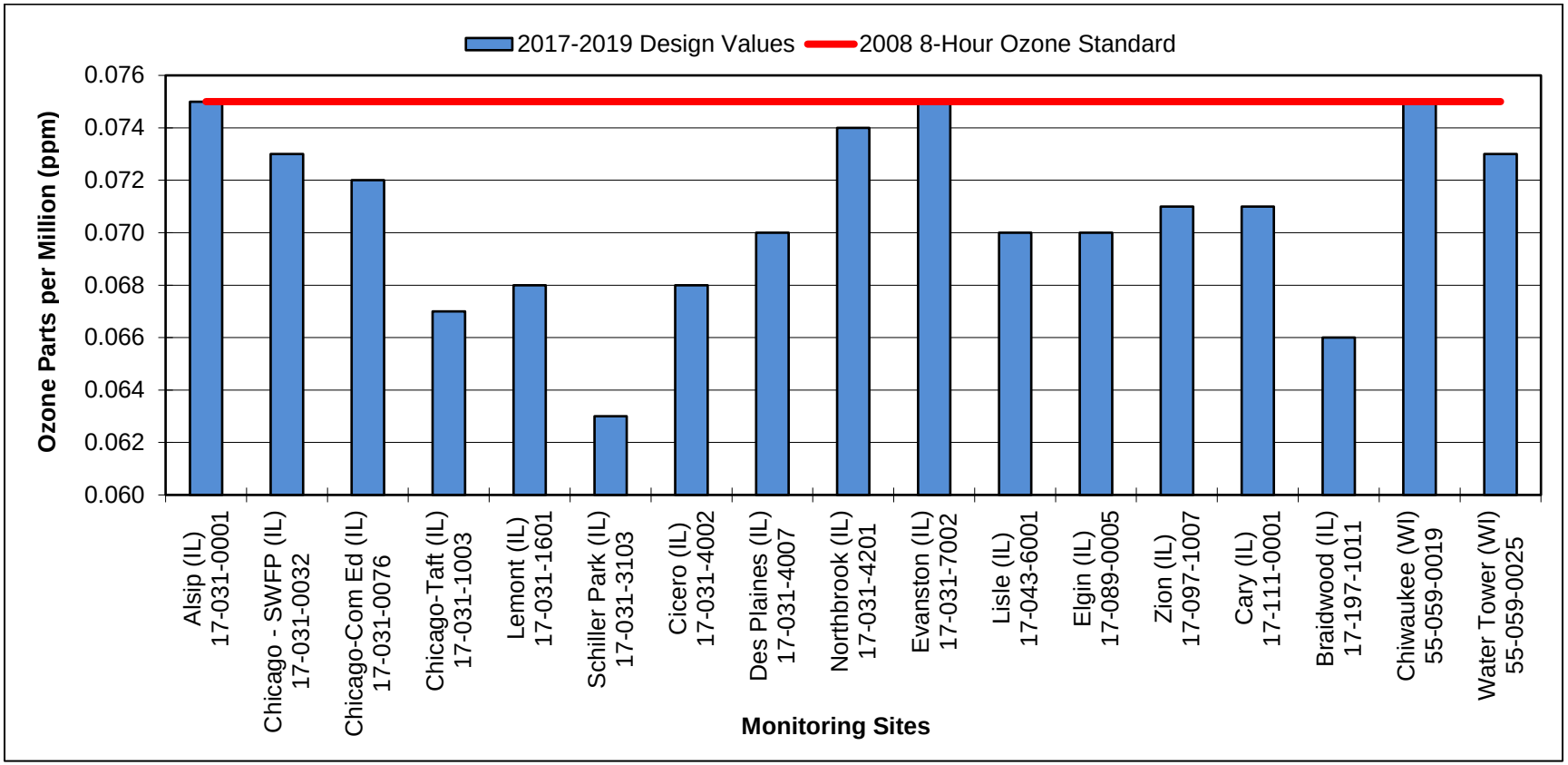


Table 2.2 outlines the annual fourth-high values for 2014-2019 and three-year design values for 2014-2016 through 2017-2019 for fifteen (15) Illinois monitoring sites and two (2) Wisconsin monitoring sites within their respective portions of the nonattainment area. All of these sites recorded design values at or below the 2008 8-hour ozone NAAQS of 0.075 ppm for the most recent design value years of 2017-2019 as shown in Graph 2.3. Graph 2.4 illustrates the downward trend that Illinois' and Wisconsin's monitors in the Chicago nonattainment area have demonstrated leading up to the current design value years that have brought their portions into attainment of the 2008 8-hour ozone NAAQS.

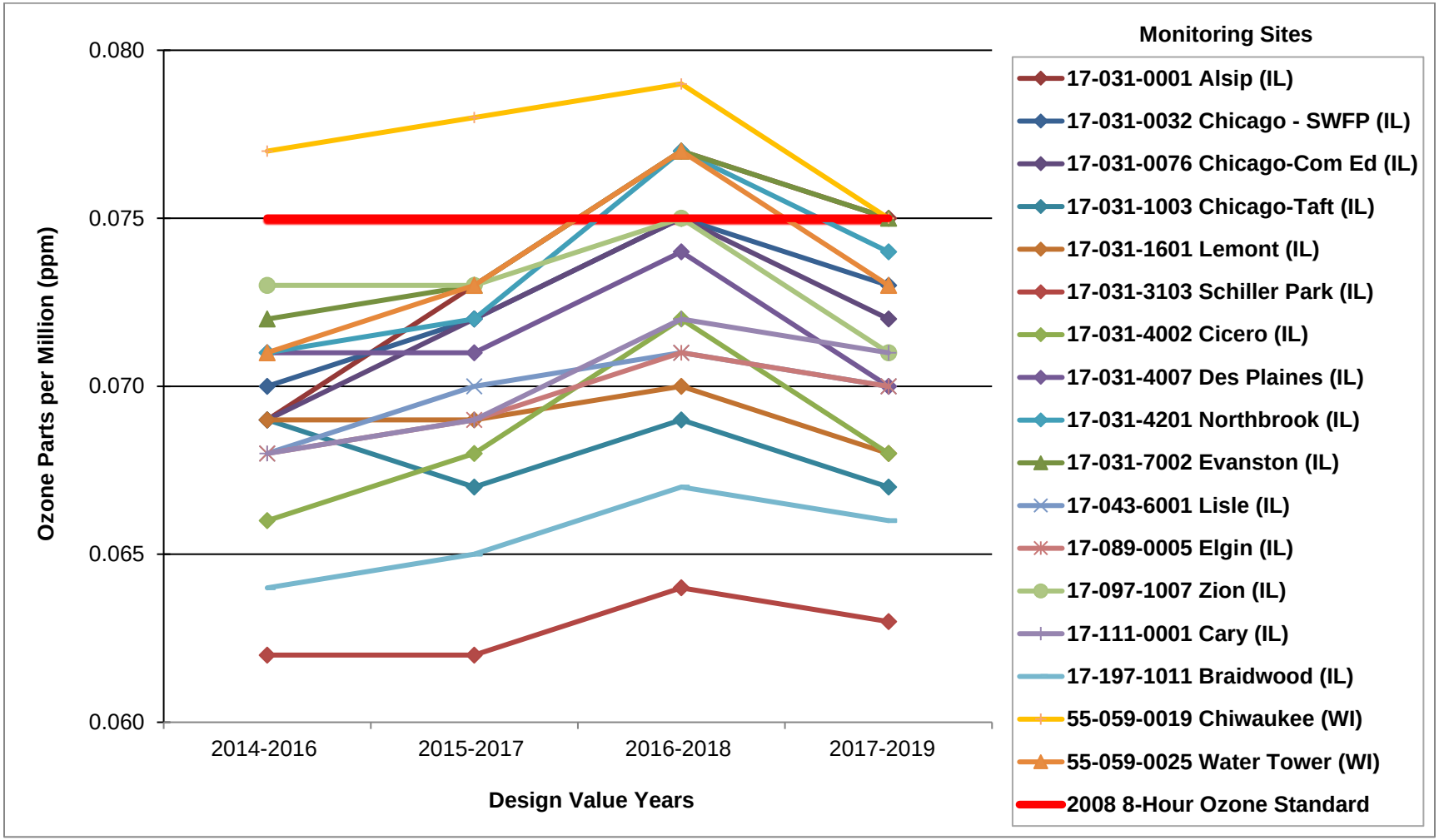
Table 2.2: Monitoring Site's Annual 4th Highs 2014-2019 and Design Values for Illinois and Wisconsin, 2014-2016 through 2017-2019

Monitors			Annual 4th High (ppm)						Design Value (average of 4th highs (ppm)			
AQS #	County	Site	2014	2015	2016	2017	2018	2019	2014-2016	2015-2017	2016-2018	2017-2019
17-031-0001	Cook	Alsip	0.066	0.066	0.075	0.078	0.079	0.070	0.069	0.073	0.077	0.075
17-031-0032	Cook	Chicago - SWFP	0.067	0.066	0.077	0.074	0.076	0.071	0.070	0.072	0.075	0.073
17-031-0076	Cook	Chicago-Com Ed	0.067	0.065	0.075	0.078	0.074	0.065	0.069	0.072	0.075	0.072
17-031-1003	Cook	Chicago-Taft	0.065	0.068	0.075	0.060	0.073	0.069	0.069	0.067	0.069	0.067
17-031-1601	Cook	Lemont	0.07	0.066	0.073	0.070	0.068	0.068	0.069	0.069	0.070	0.068
17-031-3103	Cook	Schiller Park	0.063	0.058	0.067	0.061	0.065	0.064	0.062	0.062	0.064	0.063
17-031-4002	Cook	Cicero	0.063	0.061	0.076	0.068	0.072	0.064	0.066	0.068	0.072	0.068
17-031-4007	Cook	Des Plaines	0.069	0.068	0.076	0.071	0.075	0.066	0.071	0.071	0.074	0.070
17-031-4201	Cook	Northbrook	0.068	0.068	0.079	0.070	0.083	0.069	0.071	0.072	0.077	0.074
17-031-7002	Cook	Evanston	0.072	0.070	0.076	0.073	0.084	0.069	0.072	0.073	0.077	0.075
17-043-6001	DuPage	Lisle	0.064	0.067	0.074	0.069	0.071	0.070	0.068	0.070	0.071	0.070
17-089-0005	Kane	Elgin	0.066	0.065	0.074	0.069	0.072	0.071	0.068	0.069	0.071	0.070
17-097-1007	Lake	Zion	0.073	0.070	0.077	0.074	0.074	0.066	0.073	0.073	0.075	0.071
17-111-0001	McHenry	Cary	0.067	0.064	0.073	0.070	0.074	0.070	0.068	0.069	0.072	0.071
17-197-1011	Will	Braidwood	0.064	0.064	0.064	0.068	0.071	0.060	0.064	0.065	0.067	0.066
55-059-0019	Kenosha, WI	Chiwaukee	0.076	0.075	0.080	0.079	0.079	0.067	0.077	0.078	0.079	0.075
55-059-0025	Kenosha, WI	Water Tower	0.070	0.068	0.076	0.076	0.080	0.063	0.071	0.073	0.077	0.073

Graph 2.3: Monitoring Sites' 2017-2019 Design Values - Illinois and Wisconsin



Graph 2.4: Monitoring Sites' 2014-2019 Design Value Trends - Illinois and Wisconsin



2.1.2 Atmospheric Dispersion Modeling

Although U.S. EPA's Redesignation Guidance does not require modeling for ozone nonattainment areas seeking redesignation, extensive modeling has been performed covering the Chicago-Naperville IL-IN-WI region to determine the effect of national emission control strategies on ozone levels. This region includes Lake and Porter counties in Indiana. These modeling analyses determined that this region is significantly impacted by ozone and ozone precursor transport, and regional NO_x and VOC emission reductions have helped the area attain and additional future reductions will ensure continued compliance (maintenance) with the 2008 8-hour ozone NAAQS well into the future.

2.1.2.1 U.S. EPA Modeling Analysis for Interstate Transport "Good Neighbor" Provision

U.S. EPA is currently in the process of evaluating photochemical air quality modeling using a 2016 emissions and meteorology platform. Since the results of this modeling are still in the evaluation phase, they will not be discussed in this analysis. The most recent photochemical modeling released by the U.S. EPA was for the Interstate Transport "Good Neighbor" Provision for the 2015 8-hour ozone NAAQS of 0.070 ppm. This latest analysis was released in 2018 and is included in the "Information on the Interstate Transport State Implementation Plan Submissions for the 2015 Ozone National Ambient Air Quality Standard under Clean Air Act Section 110(a)(2)(D)(i)(I)." While this modeling was conducted under a more stringent 8-hour ozone NAAQS, it shows that the monitors in the non-attainment area are projected to have 2023 ozone design values below both the 2008 and 2015 ozone NAAQS'. Paired with current monitoring data, this analysis demonstrates that the area has attained and will continue to maintain compliance of the standard well into the future with an increasing margin of safety over time.

This modeling was conducted to identify monitoring sites that may have issues attaining the 2015 ozone NAAQS in 2023, and identify states that were contributing to attainment issues at a given monitoring site. The air quality model used for this modeling was the Comprehensive Air Quality Model with Extensions (CAMx) version 6.40. The modeling domain consisted of 12 kilometer (km) x 12 km coarse grid covering the continental United States and portions of Canada and Mexico, and 35 vertical layers from the surface up through the troposphere, to a height of 50 millibars of pressure. Baseyear 2011 emissions were modeled, with emissions projected to 2023. Meteorology from 2011 was created using the Weather Research Forecasting (WRF) Model version 3.4 and used for the base case and future year modeling runs. More detailed information on the CAMx input file and additional data used for the photochemical modeling can be found in the U.S. EPA's "Air Quality Modeling Technical Support Document for the 2015 Ozone NAAQS Preliminary Interstate Transport Assessment," dated December 2016.

In the document titled “Modeling Guidance for Demonstrating Air Quality Goals for Ozone, $PM_{2.5}$ and Regional Haze,” U.S. EPA states that calculation of a monitor’s design value should consider the 3x3 grid cell array surrounding the grid cell that obtains the monitor. However, for the 2015 ozone transport modeling, U.S. EPA provided results using an alternative method which eliminates grid cells that are covered by 50% water or more and do not contain a monitor. Since the Chicago-Naperville IL-IN-WI Non-Attainment area is on the Lake Michigan shoreline, these alternative modeling results will be presented here.

Table 2.3 shows the results of U.S. EPA’s “Good Neighbor” Provision modeling for ozone impacts at the ozone monitors in the Chicago region. The monitor identification number, county and state locations are listed, as well as the 2009 through 2013 8-hour weighted 5-year ozone design values that were used to determine future year 2023 modeling results. Model results are used in a relative rather than absolute sense. Relative use of the model results calculates the fractional change in maximum concentrations based on two different emission scenarios, 2011 and 2023 emissions for this exercise. This fractional change, also known as a relative response factor (RRF), can be applied to each monitor’s average base year design value to determine ozone impacts. This approach differs from using the absolute or actual modeled result, which may show under or over-predictions with the actual monitored values. The 2009 through 2013 design values were multiplied by the corresponding RRF to determine all future year base case design values. The 2023 projected emissions were modeled to determine the future year design values.

Table 2.3: Modeling Results: U.S. EPA “Good Neighbor” Provision Modeling Results (Values in Parts Per Million)

Monitor ID	County	State	Average Design Value 2009-2013	Future Average Design Value 2023 Base
170310001	Cook	IL	0.0720	0.0632
170310032	Cook	IL	0.0777	0.0666
170310076	Cook	IL	0.0717	0.0627
170311003	Cook	IL	0.0697	0.0624
170311601	Cook	IL	0.0713	0.0615
170314002	Cook	IL	0.0717	0.0623
170314007	Cook	IL	0.0657	0.0580
170314201	Cook	IL	0.0757	0.0668
170317002	Cook	IL	0.0760	0.0668
170436001	DuPage	IL	0.0663	0.0579
170890005	Kane	IL	0.0697	0.0628
170971007	Lake	IL	0.0793	0.0634
171110001	McHenry	IL	0.0697	0.0618
171971011	Will	IL	0.0640	0.0556
180890022	Lake	IN	0.0667	0.0583
180892008	Lake	IN	0.0680	0.0604
181270024	Porter	IN	0.0703	0.0618
181270026	Porter	IN	0.0630	0.0544
550590019	Kenosha	WI	0.0810	0.0648

2.1.2.2 LADCO Modeling for 8-Hour Ozone Standard

The Lake Michigan Air Directors Consortium (LADCO) performed 2015 8-hour ozone transport modeling for ozone using CAMx. The modeling platform for this modeling was nearly identical to U.S. EPA's modeling. More detailed information on the CAMx input file and additional data used for the photochemical modeling can be found in LADCO's "Interstate Transport Modeling for the 2015 Ozone National Ambient Air Quality Standard, CAMx Source Apportionment Modeling Protocol," dated August 2018. The main difference between the two modeling platforms was LADCO's use of the Eastern Regional Technical Advisory Committee (ERTAC) power sector emission modeling in place of U.S. EPA's IPM power sector modeling. As shown in Table 2.4, LADCO's results are similar to U.S. EPA's results, and draw the same conclusion for the Chicago-Naperville Non-Attainment area with respect to the 2008 8-hour ozone NAAQS.

Table 2.4: LADCO's Modeling Results for the Chicago Region (Values in Part per Million)

Monitor ID	County	State	Average Design Value 2009-2013	Future Average Design Value 2023 Base
170310001	Cook	IL	0.0720	0.0628
170310032	Cook	IL	0.0777	0.0662
170310076	Cook	IL	0.0717	0.0615
170311003	Cook	IL	0.0697	0.0617
170311601	Cook	IL	0.0713	0.0613
170314002	Cook	IL	0.0717	0.0620
170314007	Cook	IL	0.0657	0.0574
170314201	Cook	IL	0.0757	0.0662
170317002	Cook	IL	0.0760	0.0661
170436001	DuPage	IL	0.0663	0.0576
170890005	Kane	IL	0.0697	0.0622
170971007	Lake	IL	0.0793	0.0627
171110001	McHenry	IL	0.0697	0.0614
171971011	Will	IL	0.0640	0.0553
180890022	Lake	IN	0.0667	0.0579
180892008	Lake	IN	0.0680	0.0617
181270024	Porter	IN	0.0703	0.0614
181270026	Porter	IN	0.0630	0.0541
550590019	Kenosha	WI	0.0810	0.0641

2.1.2.3 Summary of Existing Modeling Results

All ozone monitors in the Chicago-Naperville IL-IN-WI non-attainment area are currently in attainment with the 2008 8-hour ozone NAAQS of 0.075 ppm. U.S. EPA and LADCO modeling shows that the Chicago region remains in attainment of the 2008 and 2015 8-hour ozone NAAQS's in 2023. Future national and local emission control strategies to be implemented in the next several years will provide assurance that air quality in the

Chicago area will continue to attain the NAAQS well into the future with an increasing margin of safety over time.

2.1.2.4 Meteorological Analysis of High-Ozone Events

A meteorological analysis was performed to demonstrate that the reductions in monitored ozone were the result of permanent and enforceable reductions in precursor emissions and not the result of unusually favorable meteorology. A Classification and Regression Tree (CART) analysis for years 2017 – 2018 performed by the Lake Michigan Air Directors Consortium (LADCO) and a temperature analysis for 2019 performed by IDEM clearly demonstrates that the improvement in air quality was not the result of favorable meteorology. The analyses can be found in Appendix B.

2.2 Approved State Implementation Plan

Section 182(b)(1)(A)(i) of the CAA requires states with moderate, or higher, ozone nonattainment areas to submit a plan (referred to as an "attainment demonstration") detailing how the ozone standard will be attained as expeditiously as practicable. The plan must include a demonstration that the area will meet the NAAQS by the revised applicable attainment date (i.e. July 20, 2018). On February 28, 2017, IDEM submitted the attainment demonstration for Lake and Porter counties, as part of its amendments to Indiana's SIP to fulfill Section 172 and 182 CAA requirements. On February 13, 2019, U.S. EPA published approval of the 2011 revised base-year emissions inventory for NO_x and VOCs, 15% reasonable further progress (RFP) plan, 3% RFP contingency measures plan, New Source Review (NSR) certification, VOC reasonably available control technologies (RACT) certification, and enhanced motor vehicle inspection and maintenance certification with an effective date of March 15, 2019. The attainment demonstration was not part of this action and will be addressed in a separate future action.

2.3 NO_x RACT

On January 22, 2020, IDEM submitted a NO_x RACT waiver request for major stationary sources of NO_x in Lake and Porter counties, Indiana. RACT is included as part of the implementation of the 2008 8-hour ozone standard for subpart 3, serious nonattainment areas. Specifically, the request seeks to exempt these sources (as defined in Section 302 and Subsections 182(c) and (d) of the CAA from the RACT requirements of Section 182(b)(2)), based on the fact that the entire nonattainment area, as the result of permanent and enforceable emission control measures, has recorded three (3) years of complete, quality assured ambient air quality monitoring data for the years 2017 – 2019 demonstrating attainment of the 2008 8-hour ozone standard, as shown in Tables 2.1 and 2.2. As such, the area is eligible for a waiver of NO_x RACT requirements, as specified in Section 182(f)(1)(A) of the CAA.

IDEM also requested to withdraw the Section 182(f) NO_x exemption request for Lake and Porter counties under the "moderate" classification, submitted on February 10, 2017, as it is no longer applicable in light of the area's attainment of the standard.

2.4 Permanent and Enforceable Improvement in Air Quality

Permanent and enforceable reductions of NO_x and VOCs have resulted in attainment of the 2008 8-hour ozone standard. Some of these reductions were due to the application of RACT rules and some were due to the application of tighter federal standards on new vehicles. Also, Title IV of the CAA and the NO_x SIP Call, and subsequent Clean Air Interstate and Cross-State Air Pollution Rule programs, required the reduction of NO_x from utility sources. Covered sources are prohibited from reducing or removing emissions controls (anti-backsliding) following the redesignation of the area unless such a change is first approved by U.S. EPA as a revision to Indiana's SIP, consistent with Section 110(l) of the CAA.

2.4.1 Reasonably Available Control Technology (RACT) and other State Volatile Organic Compound (VOC) Rules

As required by Section 172 of the CAA, Indiana has promulgated several rules requiring RACT for emissions of VOCs since the mid 1990's. In addition, other statewide rules for controlling VOCs have also been promulgated. The Indiana VOC rules are found in 326 IAC 8. The following is a listing of statewide rules that assist with the reduction of VOCs in the state:

326 IAC 8-1-6	New facilities; general reduction requirements (Best Available Control Technology for Non-Specific Sources)
326 IAC 8-2	Surface Coating Emission Limitations
326 IAC 8-3	Organic Solvent Degreasing Operations
326 IAC 8-4	Petroleum Sources
326 IAC 8-5	Miscellaneous Operation
326 IAC 8-6	Organic Solvent Emission Limitations
326 IAC 8-10	Automobile Refinishing
326 IAC 8-14	Architectural and Industrial Maintenance Coatings
326 IAC 8-15	Standards for Consumer and Commercial Products

2.4.2 Implementation of Past State Implementation Plans (SIP) Revisions

Lake and Porter counties, Indiana, were previously nonattainment under the 1-hour ozone standard. The area met all of its 1-hour SIP obligations, including an U.S. EPA-approved attainment demonstration. All of the control measures outlined within the Post-1999 (2002, 2005, and 2007) Rate of Progress (ROP) plans have been fully implemented. The area was also designated nonattainment for ozone under the 1997 8-hour standard in 2004. Since that time, the area has attained the 1997 8-hour ozone standard and was redesignated to attainment effective May 11, 2010. Therefore, no further SIP revisions are required under the 1997 8-hour ozone standard.

2.4.3 Controls Specific to Lake and Porter Counties, Indiana

Local control measures, including some RACT rules specific to Lake and Porter counties, have helped reduce VOC emissions and other types of emissions in Northwest Indiana. These measures include:

326 IAC 8-7	Specific VOC Reduction Requirements
326 IAC 8-8	Municipal Solid Waste Landfills
326 IAC 8-9	Volatile Organic Liquid Storage Vessels
326 IAC 8-11	Wood Furniture Coatings
326 IAC 8-12	Shipbuilding or Ship Repair Operations
326 IAC 8-13	Sinter Plants
326 IAC 8-16	Offset Lithographic Printing and Letterpress Printing
326 IAC 8-17	Industrial Solvent Cleaning Operations
326 IAC 8-18	Synthetic Organic Chemical Manufacturing Industry Air Oxidation, Distillation, and Reactor Processes
326 IAC 8-19	Control of Volatile Organic Compound Emissions from Process Vents in Batch Operations
326 IAC 8-20	Industrial Wastewater
326 IAC 8-21	Aerospace Manufacturing and Rework Operations
326 IAC 8-22	Miscellaneous Industrial Adhesives
326 IAC 13	Motor Vehicle Emission and Fuel Standards (including a motor vehicle inspection and maintenance program for Lake and Porter counties)
326 IAC 4-1-4.1(c)	Ban on residential burning in Lake and Porter counties
40 CFR 80.70(f)(3)	Federal requirement for the use of federal reformulated gasoline (RFG) in Lake and Porter counties

2.4.4 Controls to Remain in Effect

Indiana commits to maintain the control measures listed above after redesignation, or submit to U.S. EPA as a SIP revision, any changes to its rules or emission limits applicable to NO_x or VOC sources as required for maintenance of the 2008 8-hour ozone standard in Lake and Porter counties, Indiana. Indiana, through IDEM's OAQ and its Compliance and Enforcement Branch, has the legal authority and necessary resources to actively enforce any violations of its rules or permit provisions. After redesignation, IDEM intends to continue enforcing all rules that relate to the emission of ozone precursors in Lake and Porter counties, Indiana.

2.4.5 New Source Review (NSR) Provisions[4]

Indiana has a long standing and fully implemented NSR program that is outlined in 326 IAC 2. The rule includes provisions for the Prevention of Significant Deterioration (PSD) permitting program in 326 IAC 2-2 and the Emission Offset Permitting Program in 326 IAC 2-3. Indiana's PSD program was conditionally approved in the March 3, 2003, *Federal Register* (FR) published at 68 FR 9892 and received final approval on May 20, 2004 (69 FR 29071) by U.S. EPA as part of the SIP.

Any facility that is not listed in the 2014 emission inventory, or for which emission reduction credit through closing was taken in demonstrating attainment, will not be allowed to construct, reopen, modify, or reconstruct without meeting all applicable permit rule requirements. The review process will be identical to that used for new sources. Once the Chicago nonattainment area is redesignated to attainment, the OAQ will implement NSR for major sources in Lake and Porter counties, Indiana through the PSD program. This program requires an air quality analysis to evaluate whether the new source will threaten the NAAQS. Together, these rules will substantially reduce local and regional sources of ozone precursors.

2.5 Approved Maintenance Plan

A maintenance plan provides for the continued attainment of the air quality standard for a period of 10 years after U.S. EPA has formally redesignated the area to attainment. The plan also provides assurances that if there is a subsequent violation of the air quality standard, measures in the maintenance plan will prevent any future occurrences through contingency measures that would be triggered.

Indiana submits the maintenance plan found in Section 3.0 of this document for U.S. EPA's consideration and approval. Once the maintenance plan is approved, the area will have a fully approved implementation plan under section 110(a) of the CAA.

2.6 Section 110 and Part D Requirements

Prior to redesignation, a state containing a nonattainment area must demonstrate compliance with all requirements applicable to the area under section 110 and Part D of the CAA. This means the state must meet all requirements that applied to the area prior to, and at the time of, the submission of a complete request for redesignation to attainment.

On August 7, 2019 (84 FR 44238), U.S. EPA reclassified the Chicago area from moderate to serious and established August 3, 2020 as the due date for serious area SIP revisions. No requirements under Section 182(c) of the CAA became due prior to IDEM's submission of the complete redesignation request for the Indiana portion of the

[4] https://www.federalregister.gov/articles/2004/05/20/04-11337/approval-and-promulgation-of-implementation-plans-indiana

Chicago area, and, therefore, none are applicable to the area for purposes of redesignation.

2.6.1 Section 110 CAA Requirements

Section 110(a) of the CAA contains the general requirements for a SIP. Only the Section 110 requirements that are linked with a particular area's designation are the relevant measures to consider in evaluating a redesignation request. Further, Indiana believes that other Section 110 elements that are not connected with nonattainment plan submissions and not linked with an area's attainment status are also not applicable requirements for purposes of redesignation as a state remains subject to these requirements after an area is redesignated to attainment. The requirements of CAA Section 110(a)(2) that are statewide requirements and that are not linked to the 2008 8-hour ozone attainment status of Indiana's portion of the Chicago-Naperville, IL-IN-WI, nonattainment area (Lake and Porter counties) are therefore not applicable requirements for purposes of review of Indiana's redesignation request.

Indiana's infrastructure SIP for the 2008 8-hour ozone standard was approved on April 16, 2015, U.S. EPA did not act on Section 110(a)(2)(D)(i)(I) of the CAA (Prongs 1 and 2) relating to interstate transport. On December 6, 2018, U.S. EPA signed a final action determining that the existing CSAPR Update fully addresses, and provides complete remedy for, the CAA's good neighbor provision requirements for the remaining CSAPR Update states, including Indiana (83 FR 65878). The final rule went into effect on February 29, 2019. According to U.S. EPA, the final Determination Rule satisfied U.S. EPA's obligation to fully address the good neighbor provision requirements for the 2008 8-hour ozone standard. As such, U.S. EPA required no further action be taken by Indiana to address the good neighbor provision requirements and the supplemental information submitted on March 29, 2018 was unnecessary. Therefore, Indiana withdrew the March 29, 2018, submittal on July 9, 2019.

Downwind states, that have undertaken court challenges to force U.S. EPA to bring the upwind states, including Indiana, into compliance with the CAA's good neighbor provision requirements in the past, challenged U.S. EPA's decision to require no further action in a court filling in the D.C. Circuit on January 30, 2019.[5] On October 1, 2019, the D.C. Circuit struck down the rule, on the basis that future action is required to meet a statutory 2021 deadline.[6]

2.6.2 CAA Part D Plan Requirements for Nonattainment Areas

Part D of the CAA contains requirements applicable to all areas designated nonattainment. Ozone nonattainment areas must meet the general provisions of Subpart 1 and the specific ozone provisions in Subpart 2. The maintenance plan

[5] https://www.epa.gov/sites/production/files/2019-01/documents/downwinders_19-1020_pfr_01302019.pdf
[6] https://policyintegrity.org/documents/Opinion_19-1019.pdf

associated with this request for redesignation for Lake and Porter counties, Indiana is a SIP revision for Indiana's portion of an area designated as a nonattainment area and meets the applicable requirements of Part D of Title 1 of the CAA.

2.6.2.1 Section 172(c) CAA Requirements

Section 172(c) of the CAA contains general requirements for nonattainment plans. These requirements include reasonable further progress, emission inventories, permitting provisions, and other measures for attainment. These requirements were addressed in the attainment demonstration submitted to U.S. EPA on February 28, 2017.

2.6.2.2 Section 173 CAA Requirements

These provisions outline requirements related to permitting of air pollution sources in nonattainment areas. Stationary sources of air pollution are subject to the applicable regulations of 326 IAC 2. These regulations include:

- Prevention of Significant Deterioration (PSD) Permitting Requirements (326 IAC 2-2)
- Emission Offset Permitting Program Requirements (326 IAC 2-3)

These permitting, stationary source monitoring and reporting, preconstruction review, offset ratios, and enforceable emission limitation requirements were adopted to implement the federally mandated requirements in Sections 110, 172, and 173 of the CAA.

2.6.2.3 Section 176(c) CAA Requirements

Transportation conformity is required under Section 176(c) of the CAA to ensure that federally supported highway and transit project activities are consistent with (i.e. "conform to") the purpose of the SIP. Indiana's general conformity rules were approved into Section 176(c) of the CAA on January 14, 1998 (63 FR 2146). Transportation conformity, as discussed below, applies to areas that are designated nonattainment and those areas redesignated attainment after 1990 (i.e. "maintenance areas") with plans developed under Section 175A of the CAA for transportation-related criteria pollutants.

U.S. EPA requirements outlined in 40 CFR 93.118(e)(4) stipulate that mobile source emissions budgets (MVEBs) for NO_x and VOC be established as part of a SIP. The MVEBs are necessary to demonstrate conformance of transportation plans and improvement programs with the SIP. A general summary of the Motor Vehicle Emission Simulator (MOVES) methodology used in this area can be found in Appendix C. In addition, due to the size of the MOVES input and output files, they will be provided electronically to appropriate staff with this submittal.

2.6.2.3.1 On-Road Emission Estimations

The Northwestern Indiana Regional Planning Commission (NIRPC) is the Metropolitan Planning Organization (MPO) for the area that includes Lake, Porter, and LaPorte counties. This organization maintains a travel demand forecast model that is used to simulate the traffic in the area and is used to predict what that traffic will be like in future years given growth expectations. The model is used mostly to identify where travel capacity will be needed and to determine the infrastructure requirements necessary to meet that need. It is also used to support the calculation of mobile source emissions. The travel demand forecast model is used to predict the total daily Vehicle Miles Traveled (VMT) and a U.S. EPA software program called MOVES is used to calculate the emissions per mile. The product of these two outputs, once combined, is the total amount of pollution emitted by on-road vehicles for the particular analyzed area.

2.6.2.3.2 Overview

Broadly described, MOVES is used to determine "emission factors," which are the average emissions per mile (grams/mile) for the ozone precursors: NO_x and VOC. There are numerous variables that can affect the emission factors. The vehicle fleet (vehicles on the road) age and the vehicle types have a major effect on the emission factors. The facility type the vehicles are traveling on (MOVES facility types are Freeway and Arterial and distinguish between urban and rural areas) and the vehicle speeds also affect the emission factor values. Meteorological factors, such as hourly air temperature and humidity, and the area's Vehicle Inspection/Maintenance program affect the emission factors as well. These data are estimated using the best available data to generate emission factors for appropriate ozone precursors, NO_x and VOC. VMT data is generated by the region's travel demand model. Once emission factors are determined, the emission factor(s) is multiplied by the VMT to ultimately determine the quantity of vehicle emissions.

2.6.2.3.3 Emission Estimates

Table 2.5 outlines the on-road emission estimations for the Lake and Porter ozone nonattainment area for the years 2011, 2017, 2025, and 2030 which are based on the actual travel demand model network runs generating estimated emissions for those years under the Northwest Indiana 2050 Transportation Plan. Table 2.6 contains the on-road emission estimations in tons per summer day (tpsd) for the entire Chicago nonattainment area for the same years of 2011, 2017, and the projected years of 2025 and 2030.

Table 2.5: Emission Estimations and Projections for On-Road Mobile Sources - Lake and Porter Counties, Indiana, 2011 (Base-Year), 2017 (Attainment-Year), 2025 (Interim-Year), and 2030 (Maintenance-Year)

Lake and Porter	2011	2017	2025	2030
NO_x, tpsd	24.70	12.85	8.53	6.62
VOC, tpsd	9.58	6.07	4.91	3.77

Table 2.6: Emission Estimations and Projections for On-Road Mobile Sources - Entire Chicago Nonattainment Area, 2011 (Base-Year), 2017 (Attainment-Year), 2025 (Interim-Year), and 2030 (Maintenance-Year)

Entire Area	2011 (Base-Year)	2017 (Attainment-Year)	2025 (Interim-Year)	2030 (Maintenance-Year)
NO_x tpsd	326.43	193.32	95.04	73.42
VOC tpsd	103.15	88.98	58.71	47.14

2.6.2.3.4 Motor Vehicle Emission Budget

Table 2.7 contains the motor vehicle emissions budget for the Lake and Porter ozone nonattainment area for the years 2025 and 2030.

Table 2.7: Motor Vehicle Emission Budgets Lake and Porter Ozone Nonattainment Area

Lake and Porter	2025	2030
NO_x, tpsd	9.81	7.61
VOC, tpsd	4.94	4.34

This budget includes the projected emission estimates for 2025 and 2030 with a 15% margin of safety applied to NO_x emission estimates for 2025 and 2030 as well as VOC emission estimates for 2030. Due to a slight increase in area and point source emissions between 2017 and 2025, a VOC margin of safety for 2025 is limited to 0.03 tons/day and has been applied in Table 2.7. Since assumptions change over time, IDEM determined a 15% margin of safety as described above to be reasonable to account for such changes within the conformity process. The emission estimates derive from the NIRPC travel demand model and MOVES as described above under the Northwest Indiana 2050 Transportation Plan. The emissions calculation methodology, latest planning assumptions, and margin of safety were determined through the interagency consultation process described in the Interagency Consultation Group Conformity Consultation Guidance.[7]

[7] https://www.in.gov/idem/airquality/files/transportation_conformity_apndx_b.pdf

2.6.2.4 Section 191(a) CAA Requirements

Section 191(a) of the CAA identifies requirements related to nonattainment plan submission and attainment deadlines. Indiana has submitted all required SIP elements for this area in either previous submittals, or as part of this submittal. On February 28, 2017, Indiana submitted the attainment demonstration for its portion of the Chicago-Naperville, IN-IL-WI, nonattainment area to U.S. EPA.

3.0 LAKE and PORTER, IN OZONE NONATTAINMENT AREA MAINTENANCE PLAN

On August 7, 2019, U.S. EPA designated Lake and Porter counties and the entire area as nonattainment and reclassified it as "serious" under Subpart 2 of Part D, Title I of the CAA for failing to attain by the July 20, 2018 attainment date. This designation became effective on September 23, 2019. However, ozone data from all monitors within the Chicago nonattainment area for the 2017-2019 design value period indicate that the 2008 8-hour ozone standard was attained at the end of 2019, well in advance of the July 20, 2021, attainment date. In order for the Chicago Nonattainment Area to be redesignated to attainment, Indiana, Illinois, and Wisconsin must submit, and U.S. EPA must approve, a SIP showing maintenance of the 2008 8-hour ozone NAAQS within the nonattainment area for at least 10 years after redesignation.

According to U.S. EPA's *Redesignation Guidance*, states may generally demonstrate maintenance of the standard "by either showing that future emissions of a pollutant or its precursors will not exceed the level of the attainment inventory, or by modeling to show that the future mix of sources and emissions rates will not cause a violation of the NAAQS". Per U.S. EPA guidance, Indiana is relying on the attainment inventory approach to demonstrate maintenance of the 2008 ozone 8-hour NAAQS. Emission projections outlined in this document clearly illustrate that NO_x and VOC emissions in Lake and Porter counties, Indiana, as well as the entire nonattainment area, will continue to decline between the 2017 attainment-year and the 2030 maintenance-year. The following plan has been developed in support of Indiana's request for redesignation.

U.S. EPA's Redesignation Guidance states that the maintenance plan must consist of the following items:

- Attainment Inventory
- Demonstration of Maintenance
- Continued Operation of Monitoring Network
- Verification of Continued Attainment
- Contingency Plan

3.1 Emission Inventory

In consultation with U.S. EPA, Illinois, and Wisconsin, a base-year of 2011, an attainment-year of 2017, an interim-year of 2025, and a maintenance-year of 2030 were selected. The 2011 base-year emissions inventory represents a comprehensive, accurate, and current inventory of actual emissions from all sources of NO_x and VOCs in Lake and Porter counties. The Ozone NAAQS Emissions Modeling platform (2011v6.2) was used to collect data for the 2011 NEI year. Point source, EGU point sources, area, and non-road emissions were compiled from the data available on U.S. EPA's Emissions Modeling Clearinghouse website for the entire Chicago nonattainment area.[8] On-road values for Lake and Porter counties were produced from MOVES2014 and the NIRPC travel demand model, but were based on actual travel demand model network runs 2011 and 2017. Biogenic emissions are not included in these summaries.

Lake and Porter counties 2017 total inventory includes point sources, EGU-point sources, area, and non-road emissions compiled from the data available on U.S. EPA's Emission Modeling Platform 2016v1.[9] The modeling platform provides emission estimates for 2016 and projections to 2023 and 2028. The annual emissions provided by this inventory are then used to calculate average summerday emissions using U.S. EPA guidance on how the model estimates daily emissions. The monthly profile percentages for June, July, and August were added together and then divided by the number of days in the season (92). This is applied at the process level using the profiles that are specified for each source classification code (SCC) that is assigned to the process.[10] The on-road 2017 emission estimates are based on actual travel demand model network runs generating estimated emissions for those years under the Northwest Indiana 2050 Transportation Plan.

Lake and Porter's projected inventory for 2025 was a straight-line interpolation between the projected modeling inventories for 2023 and 2028. The interpolations were performed at the process level to capture the highest level of detail for the expected changes over time. The 2030 projected inventory for point, area, and non-road sectors were estimated at the process level as well, using inventory data points from 2016, 2023, and 2028 and utilizing the TREND function in Microsoft Excel. If the TREND function resulted in a negative value the emissions were assumed to not change. EGU-point emissions for 2030 were estimated from the ERTAC model. The on-road 2025 and 2030 emission estimates are based on the actual travel demand model network runs generating estimated emissions to exist for those years under the Northwest Indiana 2050 Transportation Plan.

3.2 Attainment Inventory

U.S. EPA's Redesignation Guidance requires states to identify the level of emissions in an affected area that is sufficient to attain and maintain the NAAQS. To satisfy this

[8] https://www.epa.gov/air-emissions-modeling/2011-version-62-technical-support-document
[9] https://www.epa.gov/air-emissions-modeling/2014-2016-version-7-air-emissions-modeling-platforms
[10] https://ofmpub.epa.gov/sccwebservices/sccsearch/

requirement, Indiana is submitting the inventory shown in Tables 3.1 through Table 3.3. This inventory is a comprehensive inventory of ozone precursor emissions (NO_x and VOC) representative of the year when the area achieved attainment of the ozone air quality standard.

Table 3.1: Lake and Porter Counties, Indiana NO_x Attainment-Year (2017) Emission Inventory (Tons per Summer Day)

Sector	Lake County	Porter County	Total
EGU-Point	0.27	3.46	3.73
Point	30.38	25.04	55.42
Area	4.91	3.15	8.06
Non-road	4.92	1.81	6.73
On-road	8.91	3.94	12.85
TOTAL	**49.39**	**37.40**	**86.79**

Table 3.2: Lake and Porter Counties, Indiana VOC Attainment-Year (2017) Emission Inventory (Tons per Summer Day)

Sector	Lake County	Porter County	Total
EGU-Point	0.08	0.12	0.20
Point	8.19	1.97	10.16
Area	13.99	5.57	19.56
Non-road	2.53	1.53	4.06
On-road	4.37	1.70	6.07
TOTAL	**29.16**	**10.89**	**40.05**

Table 3.3: Entire Chicago Nonattainment Area NO_x and VOC Attainment-Year (2017) Emission Inventory (Tons per Summer Day)

Sector	NO_x Total	VOC Total
Illinois		
EGU-Point	29.23	0.78
Point	47.59	44.53
Area	33.60	226.69
Non-road	142.64	80.56
On-road	177.66	81.49
Total	**430.72**	**434.05**
Indiana		
EGU-Point	3.73	0.20
Point	55.42	10.16
Area	8.06	19.56
Non-road	6.73	4.06
On-road	12.85	6.07
Total	**86.79**	**40.05**
Wisconsin		
EGU-Point	8.55	0.32
Point	0.13	0.07
Area	1.02	3.49
Non-road	1.67	0.74
On-road	2.81	1.42
Total	**14.18**	**6.04**
Total Nonattainment Area		
EGU-Point	41.51	1.30
Point	103.14	54.76
Area	42.68	249.74
Non-road	151.04	85.36
On-road	193.32	88.98
TOTAL	**531.69**	**480.14**

3.2 Demonstration of Maintenance

As mentioned in Section 3.0, Indiana is relying on the emissions inventory approach to demonstrate maintenance of the ozone 8-hour NAAQS. That is, emissions projected at least ten years following redesignation (i.e. the maintenance year) must not increase above the attainment-year inventory.

3.2.1 Projected Inventory

Maintenance is demonstrated when the future-year (2030) projected NO_x and VOC emissions totals are below the 2017 attainment year.

Tables 3.4 and 3.5 illustrate projected anthropogenic NO_x emissions for both Lake and Porter counties, Indiana, and the entire Chicago nonattainment area. Tables 3.6 and 3.7 illustrate projected anthropogenic VOC emissions for both Lake and Porter counties, Indiana and the entire Chicago nonattainment area.

Table 3.4: Lake and Porter Counties, Indiana NO_x Emission Inventory Totals (Tons per Summer Day)

Sector	2011 Base	2017 Attainment	2025 Interim	2030 Maintenance	Safety Margin
EGU- Point	30.15	3.73	0.34	0.34	-3.39
Point	66.46	55.42	58.49	59.30	3.88
Area	9.69	8.06	7.13	6.68	-1.38
Nonroad	12.69	6.73	4.28	3.22	-3.51
Onroad	24.70	12.85	8.53	6.62	-6.23
TOTAL	**143.69**	**86.79**	**78.77**	**76.16**	**-10.63**

Table 3.5: NO_x Emission Inventory Totals for the Illinois, Indiana, and Wisconsin portions of the Chicago Nonattainment Area (Tons per Summer Day)

Sector	2011 Base	2017 Attainment	2025 Interim	2030 Maintenance	Safety Margin
Illinois					
EGU- Point	67.41	29.23	49.56	60.75	31.52
Point	52.57	47.59	47.68	48.54	0.95
Area	27.14	33.60	33.83	33.97	0.37
Nonroad	188.34	142.64	114.83	106.92	-35.72
Onroad	296.38	177.66	85.04	65.66	-112.00
TOTAL	**631.84**	**430.72**	**330.94**	**315.84**	**-114.88**
Indiana					
EGU- Point	30.15	3.73	0.34	0.34	-3.39
Point	66.46	55.42	58.49	59.30	3.88
Area	9.69	8.06	7.13	6.68	-1.38
Nonroad	12.69	6.73	4.28	3.22	-3.51
Onroad	24.70	12.85	8.53	6.62	-6.23
TOTAL	**143.69**	**86.79**	**78.77**	**76.16**	**-10.63**
Wisconsin					
EGU- Point	8.71	8.55	0.00	0.00	-8.55
Point	0.11	0.13	0.16	0.16	0.03
Area	1.09	1.02	1.00	0.99	-0.03
Nonroad	2.08	1.67	1.24	1.15	-0.52
Onroad	5.35	2.81	1.47	1.14	-1.67
TOTAL	**17.34**	**14.18**	**3.87**	**3.44**	**-10.74**
Total Nonattainment Area					
EGU- Point	106.27	41.51	49.90	61.09	19.58
Point	119.14	103.14	106.33	108.00	4.86
Area	37.92	42.68	41.96	41.64	-1.04
Nonroad	203.11	151.04	120.35	111.29	-39.75
Onroad	326.43	193.32	95.04	73.42	-119.90
TOTAL	**792.87**	**531.69**	**413.58**	**395.44**	**-136.25**

Table 3.6: Lake and Porter Counties, Indiana VOC Emission Inventory Totals (Tons per Summer Day)

Sector	2011 Base	2017 Attainment	2025 Interim	2030 Maintenance	Safety Margin
EGU- Point	0.63	0.20	0.07	0.06	-0.14
Point	17.07	10.16	11.70	11.57	1.41
Area	18.07	19.56	19.76	19.86	0.30
Nonroad	14.19	4.06	3.58	3.38	-0.68
Onroad	9.58	6.07	4.91	3.77	-2.30
TOTAL	**59.54**	**40.05**	**40.02**	**38.64**	**-1.41**

Table 3.7: VOC Emission Inventory Totals for the Illinois, Indiana, and Wisconsin portions of the Chicago Nonattainment Area (Tons per Summer Day)

Sector	2011 Base	2017 Attainment	2025 Interim	2030 Maintenance	Safety Margin
Illinois					
EGU- Point	0.62	0.78	2.12	2.64	1.86
Point	47.63	44.53	43.67	43.57	-0.96
Area	210.04	226.69	221.71	221.40	-5.29
Nonroad	169.58	80.56	79.07	82.27	1.71
Onroad	91.04	81.49	52.85	42.64	-38.85
TOTAL	**518.91**	**434.05**	**399.42**	**392.52**	**-41.53**
Indiana					
EGU- Point	0.63	0.20	0.07	0.06	-0.14
Point	17.07	10.16	11.70	11.57	1.41
Area	18.07	19.56	19.76	19.86	0.30
Nonroad	14.19	4.06	3.58	3.38	-0.68
Onroad	9.58	6.07	4.91	3.77	-2.30
TOTAL	**59.54**	**40.05**	**40.02**	**38.64**	**-1.41**
Wisconsin					
EGU- Point	0.38	0.32	0.00	0.00	-0.32
Point	0.18	0.07	0.15	0.15	0.08
Area	3.76	3.49	3.48	3.50	0.01
Nonroad	1.13	0.74	0.64	0.62	-0.12
Onroad	2.53	1.42	0.95	0.73	-0.69
TOTAL	**7.98**	**6.04**	**5.22**	**5.00**	**-1.04**

Total Nonattainment Area					
EGU- Point	1.63	1.30	2.19	2.70	1.40
Point	64.88	54.76	55.52	55.29	0.53
Area	231.87	249.74	244.95	244.76	-4.98
Nonroad	184.90	85.36	83.29	86.27	0.91
Onroad	103.15	88.98	58.71	47.14	-41.84
TOTAL	**586.43**	**480.14**	**444.66**	**436.16**	**-43.98**

Overall emissions of NO_x and VOC within Lake and Porter counties, Indiana, as well as the entire Chicago nonattainment area are projected to decrease as shown in Tables 3.8 and 3.9. The overall decrease in NO_x and VOC emissions has helped the area attain the standard and additional projected future emission reductions will ensure the area continues to attain the standard well into the future.

Table 3.8: Lake and Porter Counties, Indiana Comparison of 2017 Attainment Year and 2025 and 2030 Projected Emission Estimates (Tons per Summer Day)

Pollutant	2017	2025	Difference Between 2017 and 2025	2030	Difference Between 2017 and 2030
NO_x	86.79	78.77	**-8.02**	76.16	**-10.63**
VOC	40.05	40.02	**-0.03**	38.64	**-1.41**

Table 3.9: Entire Chicago Nonattainment Area Comparison of 2017 Attainment Year and 2025 and 2030 Projected Emission Estimates (Tons per Summer Day)

Pollutant	2017	2025	Difference Between 2017 and 2025	2030	Difference Between 2017 and 2030
Illinois					
NO_x	430.72	330.94	**-99.78**	315.84	**-114.88**
VOC	434.05	399.42	**-34.63**	392.52	**-41.53**
Indiana					
NO_x	86.79	78.77	**-8.02**	76.16	**-10.63**
VOC	40.05	40.02	**-0.03**	38.64	**-1.41**
Wisconsin					
NO_x	14.18	3.87	**-10.31**	3.44	**-10.74**
VOC	6.04	5.22	**0.82**	5.00	**-1.04**
Total Nonattainment Area					
NO_x	531.69	413.58	**-118.11**	395.44	**-136.25**
VOC	480.14	444.66	**-35.48**	436.16	**-43.98**

As identified in Table 2.5, a 15% margin of safety is being allocated to the 2025 and 2030 motor vehicle emission projections for Lake and Porter counties, Indiana. U.S. EPA's transportation conformity regulations allow for allocation, through a revision to the SIP, of all or some portion of the area's overall safety margin (emission reductions from 2017 to 2030) to the motor vehicle emission budget projections for future conformity. As identified in Table 2.5, projected NO_x and VOC emission reductions from 2017 to 2030 in Lake and Porter counties, Indiana allows for a 15% margin of safety being applied to the 2025 and 2030 MVEBs in Table 2.7.

3.2.2 Modeling Demonstration

Although U.S. EPA's Redesignation Guidance does not require modeling for ozone nonattainment areas, IDEM is providing the most recent photochemical modeling released by the U.S. EPA, which was for the Interstate Transport "Good Neighbor" Provision for the 2015 8-hour ozone NAAQS of 0.070 ppm. While this modeling was conducted under a more stringent 8-hour ozone NAAQS, it shows the monitors in the non-attainment area are projected to have 2023 ozone design values below both the 2008 and 2015 ozone NAAQS. Paired with current monitoring data, this analysis demonstrates the area has attained and will continue to maintain compliance with the 2008 8-hour ozone NAAQS well into the future with an increased margin of safety over time. Additional information regarding the modeling demonstration can be found in Section 2.1.2.

3.3 Monitoring Network

Indiana commits to continue monitoring ozone levels at the sites indicated in Table 2.1. IDEM will consult with U.S. EPA Region V staff prior to making changes to the existing monitoring network, should changes become necessary in the future. IDEM will continue to quality assure the monitoring data to meet the requirements of 40 CFR 58. Updates to the IDEM website will provide real time availability of the data and knowledge of any exceedances.[11] IDEM will enter all data into AQS in a timely manner in accordance with federal guidelines.

Indiana, Illinois, and Wisconsin have all quality-assured their portions of the data shown in Appendix A in accordance with 40 CFR 58.15. Indiana, Illinois, and Wisconsin have each recorded their data in the AQS database making the data available to the public. Further, according to the applicable requirements in 40 CFR 58.10, Indiana will consult with U.S. EPA through the annual review of Indiana's monitoring network prior to making any changes to the existing monitoring network.

[11] https://www.in.gov/idem/airquality/2485.htm

3.4 Verification of Continued Attainment

According to U.S. EPA's "Procedures for Processing Requests to Redesignate Area to Attainment", each State should ensure that it has the legal authority to implement and enforce all measures necessary to attain and maintain the 2008 8-hour NAAQS for ozone. Indiana maintains the legal authority, necessary resources, and structural components of its air quality management program to implement and enforce all measures necessary to maintain the NAAQS.

In order to track the progress of maintenance plan, Indiana commits to periodically reevaluate the emissions inventory, as well as monitor contingency plan indicators and triggers as discussed in Section 3.5.

3.5 Contingency Plan

As required by Section 175A(b) of the CAA, Indiana commits to submit to the Administrator, eight (8) years after redesignation, an additional revision of the SIP. The revision will contain Indiana's plan for maintaining the 2008 8-hour NAAQS for ozone for an additional ten (10) years beyond the first ten (10) year maintenance period after redesignation.

Indiana commits to adopt and expeditiously implement necessary corrective actions in response to exceeding specified levels or in the event that future violations of the ambient standard occur. Indiana hereby commits to adopt and implement necessary corrective actions in the following circumstances:

3.5.1 Warning Level Response

A Warning Level Response shall be prompted whenever an annual (1-year) 4th high monitored value of 0.079 ppm occurs in a single ozone season or a two-year average 4th high monitored value of 0.076 ppm or greater occurs within the maintenance area. A Warning Level Response will consist of a study to determine whether the ozone value indicates a trend toward higher ozone values or whether emissions appear to be increasing. The study will evaluate whether the trend, if any, is likely to continue and, if so, the control measures necessary to reverse the trend. It will also take into consideration ease and timing for implementation, as well as economic and social considerations. Implementation of necessary controls in response to a Warning Level Response trigger will take place as expeditiously as possible, but in no event later than twelve months from the conclusion of the most recent ozone season.

Should it be determined through the Warning Level study that action is necessary to reverse the noted trend, procedures for control selection and implementation outlined under "Action Level Response" shall be followed.

3.5.2 Action Level Response

An Action Level Response shall be prompted whenever a violation of the standard (three-year average fourth high monitored value of 0.076 ppm or greater) occurs within the maintenance area. In the event that the Action Level is triggered and is not found to be due to an exceptional event, malfunction, or noncompliance with a permit condition or rule requirement, IDEM will determine additional control measures needed to assure future attainment of the NAAQS for ozone. In this case, measures that can be implemented in a short time will be selected and be in place within eighteen (18) months from the close of the ozone season that prompted the Action Level. Should it be determined that any of the above action is necessary the following procedures for control selection and implementation shall be followed.

3.5.3 Control Measure Selection and Implementation

Adoption of any additional control measure(s) is subject to the necessary administrative and legal process. This process will include posting of notices, an opportunity for public hearings, and other measures required by Indiana law for rulemaking by the State of Indiana's Environmental Rules Board.

If new measures or control is already promulgated and scheduled to be implemented at the federal or state level and that measure or control is determined to be sufficient to address the upward trend in air quality, additional local measures may be unnecessary. Furthermore, Indiana will submit to U.S. EPA an analysis to demonstrate that the proposed measure(s) are adequate to return the area to attainment.

3.5.4 Contingency Measures

Contingency measures to be considered will be selected from a comprehensive list of measures deemed appropriate and effective at the time the selection is made. Listed below are example measures that may be considered. The selection of measures will be based upon cost-effectiveness, emission-reduction potential, economic and social considerations, or other factors that IDEM deems appropriate. IDEM will solicit input from all interested and affected persons in the maintenance area prior to selecting appropriate contingency measures. All of the listed contingency measures are potentially effective or proven methods of obtaining significant reductions of ozone precursor emissions. It is not possible at this time to determine what control measure(s) will be appropriate at an unspecified time in the future. Therefore, the list of contingency measures outlined below is not comprehensive. Indiana anticipates that if contingency measures should ever be necessary, it is unlikely that a significant number (i.e., all those listed below) will be required.

1. Enhancements to the vehicle emissions testing program (increased weight limit, addition of diesel vehicles, etc.)
2. Asphalt paving (lower VOC formulation)
3. Diesel exhaust retrofits
4. Traffic flow improvements
5. Idle reduction programs
6. Portable fuel container regulation (statewide)
7. Park and ride facilities
8. Rideshare/carpool program
9. VOC cap/trade program for major stationary sources
10. NO_x Reasonably Available Control Technology

At the time these measures are under consideration an opportunity for full public participation will be provided, during which the relative costs and benefits of individual measures can be fully evaluated. No contingency measures will be implemented without providing the opportunity for full public participation.

4.0 PUBLIC PARTICIPATION

In accordance with 40 CFR 51.102, public participation in this request was provided as follows:

Notice of availability of the complete document and a request for the opportunity for a public hearing was made available on IDEM's website on January 21, 2020, at https://www.in.gov/idem/5474.htm. It remained posted on the site until at least February 24, 2020.

During the public comment period IDEM did not receive any public comments. The deadline during the public comment period to request a hearing was February 21, 2020. There was not a request for a public hearing and therefore the hearing was not required to be held.

A copy of the legal public notice can be found in Appendix D.

5.0 CONCLUSIONS

Lake and Porter counties, along with the remaining portion of the Chicago-Naperville, IL-IN-WI nonattainment area, have attained the 2008 8-hour NAAQS for ozone. This petition demonstrates that Lake and Porter counties have complied with the applicable provisions of the CAA regarding redesignation of ozone nonattainment areas. IDEM has prepared a Redesignation Request and Maintenance Plan that meets the requirement of Section 110(a)(1) of the CAA.

Indiana has performed an analysis that shows the air quality improvements are due to permanent and enforceable measures. Some of these reductions were due to the application of RACT rules and some were due to the application of tighter federal

standards on new vehicles. Also, Title IV of the CAA and the NO_x SIP Call, and subsequent CAIR and CSAPR programs, required the reduction of NO_x from utility sources through the implementation of a trading program. Covered sources are prohibited from reducing or removing emissions controls (anti-backsliding) following the redesignation of the area unless such a change is first approved by U.S. EPA as a revision to Indiana's SIP, consistent with Section 110(l) of the CAA.

Under the previous 1-hour ozone standard and the 1997 8-hour ozone standard, controls have been implemented in Lake and Porter counties that are more stringent than in any other portion of Indiana. These controls are comparable to controls implemented elsewhere within the nonattainment area and shall remain in effect following redesignation to ensure continued compliance with the standard.

In addition to the corrective actions (should they be necessary) outlined in this submittal, Indiana continues to participate in the regional air quality planning efforts sponsored by LADCO. The current goal of the planning process is to establish a regional control strategy that provides for attainment of the ozone and fine particle standards throughout the states of Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin. Along with the other LADCO states, Indiana is developing local and statewide emission control measures where photochemical modeling and culpability analyses demonstrate a clear need. Cost effectiveness analyses justify the implementation of such measures. These actions will provide for an even greater margin of safety for the Chicago area and ensure continued maintenance with the standard well into the future.

Based on this presentation, Indiana's portion of the Chicago-Naperville, IL-IN-WI, nonattainment area (Lake and Porter counties) meets the requirements for redesignation under Section 107(d)(3) of the CAA and U.S. EPA guidance. Furthermore, because this area is subject to transport, additional regional NO_x and VOC reductions will ensure continued compliance (maintenance) with the 2008 8-hour ozone standard and provide an increased margin of safety. As such, the submitted plan is complete and meets the requirements necessary for full approval and the redesignation of the area.

Consistent with the authority granted to U.S. EPA under Section 107(d)(3) of the CAA, Indiana requests that Lake and Porter counties be redesignated from nonattainment to attainment of the 2008 8-hour ozone standard simultaneously with U.S. EPA approval of the Redesignation Request and Maintenance Plan provisions contained herein.

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APPENDIX A

Air Quality System (AQS) Monitoring Data Values for Indiana's Portion (Lake and Porter Counties), Illinois' Portion, and Wisconsin's Portion of the Chicago-Naperville, IL-IN-WI, 2008 8-Hour Ozone Nonattainment Area

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AQS Monitoring Data Tables for Indiana's Portion of the Chicago-Naperville, IL-IN-WI, 2008 8-Hour Ozone Nonattainment Area

Ozone (44201) | Indiana | Parts per million (007)

1-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	VALID DAYS MEAS	NUM DAYS REQ	1ST MAX 1-HR	2ND MAX 1-HR	3RD MAX 1-HR	4TH MAX 1-HR	DAY MAX> STD	EST DAYS> STD	MISS DAYS< STD	CERT and EVAL	EDT
18-089-0022	1	0520	Gary	Lake	201 MISSISSIPPI ST., IITRI BUNKER	2014	047	177	183	.079	.078	.077	.076	0	0.0	1	Y	0
18-089-0022	1	0520	Gary	Lake	201 MISSISSIPPI ST., IITRI BUNKER	2015	047	173	183	.086	.077	.072	.071	0	0.0	3	Y	0
18-089-0022	1	0520	Gary	Lake	201 MISSISSIPPI ST., IITRI BUNKER	2016	047	181	183	.108	.090	.078	.077	0	0.0	2	Y	0
18-089-0022	1	0520	Gary	Lake	201 MISSISSIPPI ST., IITRI BUNKER	2017	047	241	245	.093	.086	.085	.084	0	0.0	2	Y	0
18-089-0022	1	0520	Gary	Lake	201 MISSISSIPPI ST., IITRI BUNKER	2018	047	234	245	.099	.093	.090	.074	0	0.0	0	Y	0
18-089-0022	1	0520	Gary	Lake	201 MISSISSIPPI ST., IITRI BUNKER	2019	047	233	245	.081	.081	.078	.075	0	0.0	3	Y	0
18-089-2008	1	0520	Hammond	Lake	1300 141 ST STREET	2014	047	174	183	.084	.084	.077	.075	0	0.0	0	Y	0
18-089-2008	1	0520	Hammond	Lake	1300 141 ST STREET	2015	047	147	183	.068	.068	.068	.065	0	0.0	0	Y	0
18-089-2008	1	0520	Hammond	Lake	1300 141 ST STREET	2016	047	177	183	.088	.087	.086	.083	0	0.0	0	Y	0
18-089-2008	1	0520	Hammond	Lake	1300 141 ST STREET	2017	047	235	245	.101	.090	.081	.081	0	0.0	1	Y	0
18-089-2008	1	0520	Hammond	Lake	1300 141 ST STREET	2018	047	243	245	.080	.077	.075	.071	0	0.0	2	Y	0

Ozone (44201) | Indiana | Parts per million (007)

8-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	%OBS	VALID DAYS MEAS	NUM DAYS REQ	1ST MAX 8-HR	2ND MAX 8-HR	3RD MAX 8-HR	4TH MAX 8-HR	DAY MAX> STD	CERT and EVAL	EDT
18-089-2008	1	0520	Hammond	Lake	1300 141 ST STREET	2019	047	75	183	245	.067	.066	.066	.065	0		0
18-127-0024	1	0520	Ogden Dunes (Wickliffe)	Porter	84 DIANA RD/ WATER TREATMENT PLANT	2014	047	96	175	183	.073	.071	.071	.071	0	Y	0
18-127-0024	1	0520	Ogden Dunes (Wickliffe)	Porter	84 DIANA RD/ WATER TREATMENT PLANT	2015	047	100	183	183	.077	.071	.067	.066	1	Y	0
18-127-0024	1	0520	Ogden Dunes (Wickliffe)	Porter	84 DIANA RD/ WATER TREATMENT PLANT	2016	047	100	183	183	.078	.072	.071	.070	1	Y	0
18-127-0024	1	0520	Ogden Dunes (Wickliffe)	Porter	84 DIANA RD/ WATER TREATMENT PLANT	2017	047	98	240	245	.080	.079	.072	.072	2	Y	0
18-127-0024	1	0520	Ogden Dunes (Wickliffe)	Porter	84 DIANA RD/ WATER TREATMENT PLANT	2018	047	94	231	245	.085	.084	.084	.071	3	Y	0
18-127-0024	1	0520	Ogden Dunes (Wickliffe)	Porter	84 DIANA RD/ WATER TREATMENT PLANT	2019	047	71	173	245	.074	.069	.068	.068	0		0
18-127-0026	1	0520	Not in a city	Porter	1000 WESLEY ST./ VALPARAISO WATER DEPT.	2014	047	98	179	183	.071	.071	.070	.067	0	Y	0
18-127-0026	1	0520	Not in a city	Porter	1000 WESLEY ST./ VALPARAISO WATER DEPT.	2015	047	96	176	183	.067	.065	.063	.060	0	Y	0
18-127-0026	1	0520	Not in a city	Porter	1000 WESLEY ST./ VALPARAISO WATER DEPT.	2016	047	95	173	183	.077	.072	.072	.071	1	Y	0
18-127-0026	1	0520	Not in a city	Porter	1000 WESLEY ST./ VALPARAISO WATER DEPT.	2017	047	94	230	245	.081	.078	.077	.077	4	Y	0
18-127-0026	1	0520	Not in a city	Porter	1000 WESLEY ST./ VALPARAISO	2018	047	100	244	245	.080	.077	.073	.071	2	Y	0

Ozone (44201) Indiana Parts per million (007)

8-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	%OBS	VALID DAYS MEAS	NUM DAYS REQ	1ST MAX 8-HR	2ND MAX 8-HR	3RD MAX 8-HR	4TH MAX 8-HR	DAY MAX> STD	CERT and EVAL EDT
18-127-0026	1	0520	Not in a city	Porter	1000 WESLEY ST./ VALPARAISO WATER DEPT.	2019	047	71	174	245	.075	.074	.074	.071	0	0

AQS Monitoring Data for Illinois' Portion of the Chicago-Naperville, IL-IN-WI, 2008 8-Hour Ozone Nonattainment Area

Ozone (44201) | Illinois | Parts per million (007)

8-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	%OBS	VALID DAYS MEAS	NUM DAYS REQ	1ST MAX 8-HR	2ND MAX 8-HR	3RD MAX 8-HR	4TH MAX 8-HR	DAY MAX> STD	CERT and EVAL	EDT
17-031-0001	1	0258	Alsip	Cook	4500 W. 123RD ST.	2014	087	94	202	214	.080	.073	.072	.066	1	Y	0
17-031-0001	1	0258	Alsip	Cook	4500 W. 123RD ST.	2015	087	95	204	214	.087	.070	.069	.066	1	Y	0
17-031-0001	1	0258	Alsip	Cook	4500 W. 123RD ST.	2016	087	94	201	214	.085	.076	.075	.075	2	Y	0
17-031-0001	1	0258	Alsip	Cook	4500 W. 123RD ST.	2017	087	90	221	245	.092	.078	.078	.078	6	Y	0
17-031-0001	1	0258	Alsip	Cook	4500 W. 123RD ST.	2018	087	98	239	245	.086	.085	.083	.079	5	Y	0
17-031-0001	1	0258	Alsip	Cook	4500 W. 123RD ST.	2019	087	70	171	245	.079	.079	.074	.070	2		0
17-031-0032	1	0258	Chicago	Cook	3300 E. CHELTENHAM PL.	2014	087	97	208	214	.083	.074	.074	.067	1	Y	0
17-031-0032	1	0258	Chicago	Cook	3300 E. CHELTENHAM PL.	2015	087	96	205	214	.079	.072	.069	.066	1	Y	0
17-031-0032	1	0258	Chicago	Cook	3300 E. CHELTENHAM PL.	2016	087	100	213	214	.085	.082	.081	.077	8	Y	0
17-031-0032	1	0258	Chicago	Cook	3300 E. CHELTENHAM PL.	2017	087	99	243	245	.084	.080	.078	.074	3	Y	0
17-031-0032	1	0258	Chicago	Cook	3300 E. CHELTENHAM PL.	2018	087	93	227	245	.089	.083	.080	.076	4	Y	0
17-031-0032	1	0258	Chicago	Cook	3300 E. CHELTENHAM PL.	2019	087	71	175	245	.075	.072	.072	.071	0		0
17-031-0076	1	0258	Chicago	Cook	7801 LAWNDALE	2014	087	91	195	214	.077	.069	.068	.067	1	Y	0
17-031-0076	1	0258	Chicago	Cook	7801 LAWNDALE	2015	087	98	210	214	.074	.069	.065	.065	0	Y	0
17-031-0076	1	0258	Chicago	Cook	7801 LAWNDALE	2016	087	99	211	214	.078	.077	.076	.075	3	Y	0
17-031-0076	1	0258	Chicago	Cook	7801 LAWNDALE	2017	087	97	237	245	.096	.080	.079	.078	4	Y	0
17-031-0076	1	0258	Chicago	Cook	7801 LAWNDALE	2018	087	98	240	245	.087	.078	.078	.074	3	Y	0
17-031-0076	1	0258	Chicago	Cook	7801 LAWNDALE	2019	087	71	173	245	.074	.069	.066	.065	0		0
17-031-1003	2	0258	Chicago	Cook	6545 W. HURLBUT ST.	2014	087	93	200	214	.076	.075	.066	.065	1	Y	0

Ozone (44201) Illinois Parts per million (007)

8-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	%OBS	VALID DAYS MEAS	NUM DAYS REQ	1ST MAX 8-HR	2ND MAX 8-HR	3RD MAX 8-HR	4TH MAX 8-HR	DAY MAX>STD	CERT and EVAL	EDT
17-031-1003	2	0258	Chicago	Cook	6545 W. HURLBUT ST.	2015	087	100	214	214	.079	.070	.069	.068	1	Y	0
17-031-1003	2	0258	Chicago	Cook	6545 W. HURLBUT ST.	2016	087	97	207	214	.086	.079	.078	.075	3	Y	0
17-031-1003	2	0258	Chicago	Cook	6545 W. HURLBUT ST.	2017	087	93	227	245	.065	.064	.062	.060	0	Y	0
17-031-1003	2	0258	Chicago	Cook	6545 W. HURLBUT ST.	2018	087	85	208	245	.095	.079	.077	.073	3	Y	0
17-031-1003	2	0258	Chicago	Cook	6545 W. HURLBUT ST.	2019	087	69	170	245	.077	.072	.070	.069	1		0
17-031-1601	1	0258	Lemont	Cook	729 HOUSTON	2014	087	97	208	214	.076	.073	.070	.070	1	Y	0
17-031-1601	1	0258	Lemont	Cook	729 HOUSTON	2015	087	97	208	214	.076	.069	.069	.066	1	Y	0
17-031-1601	1	0258	Lemont	Cook	729 HOUSTON	2016	087	99	211	214	.086	.079	.078	.073	3	Y	0
17-031-1601	1	0258	Lemont	Cook	729 HOUSTON	2017	087	98	239	245	.077	.074	.071	.070	1	Y	0
17-031-1601	1	0258	Lemont	Cook	729 HOUSTON	2018	087	96	235	245	.079	.075	.069	.068	1	Y	0
17-031-1601	1	0258	Lemont	Cook	729 HOUSTON	2019	087	72	176	245	.080	.076	.073	.068	2		0
17-031-3103	2	0513	Schiller Park	Cook	4743 MANNHEIM RD.	2014	087	95	204	214	.071	.069	.065	.063	0	Y	0
17-031-3103	2	0513	Schiller Park	Cook	4743 MANNHEIM RD.	2015	087	99	211	214	.066	.062	.062	.058	0	Y	0
17-031-3103	2	0513	Schiller Park	Cook	4743 MANNHEIM RD.	2016	087	96	206	214	.074	.073	.069	.067	0	Y	0
17-031-3103	2	0513	Schiller Park	Cook	4743 MANNHEIM RD.	2017	087	96	235	245	.064	.063	.062	.061	0	Y	0
17-031-3103	2	0513	Schiller Park	Cook	4743 MANNHEIM RD.	2018	087	96	236	245	.081	.068	.066	.065	1	Y	0
17-031-3103	2	0513	Schiller Park	Cook	4743 MANNHEIM RD.	2019	047	75	183	245	.076	.068	.065	.064	1		0
17-031-4002	1	0258	Cicero	Cook	1820 S. 51ST AVE.	2014	087	96	205	214	.073	.073	.063	.063	0	Y	0
17-031-4002	1	0258	Cicero	Cook	1820 S. 51ST AVE.	2015	087	99	211	214	.077	.065	.063	.061	1	Y	0

Ozone (44201) Illinois Parts per million (007)

8-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	%OBS	VALID DAYS MEAS	NUM DAYS REQ	1ST MAX 8-HR	2ND MAX 8-HR	3RD MAX 8-HR	4TH MAX 8-HR	DAY MAX> STD	CERT and EVAL	EDT
17-031-4002	1	0258	Cicero	Cook	1820 S. 51ST AVE.	2016	087	100	213	214	.080	.079	.077	.076	5	Y	0
17-031-4002	1	0258	Cicero	Cook	1820 S. 51ST AVE.	2017	087	89	218	245	.085	.075	.069	.068	1	Y	0
17-031-4002	1	0258	Cicero	Cook	1820 S. 51ST AVE.	2018	087	95	233	245	.088	.077	.076	.072	3	Y	0
17-031-4002	1	0258	Cicero	Cook	1820 S. 51ST AVE.	2019	087	60	146	245	.068	.068	.066	.064	0		0
17-031-4007	1	0513	Des Plaines	Cook	9511 W. HARRISON ST	2014	087	98	209	214	.081	.077	.069	.069	2	Y	0
17-031-4007	1	0513	Des Plaines	Cook	9511 W. HARRISON ST	2015	087	99	212	214	.076	.072	.068	.068	1	Y	0
17-031-4007	1	0513	Des Plaines	Cook	9511 W. HARRISON ST	2016	087	99	212	214	.093	.080	.078	.076	4	Y	0
17-031-4007	1	0513	Des Plaines	Cook	9511 W. HARRISON ST	2017	087	99	243	245	.081	.078	.071	.071	2	Y	0
17-031-4007	1	0513	Des Plaines	Cook	9511 W. HARRISON ST	2018	087	98	240	245	.089	.080	.079	.075	3	Y	0
17-031-4007	1	0513	Des Plaines	Cook	9511 W. HARRISON ST	2019	087	69	169	245	.077	.068	.066	.066	1		0
17-031-4201	1	0513	Northbrook	Cook	750 DUNDEE ROAD	2014	087	93	200	214	.081	.076	.069	.065	2	Y	0
17-031-4201	1	0513	Northbrook	Cook	750 DUNDEE ROAD	2015	087	100	214	214	.071	.071	.069	.068	0	Y	0
17-031-4201	1	0513	Northbrook	Cook	750 DUNDEE ROAD	2016	087	99	212	214	.083	.083	.079	.079	5	Y	0
17-031-4201	1	0513	Northbrook	Cook	750 DUNDEE ROAD	2017	087	96	352	365	.082	.081	.077	.070	3	Y	0
17-031-4201	1	0513	Northbrook	Cook	750 DUNDEE ROAD	2018	087	96	352	365	.096	.086	.084	.083	6	Y	0
17-031-4201	1	0513	Northbrook	Cook	750 DUNDEE ROAD	2019	000	66	240	365	.070	.070	.069	.069	0		0
17-031-7002	1	0513	Evanston	Cook	531 E. LINCOLN	2014	087	96	205	214	.079	.077	.075	.072	2	Y	0
17-031-7002	1	0513	Evanston	Cook	531 E. LINCOLN	2015	087	98	209	214	.088	.071	.071	.070	1	Y	0
17-031-7002	1	0513	Evanston	Cook	531 E. LINCOLN	2016	087	96	205	214	.084	.079	.077	.076	4	Y	0
17-031-7002	1	0513	Evanston	Cook	531 E. LINCOLN	2017	087	98	240	245	.085	.079	.076	.073	3	Y	0
17-031-7002	1	0513	Evanston	Cook	531 E. LINCOLN	2018	087	99	242	245	.096	.092	.086	.084	10	Y	0

Ozone (44201) Illinois Parts per million (007)

8-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	%OBS	VALID DAYS MEAS	NUM DAYS REQ	1ST MAX 8-HR	2ND MAX 8-HR	3RD MAX 8-HR	4TH MAX 8-HR	DAY MAX> STD	CERT and EVAL	EDT
17-031-7002	1	0513	Evanston	Cook	531 E. LINCOLN	2019	087	75	184	245	.071	.071	.071	.069	0		0
17-043-6001	1	0513	Lisle	DuPage	RT. 53	2014	087	90	193	214	.071	.071	.068	.064	0	Y	0
17-043-6001	1	0513	Lisle	DuPage	RT. 53	2015	087	98	209	214	.068	.068	.067	.067	0	Y	0
17-043-6001	1	0513	Lisle	DuPage	RT. 53	2016	087	87	187	214	.081	.079	.077	.074	3	Y	0
17-043-6001	1	0513	Lisle	DuPage	RT. 53	2017	087	90	221	245	.079	.071	.070	.069	1	Y	0
17-043-6001	1	0513	Lisle	DuPage	RT. 53	2018	087	93	229	245	.074	.073	.071	.071	0	Y	0
17-043-6001	1	0513	Lisle	DuPage	RT. 53	2019	087	74	182	245	.095	.073	.071	.070	1		0
17-089-0005	1	0513	Elgin	Kane	665 DUNDEE RD.	2014	087	100	213	214	.071	.070	.067	.066	0	Y	0
17-089-0005	1	0513	Elgin	Kane	665 DUNDEE RD.	2015	087	99	211	214	.066	.066	.065	.065	0	Y	0
17-089-0005	1	0513	Elgin	Kane	665 DUNDEE RD.	2016	087	95	203	214	.082	.081	.076	.074	3	Y	0
17-089-0005	1	0513	Elgin	Kane	665 DUNDEE RD.	2017	087	96	236	245	.083	.070	.070	.069	1	Y	0
17-089-0005	1	0513	Elgin	Kane	665 DUNDEE RD.	2018	087	99	243	245	.077	.077	.074	.072	2	Y	0
17-089-0005	1	0513	Elgin	Kane	665 DUNDEE RD.	2019	087	75	184	245	.074	.072	.071	.071	0		0
17-097-1007	1	0513	Zion	Lake	ILLINOIS BEACH STATE PARK	2014	087	100	213	214	.079	.074	.074	.073	1	Y	0
17-097-1007	1	0513	Zion	Lake	ILLINOIS BEACH STATE PARK	2015	087	98	210	214	.077	.071	.071	.070	1	Y	0
17-097-1007	1	0513	Zion	Lake	ILLINOIS BEACH STATE PARK	2016	087	99	212	214	.082	.081	.077	.077	5	Y	0
17-097-1007	1	0513	Zion	Lake	ILLINOIS BEACH STATE PARK	2017	087	100	244	245	.079	.077	.076	.074	3	Y	0
17-097-1007	1	0513	Zion	Lake	ILLINOIS BEACH STATE PARK	2018	087	95	232	245	.091	.088	.082	.074	3	Y	0
17-097-1007	1	0513	Zion	Lake	ILLINOIS BEACH STATE PARK	2019	087	75	183	245	.075	.072	.067	.066	0		0
17-111-0001	1	0513	Cary	McHenry	FIRST ST. & THREE OAKS RD.	2014	087	100	214	214	.081	.073	.071	.067	1	Y	0
17-111-0001	1	0513	Cary	McHenry	FIRST ST. & THREE OAKS RD.	2015	087	93	199	214	.071	.066	.064	.064	0	Y	0
17-111-0001	1	0513	Cary	McHenry	FIRST ST. &	2016	087	98	209	214	.079	.074	.073	.073	1	Y	0

Ozone (44201) Illinois Parts per million (007)

8-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	%OBS	VALID DAYS MEAS	NUM DAYS REQ	1ST MAX 8-HR	2ND MAX 8-HR	3RD MAX 8-HR	4TH MAX 8-HR	DAY MAX> STD	CERT and EVAL	EDT
17-111-0001	1	0513	Cary	McHenry	FIRST ST. & THREE OAKS RD.	2017	087	95	233	245	.080	.071	.071	.070	1	Y	0
17-111-0001	1	0513	Cary	McHenry	FIRST ST. & THREE OAKS RD.	2018	087	98	239	245	.077	.076	.075	.074	2	Y	0
17-111-0001	1	0513	Cary	McHenry	FIRST ST. & THREE OAKS RD.	2019	087	68	167	245	.078	.071	.070	.070	1		0
17-197-1011	1	0513	Braidwood	Will	36400 S. ESSEX RD.	2014	087	88	188	214	.069	.068	.065	.064	0	Y	0
17-197-1011	1	0513	Braidwood	Will	36400 S. ESSEX RD.	2015	087	97	208	214	.068	.067	.064	.064	0	Y	0
17-197-1011	1	0513	Braidwood	Will	36400 S. ESSEX RD.	2016	087	100	213	214	.072	.069	.069	.064	0	Y	0
17-197-1011	1	0513	Braidwood	Will	36400 S. ESSEX RD.	2017	087	96	234	245	.068	.068	.068	.068	0	Y	0
17-197-1011	1	0513	Braidwood	Will	36400 S. ESSEX RD.	2018	087	96	236	245	.078	.076	.075	.071	2	Y	0
17-197-1011	1	0513	Braidwood	Will	36400 S. ESSEX RD.	2019	087	75	183	245	.065	.063	.062	.060	0		0

AQS Monitoring Data for Wisconsin's Portion of the Chicago-Naperville, IL-IN-WI, 2008 8-Hour Ozone Nonattainment Area

Ozone (44201) | Wisconsin | Parts per million (007)

8-HOUR

SITE ID	POC	PQAO	CITY	COUNTY	ADDRESS	YEAR	METH	%OBS	VALID DAYS MEAS	NUM DAYS REQ	1ST MAX 8-HR	2ND MAX 8-HR	3RD MAX 8-HR	4TH MAX 8-HR	DAY MAX> STD	CERT and EVAL	EDT
55-059-0019	1	1175	Pleasant Prairie	Kenosha	CHIWAUKEE PRAIRIE, 11838 FIRST COURT	2014	087	100	213	214	.080	.080	.076	.076	5	Y	0
55-059-0019	1	1175	Pleasant Prairie	Kenosha	CHIWAUKEE PRAIRIE, 11838 FIRST COURT	2015	087	99	211	214	.080	.077	.075	.075	2	Y	0
55-059-0019	1	1175	Pleasant Prairie	Kenosha	CHIWAUKEE PRAIRIE, 11838 FIRST COURT	2016	087	99	212	214	.090	.086	.083	.080	7	Y	0
55-059-0019	1	1175	Pleasant Prairie	Kenosha	CHIWAUKEE PRAIRIE, 11838 FIRST COURT	2017	087	100	229	229	.084	.080	.080	.079	7	Y	0
55-059-0019	1	1175	Pleasant Prairie	Kenosha	CHIWAUKEE PRAIRIE, 11838 FIRST COURT	2018	087	100	229	229	.092	.088	.087	.079	6	Y	0
55-059-0019	1	1175	Pleasant Prairie	Kenosha	CHIWAUKEE PRAIRIE, 11838 FIRST COURT	2019	087	75	184	245	.076	.072	.070	.067	1		0
55-059-0025	1	1175	Kenosha	Kenosha	4504 64th Ave.	2014	087	95	204	214	.081	.072	.072	.070	1	Y	0
55-059-0025	1	1175	Kenosha	Kenosha	4504 64th Ave.	2015	087	99	212	214	.071	.069	.068	.068	0	Y	0
55-059-0025	1	1175	Kenosha	Kenosha	4504 64th Ave.	2016	087	99	212	214	.084	.076	.076	.076	4	Y	0
55-059-0025	1	1175	Kenosha	Kenosha	4504 64th Ave.	2017	087	100	229	229	.081	.078	.077	.076	4	Y	0
55-059-0025	1	1175	Kenosha	Kenosha	4504 64th Ave.	2018	087	100	229	229	.084	.084	.081	.080	6	Y	0
55-059-0025	1	1175	Kenosha	Kenosha	4504 64th Ave.	2019	087	75	184	245	.073	.069	.068	.063	0		0

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APPENDIX B

Classification and Regression Tree (CART) and Temperature Analysis for Chicago-Naperville, IL-IN-WI, 2008 8-Hour Ozone Nonattainment Area, 2005-2018

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Classification and Regression Tree (CART) Analysis for Chicago-Naperville, IL-IN-WI, 2008 8-Hour Ozone Nonattainment Area

A classification and regression tree (CART) analysis is a statistical tool to classify data. Here, it is applied to 8-hour ozone and meteorological data to determine the meteorological conditions most commonly associated with high-ozone days in the Chicago-Naperville, IL-IN-WI 2008 8-hour ozone nonattainment area. Once days are classified by their meteorology, ozone concentration trends among days with the same meteorological conditions can be developed. By examining trends only on days with similar meteorology, the influence of year-to-year meteorological variability on ozone concentrations is minimized and any remaining trend is assumed to be the result of reductions in emissions of ozone precursors and other non-meteorological factors.

This CART analysis was conducted by the Lake Michigan Air Directors Consortium (LADCO) using 8-hour ozone monitoring data selected from Chicago-area ozone sites: Alsip (AQS Site ID 17-031-0001), South Water Filtration Plant (17-031-0032), ComEd (17-031-0076), Taft High School (17-031-1003), Lemont (17-031-1601), Cicero (17-031-4002), Des Plaines (17-031-4007), Northbrook (17-031-4201), and Evanston (17-031-7002). The analysis included data from the years 2005 – 2018 and therefore addresses long-term trends of meteorological conditions associated with ambient ground-level ozone concentrations. The goal of the analysis was to determine the meteorological conditions associated with high ozone episodes in the Chicago air-shed and to construct trends for the days identified as sharing similar meteorological characteristics.

The CART analyses for the Chicago-area ozone study processed multiple meteorological variables for each day to determine which are the most effective at predicting ozone concentrations. Meteorological data collected for the analysis was taken from the Chicago O'Hare Airport National Weather Service (NWS) station and processed by LADCO. Upper air observations, taken from Lincoln, Illinois NWS site, were downloaded from the National Climatic Data Center (NCDC) Integrated Global Radiosonde Archive. Meteorological variables included:

- daily precipitation
- cloud cover
- 850 and 700 millibar (mb) temperatures at 6 a.m.
- maximum daily temperature, dew point, relative humidity, and pressure
- average daily wind speed
- average wind direction during the day, morning and afternoon as North/South, East/West wind vectors
- morning, afternoon, and evening dew point and pressure
- day of the week
- previous day's average temperature, pressure, wind speed, and wind direction

- change in temperature and pressure from previous day
- 2- and 3-day average wind speed and temperature
- other meteorological parameters.

Regression trees, where each branch describes the meteorological conditions associated with different ozone concentrations, were developed to classify each summer day (May – September). Although the exact selection of predictive variables changes from site-to-site, the universally common predictors are temperature, wind direction, and relative humidity. These are included in the dataset as daily averages and maximums as well as averages at specific times throughout the day (morning represented as 7-10 a.m., afternoon represented as 1-4 p.m., etc.). Similar days were assigned to nodes, which are equivalent to branches of the regression tree. By grouping days with similar meteorology, the influence of meteorological variability on the underlying trend in ozone concentrations is partially removed; the remaining trend is presumed to be due to trends in precursor emissions or other non-meteorological influences. Ozone trends of these nodes were then plotted.

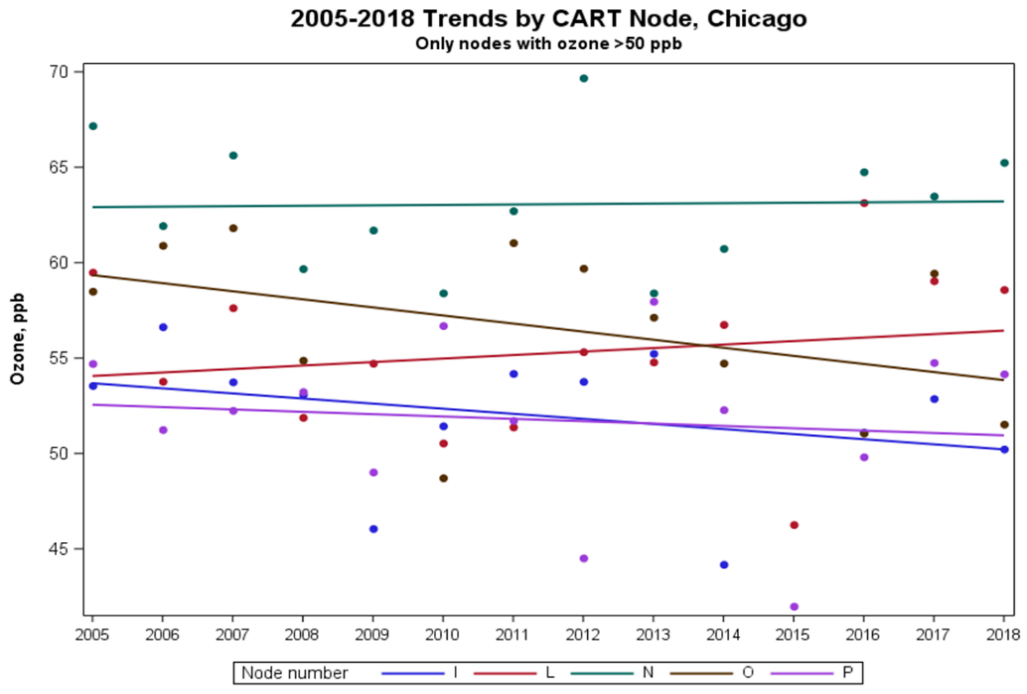
The CART analysis determined that there were five nodes from the Chicago area monitors that demonstrated similar meteorological conditions and had the strongest correlation with high ozone episodes (greater than 50 parts per billion (ppb) of ozone). Table 1 categorizes the analysis and the shared meteorological conditions for each high-ozone node along with the frequency and average ozone concentrations. All of the high-ozone nodes had high maximum temperatures, and many were distinguished by southerly or southeasterly winds and/or low relative humidity.

Table 1: Meteorological Conditions, Occurrence, and Average Ozone for the Five Nodes Identified with High Ozone Concentrations (> 50 ppb) for the Chicago Area Monitors

	Node				
Conditions	**L**	**P**	**I**	**N**	**O**
Average PM temperature	< 84.662 ˚F		>= 84.662 ˚F		
V component of 24-hour transport vector	>= -194.239 km				
Average mid-day relative humidity	< 66.707%				
Average daily relative humidity	< 58.434%	>= 58.434%	>= 64.654%	< 64.654%	
Average wind direction		< 127.5˚			
Previous day station pressure			>= 983.196 mb		
Average 2-day wind speed				< 4.255 m/s	>= 4.255 m/s
Average ozone (ppb)	55.8	53.3	52.3	64.7	57.2
Number of observations	1,215		1,166	1,641	554

The highest average ozone concentrations were observed for Node N. This node was characterized by average afternoon temperatures above 84.6 degrees Fahrenheit (˚F), a previous day meteorological station's atmospheric pressure greater than or equal to 983.2 millibars, average daily relative humidity less than 64.6%, and 2-day average wind speed less than 4.2 meters per second (m/s). It contained 1,641 observations with an 8-hour ozone concentration average of 64.7 ppb in the data set under the aforementioned conditions. Node O contains the exact same set of conditions as Node N except that the 2-day average wind speed was greater than 4.2 m/s. Node O contained 554 observations with an ozone average of 57.2 ppb, making it the second highest node. Node L was the third highest node with 1,215 observations and an ozone average of 55.8 ppb. Node L is characterized by average afternoon temperatures less than 84.6 ˚F, a v component of 24-hour transport vector greater than or equal to -194.2 kilometers (km), an average mid-day relative humidity less than 66.7%, and an average daily relative humidity less than 58.4%. Node P was the next highest node at 53.3 ppb and contained the same conditions as Node L except for having an average daily relative humidity greater than or equal to 58.4% and having an average wind direction greater than 127.5 degrees (˚). The last node with an ozone average greater than 50 ppb was Node I at 52.3 ppb from 1,166 observations. Node I contains days with average afternoon temperatures above 84.6 ˚F, a previous day station pressure greater than or equal to 983.2 mb, and average daily relative humidity greater than or equal to 64.6%. Chart 1 below plots the 2005 – 2018 ozone trends for each node identified as having ozone averages greater than 50 ppb.

Chart 1: Ozone Trends by CART Node



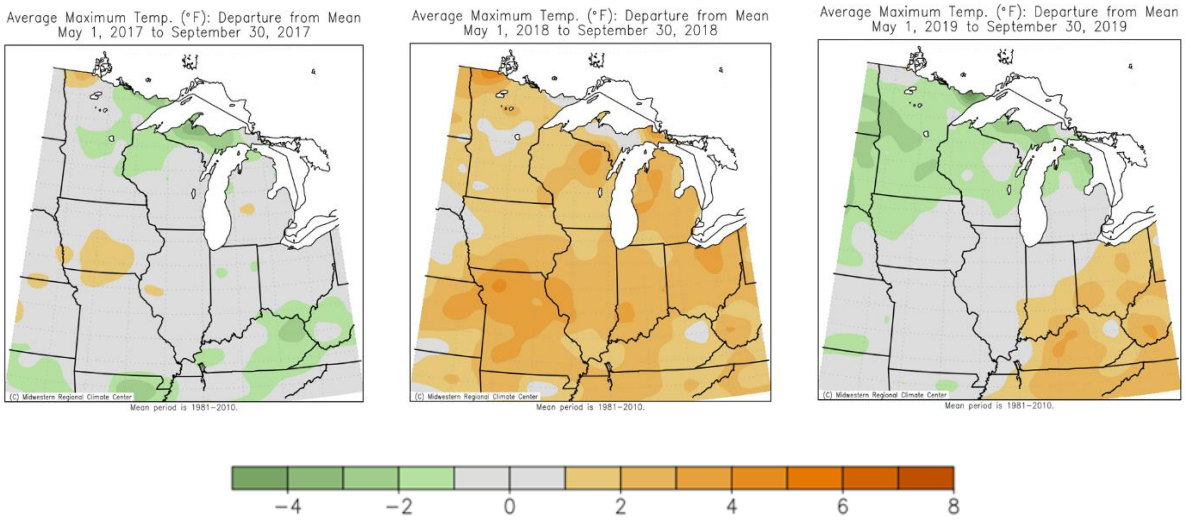
These analyses demonstrate that ozone concentrations, for a given set of high-ozone meteorological conditions, have decreased over time in the Chicago-area. In particular, this analysis shows that ozone concentrations have decreased on days with high average temperatures and the right combination of (mostly south-southeasterly) winds, low relative humidity, and other characteristics. While maximum temperatures play an important role in the formation of ozone, the CART analysis reveals that other meteorological parameters (such as afternoon temperature, pressure, relative humidity, transport, and wind speed) also play important roles in creating conditions conducive for ozone formation.

By using a CART analysis to analyze 8-hour ozone data in the Chicago-area, the influence of variations in meteorology can be mitigated such that comparisons of high ozone days with similar meteorological conditions can be made to determine if ozone values have decreased over time due to anthropogenic emission reductions. In general, ozone trends in the Chicago-area have declined since 2005. Furthermore, under meteorological conditions when monitored 8-hour ozone has historically been at its highest, more recent ozone concentrations are lower under similar meteorological conditions. This analysis demonstrates that the observed reductions in ozone concentrations have not been driven by favorable meteorological conditions. These results further suggest that progress in reducing ozone precursor emissions is likely an important driver of the observed reductions in 8-hour ozone concentrations in the Chicago nonattainment area as well as lakeshore and inland areas to the north and east.

Temperature Analysis for 2017-2019 for Chicago-Naperville, IL-IN-WI, 2008 8-Hour Ozone Nonattainment Area

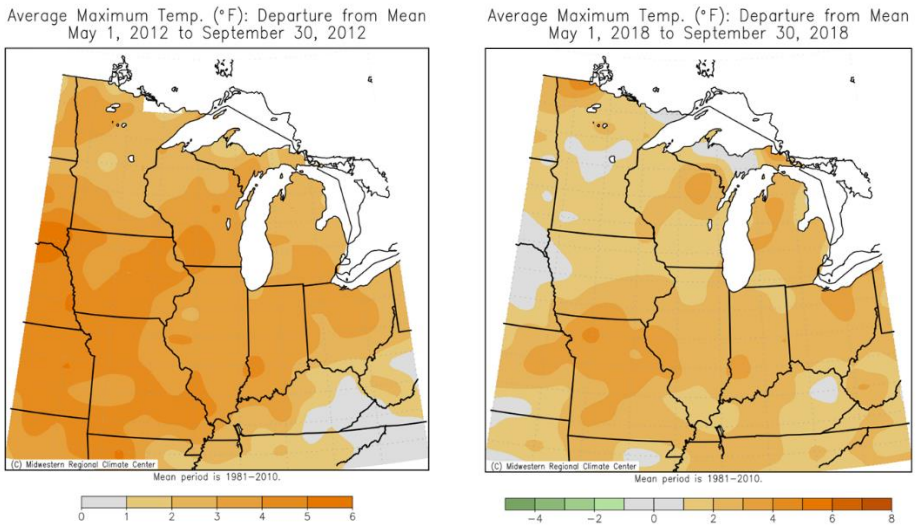
Maximum daily temperature is an important meteorological indicator for ozone formation. Higher daily maximum temperatures tend to lead to conducive weather conditions that form ozone and allow for higher 8-hour concentrations. Chart 2 shows the average maximum temperature as a departure from mean for the time period May 1st to September 30th for the years of 2017 to 2019 for the Chicago-Naperville nonattainment area and surrounding region. As shown, 2017 and 2019 were both near-normal years for temperature for the Chicago-Naperville nonattainment area, with average maximum temperature departures from normal between -1 and +1 ˚F. 2018 was a warmer than normal year, with maximum daily temperatures running 2–4 ˚F above normal during the time period.

Chart 2: **Average Maximum Temperature Departure from Mean (˚F), May to September, 2017 – 2019 (Source: Midwestern Regional Climate Center)**



2017 and 2019 had ozone values that were generally on average with ozone values from several previous years. 2018 had elevated ozone values over 2017 and 2019, which would be expected in a warmer year. However, comparison of ozone values in 2018 to a year that had similar temperatures shows the effect of emission reductions in the Chicago-Naperville nonattainment area. The most recent year with similar temperature as 2018 was 2012, where temperatures ranged 2-4 ˚F above normal. Chart 3 shows this temperature comparison.

Chart 3: Average Maximum Temperature Departure from Mean (˚F), May to September, 2012 and 2018 (Source: Midwestern Regional Climate Center)



While temperatures were nearly the same across the area between the two years, 4th high 8-hour ozone values were 5-10 ppb lower in 2018 than in 2012. These differences in ozone values in similar temperature conditions, also confirmed in the CART analysis, can be attributed to the emission reductions implemented across the Chicago-Naperville, IL-IN-WI nonattainment area.

APPENDIX C

MOVES2014 Input Data and Parameters

Northwest Indiana Regional Planning Commission (NIRPC) Lake, Porter, and LaPorte Counties

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MOVES2014 Input Data and Parameters

May 27, 2015

Northwest Indiana Regional Planning Commission (NIRPC)
Lake, Porter and LaPorte Counties

Developed for:
Indiana Department of Transportation

Developed by:
THE CORRADINO GROUP
Engineers • Planners • Program Managers • Environmental Scientists

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List of Tables

1.0 Introduction

This report documents the methods used to create input parameters prior to running a set of MOVES2014 runs for Northwest Indiana Regional Planning Commission (NIRPC) covering the following:

- Lake and Porter Counties 8-hour Ozone Maintenance Area
- Lake and Porter Counties PM 2.5 non-attainment area.
- LaPorte County 8-hour Ozone Maintenance Area

This report contains a discussion of the input settings used in MOVES2014 and the development of the input datasets. These MOVES2014 runs are intended to develop a default set of emission rates that can be used for conformity determination and is part of a statewide effort being conducted by the Indiana Department of Transportation (INDOT) for all participating MPOs or other jurisdictions with air quality conformity needs.

What Has Been Updated?

MOVES Input	Updated?	Notes
Source (Vehicle) Type Population	**Yes**	*New BMV data*
Vehicle Type VMT (by 13 MOVES Vehicle Types)	**Yes**	*HourVMTFraction updated using INDOT WIM & ATR data*
Age Distribution (Vehicle Population by Age of Vehicle)	**Yes**	*New BMV data*
Fuel (AVFT, % Fuel Type/Engine Type by Vehicle Type)	**Yes**	*New BMV data*
Fuel (all other files)	**Yes**	*Used MOVES2014 defaults for each county*
Average Speed Distribution (% of VHT in each 5 mph speed bin)	**No**	*Not Needed for Emission Rate Mode (Dummy Inputs)*
Road Type Distribution (VMT by 5 MOVES Road Types)	**No**	*Retained inputs from 2012 emission rate development*
Ramp Fraction	**No**	*Retained inputs from 2012 emission rate development*
Meteorology Data	**No**	*Retained inputs from 2012 emission rate development*
I/M Program	**No**	*Retained inputs from 2012 emission rate development*

2.0 Source Type Population

The vehicle populations for light duty vehicles, which include motorcycles, passenger cars, passenger trucks, and light commercial trucks (source types 11, 21, 31, and 32 respectively) were developed from a new vehicle registration dataset provided to INDOT by the Indiana Bureau of Motor Vehicles (BMV) in December of 2014. These are discussed in section 2.1 below. The vehicle populations for heavy duty vehicles, which include trucks and buses (source types 41, 42, 43, 51, 52, 53, 54, 61, and 62 respectively) were developed using procedures recommended in EPA's MOVES guidance. This is discussed in section 2.2 below.

2.1 BMV Vehicle Registration and License Data

A statewide vehicle fleet dataset was provided to the Indiana Department of Transportation (INDOT) from the Indiana Bureau of Motor Vehicles (BMV) in December of 2014. The analysis was performed by the Corradino Group under contract to INDOT. The dataset was processed by BMV and combined attributes of both vehicle title/registration (VIN) and license type.

The raw BMV dataset contained the number of vehicles classified by the combination of:

- Vehicle Type, and
- Vehicle Year, and
- Fuel Type, and
- County

There were approximately 6.67 million VINs in the statewide data set. Out of these, approximately 5.85 million were for On-Road vehicles of interest to this analysis.

BMV Vehicle Type Records Excluded from Further Analysis:

- Low Speed
- Off-Road Vehicle
- RV-Travel Trailer
- Snowmobile
- Special Machinery
- Trailer
- Watercraft

Table 2 shows how the BMV Vehicle Type classifications were cross-mapped to MOVES Source Type ID categories. The vehicle populations for light duty vehicles, which including motorcycles, passenger cars, passenger trucks, and light commercial trucks (source types 11, 21, 31, and 32 respectively) were developed from the 2014 BMV vehicle registration. The vehicle populations for heavy duty vehicles, which include trucks and buses (source types 41, 42, 43, 51, 52, 53, 54, 61, and 62 respectively) used the BMV heavy duty vehicle population as a control total for each county.

Table 2: BMV Data to MOVES2014

BMV Type	MOVES Usage			
	Source Type ID	Source Type Population	Vehicle Age Distribution	AVFT File
MOTORCYCLE	11	X	X	MD
Dealer	21	X	X	X
PASSENGER	21	X	X	X
RV-Truck Camper	31	X	X	X
Truck 7,000	31	X	X	X
Truck 9,000	31	X	X	X
Truck Camper	31	X	X	X
Farm Truck	32	X	X	X
Truck 10,000	32	X	X	X
Truck 11,000	32	X	X	X
City Bus	42	T	MD	MD
Commercial Bus	42	T	MD	MD
Church Bus	43	T	MD	MD
School Bus	43	T	MD	MD
Special Bus	43	T	MD	MD
Recovery Vehicle	52	T	MD	MD
Truck 16,000	52	T	MD	MD
Truck 20,000	52	T	MD	MD
Truck 23,000	52	T	MD	MD
Truck 26,000	52	T	MD	MD
Truck 30,000	52	T	MD	MD
Truck 36,000	53	T	MD	MD
Truck 42,000	53	T	MD	MD
Truck 48,000	53	T	MD	MD
Truck 54,000	53	T	MD	MD
Truck 60,000	53	T	MD	MD
RV	54	T	MD	MD
RV-Motorhome	54	T	MD	MD
Farm Semi Tractor	61	T	MD	MD
Truck 66,000	61	T	MD	MD
Truck 66,000+	61	T	MD	MD
Semi Tractor	62	T	MD	MD
Truck	62	T	MD	MD
SEMI	62	T	MD	MD
Semi	62	T	MD	MD
LOW SPEED	N/A	N/A	N/A	N/A
OFF-ROAD VEHICLE	N/A	N/A	N/A	N/A
RV-Travel Trailer	N/A	N/A	N/A	N/A
SNOWMOBILE	N/A	N/A	N/A	N/A
SPECIAL MACHINERY	N/A	N/A	N/A	N/A
TRAILER	N/A	N/A	N/A	N/A
WATERCRAFT	N/A	N/A	N/A	N/A

Legend	
X	BMV values were used
MD	Moves Defaults used in place of BVM data
T	BMV data used for Heavy Duty Veh. control total applied to MAR method
N/A	Discarded

2.2 Heavy Vehicle Source Types

Vehicle populations for all other source types (buses and heavy vehicles) were derived by applying the Mileage Accumulation Rate (MAR) method documented in EPA's Technical Guidance on the Use of MOVES2010 for Emission Inventory Preparation in State Implementation Plans and Transportation Conformity, Section 3.3 Source Type Population.

Mileage Accumulation Rates

Development of the Mileage Accumulation Rates was done during the previous 2011-2012 emission rate development process facilitated by INDOT. The MARs developed at that time have been carried forward into this update, but have been updated to reconcile with current BMV data related to heavy vehicles. The default MARs were extracted from MOVES by running MOVES for a single pollutant and a single year for all vehicles, fuels, months, days, and hours. The activity output was set to report both distance and population. A ratio of population to vehicle-miles-traveled (VMT) was calculated from these outputs. The ratios were calculated for each source type.

The Northwestern Indiana Regional Planning Commission (NIRPC), which is the metropolitan planning organization (MPO) for Lake and Porter Counties, provided VMT by MOVES road types extracted from their travel demand model's base year. Since the default MARs in MOVES vary by year (but not by location), the MOVES run that was executed to extract the MARs was run for a year consistent with the travel demand model's base year. This resulted in MARs that could be applied directly to the validated VMTs reported by the travel demand model. The travel demand model VMTs were converted into annual VMT and distributed by vehicle types using statewide default VMT distribution factors documented in this report in the section on Default VMT Distributions. The MARs were then applied to the annual vehicle type VMTs. The result was an estimated vehicle population for each source type for the travel demand model's base year. Since the vehicle populations for source types 11, 21, 31, and 32 were developed directly from the vehicle registration data, the population estimates derived for those source types using the MAR method were discarded and the observed data were used instead. As a final step, MAR-derived heavy duty vehicle classes were adjusted proportionally to match heavy duty vehicle population totals for each county from BMV data.

2.3 Forecasting Vehicle Populations by Source Types

Future year vehicle populations were developed base on socioeconomic growth rates for the maintenance area. The MPO provided base year and horizon year population and employment data for the area. Annual growth rates were calculated for population growth and employment growth individually. Population growth rates were then used to grow the light vehicle populations (source types 11, 21, 31, and 32). Employment growth rates were used to grow the heavy vehicle populations (source types 41, 42, 43, 51, 52, 53, 54, 61, and 62). Vehicle populations were calculated in 5 year increments from 2015 to 2045. The county level source type values and forecasts are shown in Tables A-1, A-2, and A-3 in Appendix A. When generating MOVES2014 emission rates the vehicle populations for Lake and Porter Counties are

combined into a single input file. LaPorte County emission rates are developed separately, so the county's vehicle population files are not combined with Lake and Porter county files.

2.4 Vehicle Age Distribution

The vehicle age distributions for MOVES source types 11, 21, 31, and 32 (motorcycles, cars, passenger trucks, and light commercial vehicles respectively) were developed through an analysis of Indiana's 2014 vehicle registration data. The BMV dataset allowed the totals for each model year by vehicle type and county to be assembled into the required MOVES 2014 format. Whereby, the vehicles are classified into one year age bins between 0 and 29 years old, and older vehicles into the 30 years old or more bin.

In keeping with previous practice, vehicle age distributions were only derived for light duty vehicles from the BMV data (source types 11, 21, 31, and 32 from the vehicle registration data). Because of the transient nature of the heavy vehicle classes, MOVES2014 default vehicle age distributions specific to each source types were used. Vehicle age distributions for all source types were kept constant for all future years. The vehicle age distributions for Lake and Porter Counties as a combined area are shown in Appendix A of this report.

3.0 Vehicle Type VMT

As part of the previous 2011-2012 emission rate development effort, INDOT developed a default set of VMT distribution factors by Highway Performance Monitoring System (HPMS) vehicle type and by MOVES road type. The original distribution factors were developed by analyzing four consecutive years of continuous traffic count data ending in 2010 for twenty permanent traffic count stations throughout Indiana. During the current update, the Corradino Group evaluated the latest four years of continuous traffic count data; covering the years 2011, 2012, 2013, and 2014.

The stations were selected to provide a spread of locations corresponding to each of the four MOVES road types. Furthermore, these stations were selected from among sites that were concentrated in nonattainment and maintenance areas. An inventory of the sites used to develop the distributions is shown in Figure 1. Of the available sites, 16 unique Weigh in Motion (WIM) sites and 26 ATR sites were utilized.

The vehicle counts reported at each station were provided by vehicle class. These were aggregated into the six basic HPMS vehicle types: motorcycle, passenger car, light truck, bus, single-unit heavy truck, and combination heavy truck. The distribution of VMT by vehicle type was calculated for each road type by taking each vehicle type's percentage of total traffic.

3.1 Road Type, Daily, and Monthly Distributions

Road Type, Daily and Monthly distribution factors were calculated from INDOT's official count adjustment factors which are more commonly used to develop AADT from raw traffic counts. These factors are based on the set of daily traffic counts collected from all permanent count stations throughout the state. The daily distribution factors determine what percentage of VMT is occurring on weekdays and what percentage is occurring on weekends. The monthly distribution factors determine what percentage of annual VMT is occurring in each month of the year. After comparing results for Daily and Monthly distributions developed using the 2007-2010 data versus the newer 2011-2014 data, the differences were trivial and the previously developed MOVES Daily and Monthly VMT fraction files were retained for use in the MOVES2014 analysis.

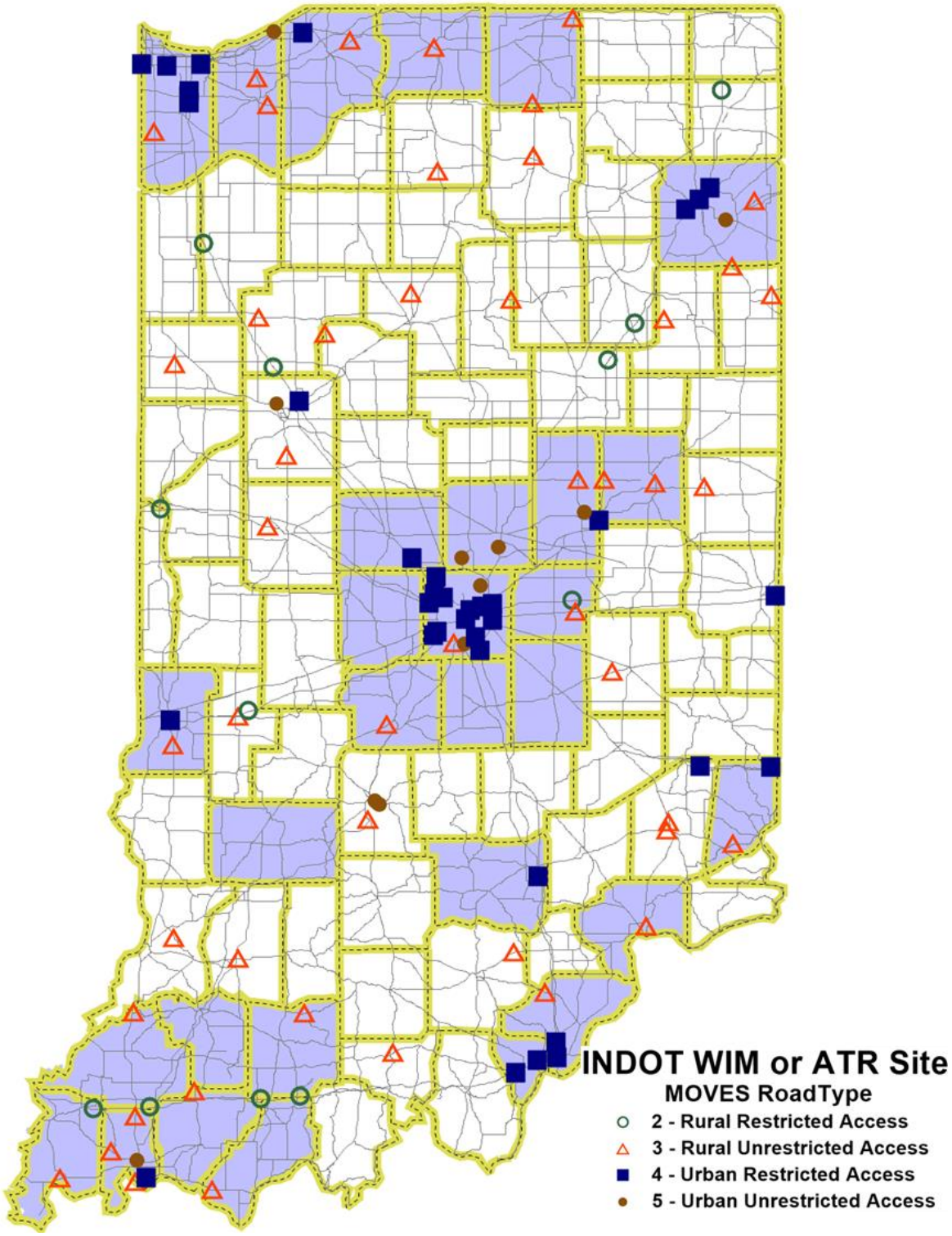
VehTypeVMT - When converting files from MOVES 2010 format to MOVES 2014 format, HPMS Base Year VMT by HPMS Vehicle Type ID was converted so that VMT for HPMS vehicle types 20 and 30 were combined and classified as HPMS vehicle type 25.

The statewide default daily distribution factors are shown in Tables C-1, C-2, and C-4 in Appendix C. The statewide default monthly distribution factors are also shown in Appendix C.

3.2 Hourly Distributions

The same set of forty two permanent traffic count locations discussed in the section on Default VMT Distributions was analyzed to develop a set of hourly distribution factors. These factors were calculated by road type, by HPMS vehicle type. Hourly factors were only calculated for the average weekday. The hourly distribution pattern for each traffic count location was reviewed. Any data that appeared to reflect either an error in the data or an outlier of behavior were removed to prevent bias in the data. The statewide default hourly distribution factors are presented in Appendix B.

Figure 1 - INDOT Continuous Count Locations



4.0 Average Speed Distribution

National MOVES defaults are used for the average speed distribution inputs. Per the *User Guide for MOVES2014*, when running MOVES2014 in emission rate mode, the speed distribution is needed for model setup, but not used in the development of emission rates. The speed distribution for a given scenario is accounted for later in the inventory development process, when the emission rates are applied to detailed travel demand model outputs as part of the INDOT Air Quality Post-Processor.

5.0 Ramp Fraction

The ramp fractions represent the percentage of vehicle-hours-traveled (VHT) for road types 2 (rural restricted access) and 4 (urban restricted access) occurring on the ramps associated with those road types. These fractions were calculated based on the percentage of VHT occurring on ramps reported by the base year travel demand model. These ramp fractions are reported in Appendix C.

6.0 Meteorology Data

The default set of hourly temperatures and hourly relative humidity for use in MOVES 2014 was retained from the MOVES 2010a inputs originally developed using EPA's data converters for changing MOBILE6.2 minimum / maximum temperatures and absolute humidity to the MOVES equivalent formats.

Meteorological data reflect average annual conditions for the PM 2.5 runs. During the previous emission rate update, the MOBILE6.2 meteorological input data for each of the twelve months of the years were averaged together to create average annual temperatures and humidity. These were then passed through the data converters. The data reflect summer conditions for ozone using MOBILE6.2 inputs for July. The MOVES formatted meteorological data for the NIRPC counties of Lake, Porter, and LaPorte as a combined area are presented in Appendix C of this report.

7.0 Fuel

The 2014 version of MOVES has features developed as a result of the EPAct Tier 2 Gasoline Model, impacts of ethanol and other key fuel properties, and incorporates the EPA Sulfur Effects Model. MOVES2014 has a new set of Fuel Supply Regions based on regional fuels, and reduces the number of Fuels in MOVES from approximately 300 to 40. MOVES2014 contains the most current ethanol (E10, E15,E85) and fuel formulation projections based on AEO2014.

Development of the updated NIRPC emission rates uses default MOVES2014 fuel formulation assumptions based on each county's Fuel Supply Region, and defaults to summer conditions.

Figure 2-Indiana Fuel Supply Regions

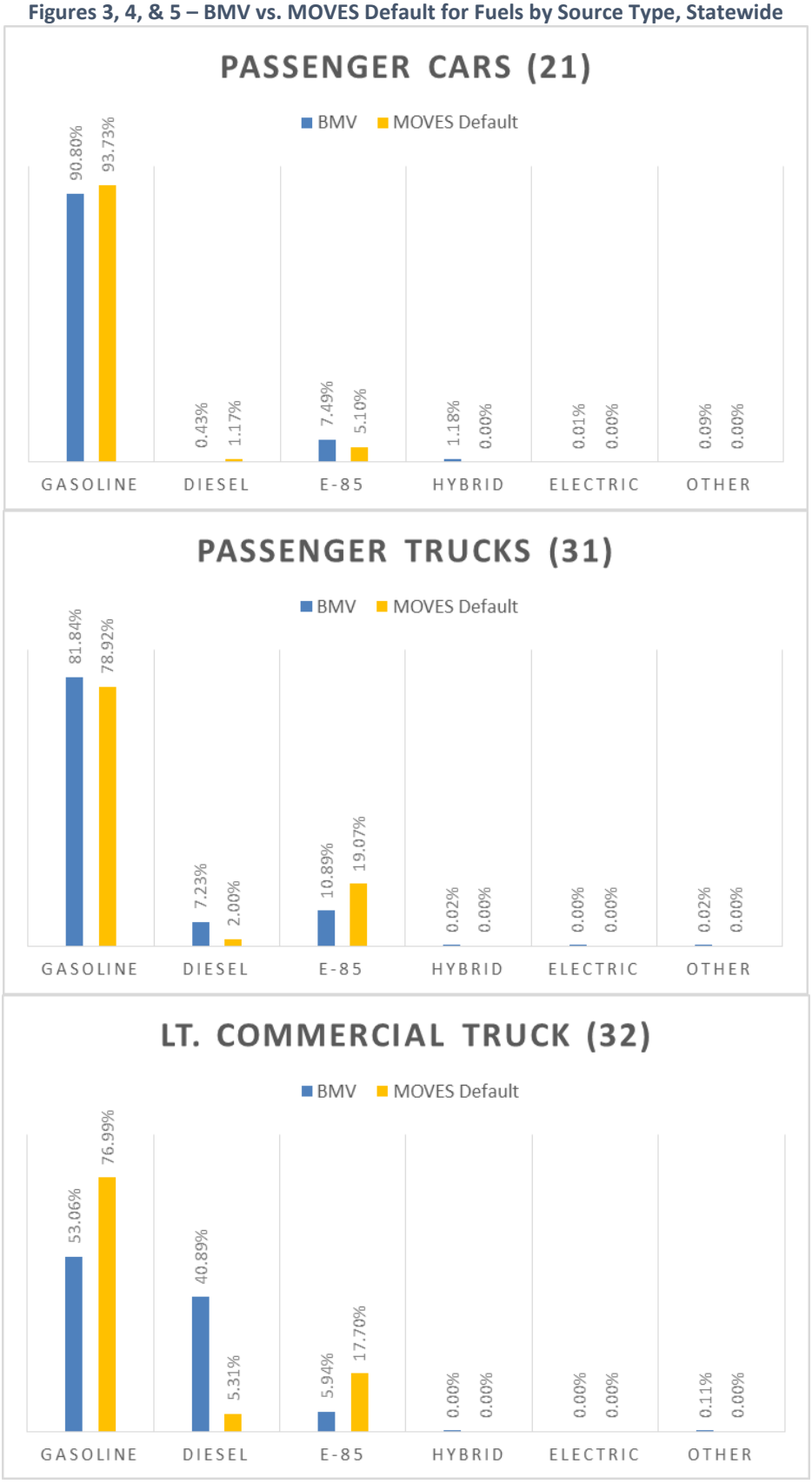
AVFT Assumptions

The 2014 BMV fleet mix data allowed the differentiation of vehicle types by fuel types. An evaluation of differences between BMV-derived data and MOVES 2014 defaults was conducted for light duty vehicles. Results showed that in many of the urban counties, the number of hybrid and electric passenger cars is large enough to warrant inclusion in the AVFT input file. The default MOVES file assumes zero hybrid or electric cars statewide. Additionally, BMV data shows a much larger fraction of diesel powered light duty trucks than indicated in the default data. And, the E-85 market share is actually much smaller in Indiana, than assumed in the default data. Statewide results are shown in Table 3, and Figures 3, 4, and 5. Because of these differences, it was decided that the BMV data provides a better set of assumptions for the light duty vehicle classes. Specific AVFT values used for this region are shown in the appendix A.

Table 3: Comparison of BMV Data to MOVES2014 AVFT Defaults

Fuel Type and Vehicle Technology *Statewide*			**FuelType -->**	1	2	5	1	9	X
			EngTech -->	1	1	1	12	30	X
Data Source	**Vehicle Type**	**Code**	**Year**	**Gasoline**	**Diesel**	**E-85**	**Hybrid**	**Electric**	**Other**
BMV	Passenger Car	21	2015	90.80%	0.43%	7.49%	1.18%	0.01%	0.09%
BMV	Passenger Truck	31	2015	81.84%	7.23%	10.89%	0.02%	0.00%	0.02%
BMV	Light Commercial Truck	32	2015	53.06%	40.89%	5.94%	0.00%	0.00%	0.11%
MOVES Default	Passenger Car	21	2015	93.73%	1.17%	5.10%	0.00%	0.00%	0.00%
MOVES Default	Passenger Truck	31	2015	78.92%	2.00%	19.07%	0.00%	0.00%	0.00%
MOVES Default	Light Commercial Truck	32	2015	76.99%	5.31%	17.70%	0.00%	0.00%	0.00%

Figures 3, 4, & 5 – BMV vs. MOVES Default for Fuels by Source Type, Statewide



8.0 I/M Program

Vehicles registered in Lake and Porter counties are required to undergo emissions tests and tampering inspections every two years if they were manufactured after 1976 and have a gross vehicle weight rating (GVWR) of 9,000 pounds or less. Vehicles manufactured in odd-numbered years are tested during odd-numbered years and vehicles manufactured in even-numbered years tested during even-numbered years. Exemptions include vehicles manufactured during the four latest model years and antique vehicles. MOVES input coding is consistent with the current local I/M Program in Lake and Porter counties. See Table C-8 in Appendix C.

9.0 Summary of MOVES2014 Runs and Settings

Table 4 –Summary of Lake and Porter Ozone and PM 2.5 Emission Rate Runs

Lake and Porter Runs			
	MOVES Input Item		
	Screen	Ozone	PM 2.5
Description	Description	User Choice	
Scale	Domain/Scale	County	
	Calculation Type	Emission Rate	
Time Spans	Time Aggregation Level	Hour	Hour
	Year	2015, 2020, 2025, 2030, 2035, 2040, 2045	2015, 2020, 2025, 2030, 2035, 2040, 2045
	Months	July	April
	Days	Weekday	Weekday
	Hours	Select All	Select All
Geographic Bounds	Geographic Bounds	Lake County*	Lake County*
Vehicles	Vehicles	All Gas and Diesel Combinations	
Road Type	Road Type	Select All	
Pollutants/ Processes	Pollutants/ Processes	VOC, NOx, and supporting	PM 2.5 with all subspecies; NOx & SO2
General Output	Database Name	LakePorter Ozone	LakePorter PM
	Units	Select "Grams" and "Miles" and "Joules"	
	Activity	Distance, Population	
Output Emissions Detail	On Road	Select "Source Use Type" and "Road Type"	

*Represents both Lake and Porter Counties.

Table 5 –Summary of LaPorte County Ozone Emission Rate Runs

LaPorte Runs MOVES Input Item Screen		Ozone
Description	Description	User Choice
Scale	Domain/Scale	County
	Calculation Type	Emission Rate
Time Spans	Time Aggregation Level	Hour
	Year	2015, 2020, 2025, 2030, 2035, 2040, 2045
	Months	July
	Days	Weekday
	Hours	Select All
Geographic Bounds	Geographic Bounds	LaPorte County
Vehicles	Vehicles	All Gas and Diesel Combinations
Road Type	Road Type	Select All
Pollutants/ Processes	Pollutants/ Processes	VOC, NOx, and supporting
General Output	Database Name	LaPorte Ozone
	Units	Select "Grams" and "Miles" and "Joules"
	Activity	Distance, Population
Output Emissions Detail	On Road	Select "Source Use Type" and "Road Type"

Table 6 –Summary of County Data Manager Inputs

County Data Manager Input	Excel Sheet Tab Name	Ozone	PM 2.5
Source (Vehicle) Type Population	sourceTypeYear	Local Registration for Source Types 11, 21, 31, and 32; Estimated population using default MOVES mileage accumulation rates and local VMT for all other source types. Future year vehicle populations based on population growth rates for source types 11, 21, 31, and 32. Employment growth used for all other source types.	
Vehicle Type VMT (by 13 MOVES Vehicle Types)	HPMSVTypeYear	Statewide default vehicle distributions across road types developed by INDOT using an analysis of permanent count station data from a statewide data set.	
	MonthVMTFraction	Statewide default monthly fractions developed by INDOT using an analysis of permanent count station data from a statewide data set.	
	DayVMTFraction	Statewide default daily fractions developed by INDOT using an analysis of permanent count station data from a statewide data set.	
	HourVMTFraction	Statewide default hourly fractions developed by INDOT using an analysis of permanent count station data from a statewide data set.	
Average Speed Distribution (% of VHT in each 5 mph speed bin)	avgSpeed Distribution	National defaults.	
Road Type Distribution (VMT by 5 MOVES Road Types)	roadType Distribution	Calculated from local VMT data. Use travel demand model base year distributions for all years.	
Age Distribution (Vehicle Population by Age of Vehicle)	sourceTypeAge Distribution	Local age distributions developed from vehicle registration data for source types 11, 21, 31, and 32. Default MOVES age distributions for all other source types.	
Ramp Fraction	RoadType	Based on NIRPC travel demand model.	
Meteorology Data	ZoneMonthHour	MOBILE6 Summer Met Data Converted to MOVES format	MOBILE6 12 month Met Data Converted to MOVES format and averaged to annual meteorology
Fuel (% of Market Share by Fuel Type)	FuelFormulation	MOVES Defaults	
	FuelSupply	County MOVES Defaults for Summer (check if varies among counties)	County MOVES Defaults for annual (check if varies among counties)
I/M Program	IMCoverage	Consistent with current local I/M Program	

MOVES Codes used in the Appendices

Throughout the following appendices, references are made to MOVES2014 codes for two types of data. The values for the source type codes are shown in the Table 7 below. The values for the road type codes are shown in Table 8.

Table 7 - MOVES (vehicle) Source Types

SourceTypeID	Description
11	Motorcycles
21	Passenger Car
31	Passenger Truck
32	Light Commercial Truck
41	Intercity Bus
42	Transit Bus
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

Table 8 - MOVES Road Types

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

Appendix A – Updated Vehicle Fleet Assumptions Derived from BMV Data

Table A-1: Vehicle Population for Lake County

	Year									
sourceTypeID	2010	2012	2014	2015	2020	2025	2030	2035	2040	2045
11	12,337	12,527	12,718	12,840	13,283	13,742	14,218	14,710	15,218	15,667
21	196,949	199,987	203,025	204,970	212,059	219,394	226,982	234,833	242,954	250,115
31	107,894	109,559	111,223	112,289	116,172	120,190	124,347	128,648	133,098	137,020
32	33,033	33,543	34,052	34,379	35,567	36,797	38,071	39,387	40,750	41,951
41	231	236	240	244	253	264	276	288	299	310
42	123	125	128	130	134	140	146	153	159	164
43	1,584	1,614	1,645	1,666	1,736	1,810	1,886	1,966	2,050	2,121
51	41	42	43	44	45	47	49	51	54	55
52	2,695	2,748	2,800	2,835	2,955	3,079	3,211	3,346	3,488	3,609
53	321	327	334	338	352	367	383	399	416	431
54	616	628	640	648	675	703	734	764	797	824
61	4,978	5,075	5,171	5,236	5,458	5,689	5,930	6,182	6,443	6,668
62	5,680	5,790	5,901	5,975	6,227	6,491	6,767	7,053	7,352	7,608

Table A-2: Vehicle Population for Porter County

	Year									
sourceTypeID	2010	2012	2014	2015	2020	2025	2030	2035	2040	2045
11	6,612	6,714	6,816	6,881	7,119	7,365	7,620	7,882	8,157	8,396
21	69,425	70,496	71,567	72,253	74,752	77,336	80,012	82,779	85,642	88,166
31	45,870	46,578	47,285	47,739	49,389	51,098	52,865	54,694	56,586	58,254
32	14,044	14,260	14,477	14,616	15,121	15,644	16,185	16,745	17,324	17,834
41	58	59	60	61	63	66	68	71	74	76
42	30	31	31	32	33	34	36	37	39	40
43	397	405	413	418	435	454	474	493	514	532
51	13	13	14	14	14	15	15	16	17	17
52	897	915	932	944	983	1,025	1,069	1,114	1,161	1,202
53	106	108	110	112	116	121	126	132	138	142
54	204	208	212	215	223	233	243	254	265	274
61	1,435	1,463	1,490	1,509	1,573	1,639	1,709	1,781	1,856	1,921
62	1,637	1,669	1,700	1,722	1,794	1,870	1,949	2,032	2,118	2,191

Table A-3: Vehicle Population for LaPorte County

	Year									
sourceTypeID	2010	2012	2014	2015	2020	2025	2030	2035	2040	2045
11	2,820	2,846	2,871	2,886	2,947	3,009	3,073	3,138	3,204	3,266
21	50,742	51,200	51,658	51,927	53,025	54,146	55,291	56,461	57,655	58,760
31	33,729	34,034	34,338	34,517	35,247	35,992	36,753	37,530	38,324	39,058
32	10,327	10,420	10,513	10,568	10,791	11,019	11,252	11,490	11,733	11,958
41	48	49	50	50	52	53	55	57	59	61
42	26	26	27	27	28	29	30	31	32	33
43	329	334	339	342	353	365	377	389	402	413
51	13	14	14	14	14	15	15	16	16	17
52	842	854	866	874	902	932	962	993	1,025	1,054
53	100	102	103	104	108	111	115	119	122	126
54	192	195	198	200	206	213	220	227	235	241
61	1,616	1,639	1,662	1,677	1,731	1,788	1,845	1,905	1,967	2,022
62	1,845	1,871	1,897	1,914	1,976	2,040	2,106	2,174	2,244	2,307

Data Sources: SourceTypes 11, 21, 31, and 32 use 2014 Indiana BMV summary statistics for vehicle registration & license plate data by county. All other Source Types use Mileage Accumulation Rate (MAR) method.

Table A-4: Vehicle Age Distribution for Lake County

Vehicle Age Distribution for Lake County

	SourceTypeID												
AgeID	11	21	31	32	41	42	43	51	52	53	54	61	62
0	0.001374	0.008340	0.002494	0.012087	0.064302	0.054574	0.062222	0.049424	0.058853	0.078754	0.061510	0.053563	0.067085
1	0.024433	0.054402	0.040446	0.021072	0.062673	0.053191	0.060645	0.048172	0.057361	0.076759	0.059951	0.053563	0.067085
2	0.035352	0.060541	0.040612	0.031768	0.062485	0.053032	0.060464	0.048028	0.057190	0.076529	0.059772	0.054105	0.067762
3	0.036191	0.058054	0.039864	0.033480	0.062423	0.052979	0.060403	0.047980	0.057133	0.076453	0.059712	0.057558	0.072087
4	0.028403	0.052297	0.046681	0.033907	0.061737	0.052397	0.059740	0.047452	0.056505	0.075612	0.059056	0.056418	0.070660
5	0.026418	0.047029	0.032839	0.016579	0.055917	0.047458	0.054108	0.042979	0.051178	0.068485	0.053488	0.048929	0.061280
6	0.046652	0.041365	0.026146	0.022890	0.046837	0.039751	0.045321	0.035999	0.042867	0.057363	0.044802	0.036603	0.045843
7	0.054974	0.060531	0.048842	0.060327	0.042579	0.036137	0.041201	0.032727	0.038970	0.052148	0.040729	0.034074	0.042676
8	0.065053	0.066109	0.053955	0.042357	0.046827	0.039743	0.045312	0.035992	0.042858	0.057351	0.044793	0.035809	0.044849
9	0.064213	0.059333	0.050796	0.064820	0.053438	0.045353	0.051709	0.041073	0.048909	0.065448	0.051117	0.052629	0.065914
10	0.060854	0.065959	0.058632	0.057867	0.053271	0.045212	0.051548	0.040945	0.048756	0.065244	0.050958	0.062452	0.078217
11	0.048484	0.056773	0.061126	0.060862	0.040795	0.053620	0.041108	0.031356	0.039149	0.052388	0.030273	0.047826	0.059899
12	0.061923	0.058270	0.058715	0.052733	0.033192	0.048994	0.038293	0.025512	0.029448	0.039407	0.046610	0.038913	0.048735
13	0.050928	0.052756	0.058278	0.055942	0.027735	0.045609	0.033375	0.054598	0.031640	0.019477	0.029167	0.032515	0.046299
14	0.044132	0.049197	0.056491	0.055835	0.036429	0.037775	0.043086	0.063266	0.036444	0.019469	0.034780	0.042708	0.046207
15	0.040467	0.042045	0.050110	0.055086	0.028351	0.033295	0.021016	0.039565	0.035789	0.031185	0.033520	0.033237	0.030044
16	0.032832	0.039475	0.050360	0.042037	0.023588	0.027913	0.025367	0.034157	0.025999	0.023020	0.023315	0.027654	0.023052
17	0.025960	0.025040	0.038679	0.033586	0.017564	0.024497	0.020683	0.014635	0.019796	0.005226	0.020675	0.020591	0.013845
18	0.020463	0.025352	0.042566	0.036047	0.020119	0.025048	0.026689	0.040196	0.019374	0.003721	0.015546	0.023587	0.010007
19	0.021303	0.013446	0.023465	0.029522	0.022579	0.036661	0.030145	0.034228	0.022734	0.017578	0.020363	0.026470	0.009860
20	0.015194	0.014957	0.027684	0.025350	0.022641	0.028197	0.017388	0.027008	0.028940	0.018387	0.026594	0.026543	0.009576
21	0.014278	0.008204	0.022758	0.025136	0.021297	0.022441	0.020903	0.036743	0.025509	0.012162	0.023847	0.024967	0.008340
22	0.012827	0.006517	0.015962	0.016793	0.022137	0.020761	0.021174	0.029424	0.021171	0.002921	0.023292	0.025952	0.002197
23	0.007788	0.003712	0.008314	0.011766	0.018775	0.017685	0.018686	0.036737	0.025574	0.000660	0.017364	0.022011	0.002282
24	0.006795	0.003360	0.007732	0.010696	0.016580	0.015344	0.016222	0.019537	0.018134	0.001323	0.018639	0.019438	0.002895
25	0.008017	0.001969	0.004967	0.010375	0.013046	0.011961	0.012527	0.020286	0.010153	0.001326	0.018907	0.015295	0.001496
26	0.006490	0.002357	0.006214	0.012943	0.005207	0.011471	0.004628	0.005879	0.015824	0.000000	0.012386	0.006104	0.000305
27	0.005116	0.001262	0.003679	0.009306	0.004438	0.006255	0.003427	0.006619	0.008243	0.000585	0.007312	0.005202	0.000237
28	0.008628	0.001418	0.002245	0.005883	0.003853	0.002715	0.004023	0.005865	0.007845	0.000422	0.004020	0.004518	0.000754
29	0.010460	0.000880	0.001164	0.007594	0.005020	0.007381	0.003956	0.001470	0.008291	0.000000	0.000530	0.005885	0.000248
30	0.113996	0.019050	0.018186	0.045352	0.004164	0.002547	0.004629	0.002149	0.009364	0.000597	0.006972	0.004882	0.000264

Data Sources: SourceTypes 11, 21, 31, and 32 were obtained directly from Dec. 2014 Indiana BMV summary statistics for vehicle registration & license plate data by county. All other Source Types use MOVES defaults.

Vehicle Age Distribution for Porter County

Table A-5: Vehicle Age Distribution for Porter County

	SourceTypeID												
AgeID	11	21	31	32	41	42	43	51	52	53	54	61	62
0	0.001004	0.009873	0.003318	0.007176	0.064302	0.054574	0.062222	0.049424	0.058853	0.078754	0.061510	0.053563	0.067085
1	0.029682	0.059695	0.043803	0.017096	0.062673	0.053191	0.060645	0.048172	0.057361	0.076759	0.059951	0.053563	0.067085
2	0.034270	0.068999	0.045440	0.026171	0.062485	0.053032	0.060464	0.048028	0.057190	0.076529	0.059772	0.054105	0.067762
3	0.038428	0.070466	0.046016	0.032503	0.062423	0.052979	0.060403	0.047980	0.057133	0.076453	0.059712	0.057558	0.072087
4	0.026670	0.060969	0.047962	0.023217	0.061737	0.052397	0.059740	0.047452	0.056505	0.075612	0.059056	0.056418	0.070660
5	0.029825	0.053993	0.033273	0.017307	0.055917	0.047458	0.054108	0.042979	0.051178	0.068485	0.053488	0.048929	0.061280
6	0.045311	0.045523	0.029335	0.017729	0.046837	0.039751	0.045321	0.035999	0.042867	0.057363	0.044802	0.036603	0.045843
7	0.054058	0.065727	0.052741	0.044322	0.042579	0.036137	0.041201	0.032727	0.038970	0.052148	0.040729	0.034074	0.042676
8	0.062661	0.068834	0.058493	0.047699	0.046827	0.039743	0.045312	0.035992	0.042858	0.057351	0.044793	0.035809	0.044849
9	0.064812	0.058347	0.052830	0.054031	0.053438	0.045353	0.051709	0.041073	0.048909	0.065448	0.051117	0.052629	0.065914
10	0.056352	0.064049	0.063316	0.050232	0.053271	0.045212	0.051548	0.040945	0.048756	0.065244	0.050958	0.062452	0.078217
11	0.047892	0.056037	0.061856	0.059519	0.040795	0.053620	0.041108	0.031356	0.039149	0.052388	0.030273	0.047826	0.059899
12	0.062518	0.053003	0.060484	0.049388	0.033192	0.048994	0.038293	0.025512	0.029448	0.039407	0.046610	0.038913	0.048735
13	0.050473	0.046128	0.055750	0.049599	0.027735	0.045609	0.033375	0.054598	0.031640	0.019477	0.029167	0.032515	0.046299
14	0.040436	0.041416	0.051900	0.054031	0.036429	0.037775	0.043086	0.063266	0.036444	0.019469	0.034780	0.042708	0.046207
15	0.029682	0.035467	0.047255	0.058041	0.028351	0.033295	0.021016	0.039565	0.035789	0.031185	0.033520	0.033237	0.030044
16	0.032836	0.032341	0.047299	0.047066	0.023588	0.027913	0.025367	0.034157	0.025999	0.023020	0.023315	0.027654	0.023052
17	0.024089	0.019966	0.033583	0.033347	0.017564	0.024497	0.020683	0.014635	0.019796	0.005226	0.020675	0.020591	0.013845
18	0.020648	0.019324	0.040175	0.038413	0.020119	0.025048	0.026689	0.040196	0.019374	0.003721	0.015546	0.023587	0.010007
19	0.019644	0.010459	0.020486	0.030393	0.022579	0.036661	0.030145	0.034228	0.022734	0.017578	0.020363	0.026470	0.009860
20	0.018497	0.011541	0.024070	0.037358	0.022641	0.028197	0.017388	0.027008	0.028940	0.018387	0.026594	0.026543	0.009576
21	0.013192	0.006087	0.018052	0.028704	0.021297	0.022441	0.020903	0.036743	0.025509	0.012162	0.023847	0.024967	0.008340
22	0.013479	0.005051	0.012920	0.023639	0.022137	0.020761	0.021174	0.029424	0.021171	0.002921	0.023292	0.025952	0.002197
23	0.008603	0.003163	0.006770	0.012241	0.018775	0.017685	0.018686	0.036737	0.025574	0.000660	0.017364	0.022011	0.002282
24	0.007886	0.002906	0.006991	0.011397	0.016580	0.015344	0.016222	0.019537	0.018134	0.001323	0.018639	0.019438	0.002895
25	0.007456	0.001815	0.004115	0.015407	0.013046	0.011961	0.012527	0.020286	0.010153	0.001326	0.018907	0.015295	0.001496
26	0.006883	0.001971	0.004425	0.013719	0.005207	0.011471	0.004628	0.005879	0.015824	0.000000	0.012386	0.006104	0.000305
27	0.006453	0.001146	0.002832	0.011397	0.004438	0.006255	0.003427	0.006619	0.008243	0.000585	0.007312	0.005202	0.000237
28	0.007169	0.001274	0.001770	0.005910	0.003853	0.002715	0.004023	0.005865	0.007845	0.000422	0.004020	0.004518	0.000754
29	0.011758	0.000843	0.001150	0.008020	0.005020	0.007381	0.003956	0.001470	0.008291	0.000000	0.000530	0.005885	0.000248
30	0.127330	0.023586	0.021592	0.074926	0.004164	0.002547	0.004629	0.002149	0.009364	0.000597	0.006972	0.004882	0.000264

Data Sources: SourceTypes 11, 21, 31, and 32 were obtained directly from Dec. 2014 Indiana BMV summary statistics for vehicle registration & license plate data by county. All other Source Types use MOVES defaults.

Table A-6: Vehicle Age Distribution for LaPorte County

Vehicle Age Distribution for LaPorte County

	SourceTypeID												
AgeID	11	21	31	32	41	42	43	51	52	53	54	61	62
0	0.001111	0.005958	0.002961	0.010617	0.064302	0.054574	0.062222	0.049424	0.058853	0.078754	0.061510	0.053563	0.067085
1	0.020894	0.037845	0.025235	0.022561	0.062673	0.053191	0.060645	0.048172	0.057361	0.076759	0.059951	0.053563	0.067085
2	0.024228	0.047465	0.026829	0.030524	0.062485	0.053032	0.060464	0.048028	0.057190	0.076529	0.059772	0.054105	0.067762
3	0.033785	0.049478	0.030154	0.036496	0.062423	0.052979	0.060403	0.047980	0.057133	0.076453	0.059712	0.057558	0.072087
4	0.026006	0.046586	0.035574	0.041141	0.061737	0.052397	0.059740	0.047452	0.056505	0.075612	0.059056	0.056418	0.070660
5	0.021116	0.041844	0.026419	0.017253	0.055917	0.047458	0.054108	0.042979	0.051178	0.068485	0.053488	0.048929	0.061280
6	0.041565	0.034521	0.019450	0.016589	0.046837	0.039751	0.045321	0.035999	0.042867	0.057363	0.044802	0.036603	0.045843
7	0.052456	0.054490	0.040494	0.059721	0.042579	0.036137	0.041201	0.032727	0.038970	0.052148	0.040729	0.034074	0.042676
8	0.055568	0.057422	0.042999	0.043796	0.046827	0.039743	0.045312	0.035992	0.042858	0.057351	0.044793	0.035809	0.044849
9	0.071127	0.057247	0.045686	0.055740	0.053438	0.045353	0.051709	0.041073	0.048909	0.065448	0.051117	0.052629	0.065914
10	0.058902	0.063908	0.052610	0.036496	0.053271	0.045212	0.051548	0.040945	0.048756	0.065244	0.050958	0.062452	0.078217
11	0.052901	0.059922	0.059215	0.049104	0.040795	0.053620	0.041108	0.031356	0.039149	0.052388	0.030273	0.047826	0.059899
12	0.065570	0.058165	0.054887	0.024552	0.033192	0.048994	0.038293	0.025512	0.029448	0.039407	0.046610	0.038913	0.048735
13	0.054679	0.059354	0.058531	0.040478	0.027735	0.045609	0.033375	0.054598	0.031640	0.019477	0.029167	0.032515	0.046299
14	0.043565	0.050802	0.055434	0.044459	0.036429	0.037775	0.043086	0.063266	0.036444	0.019469	0.034780	0.042708	0.046207
15	0.040009	0.050951	0.059169	0.035833	0.028351	0.033295	0.021016	0.039565	0.035789	0.031185	0.033520	0.033237	0.030044
16	0.029562	0.042128	0.052656	0.045123	0.023588	0.027913	0.025367	0.034157	0.025999	0.023020	0.023315	0.027654	0.023052
17	0.028006	0.032737	0.049148	0.027870	0.017564	0.024497	0.020683	0.014635	0.019796	0.005226	0.020675	0.020591	0.013845
18	0.021338	0.029279	0.045914	0.028534	0.020119	0.025048	0.026689	0.040196	0.019374	0.003721	0.015546	0.023587	0.010007
19	0.023783	0.021375	0.033798	0.018580	0.022579	0.036661	0.030145	0.034228	0.022734	0.017578	0.020363	0.026470	0.009860
20	0.013336	0.018429	0.035984	0.037160	0.022641	0.028197	0.017388	0.027008	0.028940	0.018387	0.026594	0.026543	0.009576
21	0.013114	0.012363	0.032204	0.016589	0.021297	0.022441	0.020903	0.036743	0.025509	0.012162	0.023847	0.024967	0.008340
22	0.014225	0.009242	0.020862	0.021898	0.022137	0.020761	0.021174	0.029424	0.021171	0.002921	0.023292	0.025952	0.002197
23	0.008224	0.006377	0.014394	0.014599	0.018775	0.017685	0.018686	0.036737	0.025574	0.000660	0.017364	0.022011	0.002282
24	0.007557	0.005175	0.009429	0.009290	0.016580	0.015344	0.016222	0.019537	0.018134	0.001323	0.018639	0.019438	0.002895
25	0.006446	0.003932	0.009839	0.015926	0.013046	0.011961	0.012527	0.020286	0.010153	0.001326	0.018907	0.015295	0.001496
26	0.006890	0.003797	0.009930	0.015926	0.005207	0.011471	0.004628	0.005879	0.015824	0.000000	0.012386	0.006104	0.000305
27	0.006446	0.002756	0.007197	0.015926	0.004438	0.006255	0.003427	0.006619	0.008243	0.000585	0.007312	0.005202	0.000237
28	0.010002	0.002351	0.005147	0.007299	0.003853	0.002715	0.004023	0.005865	0.007845	0.000422	0.004020	0.004518	0.000754
29	0.016893	0.002283	0.004054	0.007963	0.005020	0.007381	0.003956	0.001470	0.008291	0.000000	0.000530	0.005885	0.000248
30	0.130696	0.031819	0.033798	0.151958	0.004164	0.002547	0.004629	0.002149	0.009364	0.000597	0.006972	0.004882	0.000264

Data Sources: SourceTypes 11, 21, 31, and 32 were obtained directly from Dec. 2014 Indiana BMV summary statistics for vehicle registration & license plate data by county. All other Source Types use MOVES defaults.

Table A-7: AVFT percentages for Light Duty Vehicles

Fuel Type and Vehicle Technology									
Lake, Porter, and LaPorte Counties			FuelType -->	1	2	5	1	9	X
			engTech -->	1	1	1	12	30	X
Data Source	**Vehicle Type**	**Code**	**Year**	**Gasoline**	**Diesel**	**E-85**	**Hybrid**	**Electric**	**Other**
BMV	Passenger Car	21	2015	90.55%	0.38%	7.93%	1.02%	0.02%	0.11%
BMV	Passenger Truck	31	2015	81.89%	4.19%	13.87%	0.01%	0.00%	0.04%
BMV	Light Commercial Truck	32	2015	68.26%	24.96%	6.73%	0.01%	0.00%	0.04%

Appendix B – Updated Hourly VMT Fractions Derived from INDOT Data

Table B-1: Hourly VMT Fraction: RoadType 1, Off Network

	SourceTypeID												
Hr	11	21	31	32	41	42	43	51	52	53	54	61	62
1	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
2	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
3	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
4	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
5	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007
6	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018
7	0.046	0.046	0.046	0.046	0.046	0.046	0.046	0.046	0.046	0.046	0.046	0.046	0.046
8	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070
9	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061	0.061
10	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050
11	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050
12	0.054	0.054	0.054	0.054	0.054	0.054	0.054	0.054	0.054	0.054	0.054	0.054	0.054
13	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058
14	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058
15	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062	0.062
16	0.071	0.071	0.071	0.071	0.071	0.071	0.071	0.071	0.071	0.071	0.071	0.071	0.071
17	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077
18	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077
19	0.060	0.060	0.060	0.060	0.060	0.060	0.060	0.060	0.060	0.060	0.060	0.060	0.060
20	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044	0.044
21	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035
22	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032
23	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025
24	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018

- RoadType1 uses default values

Table B-2: Hourly VMT Fraction: RoadType 2, Rural Restricted Access

	SourceTypeID												
Hr	11	21	31	32	41	42	43	51	52	53	54	61	62
1	0.017	0.010	0.008	0.008	0.017	0.017	0.017	0.010	0.010	0.007	0.007	0.038	0.027
2	0.012	0.006	0.005	0.005	0.019	0.019	0.019	0.008	0.008	0.010	0.010	0.019	0.024
3	0.010	0.004	0.004	0.004	0.026	0.026	0.026	0.008	0.008	0.006	0.006	0.023	0.025
4	0.010	0.004	0.004	0.004	0.019	0.019	0.019	0.009	0.009	0.008	0.008	0.036	0.023
5	0.010	0.006	0.007	0.007	0.033	0.033	0.033	0.012	0.012	0.013	0.013	0.025	0.026
6	0.012	0.016	0.021	0.021	0.036	0.036	0.036	0.032	0.032	0.025	0.025	0.028	0.031
7	0.028	0.035	0.042	0.042	0.064	0.064	0.064	0.065	0.065	0.046	0.046	0.039	0.036
8	0.052	0.050	0.049	0.049	0.044	0.044	0.044	0.073	0.073	0.056	0.056	0.047	0.037
9	0.055	0.046	0.048	0.048	0.060	0.060	0.060	0.056	0.056	0.057	0.057	0.048	0.041
10	0.055	0.046	0.049	0.049	0.052	0.052	0.052	0.050	0.050	0.058	0.058	0.043	0.050
11	0.055	0.053	0.057	0.057	0.067	0.067	0.067	0.051	0.051	0.060	0.060	0.061	0.056
12	0.051	0.058	0.061	0.061	0.057	0.057	0.057	0.049	0.049	0.060	0.060	0.065	0.061
13	0.059	0.059	0.063	0.063	0.074	0.074	0.074	0.053	0.053	0.069	0.069	0.063	0.062
14	0.060	0.061	0.062	0.062	0.050	0.050	0.050	0.052	0.052	0.063	0.063	0.057	0.059
15	0.064	0.064	0.066	0.066	0.052	0.052	0.052	0.055	0.055	0.065	0.065	0.048	0.057
16	0.064	0.074	0.074	0.074	0.075	0.075	0.075	0.063	0.063	0.073	0.073	0.051	0.057
17	0.069	0.084	0.083	0.083	0.071	0.071	0.071	0.075	0.075	0.073	0.073	0.051	0.055
18	0.069	0.090	0.083	0.083	0.036	0.036	0.036	0.076	0.076	0.066	0.066	0.041	0.049
19	0.066	0.073	0.066	0.066	0.026	0.026	0.026	0.065	0.065	0.053	0.053	0.032	0.043
20	0.059	0.052	0.049	0.049	0.034	0.034	0.034	0.046	0.046	0.043	0.043	0.033	0.038
21	0.038	0.041	0.037	0.037	0.030	0.030	0.030	0.034	0.034	0.036	0.036	0.034	0.035
22	0.036	0.031	0.028	0.028	0.024	0.024	0.024	0.024	0.024	0.023	0.023	0.033	0.040
23	0.025	0.023	0.021	0.021	0.020	0.020	0.020	0.020	0.020	0.016	0.016	0.047	0.036
24	0.023	0.015	0.013	0.013	0.014	0.014	0.014	0.014	0.014	0.013	0.013	0.038	0.033

Source: INDOT Selected Weigh in Motion and ATR site data

Table B-3: Hourly VMT Fraction: RoadType 3, Rural Unrestricted Access

	SourceTypeID												
Hr	11	21	31	32	41	42	43	51	52	53	54	61	62
1	0.009	0.005	0.005	0.005	0.002	0.002	0.002	0.003	0.003	0.005	0.005	0.010	0.006
2	0.005	0.003	0.002	0.002	0.002	0.002	0.002	0.020	0.020	0.007	0.007	0.007	0.004
3	0.004	0.003	0.002	0.002	0.002	0.002	0.002	0.014	0.014	0.007	0.007	0.005	0.003
4	0.004	0.004	0.003	0.003	0.002	0.002	0.002	0.008	0.008	0.008	0.008	0.005	0.004
5	0.018	0.010	0.008	0.008	0.004	0.004	0.004	0.003	0.003	0.011	0.011	0.009	0.009
6	0.016	0.017	0.023	0.023	0.015	0.015	0.015	0.034	0.034	0.030	0.030	0.021	0.021
7	0.009	0.023	0.032	0.032	0.025	0.025	0.025	0.062	0.062	0.063	0.063	0.033	0.033
8	0.009	0.040	0.044	0.044	0.088	0.088	0.088	0.096	0.096	0.051	0.051	0.038	0.046
9	0.036	0.044	0.050	0.050	0.077	0.077	0.077	0.073	0.073	0.047	0.047	0.047	0.044
10	0.018	0.055	0.066	0.066	0.053	0.053	0.053	0.084	0.084	0.072	0.072	0.058	0.054
11	0.027	0.065	0.074	0.074	0.134	0.134	0.134	0.073	0.073	0.072	0.072	0.067	0.067
12	0.091	0.075	0.088	0.088	0.108	0.108	0.108	0.107	0.107	0.083	0.083	0.069	0.077
13	0.118	0.077	0.084	0.084	0.050	0.050	0.050	0.067	0.067	0.076	0.076	0.071	0.079
14	0.132	0.075	0.071	0.071	0.093	0.093	0.093	0.062	0.062	0.065	0.065	0.072	0.079
15	0.146	0.076	0.072	0.072	0.105	0.105	0.105	0.076	0.076	0.049	0.049	0.072	0.083
16	0.036	0.086	0.085	0.085	0.015	0.015	0.015	0.059	0.059	0.050	0.050	0.065	0.088
17	0.064	0.089	0.081	0.081	0.066	0.066	0.066	0.076	0.076	0.042	0.042	0.065	0.085
18	0.046	0.083	0.071	0.071	0.034	0.034	0.034	0.037	0.037	0.055	0.055	0.074	0.072
19	0.073	0.056	0.053	0.053	0.056	0.056	0.056	0.011	0.011	0.063	0.063	0.068	0.049
20	0.046	0.041	0.034	0.034	0.031	0.031	0.031	0.008	0.008	0.055	0.055	0.052	0.034
21	0.027	0.028	0.023	0.023	0.005	0.005	0.005	0.008	0.008	0.037	0.037	0.037	0.025
22	0.028	0.022	0.014	0.014	0.028	0.028	0.028	0.003	0.003	0.025	0.025	0.027	0.017
23	0.018	0.014	0.011	0.011	0.002	0.002	0.002	0.011	0.011	0.017	0.017	0.016	0.012
24	0.018	0.008	0.005	0.005	0.002	0.002	0.002	0.006	0.006	0.010	0.010	0.013	0.008

Source: INDOT Selected Weigh in Motion and ATR site data

Table B-5: Hourly VMT Fraction: RoadType 4, Urban Restricted Access

	SourceTypeID												
Hr	11	21	31	32	41	42	43	51	52	53	54	61	62
1	0.003	0.014	0.012	0.012	0.018	0.018	0.018	0.010	0.010	0.018	0.018	0.017	0.026
2	0.004	0.008	0.007	0.007	0.017	0.017	0.017	0.007	0.007	0.012	0.012	0.013	0.024
3	0.004	0.005	0.005	0.005	0.013	0.013	0.013	0.005	0.005	0.009	0.009	0.011	0.024
4	0.007	0.005	0.005	0.005	0.013	0.013	0.013	0.006	0.006	0.008	0.008	0.012	0.024
5	0.012	0.006	0.009	0.009	0.015	0.015	0.015	0.009	0.009	0.011	0.011	0.015	0.027
6	0.007	0.014	0.023	0.023	0.027	0.027	0.027	0.020	0.020	0.017	0.017	0.018	0.033
7	0.009	0.029	0.049	0.049	0.038	0.038	0.038	0.040	0.040	0.027	0.027	0.032	0.040
8	0.016	0.046	0.058	0.058	0.042	0.042	0.042	0.053	0.053	0.051	0.051	0.062	0.045
9	0.112	0.061	0.058	0.058	0.058	0.058	0.058	0.057	0.057	0.080	0.080	0.079	0.049
10	0.214	0.056	0.054	0.054	0.076	0.076	0.076	0.059	0.059	0.058	0.058	0.055	0.048
11	0.109	0.049	0.052	0.052	0.071	0.071	0.071	0.057	0.057	0.059	0.059	0.058	0.053
12	0.029	0.050	0.051	0.051	0.061	0.061	0.061	0.058	0.058	0.055	0.055	0.055	0.056
13	0.030	0.052	0.053	0.053	0.061	0.061	0.061	0.059	0.059	0.058	0.058	0.054	0.057
14	0.033	0.056	0.056	0.056	0.065	0.065	0.065	0.060	0.060	0.058	0.058	0.053	0.056
15	0.040	0.060	0.060	0.060	0.067	0.067	0.067	0.065	0.065	0.058	0.058	0.051	0.058
16	0.040	0.066	0.067	0.067	0.068	0.068	0.068	0.072	0.072	0.062	0.062	0.055	0.056
17	0.029	0.076	0.079	0.079	0.058	0.058	0.058	0.080	0.080	0.064	0.064	0.068	0.055
18	0.147	0.081	0.078	0.078	0.052	0.052	0.052	0.075	0.075	0.055	0.055	0.066	0.049
19	0.085	0.076	0.067	0.067	0.048	0.048	0.048	0.063	0.063	0.068	0.068	0.065	0.045
20	0.022	0.058	0.049	0.049	0.039	0.039	0.039	0.047	0.047	0.057	0.057	0.051	0.042
21	0.016	0.043	0.036	0.036	0.028	0.028	0.028	0.035	0.035	0.039	0.039	0.036	0.039
22	0.012	0.035	0.029	0.029	0.023	0.023	0.023	0.026	0.026	0.028	0.028	0.029	0.035
23	0.007	0.030	0.025	0.025	0.021	0.021	0.021	0.020	0.020	0.024	0.024	0.025	0.031
24	0.012	0.022	0.018	0.018	0.019	0.019	0.019	0.015	0.015	0.023	0.023	0.022	0.029

Source: INDOT Selected Weigh in Motion and ATR site data

Table B-6: Hourly VMT Fraction: RoadType 5, Urban Unrestricted Access

	SourceTypeID												
Hr	11	21	31	32	41	42	43	51	52	53	54	61	62
1	0.009	0.009	0.006	0.006	0.013	0.013	0.013	0.004	0.004	0.004	0.004	0.011	0.011
2	0.006	0.005	0.004	0.004	0.010	0.010	0.010	0.004	0.004	0.004	0.004	0.012	0.012
3	0.005	0.004	0.003	0.003	0.007	0.007	0.007	0.004	0.004	0.004	0.004	0.012	0.012
4	0.005	0.004	0.004	0.004	0.011	0.011	0.011	0.006	0.006	0.006	0.006	0.014	0.014
5	0.008	0.008	0.009	0.009	0.015	0.015	0.015	0.009	0.009	0.009	0.009	0.021	0.021
6	0.023	0.020	0.024	0.024	0.026	0.026	0.026	0.019	0.019	0.019	0.019	0.030	0.030
7	0.044	0.048	0.054	0.054	0.045	0.045	0.045	0.042	0.042	0.042	0.042	0.044	0.044
8	0.060	0.072	0.068	0.068	0.069	0.069	0.069	0.073	0.073	0.073	0.073	0.059	0.059
9	0.056	0.057	0.064	0.064	0.075	0.075	0.075	0.088	0.088	0.088	0.088	0.064	0.064
10	0.049	0.047	0.060	0.060	0.080	0.080	0.080	0.092	0.092	0.092	0.092	0.068	0.068
11	0.050	0.047	0.059	0.059	0.077	0.077	0.077	0.094	0.094	0.094	0.094	0.070	0.070
12	0.057	0.052	0.062	0.062	0.075	0.075	0.075	0.091	0.091	0.091	0.091	0.070	0.070
13	0.061	0.056	0.063	0.063	0.074	0.074	0.074	0.090	0.090	0.090	0.090	0.069	0.069
14	0.061	0.056	0.063	0.063	0.078	0.078	0.078	0.091	0.091	0.091	0.091	0.067	0.067
15	0.065	0.061	0.067	0.067	0.076	0.076	0.076	0.091	0.091	0.091	0.091	0.065	0.065
16	0.072	0.072	0.075	0.075	0.073	0.073	0.073	0.078	0.078	0.078	0.078	0.061	0.061
17	0.077	0.080	0.076	0.076	0.053	0.053	0.053	0.046	0.046	0.046	0.046	0.056	0.056
18	0.077	0.083	0.068	0.068	0.035	0.035	0.035	0.026	0.026	0.026	0.026	0.051	0.051
19	0.064	0.064	0.053	0.053	0.029	0.029	0.029	0.017	0.017	0.017	0.017	0.040	0.040
20	0.048	0.046	0.037	0.037	0.022	0.022	0.022	0.011	0.011	0.011	0.011	0.031	0.031
21	0.038	0.039	0.029	0.029	0.017	0.017	0.017	0.008	0.008	0.008	0.008	0.027	0.027
22	0.031	0.033	0.024	0.024	0.014	0.014	0.014	0.006	0.006	0.006	0.006	0.023	0.023
23	0.021	0.024	0.017	0.017	0.014	0.014	0.014	0.005	0.005	0.005	0.005	0.019	0.019
24	0.015	0.016	0.011	0.011	0.012	0.012	0.012	0.005	0.005	0.005	0.005	0.016	0.016

Source: INDOT Selected Weigh in Motion and ATR site data

Appendix C – Inputs Carried Over from MOVES2010a Rate Development

Table C-1: Indiana Default VMT Distributions by Vehicle Type and Road Type

Road Type	Motorcycle	Passenger Car	Light Duty Truck	Bus	Single Unit Truck	Combination Truck
2	0.00703	0.50641	0.16379	0.00417	0.00777	0.31082
3	0.00173	0.65975	0.22577	0.00079	0.01096	0.10099
4	0.00397	0.56995	0.25420	0.00283	0.00908	0.15996
5	0.00279	0.70275	0.24524	0.00140	0.00976	0.03805

Source: Statewide averages developed from Indiana Department of Transportation traffic count data.

Table C-2: Indiana Default Daily Distribution Factors

	dayID	
monthID	2	5
1	0.232541	0.767459
2	0.238055	0.761945
3	0.239340	0.760660
4	0.239605	0.760395
5	0.248476	0.751524
6	0.248974	0.751026
7	0.248115	0.751885
8	0.252703	0.747297
9	0.249608	0.750392
10	0.246281	0.753719
11	0.243974	0.756026
12	0.225878	0.774122

Source: Statewide averages developed from Indiana Department of Transportation traffic count data

Table C-3: Lake, Porter, and LaPorte Counties Ramp Fractions

Road Type	Ramp Fraction
2	0.79%
4	6.66%

Source: Analysis of VHT from the CMAP travel demand model.

Table C-4: Indiana Default Monthly Distribution Factors

monthID	monthVMTFraction
1	0.07334
2	0.06937
3	0.08270
4	0.08318
5	0.08913
6	0.08882
7	0.09080
8	0.09185
9	0.08542
10	0.08752
11	0.08124
12	0.07664

Source: Statewide averages developed from Indiana Department of Transportation traffic count data.

Table C-5: Meteorology Assumptions, Lake, Porter, and LaPorte Counties

Ozone					PM 2.5				
monthID	zoneID	HourID	temperature	relHumidity	**monthID**	zoneID	HourID	temperature	relHumidity
7	180890	1	67.0	88.0	**4**	180890	1	43.7	100.0
7	180890	2	65.8	91.8	**4**	180890	2	42.5	100.0
7	180890	3	64.9	94.9	**4**	180890	3	41.6	100.0
7	180890	4	64.2	97.2	**4**	180890	4	41.0	100.0
7	180890	5	63.6	99.0	**4**	180890	5	40.5	100.0
7	180890	6	63.0	100.0	**4**	180890	6	39.9	100.0
7	180890	7	62.5	100.0	**4**	180890	7	39.4	100.0
7	180890	8	62.9	100.0	**4**	180890	8	39.8	100.0
7	180890	9	65.5	92.6	**4**	180890	9	42.3	100.0
7	180890	10	69.7	80.2	**4**	180890	10	46.2	97.2
7	180890	11	74.0	69.4	**4**	180890	11	50.3	83.5
7	180890	12	77.7	61.4	**4**	180890	12	53.8	73.5
7	180890	13	80.9	55.3	**4**	180890	13	56.8	65.8
7	180890	14	82.6	52.2	**4**	180890	14	58.5	62.0
7	180890	15	83.2	51.2	**4**	180890	15	59.0	60.7
7	180890	16	83.4	50.9	**4**	180890	16	59.2	60.3
7	180890	17	83.0	51.6	**4**	180890	17	58.8	61.2
7	180890	18	81.7	53.7	**4**	180890	18	57.6	63.8
7	180890	19	79.7	57.5	**4**	180890	19	55.7	68.6
7	180890	20	77.0	62.9	**4**	180890	20	53.1	75.3
7	180890	21	74.3	68.8	**4**	180890	21	50.5	82.7
7	180890	22	71.9	74.5	**4**	180890	22	48.3	89.9
7	180890	23	70.3	78.8	**4**	180890	23	46.7	95.4
7	180890	24	68.6	83.4	**4**	180890	24	45.2	100.0

Source: Mobile 6.2 reported meteorological data from Air Quality Conformity Determination Between the 2040 Regional Transportation Plan, the Fiscal Year 2012 to 2015 Transportation Improvement Program, and the Indiana State Implementation Plan for Air Quality, Appendix E, developed by NIRPC in June, 2011 converted using EPA data converter.

Table C-6: Fuel

countyID	fuelYearID	monthGroupID	fuelFormulationID	marketShare	marketShareCV
18089	2010	7	20011	1	0.5
18089	2010	7	3160	1	0.5

Source: MOVES defaults for this region.

Table C-7: Fuel Formulation

Fuel Formulation ID	Fuel Sub type ID	RVP	Sulfur Level	ETOH Volume	MTBE Volume	ETBE Volume	TAME Volume	Aromatic Content
20011	20	0	11	0	0	0	0	0
3160	12	6.983	30	10	0	0	0	19.443

Fuel Formulation ID	Fuel Sub type ID	Olefin Content	Benzene Content	e200	e300	BioDiesel EsterVol	Cetane Index	PAH Content
20011	20	0	0	0	0	0	0	0
3160	12	7.262	0.633	50.756	83.915	0	0	0

Source: MOVES defaults for this region.

Table C-8: Lake and Porter County Inspection and Maintenance Program

polProcessID	stateID	countyID	yearID	sourceTypeID	fuelTypeID	IMProgramID	inspectFreq	testStandardsID	begModelYearID	endModelYearID	useIMyn	complianceFactor
101	18	18089	2010	21	1	1	2	11	1976	1980	N	93.12
101	18	18089	2010	31	1	1	2	11	1976	1980	N	93.12
101	18	18089	2010	32	1	1	2	11	1976	1980	N	93.12
102	18	18089	2010	21	1	1	2	11	1976	1980	N	93.12
102	18	18089	2010	31	1	1	2	11	1976	1980	N	93.12
102	18	18089	2010	32	1	1	2	11	1976	1980	N	93.12
101	18	18089	2010	21	1	6	2	33	1981	1995	N	93.12
101	18	18089	2010	31	1	6	2	33	1981	1995	N	93.12
101	18	18089	2010	32	1	6	2	33	1981	1995	N	93.12
102	18	18089	2010	21	1	6	2	33	1981	1995	N	93.12
102	18	18089	2010	31	1	6	2	33	1981	1995	N	93.12
102	18	18089	2010	32	1	6	2	33	1981	1995	N	93.12
301	18	18089	2010	21	1	6	2	33	1981	1995	N	93.12
301	18	18089	2010	31	1	6	2	33	1981	1995	N	93.12
301	18	18089	2010	32	1	6	2	33	1981	1995	N	93.12
302	18	18089	2010	21	1	6	2	33	1981	1995	N	93.12
302	18	18089	2010	31	1	6	2	33	1981	1995	N	93.12
302	18	18089	2010	32	1	6	2	33	1981	1995	N	93.12
101	18	18089	2010	21	1	10	2	51	1996	2008	N	93.12
101	18	18089	2010	31	1	10	2	51	1996	2008	N	93.12
101	18	18089	2010	32	1	10	2	51	1996	2008	N	93.12
102	18	18089	2010	21	1	10	2	51	1996	2008	N	93.12
102	18	18089	2010	31	1	10	2	51	1996	2008	N	93.12
102	18	18089	2010	32	1	10	2	51	1996	2008	N	93.12
301	18	18089	2010	21	1	10	2	51	1996	2008	N	93.12
301	18	18089	2010	31	1	10	2	51	1996	2008	N	93.12
301	18	18089	2010	32	1	10	2	51	1996	2008	N	93.12
302	18	18089	2010	21	1	10	2	51	1996	2008	N	93.12
302	18	18089	2010	31	1	10	2	51	1996	2008	N	93.12
302	18	18089	2010	32	1	10	2	51	1996	2008	N	93.12
112	18	18089	2010	21	1	7	2	41	1976	1995	N	93.12
112	18	18089	2010	21	1	8	2	43	1996	2008	N	93.12
112	18	18089	2010	31	1	7	2	41	1976	1995	N	93.12
112	18	18089	2010	31	1	8	2	43	1996	2008	N	93.12
112	18	18089	2010	32	1	7	2	41	1976	1995	N	93.12
112	18	18089	2010	32	1	8	2	43	1996	2008	N	93.12
113	18	18089	2010	21	1	7	2	41	1976	1995	N	93.12
113	18	18089	2010	21	1	8	2	43	1996	2008	N	93.12
113	18	18089	2010	31	1	7	2	41	1976	1995	N	93.12
113	18	18089	2010	31	1	8	2	43	1996	2008	N	93.12
113	18	18089	2010	32	1	7	2	41	1976	1995	N	93.12
113	18	18089	2010	32	1	8	2	43	1996	2008	N	93.12
101	18	18089	2010	21	1	11	2	11	1976	1980	Y	95
101	18	18089	2010	31	1	11	2	11	1976	1980	Y	95
101	18	18089	2010	32	1	11	2	11	1976	1980	Y	95
102	18	18089	2010	21	1	11	2	11	1976	1980	Y	95
102	18	18089	2010	31	1	11	2	11	1976	1980	Y	95
102	18	18089	2010	32	1	11	2	11	1976	1980	Y	95
301	18	18089	2010	21	1	11	2	11	1976	1980	Y	95
301	18	18089	2010	31	1	11	2	11	1976	1980	Y	95
301	18	18089	2010	32	1	11	2	11	1976	1980	Y	95
302	18	18089	2010	21	1	11	2	11	1976	1980	Y	95
302	18	18089	2010	31	1	11	2	11	1976	1980	Y	95
302	18	18089	2010	32	1	11	2	11	1976	1980	Y	95
101	18	18089	2010	21	1	12	2	33	1981	1995	Y	95
101	18	18089	2010	31	1	12	2	33	1981	1995	Y	95
101	18	18089	2010	32	1	12	2	33	1981	1995	Y	95
102	18	18089	2010	21	1	12	2	33	1981	1995	Y	95
102	18	18089	2010	31	1	12	2	33	1981	1995	Y	95
102	18	18089	2010	32	1	12	2	33	1981	1995	Y	95
301	18	18089	2010	21	1	12	2	33	1981	1995	Y	95
301	18	18089	2010	31	1	12	2	33	1981	1995	Y	95
301	18	18089	2010	32	1	12	2	33	1981	1995	Y	95
302	18	18089	2010	21	1	12	2	33	1981	1995	Y	95
302	18	18089	2010	31	1	12	2	33	1981	1995	Y	95
302	18	18089	2010	32	1	12	2	33	1981	1995	Y	95
112	18	18089	2010	21	1	13	2	41	1976	1995	Y	95
112	18	18089	2010	31	1	13	2	41	1976	1995	Y	95
112	18	18089	2010	32	1	13	2	41	1976	1995	Y	95
113	18	18089	2010	21	1	13	2	41	1976	1995	Y	95
113	18	18089	2010	31	1	13	2	41	1976	1995	Y	95
113	18	18089	2010	32	1	13	2	41	1976	1995	Y	95
101	18	18089	2010	21	1	14	2	51	1996	2006	Y	95
101	18	18089	2010	31	1	14	2	51	1996	2006	Y	95
101	18	18089	2010	32	1	14	2	51	1996	2006	Y	95
102	18	18089	2010	21	1	14	2	51	1996	2006	Y	95
102	18	18089	2010	31	1	14	2	51	1996	2006	Y	95
102	18	18089	2010	32	1	14	2	51	1996	2006	Y	95
301	18	18089	2010	21	1	14	2	51	1996	2006	Y	95
301	18	18089	2010	31	1	14	2	51	1996	2006	Y	95
301	18	18089	2010	32	1	14	2	51	1996	2006	Y	95
302	18	18089	2010	21	1	14	2	51	1996	2006	Y	95
302	18	18089	2010	31	1	14	2	51	1996	2006	Y	95
302	18	18089	2010	32	1	14	2	51	1996	2006	Y	95
112	18	18089	2010	21	1	15	2	45	1996	2006	Y	95
112	18	18089	2010	31	1	15	2	45	1996	2006	Y	95
112	18	18089	2010	32	1	15	2	45	1996	2006	Y	95
113	18	18089	2010	21	1	15	2	45	1996	2006	Y	95
113	18	18089	2010	31	1	15	2	45	1996	2006	Y	95
113	18	18089	2010	32	1	15	2	45	1996	2006	Y	95

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APPENDIX D

Public Participation Process Documentation

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LEGAL NOTICE OF PUBLIC HEARING

Draft Request for Redesignation and Maintenance Plan for Attainment of Indiana's Portion of the Chicago-Naperville, Illinois-Indiana-Wisconsin (IL-IN-WI), 2008 8-Hour Ozone Nonattainment Area

Lake and Porter Counties, Indiana

Note: Legal notices for public hearings are no longer published in newspapers, but can be found on the Indiana Department of Environmental Management's web site at: https://www.in.gov/idem/5474.htm

Notice is hereby given under 40 Code of Federal Regulations (CFR) 51.102 that the Indiana Department of Environmental Management (IDEM) is accepting written comment and providing an opportunity for a public hearing regarding the *Draft Request for Redesignation and Maintenance Plan for Attainment of Indiana's Portion of the Chicago-Naperville, Illinois-Indiana-Wisconsin (IL-IN-WI), 2008 8-Hour Ozone Nonattainment Area – Lake and Porter Counties, Indiana*. All interested persons are invited and will be given reasonable opportunity to express their views concerning this submittal.

Lake and Porter counties were designated nonattainment for the 2008 8-hour ozone standard in 2012 using 2009-2011 monitoring data. The area was classified as "marginal" with an attainment date of July 20, 2015. The area failed to attain the standard by the attainment date and was subsequently reclassified as "moderate" with a revised attainment date of July 20, 2018. The area failed to attain the standard by the revised attainment date and was reclassified as "serious" with a new attainment date of July 20, 2021.

Ozone monitoring data for the most recent three (3) years, 2017-2019, demonstrates that the air quality meets the 2008 8-hour ozone standard in the nonattainment area. This fact, accompanied by the permanent and enforceable decreases in emission levels discussed in Section 2.3 of the Redesignation and Maintenance Plan, justifies a redesignation to attainment for Indiana's nonattainment area based on Section 107(d)(3)(D) of the CAA.

Copies of the Redesignation Petition and Maintenance Plan will be available on or before January 22, 2020 to any person upon request at the following locations:

- Indiana Department of Environmental Management, Office of Air Quality, Indiana Government Center North, 100 North Senate Avenue, Room N1003, Indianapolis, Indiana 46204.

- Indiana Department of Environmental Management, Northwest Regional Office, 330 West U.S. Highway 30, Suites E & F, Valparaiso, Indiana.

- Crown Point Community Library, 122 North Main Street, Crown Point, Indiana.
- Gary Public Library, 220 West 5th Avenue, Gary, Indiana.
- Hammond Public Library, 564 State Street, Hammond, Indiana.
- Lake County Public Library-Highland Branch, 2841 Jewett Street, Highland, Indiana.
- Lake Station-New Chicago Branch Public Library, 2007 Central Avenue, Lake Station, Indiana.
- Valparaiso Public Library, 103 Jefferson Street, Valparaiso, Indiana.
- Whiting Public Library, 1735 Oliver Street, Whiting, Indiana.

The draft documents will also be available on the following web pages:

https://www.in.gov/idem/airquality/2440.htm
https://www.in.gov/idem/airquality/2392.htm

Any person may submit written comments on the *Draft Request for Redesignation and Maintenance Plan for Attainment of the Indiana's Portion (Lake and Porter Counties) of the Chicago-Naperville, Illinois-Indiana-Wisconsin (IL-IN-WI), 2008 8-Hour Ozone Nonattainment Area- Lake and Porter Counties, Indiana*. Written comments should be directed to: Mrs. Michele Boner, Indiana Department of Environmental Management, Office of Air Quality, Room 1003, 100 North Senate Avenue, Indianapolis, Indiana 46204. Comments can also be submitted via fax (317) 233-5967 or e-mail at mboner@idem.in.gov. Comments must be submitted by February 21, 2020. Interested parties may also present oral or written comments at the public hearing, if held. Oral statements will be heard, but for the accuracy of the record, statements should be submitted in writing. Written statements may be submitted to the attendant designated to receive written comments at the public hearing.

A public hearing on the *Draft Request for Redesignation and Maintenance Plan for Attainment of Indiana's Portion (Lake and Porter Counties) of the Chicago-Naperville, Illinois-Indiana-Wisconsin (IL-IN-WI), 2008 8-Hour Ozone Nonattainment Area- Lake and Porter Counties, Indiana Nonattainment Area* will be held if a request is received by February 21, 2020. If a hearing is requested, the hearing will be held on February 25, 2020, and the comment period will be extended to March 3, 2020. The hearing will convene at 6:00 p.m. local time at the Lake Station-New Chicago Branch Public Library located at 2007 Central Avenue, Lake Station, IN 46405. If a request for a public hearing is not received by February 21, 2020, the hearing will be cancelled. Interested parties can check the online IDEM calendar at https://calendar.in.gov/site/idem/ or contact Mrs.

Michele Boner at (317) 233-6844 or mboner@idem.in.gov, after February 24, 2020, to see if the hearing has been cancelled or will convene.

If a hearing is held, a transcript of the hearing and all written submissions provided at the public hearing shall be open to public inspection at IDEM and copies may be made available to any person upon payment of reproduction costs. Any person heard or represented at the hearing or requesting notice shall be given written notice of actions resulting from the hearing.

For additional information contact Mrs. Michele Boner, at the Indiana Department of Environmental Management, Office of Air Quality, Room N1003, Indiana Government Center North, 100 North Senate Avenue, Indianapolis, IN 46204, or call (317) 233-6844 or (800) 451-6027 ext. 3-6844 (in Indiana).

Speech and hearing impaired callers may contact the agency via the Indiana Relay Service at 1-800-743-3333. Individuals requiring reasonable accommodations for participation in this hearing should contact the IDEM Americans with Disabilities Act (ADA) coordinator at: Attn: ADA Coordinator, Indiana Department of Environmental Management – Mail Code 50-10, 100 North Senate Avenue, Indianapolis, IN 46204-2251, o*r call (317) 233-1785 (voice) or (317) 233-6565 (TDD). Please provide a minimum of 72 hours notification.*

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INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
We Protect Hoosiers and Our Environment.
100 N. Senate Avenue • Indianapolis, IN 46204
(800) 451-6027 • (317) 232-8603 • www.idem.IN.gov

Eric J. Holcomb
Governor

Bruno L. Pigott
Commissioner

January 17, 2020

CERTIFICATE OF PUBLICATION

This is to certify that the Indiana Department of Environmental Management (IDEM) Notice of the opportunity for a Public Hearing regarding the following:

- Draft Request for Redesignation and Maintenance Plan for Attainment of Indiana's Portion of the Chicago-Naperville, Illinois-Indiana-Wisconsin (IL-IN-WI), 2008 8-Hour Ozone Nonattainment Area – Lake and Porter Counties, Indiana

was published on IDEM's web site on January 17, 2020. It is expected that it will remain posted on the site until at least February 21, 2019.

The notice in full was available online at the following web address, under "Northwest/Multi-County Notices":

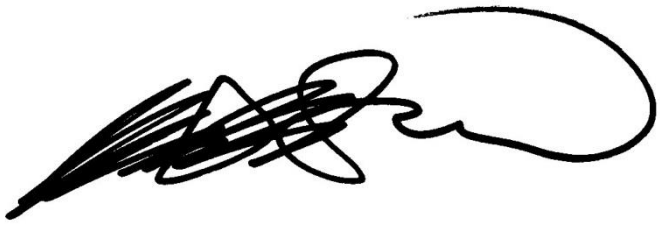
http://www.in.gov/idem/5474.htm

The draft document was also posted online January 16, 2020 at the following web address under "Lake and Porter Counties":

https://www.in.gov/idem/airquality/2440.htm

Web publication of the notice was at the request of Scott Deloney, Branch Chief, Programs Branch, Office of Air Quality, IDEM.

By:



Mike Finklestein
IDEM Webmaster

Attachments:
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