Onroad Emissions Motor Vehicle Emissions Budget (MVEB) Replacement and Emissions Update

for the

Indiana Portion (Lake and Porter Counties) of the Chicago-Naperville, IL-IN-WI 2008 8-Hour Ozone Standard Maintenance Area

Month 2026

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Introduction

On April 8, 2022, the Indiana Department of Environmental Management (IDEM) submitted supplemental information to the Technical Addendum to Section 182(c)(3) Certification of Enhanced I/M Program and Request for Redesignation and Maintenance Plan for Attainment of Indiana's Portion (Lake and Porter counties) of the Chicago-Naperville, IL-IN-WI, 2008 8-Hour Ozone Nonattainment Area. IDEM submitted the technical addendum and request for redesignation and maintenance plan to United States Environmental Protection Agency (U.S. EPA) on January 18, 2022, and December 6, 2021, respectively. U.S. EPA subsequently approved the Indiana request and motor vehicle emission budgets (MVEBs) on May 20, 2022 (87 FR 30821).

Onroad emissions and MVEBs included in the April 8, 2022, submittal were calculated using the then-current Motor Vehicle Emission Simulator (MOVES) model (MOVES3) inputs for Lake and Porter counties, Indiana. On November 21, 2024, U.S. EPA released its latest emission modeling system, MOVES5. IDEM is providing this MVEB replacement update and onroad emissions update to the previously submitted maintenance plan for Lake and Porter counties under the 2008 8-hour ozone standard to incorporate the most current MOVES5 modeling results.

Onroad Emission Estimates

Table 2.4 was included on Page 23 of the April 8, 2022, submittal. Table 2.4 - A (to be considered a replacement of the table included in the April 8, 2022, submittal) has been revised to incorporate updated onroad emission estimates for nitrogen oxides (NOx) and volatile organic compounds (VOCs) for the years 2019, 2030, and 2035. The year 2011 was removed from Table 2.4 - A as it is irrelevant for the purposes of this submittal.

Table 2.4: Emission Estimations and Projections for On-Road Mobile Sources – Lake and Porter Counties, Indiana, 2011 (Base-Year), 2019 (Attainment-Year), 2030 (Interim-Year), and 2035 (Maintenance-Year)

Lake and Porter	2011	2019	2030	2035
NOx, tpsd	31.55	9.48	4.55	4.77
VOC, tpsd	7.60	3.51	2.03	1.82

Table 2.4 - A: Emission Estimations and Projections for On-Road Mobile Sources – Lake and Porter Counties, 2019 (Attainment-Year), 2030 (Interim-Year), and 2035 (Maintenance-Year)

Lake and Porter	2019	2030	2035
NOx, tpsd	11.25	4.73	2.94
VOC, tpsd	3.56	3.00	2.55

Table 2.5 was included on Page 23 of the April 8, 2022, submittal. This table established the MVEBs for Lake and Porter Counties, Indiana. Table 2.5 - A (to be considered a replacement of the table included in the April 8, 2022, submittal) has been revised to incorporate updated MVEBs for NOx and VOCs for the years 2030, and 2035.

Table 2.5: Motor Vehicle Emission Budgets Lake and Porter Ozone Nonattainment Area

Lake and Porter	2030	2035
NOx, tpsd	5.23	5.49
VOC, tpsd	2.33	2.09

Table 2.5 - A: Motor Vehicle Emission Budgets Lake and Porter Ozone Nonattainment Area

Lake and Porter	2030	2035
NOx, tpsd	5.68	3.53
VOC, tpsd	3.60	3.06

Onroad emission estimates in Tables 2.4 – A and 2.5 – A were calculated using U.S. EPA's most current version of the MOVES5 model-produced emission factors and data extracted from the area's travel-demand model. The use of updated MOVES5 model input files for Lake and Porter counties, Indiana, can result in notably different emission estimates for the area when compared to those used to create the MVEBs for the Lake and Porter counties, Indiana, as submitted on April 8, 2022. A general summary of the MOVES methodology used in this area can be found in Appendix A. In addition, MOVES input and output files are being provided electronically with this submittal.

Onroad safety margins have been included for onroad emission estimates to accommodate the wide array of assumptions that are factored into the calculation process. Since assumptions change over time, it is necessary to have an onroad safety margin that will accommodate the impact of refined assumptions in the process. A twenty percent (20%) safety margin was applied to the projected emission estimates for

the years 2030 and 2035 through discussions with the Interagency Consultation Group, attached as Appendix B.

Emission Inventories

Tables 3.4 and 3.6 were included on Pages 28 and 30, respectively, of the April 8, 2022, submittal and detailed the sector-specific NOx and VOC emission inventory totals for Lake and Porter counties, Indiana. These tables are used to demonstrate that the application of a safety margin to MVEBs is reasonable and appropriate.

Onroad emission estimates for NOx and VOC emissions for the years 2019, 2030, and 2035, were updated using the MOVES5 model, all other sectors remain unchanged. The Area, Nonroad, Point, and EGU-Point sector inventories listed in the previous submittal tables below are still the most current available.

Table 3.4 included NOx emission inventory totals, in tons per summer day, for the years 2011 (Base-Year), 2019 (Attainment-Year), 2030 (Interim-Year, and 2035 (Maintenance-Year) along with a safety margin per sector. Table 3.4 - A (to be considered a replacement of the table included in the April 8, 2022, submittal) has been revised to incorporate updated onroad emission estimates for NOx for the years 2019, 2030, and 2035. The year 2011 was removed from Table 3.4 - A as it is irrelevant for the purposes of this submittal.

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

Sector	2011 Base	2019 Attainment	2030 Interim	2035 Maintenance	Safety Margin
Area	9.39	0.91	0.88	0.87	-0.04
Nonroad	15.84	13.43	10.25	8.49	-4.94
Onroad	31.55	9.48	4.55	4.77	-4.71
Point	70.77	59.91	60.79	61.51	1.60
EGU-Point	24.04	4.29	1.44	0.42	-3.87
Total	**151.59**	**88.02**	**77.91**	**76.06**	**-11.96**

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

Sector	2019 Attainment	2030 Interim	2035 Maintenance	Safety Margin
Area	0.91	0.88	0.87	-0.04
Nonroad	13.43	10.25	8.49	-4.94
Onroad	11.25	4.73	2.94	-8.31
Point	59.91	60.79	61.51	1.60
EGU-Point	4.29	1.44	0.42	-3.87
Total	**89.79**	**78.09**	**74.23**	**-15.56**

Table 3.6 included VOC emission inventory totals, in tons per summer day, for the years 2011 (Base-Year), 2019 (Attainment-Year), 2030 (Interim-Year, and 2025 (Maintenance-Year) along with a safety margin per sector. Table 3.6 - A (to be considered a replacement of the table included in the April 8, 2022, submittal) has been revised to incorporate updated onroad emission estimates for VOCs for the years 2019, 2030, and 2035. The year 2011 was removed from Table 3.4 - A as it is irrelevant for the purposes of this submittal.

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

Sector	2011 Base	2019 Attainment	2030 Interim	2035 Maintenance	Safety Margin
Area	18.26	17.00	17.58	17.85	0.85
Nonroad	21.43	5.53	4.80	4.35	-1.18
Onroad	7.60	3.51	2.03	1.82	-1.69
Point	17.22	10.83	10.84	10.90	0.07
EGU-Point	0.54	0.47	0.56	0.67	0.20
Total	**65.05**	**37.34**	**35.81**	**35.59**	**-1.75**

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

Sector	2019 Attainment	2030 Interim	2035 Maintenance	Safety Margin
Area	17.00	17.58	17.85	0.85
Nonroad	5.53	4.80	4.35	-1.18
Onroad	3.56	3.00	2.55	-1.01
Point	10.83	10.84	10.90	0.07
EGU-Point	0.47	0.56	0.67	0.20
Total	**37.39**	**36.78**	**36.32**	**-1.07**

Furthermore, when compared to the overall safety margin as defined in the Code of Federal Regulations (CFR) at 40 CFR 93.101, it is evident the onroad safety margin allocation is reasonable and appropriate. More specifically, even with the allocation of an onroad safety margin to mobile sources, emissions will continue to remain well below the overall safety margin for all sources as detailed in Table 3.4 - A. MVEBs are constrained to ensure that the total emissions (i.e., all source categories) do not exceed the 2019 attainment year emissions of either VOC or NOx, thereby ensuring continued maintenance of the 2008 8-hour ozone standard.

Conclusion

This MVEB update to the April 8, 2022, submittal for Indiana's portion (Lake and Porter counties) of the Chicago-Naperville, IL-IN-WI, 2008 8-hour ozone maintenance area incorporates revised onroad emission estimates for the years 2019, 2030, and 2035 and revised NOx and VOC MVEBs for the years 2030 and 2035 using U.S. EPA's most current MOVES3 model. The onroad emission estimates were calculated using the most current MOVES5 input files and data extracted from the area's travel-demand model. Onroad safety margins for NOx and VOCs, established through the interagency consultation process, are included in order to account for the wide array of assumptions that are factored into the calculation process. MVEBs are also constrained to ensure that total NOx and VOC emissions (i.e., all source categories) do not exceed attainment year (2019) emissions to ensure continued maintenance of the 2008 8-hour ozone standard. With the addition of MOVES-based onroad safety margins applied to mobile sources, Lake and Porter counties will continue to remain well below the overall safety margins for all sources into the future. As such, the 2008 8-hour ozone maintenance plan for Lake and Porter counties, Indiana, continues to meet all applicable CAA requirements.

Appendix A

Lake and Porter Counties, Indiana, Maintenance Area MOVES Methodology

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Lake and Porter Counties, Indiana 2008 Ozone NAAQS MOVES5 Technical Appendix

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MOVES5 Inputs

Run Spec Settings

Scale

2019, 2030, and 2035 MOVES5 runs all used Onroad, County Scale, and Emission Rates Calculation Type. This is consistent with NIRPC's prior MOVES3 regime and in accordance with the *MOVES5 Technical Guidance: Using MOVES to Prepare Emission Inventories for State Implementation Plans and Transportation Conformity*, hereafter referred to as the MOVES5 Technical Guidance. The required input of a MOVESScenarioID was set to 1 for all years of runs, given that this value is required and does not affect results but is merely for internal organization.

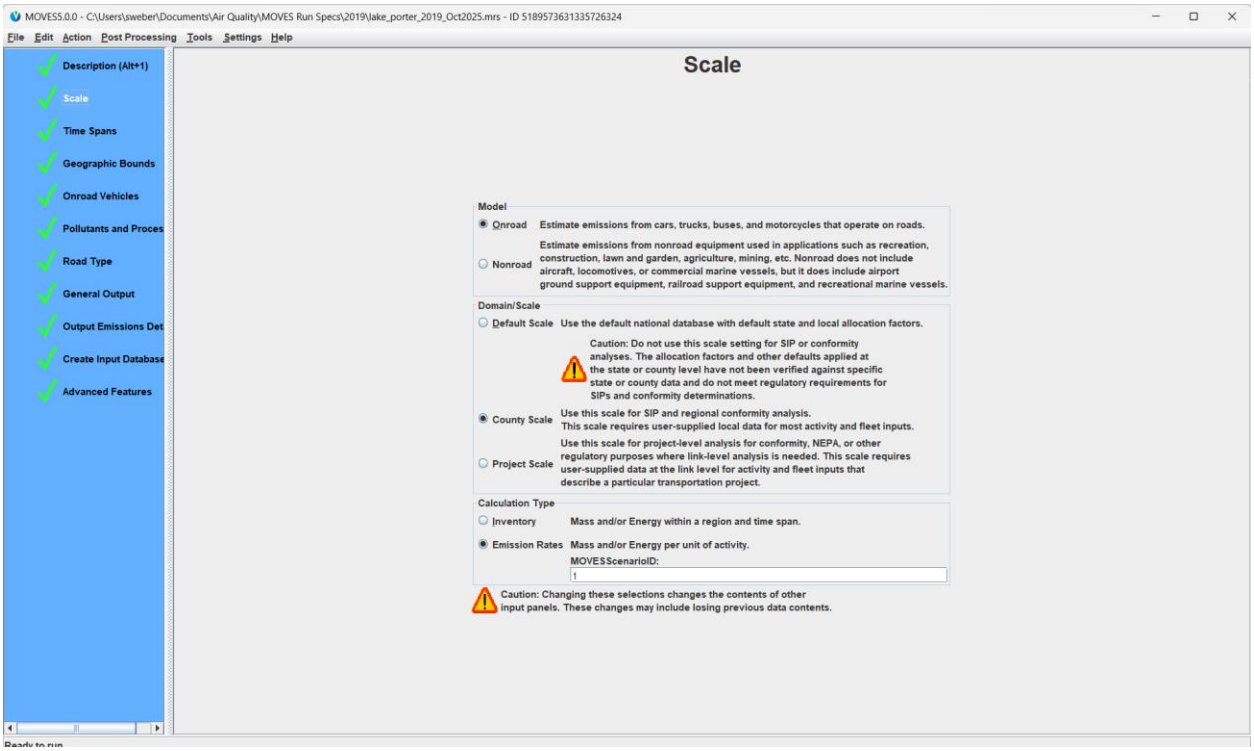

Figure 1: Scale Settings for the 2019 Run

Time Spans

A single year was used: 2019, 2030, or 2035 depending on which run. For months, only the month of July was selected for all runs. For days, only weekdays were selected. 24 hours of the day were selected for all runs. These inputs are consistent with NIRPC's prior MOVES3 regime and the MOVES5 Technical Guidance.

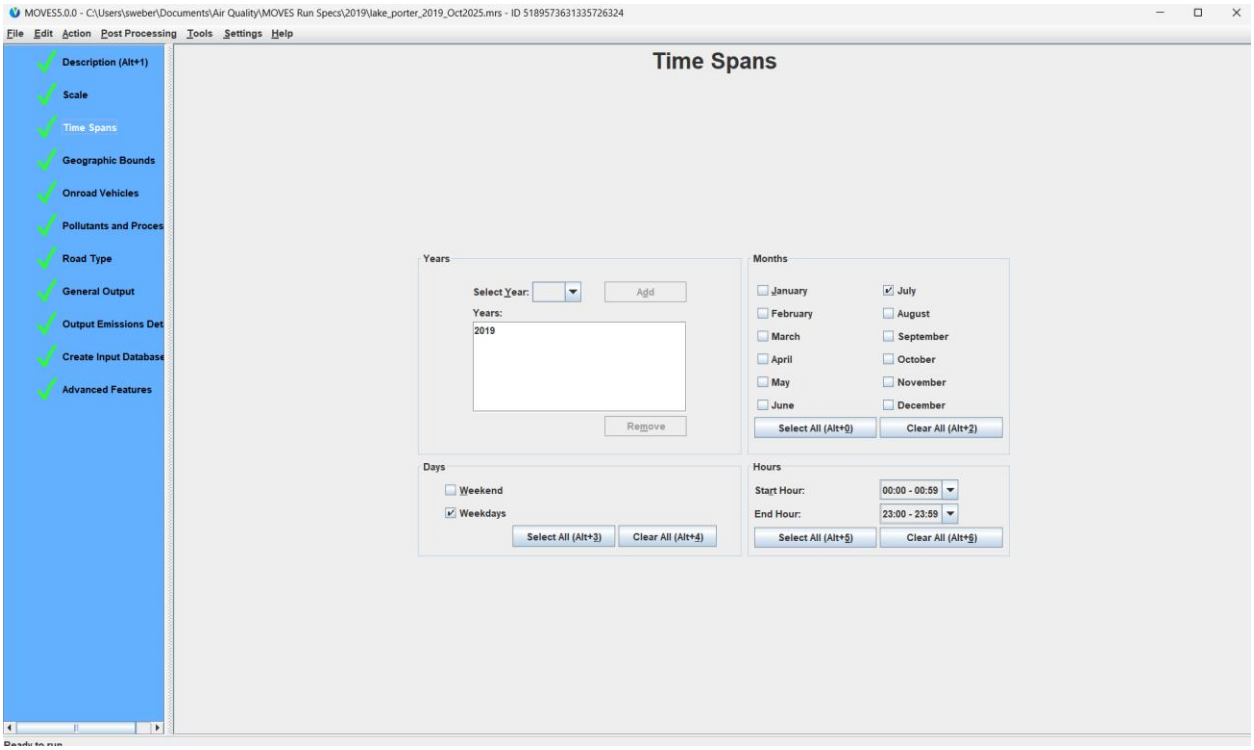

Figure 2: Time Spans Settings for the 2019 Run

Geographic Bounds

Only Lake County, IN (18089) was selected in the Geographic Bounds panel. Even though the onroad emissions inventories for these MOVES5 runs is for both Lake and Porter Counties, a County Scale run in MOVES5 can only be performed on one county, and the MOVES5 Technical Guidance states that it is acceptable to model multiple counties using one representative county, hence the selection of Lake County, the larger of the two counties by population. This is also consistent with NIRPC's prior MOVES3 regime.

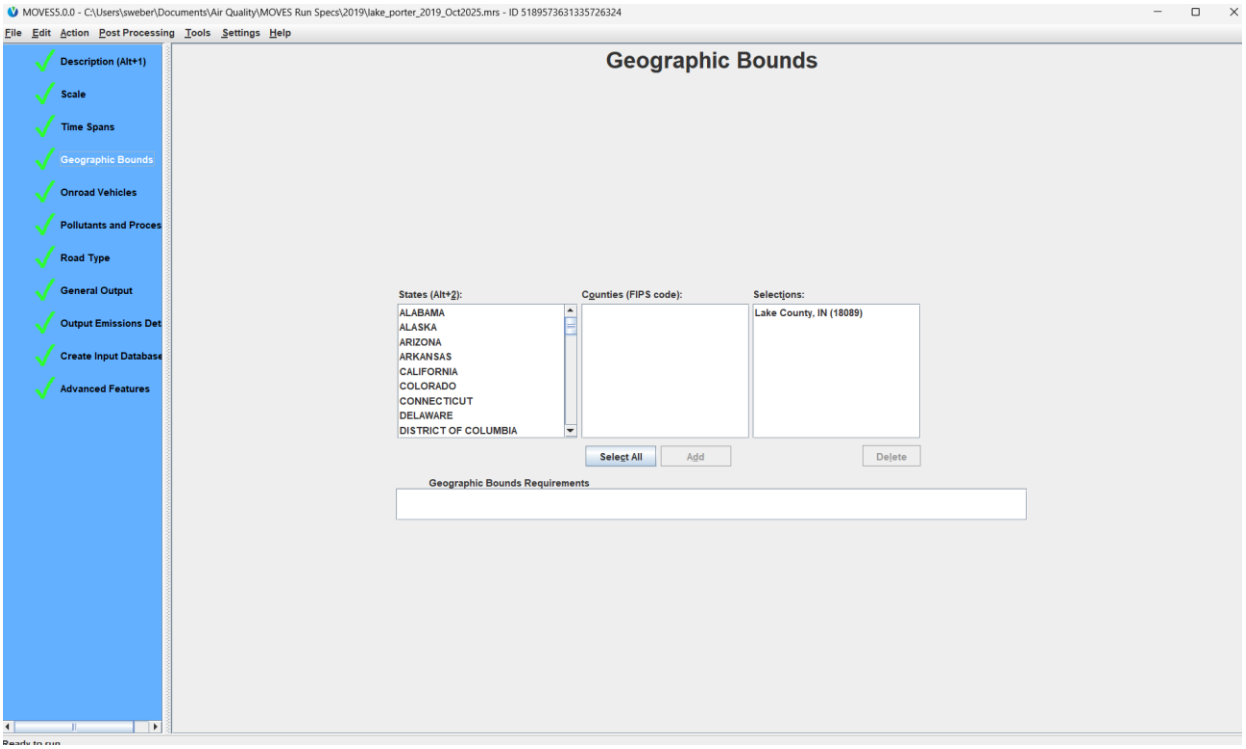

Figure 3: Geographic Bounds Settings for the 2019 Run

Onroad Vehicles

All possible combinations of source use types and fuels were selected for all MOVES5 runs. This is consistent with the MOVES5 Technical Guidance and NIRPC's prior MOVES3 regime.

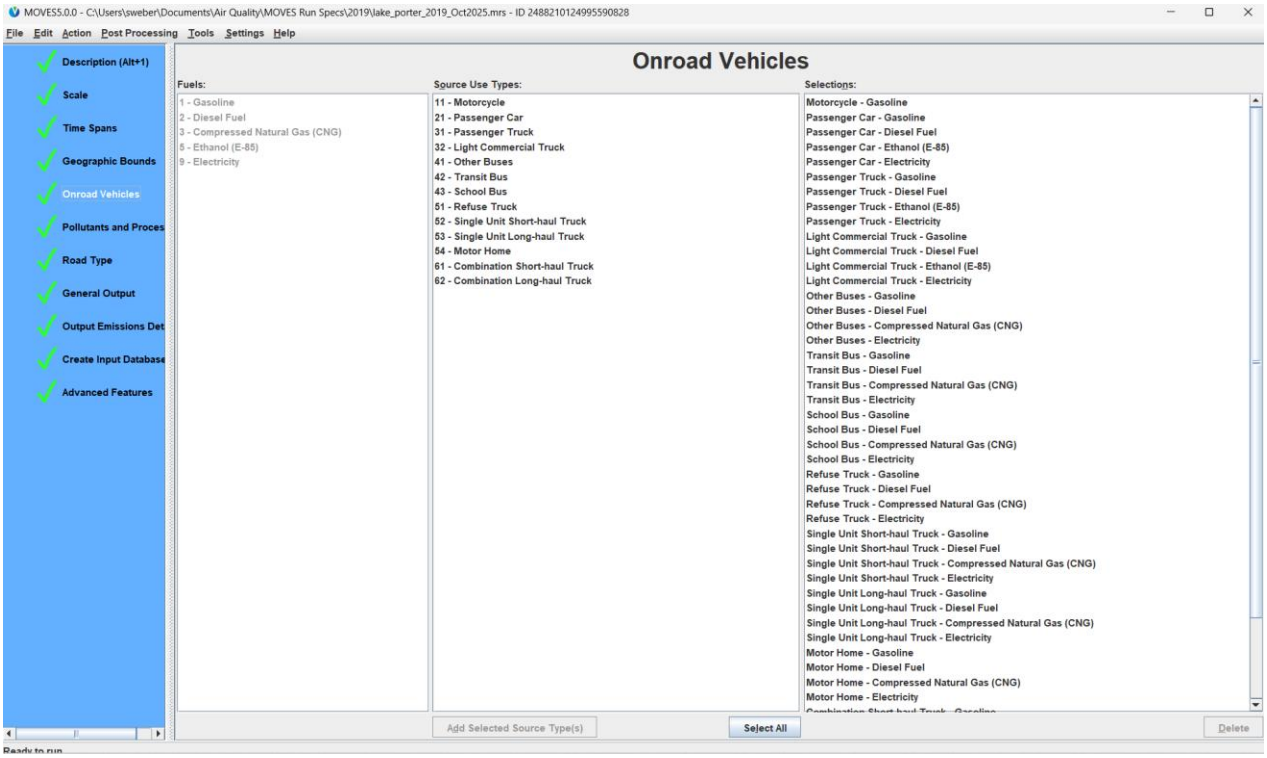

Figure 4: Onroad Vehicles Settings for the 2019 Run

Pollutants and Processes

The checkboxes for Volatile Organic Compounds (VOC) and Oxides of Nitrogen (NOx) were selected, including all of their processes, since these are the precursors of Ozone. Additionally, the "Select Prerequisites" button was pressed, resulting in Total Gaseous Hydrocarbons and Non-Methane Hydrocarbons being selected, including all of their processes. Finally, Carbon Monoxide (CO) was checked along with all of their processes to be consistent with prior NIRPC MOVES3 runs. These pollutants and processes settings were the same for all MOVES5 runs.

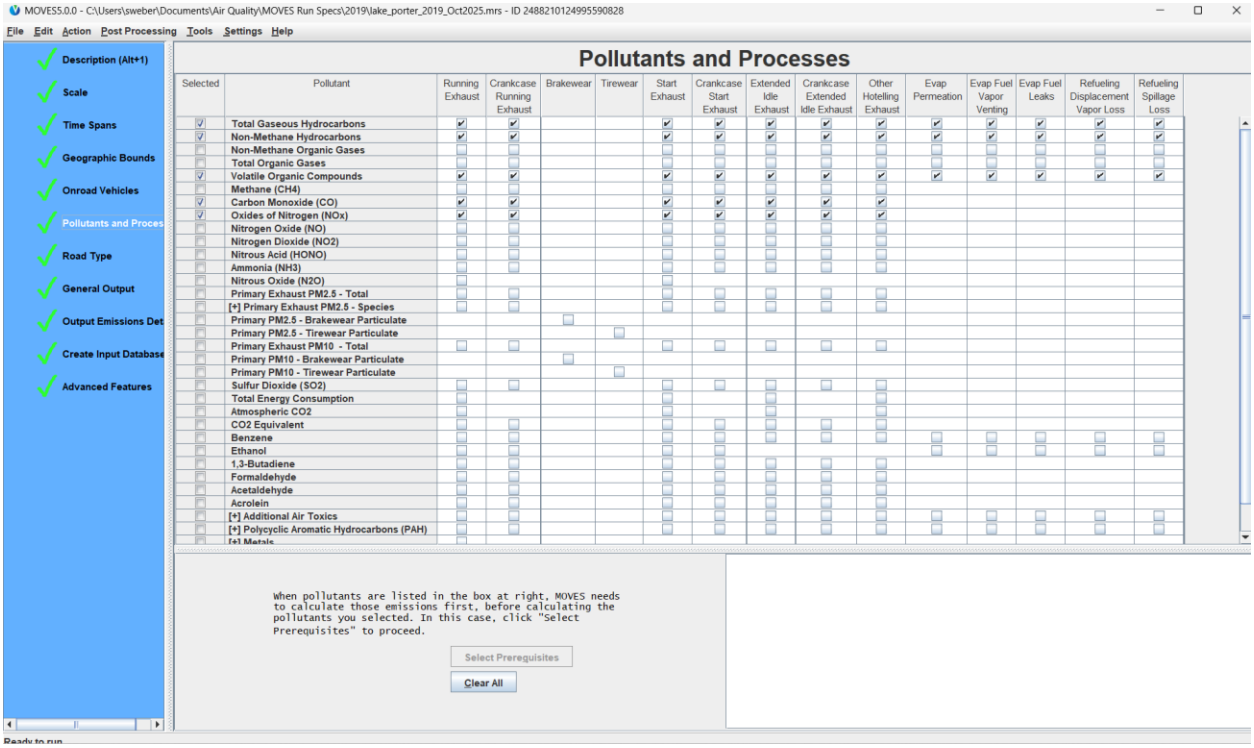

Figure 5: Pollutants and Processes Settings for the 2019 Run

Road Type

All possible road types were selected for all runs. This is consistent with the MOVES5 Technical Guidance and NIRPC's prior MOVES3 regime.

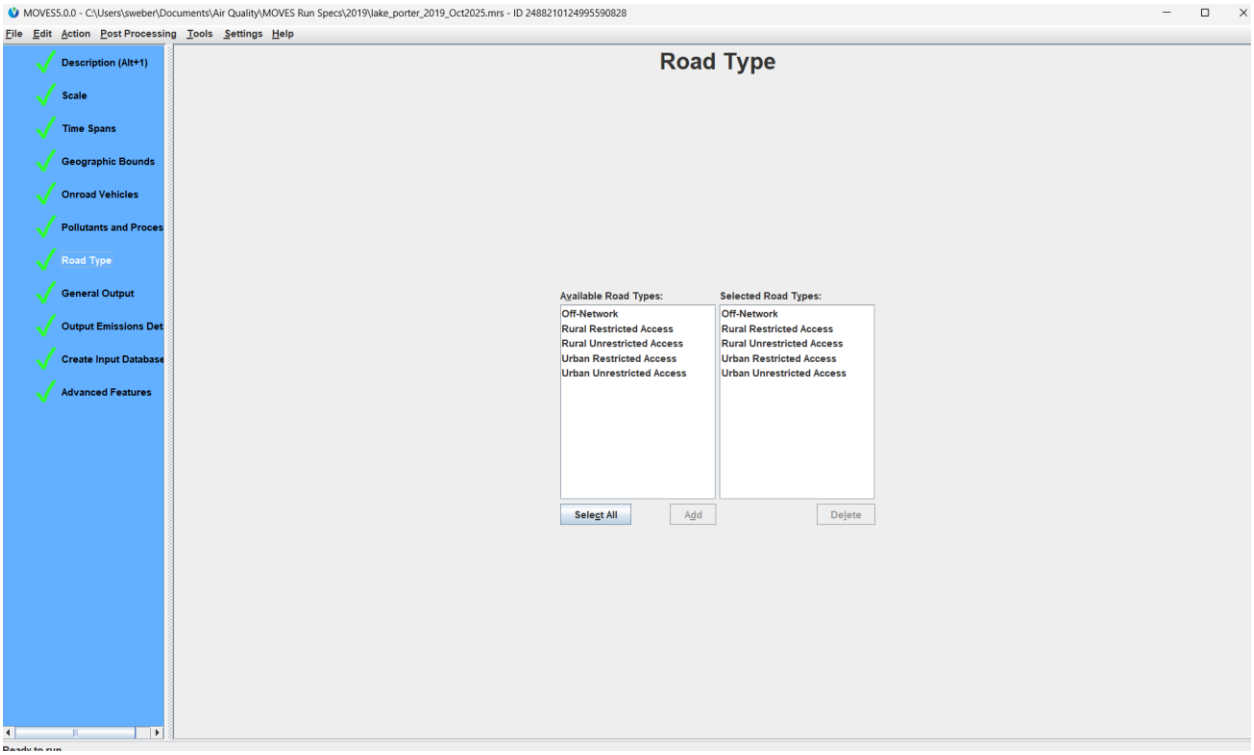

Figure 6: Road Type Settings for 2019 Run

General Output

An output database was created named, "lake_porter_[year]_out." All other settings in the General Output panel were kept at their MOVES5 defaults, with grams as the mass units, joules as the energy units, and miles as the distance units.

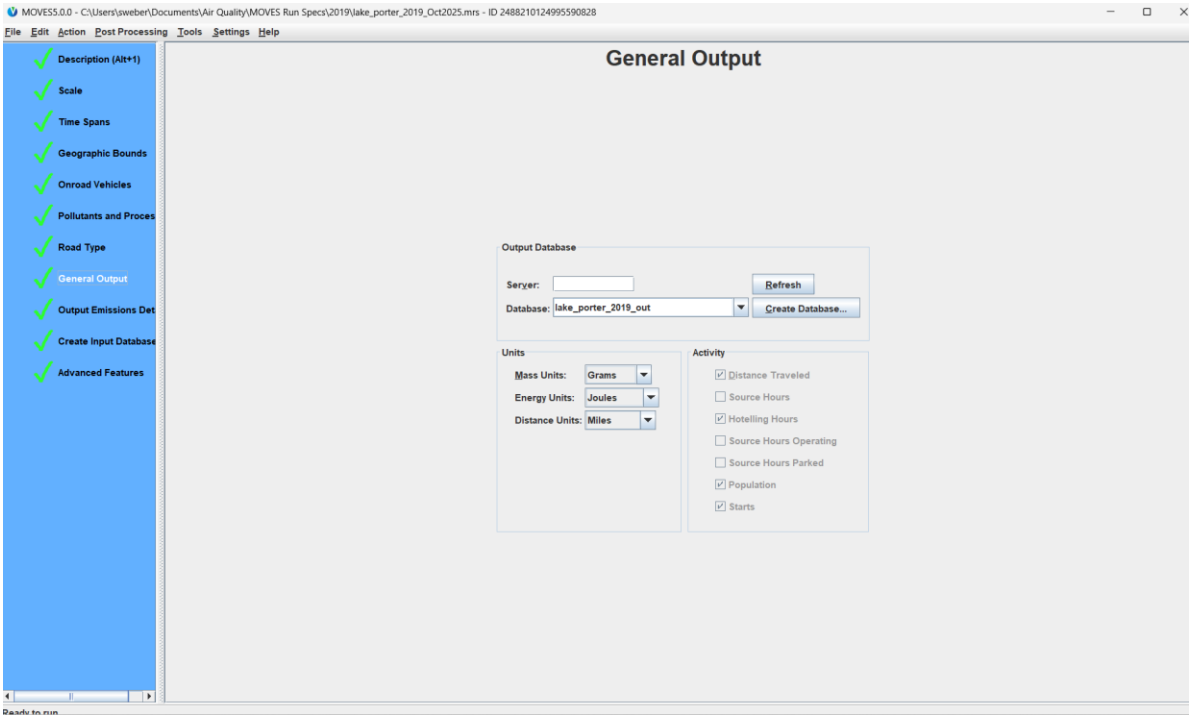

Figure 7: General Output Settings for 2019 Run

Output Emissions Detail

All settings were kept at their MOVES5 defaults except that the “Source Use Type” checkbox was checked in the Onroad context area. This is consistent with NIRPC’s prior MOVES3 regime.

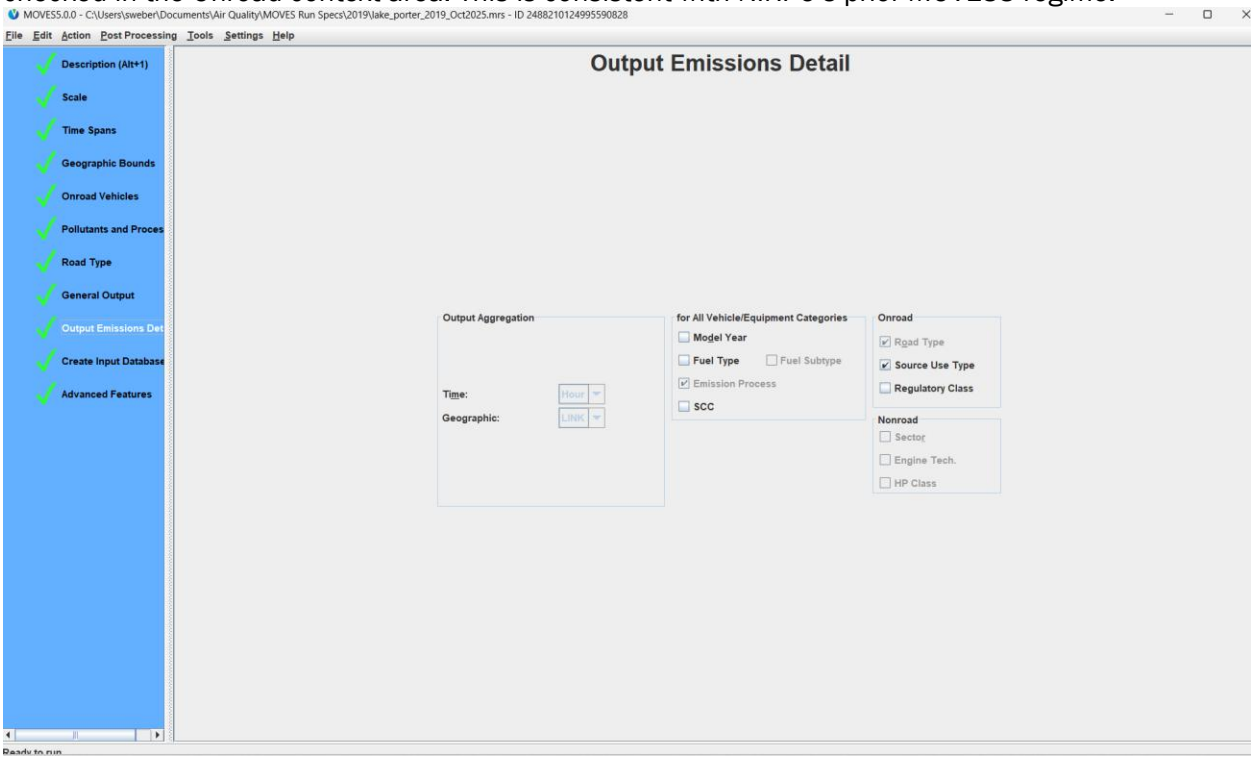

Figure 8: Output Emissions Detail Settings for 2019 Run

Create Input Database

An input database was created named, “lake_porter_[year]_in.” Details after pressing the “Enter/Edit Data” button are described in the County Data Manager Inputs section below.

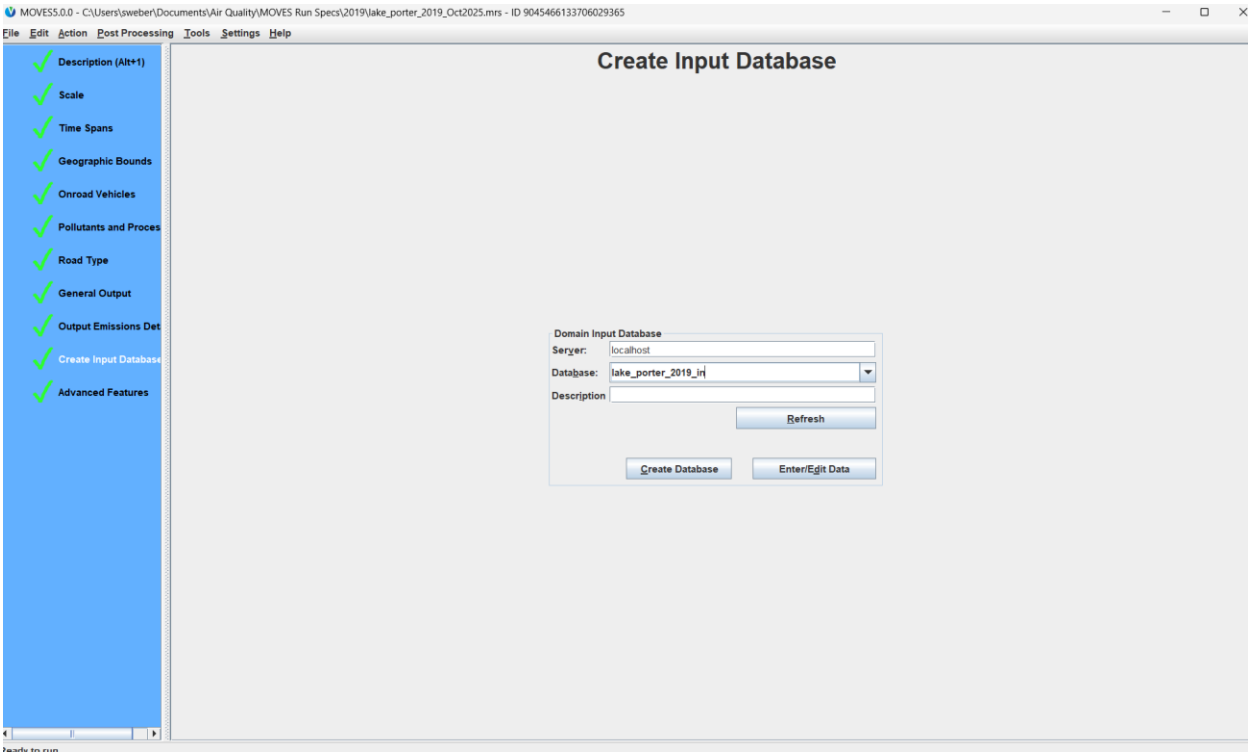

Figure 9: Create Input Database Settings for 2019 Run

Advanced Features

All settings were kept at their MOVES5 defaults. This is consistent with NIRPC's prior MOVES3 runs.

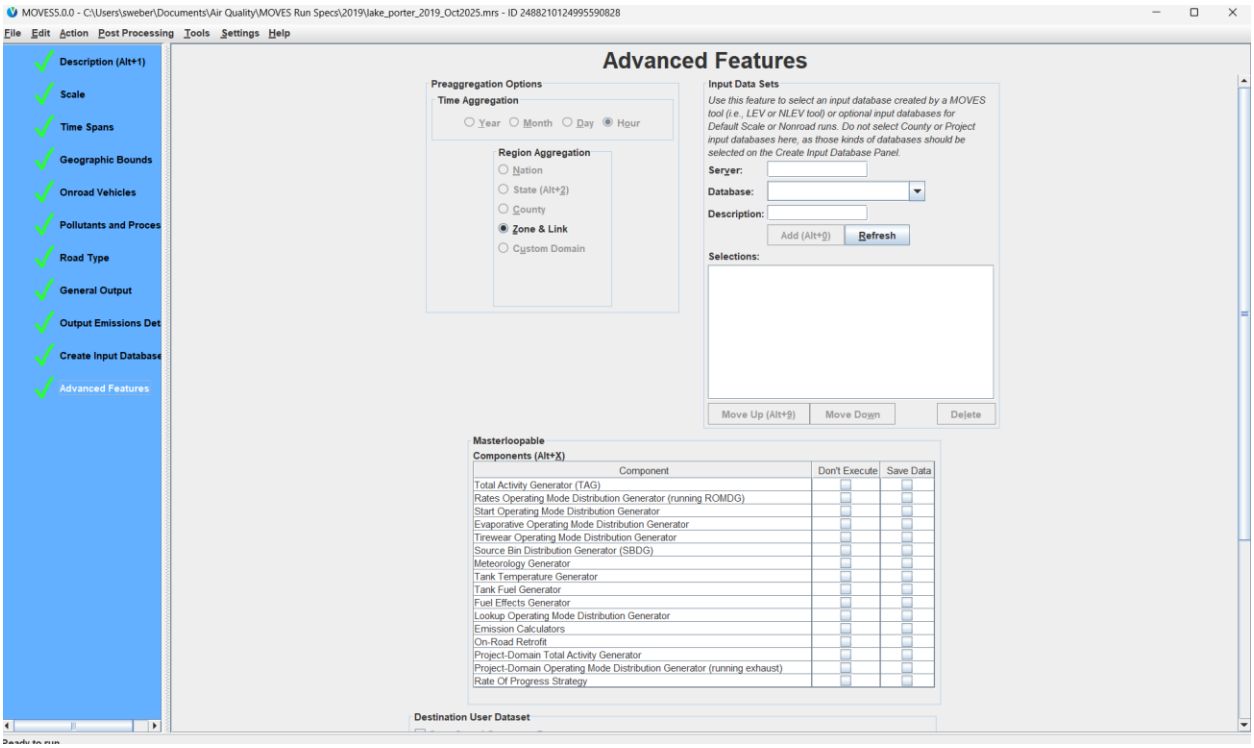

Figure 10: Advanced Features Settings for 2019 Run

County Data Manager Inputs

Hotelling

No hotelling data were inputted into any of the MOVES5 runs. According to the MOVES5 Technical Guidance, hotelling data are optional and inputting no local data means that MOVES5 calculated hotelling activity based on long-haul combination truck VMT on restricted access roads. This is also consistent with NIRPC's prior MOVES3 modeling regime.

Idle

No idle data were inputted into any of the MOVES5 runs. According to the MOVES5 Technical Guidance, idle data are optional and inputting no local data means that MOVES5 used default idle data derived from telematics data studies. This is also consistent with NIRPC's prior MOVES3 modeling regime.

Inspections and Maintenance (I/M) Programs

I/M parameter data from the existing IDEM I/M program in Lake and Porter Counties were inputted into each of the MOVES5 runs. The I/M data files used were identical to the files used in NIRPC's prior MOVES3 modeling regime. Table 1 shows the I/M parameter data for the 2019 run. The I/M parameter data for the 2030 and 2035 runs is identical to the 2019 run except that the years are changed where appropriate.

Retrofit Data

No retrofit data were inputted into any of the MOVES5 runs. Retrofit data are optional according to the MOVES5 Technical Guidance, and users should only input retrofit data if wanting to model specific retrofit program(s). This is consistent with NIRPC's prior MOVES3 modeling regime.

Generic

No changes were made in the Generic tab. Changes to the Generic tab are not required nor are recommended according to the MOVES5 Technical Guidance without consulting the EPA Regional Office. This is consistent with NIRPC's prior MOVES3 modeling regime.

Road Type Distribution

The road type distribution data inputted into MOVES5 were the same for all years of MOVES5 runs and were based on 2019 INDOT traffic count stations throughout Lake and Porter Counties. Table 2 shows the road type distribution by VMT for each combination of MOVES5 source type and road type. These inputs are the same as were used in NIRPC's prior MOVES3 modeling regime.

Source Type Population

Source type population data for the 2019 MOVES5 run were identical as the source type population data in NIRPC's prior 2019 MOVES3 modeling regime and is listed in Table 3. Source type population data for the 2030 and 2035 MOVES5 runs were based on a 2025 mid-year vehicle registration dataset from the Indiana Bureau of Motor Vehicles (BMV). Staff from the Chicago Metropolitan Agency for Planning (CMAP) applied their automated VIN decoder to the Indiana BMV vehicle registration dataset in order to derive the source type population data. The CMAP VIN decoder is the same VIN decoder as is used for Air Quality Conformity Determinations in the CMAP region, which shares an airshed with Lake and Porter Counties.

In accordance with the MOVES5 Technical Guidance, the mid-year 2025 BMV dataset was treated as a 2024 vehicle registration dataset since 2024 was the last complete model year of data. Also, after

close examination of the BMV dataset, it was determined to only be reliable for MOVES5 source types 11 (motorcycles), 21 (passenger cars), 31 (passenger trucks), 32 (light commercial trucks), and 54 (motorhomes). The procedures for deriving 2024 source type populations for other MOVES5 source types depended on the source type and are described below. Later, this section will also describe how the 2024 source type populations were projected to 2030 and 2035 runs.

For MOVES5 source type 42 (transit buses), NIRPC relied on our own local inventory of transit vehicles. These were comprised of all Lake and Porter County-serving revenue vehicles reported in the National Transit Database for the 2024 reporting year as well as local data given by Gary Public Transportation Corporation (GPTC).

For MOVES5 source types 43 (school buses) and 51 (refuse trucks), NIRPC relied on a local inventory provided by Drive Clean Indiana (DCI). DCI maintains an inventory of school buses and refuse trucks for all communities in Lake and Porter Counties for the purposes of assisting with fleet upgrades and alternative fuel grant applications.

For MOVES5 source types 52 (single unit short-haul trucks), 53 (single unit long-haul trucks), 61 (combination short-haul trucks), and 62 (combination long-haul trucks), NIRPC used the mileage accumulation rate method, which involved using a combination of MOVES5 default data and the NIRPC travel demand model. In accordance with the MOVES5 Technical Guidance, the default scale MOVES5 run ratio of (source type population / source type VMT) was multiplied by NIRPC travel demand model source type VMT to get the source type population for the relevant year. NIRPC therefore did not need to derive 2024 source type populations for these source types; instead, NIRPC used this method directly for 2030 and 2035 to prepare the source type populations for these MOVES5 runs. Since NIRPC's travel demand model is unable to differentiate between short-haul and long-haul at the aggregated VMT level, this method was first performed for source types 52 and 53 combined and 61 and 62 combined, then the MOVES5 default scale ratios of source type 52 to 53 and 61 to 62 were respectively applied to the results to get the source type populations.

In order to project the 2024 source type population for MOVES5 source types 11, 21, 31, 32, 41, 42, 43, and 51, NIRPC used the travel demand model's annual household growth rate as a proxy and applied this household growth rate to the 2024 source type population for 6 years of growth to derive 2030 source type populations and 11 years of growth to derive the 2035 source type populations. This is a reasonable method because each of these source types is related to the number of households in Lake and Porter Counties and their forecasted growth. Table 3 shows the source type population by vehicle type for the 2019, 2030, and 2035 MOVES5 runs.

Starts

No starts data were inputted into any of the MOVES5 runs. According to the MOVES5 Technical Guidance, starts data are optional and should only be inputted if the user has reliable local data. This is consistent with NIRPC's prior MOVES3 modeling regime.

Vehicle Type VMT

Identical vehicle type VMT data were inputted for all MOVES5 runs as were used in NIRPC's prior MOVES3 modeling regime. These data were derived from annual HPMS vehicle classification counts from 2019 INDOT traffic count stations throughout Lake and Porter Counties. The same growth factor based on the annual NIRPC travel demand model VMT growth was applied to derive the 2030 and 2035 annual HPMS vehicle type VMT. Month, day, and hour fractions were also identical to NIRPC's prior MOVES3 modeling regime and were based on the fractions derived from the 2019 INDOT traffic count stations. These fractions were also the same for the 2019, 2030, and 2035 MOVES5 runs. Table 4 shows the annual vehicle type VMT by HPMS class for the 2019, 2030, and

2035 MOVES5 runs. Table 5 shows the VMT month fraction data. Table 6 shows the VMT day fraction data. Tables 7 through 10 show the VMT hour fraction data for each MOVES Road Type.

Age Distribution

Age distribution data for the 2019 MOVES5 run were identical as were used in NIRPC's prior MOVES3 modeling regime for ages 0 to 29. 2019 MOVES5 age distribution data for ages 30 to 40 were derived using the built-in MOVES3 to MOVES5 database converter tool. Age distribution data for the 2030 and 2035 MOVES5 runs were derived in a similar manner as for the source type population data. CMAP's VIN decoder was used to derive age distribution data for source types 11, 21, 31, 32, and 54 for a 2024 analysis year. Age distributions for these sources for this 2024 analysis year were then projected to 2030 and 2035 using EPA's Age Distribution Projection Tool for MOVES5 Excel spreadsheet (available at https://www.epa.gov/moves/tools-develop-or-convert-moves-inputs). 2024 age distributions for source types 42, 43, and 51 were derived from the same local sources described for these source types in the Source Type Population section above, and these age distributions were also projected to 2030 and 2035 using the EPA Age Distribution Projection Tool. Age distribution for source types 52, 53, 61, and 62 were derived from MOVES5 defaults. Table 11 shows the age distribution for the 2019 MOVES5 run. Table 12 shows the age distribution for the 2030 MOVES5 run. Table 13 shows the age distribution for the 2035 MOVES5 run.

Average Speed Distribution

The average speed distribution data inputted into MOVES5 were the same for all years of MOVES5 runs and were based on 2019 INDOT traffic count stations throughout Lake and Porter Counties. The average speed distribution table is too large to print but is available upon request to NIRPC. These inputs are the same as were used in NIRPC's prior MOVES3 modeling regime.

Fuel

The fuel input in MOVES5 consists of four components: fuel supply, fuel formulation, fuel usage fraction, and AVFT. The MOVES5 defaults were used for fuel supply, fuel formulation, and fuel usage fraction for all MOVES5 runs. This is consistent with the MOVES5 Technical Guidance and NIRPC's prior MOVES3 modeling regime. Table 14 shows the fuel supply and Table 15 shows the fuel formulation used for the 2019 MOVES5 run. The fuel usage fraction table is too long to print, but it is available upon request to NIRPC staff.

The MOVES5 default AVFT was used for the 2019 MOVES5 run since that year is in the past, and according to the MOVES5 Technical Guidance, it is reasonable to use MOVES5 AVFT default data for past year model runs, especially where the percentage of Electric Vehicles (EVs) is zero or very low as was the case in 2019. The MOVES5 AVFT Tool was used to develop the AVFT inputs for the 2030 and 2035 MOVES5 runs. First, the CMAP VIN decoder of the 2025 mid-year BMV registration data was used to extract the MOVES5 fuel types by source types for source types 11, 21, 31, 32, and 54. NIRPC's local transit inventory data was used to derive the fuel type percentages for MOVES source type 42. MOVES5 defaults were used to derive the remaining fuel type percentages by source type for the remaining source types for the 2024 analysis year, since is the last complete analysis year needed in the AVFT tool input. Next, the AVFT tool was run on both the 2030 and 2035 MOVES5 runs using 2024 as the latest complete analysis year, with all gap filling methods set to automatic and all projection methods set to proportional, except for MOVES source types 53 and 62 in accordance with the MOVES5 Technical Guidance. The AVFT table is too long to print, but it is available upon request to NIRPC.

Meteorology Data

No changes were made to the meteorology data from NIRPC's MOVES3 modeling regime. 1991-2020 meteorology data were reviewed for hourly July temperature and relative humidity data at the Gary/Chicago International Airport, but it was determined that the data were essentially identical to the already existing meteorological data that was used in the MOVES3 modeling regime, so it was decided to continue using the MOVES3 meteorological data for consistency with the Indiana SIP. Table 17 shows the hourly meteorology data used for the 2019, 2030, and 2035 MOVES5 runs.

Table 1: Inspections and Maintenance (I/M) Table for 2019 Run

polProcessID	stateID	countyID	yearID	sourceTypeID	fuelTypeID	IMProgramID	inspectFreq	testStandardsID	begModelYearID	endModelYearID	useIMyn	complianceFactor
101	18	18089	2019	21	1	1	2	11	1976	1980	N	93.12
101	18	18089	2019	31	1	1	2	11	1976	1980	N	93.12
101	18	18089	2019	32	1	1	2	11	1976	1980	N	93.12
102	18	18089	2019	21	1	1	2	11	1976	1980	N	93.12
102	18	18089	2019	31	1	1	2	11	1976	1980	N	93.12
102	18	18089	2019	32	1	1	2	11	1976	1980	N	93.12
101	18	18089	2019	21	1	6	2	33	1981	1995	N	93.12
101	18	18089	2019	31	1	6	2	33	1981	1995	N	93.12
101	18	18089	2019	32	1	6	2	33	1981	1995	N	93.12
102	18	18089	2019	21	1	6	2	33	1981	1995	N	93.12
102	18	18089	2019	31	1	6	2	33	1981	1995	N	93.12
102	18	18089	2019	32	1	6	2	33	1981	1995	N	93.12
301	18	18089	2019	21	1	6	2	33	1981	1995	N	93.12
301	18	18089	2019	31	1	6	2	33	1981	1995	N	93.12
301	18	18089	2019	32	1	6	2	33	1981	1995	N	93.12
302	18	18089	2019	21	1	6	2	33	1981	1995	N	93.12
302	18	18089	2019	31	1	6	2	33	1981	1995	N	93.12
302	18	18089	2019	32	1	6	2	33	1981	1995	N	93.12
101	18	18089	2019	21	1	10	2	51	1996	2017	N	93.12
101	18	18089	2019	31	1	10	2	51	1996	2017	N	93.12
101	18	18089	2019	32	1	10	2	51	1996	2017	N	93.12
102	18	18089	2019	21	1	10	2	51	1996	2017	N	93.12
102	18	18089	2019	31	1	10	2	51	1996	2017	N	93.12
102	18	18089	2019	32	1	10	2	51	1996	2017	N	93.12
301	18	18089	2019	21	1	10	2	51	1996	2017	N	93.12
301	18	18089	2019	31	1	10	2	51	1996	2017	N	93.12
301	18	18089	2019	32	1	10	2	51	1996	2017	N	93.12
302	18	18089	2019	21	1	10	2	51	1996	2017	N	93.12
302	18	18089	2019	31	1	10	2	51	1996	2017	N	93.12
302	18	18089	2019	32	1	10	2	51	1996	2017	N	93.12
112	18	18089	2019	21	1	7	2	41	1976	1995	N	93.12
112	18	18089	2019	21	1	8	2	43	1996	2017	N	93.12
112	18	18089	2019	31	1	7	2	41	1976	1995	N	93.12
112	18	18089	2019	31	1	8	2	43	1996	2017	N	93.12
112	18	18089	2019	32	1	7	2	41	1976	1995	N	93.12
112	18	18089	2019	32	1	8	2	43	1996	2017	N	93.12
113	18	18089	2019	21	1	7	2	41	1976	1995	N	93.12
113	18	18089	2019	21	1	8	2	43	1996	2017	N	93.12
113	18	18089	2019	31	1	7	2	41	1976	1995	N	93.12
113	18	18089	2019	31	1	8	2	43	1996	2017	N	93.12
113	18	18089	2019	32	1	7	2	41	1976	1995	N	93.12
113	18	18089	2019	32	1	8	2	43	1996	2017	N	93.12
101	18	18089	2019	21	1	11	2	11	1976	1980	Y	95
101	18	18089	2019	31	1	11	2	11	1976	1980	Y	95
101	18	18089	2019	32	1	11	2	11	1976	1980	Y	95
102	18	18089	2019	21	1	11	2	11	1976	1980	Y	95
102	18	18089	2019	31	1	11	2	11	1976	1980	Y	95
102	18	18089	2019	32	1	11	2	11	1976	1980	Y	95
301	18	18089	2019	21	1	11	2	11	1976	1980	Y	95
301	18	18089	2019	31	1	11	2	11	1976	1980	Y	95
301	18	18089	2019	32	1	11	2	11	1976	1980	Y	95
302	18	18089	2019	21	1	11	2	11	1976	1980	Y	95
302	18	18089	2019	31	1	11	2	11	1976	1980	Y	95
302	18	18089	2019	32	1	11	2	11	1976	1980	Y	95
101	18	18089	2019	21	1	12	2	33	1981	1995	Y	95
101	18	18089	2019	31	1	12	2	33	1981	1995	Y	95
101	18	18089	2019	32	1	12	2	33	1981	1995	Y	95
102	18	18089	2019	21	1	12	2	33	1981	1995	Y	95
102	18	18089	2019	31	1	12	2	33	1981	1995	Y	95
102	18	18089	2019	32	1	12	2	33	1981	1995	Y	95
301	18	18089	2019	21	1	12	2	33	1981	1995	Y	95
301	18	18089	2019	31	1	12	2	33	1981	1995	Y	95
301	18	18089	2019	32	1	12	2	33	1981	1995	Y	95
302	18	18089	2019	21	1	12	2	33	1981	1995	Y	95
302	18	18089	2019	31	1	12	2	33	1981	1995	Y	95
302	18	18089	2019	32	1	12	2	33	1981	1995	Y	95
112	18	18089	2019	21	1	13	2	41	1976	1995	Y	95
112	18	18089	2019	31	1	13	2	41	1976	1995	Y	95
112	18	18089	2019	32	1	13	2	41	1976	1995	Y	95
113	18	18089	2019	21	1	13	2	41	1976	1995	Y	95
113	18	18089	2019	31	1	13	2	41	1976	1995	Y	95
113	18	18089	2019	32	1	13	2	41	1976	1995	Y	95
101	18	18089	2019	21	1	14	2	51	1996	2015	Y	95
101	18	18089	2019	31	1	14	2	51	1996	2015	Y	95
101	18	18089	2019	32	1	14	2	51	1996	2015	Y	95
102	18	18089	2019	21	1	14	2	51	1996	2015	Y	95
102	18	18089	2019	31	1	14	2	51	1996	2015	Y	95
102	18	18089	2019	32	1	14	2	51	1996	2015	Y	95
301	18	18089	2019	21	1	14	2	51	1996	2015	Y	95
301	18	18089	2019	31	1	14	2	51	1996	2015	Y	95

301	18	18089	2019	32	1	14	2	51	1996	2015	Y	95
302	18	18089	2019	21	1	14	2	51	1996	2015	Y	95
302	18	18089	2019	31	1	14	2	51	1996	2015	Y	95
302	18	18089	2019	32	1	14	2	51	1996	2015	Y	95
112	18	18089	2019	21	1	15	2	45	1996	2015	Y	95
112	18	18089	2019	31	1	15	2	45	1996	2015	Y	95
112	18	18089	2019	32	1	15	2	45	1996	2015	Y	95
113	18	18089	2019	21	1	15	2	45	1996	2015	Y	95
113	18	18089	2019	31	1	15	2	45	1996	2015	Y	95
113	18	18089	2019	32	1	15	2	45	1996	2015	Y	95

Table 2: Road Type VMT Distribution for MOVES5 Source Type Categories

Road Type	Motorcycle	Passenger Car	Light Duty Truck	Bus	Single Unit Truck	Combination Truck
Rural Restricted Access	0.074537	0.029227	0.022458	0.056774	0.028751	0.091961
Rural Unrestricted Access	0.051198	0.106098	0.086256	0.030059	0.112989	0.083255
Urban Restricted Access	0.395221	0.206320	0.345467	0.603627	0.272032	0.642037
Urban Unrestricted Access	0.479044	0.658355	0.545819	0.309540	0.586228	0.182747

Table 3: Source Type Population for 2019, 2030, and 2035 MOVES5 Runs

Source Type	2019	2030	2035
11	20,266	18,811	19,124
21	284,893	171,914	174,774
31	164,454	254,046	258,273
32	50,349	74,871	76,117
41	314	666	677
42	166	56	57
43	2,154	1,085	1,103
51	59	274	279
52	3,906	9,452	9,711
53	464	423	435
54	891	483	492
61	6,974	10,589	11,345
62	7,956	8,402	9,001

Table 4: Annual HPMS Vehicle Type VMT for 2019, 2030, and 2035 MOVES5 Runs

HPMSVtype ID	2019 VMT	2030 VMT	2035 VMT
10	23,784,315	26,473,148	27,754,501
25	6,232,528,267	6,971,933,556	7,325,054,220
40	18,427,453	20,381,784	21,310,597
50	68,388,962	76,433,443	80,273,745
60	845,478,773	933,092,192	974,691,947

Table 5: Month VMT Fractions for 2019, 2030, and 2035 MOVES5 Runs

monthID	monthVMTFraction
1	0.073342
2	0.069366
3	0.082704
4	0.083179
5	0.089135
6	0.088815
7	0.090797
8	0.091854
9	0.085418
10	0.087516
11	0.081235
12	0.076639

Table 6: Day VMT Fractions for 2019, 2030, and 2035 MOVES5 Runs (July)

Day Type	Day Type Fraction
Weekend	0.248115
Weekday	0.751885

Table 7: Hour VMT Fractions for Road Type 2 (Rural Restricted Access)

	SourceTypeID												
HourID	11	21	31	32	41	42	43	51	52	53	54	61	62
1	0.01259	0.01012	0.00850	0.00850	0.02549	0.02549	0.02549	0.01266	0.01266	0.01266	0.01266	0.01979	0.01979
2	0.01041	0.00692	0.00664	0.00664	0.02695	0.02695	0.02695	0.01146	0.01146	0.01146	0.01146	0.02121	0.02121
3	0.00980	0.00566	0.00613	0.00613	0.02311	0.02311	0.02311	0.01077	0.01077	0.01077	0.01077	0.02016	0.02016
4	0.01403	0.00697	0.00843	0.00843	0.02345	0.02345	0.02345	0.01287	0.01287	0.01287	0.01287	0.02131	0.02131
5	0.01652	0.01009	0.01340	0.01340	0.02441	0.02441	0.02441	0.01742	0.01742	0.01742	0.01742	0.02505	0.02505
6	0.03121	0.02417	0.03166	0.03166	0.03229	0.03229	0.03229	0.02610	0.02610	0.02610	0.02610	0.03050	0.03050
7	0.03991	0.03910	0.04815	0.04815	0.03023	0.03023	0.03023	0.04205	0.04205	0.04205	0.04205	0.03400	0.03400
8	0.04829	0.05288	0.05352	0.05352	0.03861	0.03861	0.03861	0.05561	0.05561	0.05561	0.05561	0.03834	0.03834
9	0.04723	0.04931	0.05414	0.05414	0.04541	0.04541	0.04541	0.06474	0.06474	0.06474	0.06474	0.04474	0.04474
10	0.05213	0.04886	0.05707	0.05707	0.05332	0.05332	0.05332	0.07111	0.07111	0.07111	0.07111	0.05177	0.05177
11	0.05592	0.05137	0.05759	0.05759	0.05767	0.05767	0.05767	0.07302	0.07302	0.07302	0.07302	0.05577	0.05577
12	0.05728	0.05331	0.05828	0.05828	0.05495	0.05495	0.05495	0.07319	0.07319	0.07319	0.07319	0.05714	0.05714
13	0.05920	0.05516	0.05994	0.05994	0.05415	0.05415	0.05415	0.07393	0.07393	0.07393	0.07393	0.05670	0.05670
14	0.06152	0.05955	0.06350	0.06350	0.05708	0.05708	0.05708	0.07465	0.07465	0.07465	0.07465	0.05675	0.05675
15	0.06478	0.06627	0.06839	0.06839	0.05519	0.05519	0.05519	0.07042	0.07042	0.07042	0.07042	0.05782	0.05782
16	0.07135	0.07649	0.07721	0.07721	0.05520	0.05520	0.05520	0.06286	0.06286	0.06286	0.06286	0.05775	0.05775
17	0.07550	0.08472	0.07926	0.07926	0.05580	0.05580	0.05580	0.05347	0.05347	0.05347	0.05347	0.05629	0.05629
18	0.06938	0.08212	0.06933	0.06933	0.05010	0.05010	0.05010	0.04369	0.04369	0.04369	0.04369	0.05270	0.05270
19	0.05422	0.06201	0.05211	0.05211	0.04597	0.04597	0.04597	0.03634	0.03634	0.03634	0.03634	0.05022	0.05022
20	0.04321	0.04590	0.03908	0.03908	0.04630	0.04630	0.04630	0.03121	0.03121	0.03121	0.03121	0.04671	0.04671
21	0.03581	0.03726	0.03110	0.03110	0.04186	0.04186	0.04186	0.02612	0.02612	0.02612	0.02612	0.04213	0.04213
22	0.02943	0.03127	0.02498	0.02498	0.03665	0.03665	0.03665	0.02158	0.02158	0.02158	0.02158	0.03814	0.03814
23	0.02235	0.02357	0.01830	0.01830	0.03475	0.03475	0.03475	0.01898	0.01898	0.01898	0.01898	0.03423	0.03423
24	0.01794	0.01692	0.01332	0.01332	0.03106	0.03106	0.03106	0.01574	0.01574	0.01574	0.01574	0.03076	0.03076

Table 8: Hour VMT Fractions for Road Type 3 (Rural Unrestricted Access)

	SourceTypeID												
HourID	11	21	31	32	41	42	43	51	52	53	54	61	62
1	0.00403	0.00732	0.00546	0.00546	0.00370	0.00370	0.00370	0.00440	0.00440	0.00440	0.00440	0.01642	0.01642
2	0.00403	0.00411	0.00346	0.00346	0.00455	0.00455	0.00455	0.00419	0.00419	0.00419	0.00419	0.01675	0.01675
3	0.00418	0.00328	0.00307	0.00307	0.00465	0.00465	0.00465	0.00735	0.00735	0.00735	0.00735	0.01655	0.01655
4	0.00531	0.00573	0.00481	0.00481	0.00398	0.00398	0.00398	0.00840	0.00840	0.00840	0.00840	0.01958	0.01958
5	0.01410	0.01513	0.01432	0.01432	0.00825	0.00825	0.00825	0.01532	0.01532	0.01532	0.01532	0.02585	0.02585
6	0.02927	0.03168	0.03543	0.03543	0.02931	0.02931	0.02931	0.02997	0.02997	0.02997	0.02997	0.03443	0.03443
7	0.03976	0.04685	0.05163	0.05163	0.04962	0.04962	0.04962	0.05578	0.05578	0.05578	0.05578	0.04405	0.04405
8	0.04482	0.06339	0.06363	0.06363	0.07684	0.07684	0.07684	0.07789	0.07789	0.07789	0.07789	0.05128	0.05128
9	0.03701	0.04604	0.05586	0.05586	0.10492	0.10492	0.10492	0.08530	0.08530	0.08530	0.08530	0.05682	0.05682
10	0.04170	0.04278	0.05479	0.05479	0.10654	0.10654	0.10654	0.08797	0.08797	0.08797	0.08797	0.05998	0.05998
11	0.05094	0.04442	0.05685	0.05685	0.11868	0.11868	0.11868	0.08863	0.08863	0.08863	0.08863	0.06335	0.06335
12	0.05639	0.05130	0.06189	0.06189	0.11545	0.11545	0.11545	0.08591	0.08591	0.08591	0.08591	0.06359	0.06359
13	0.06387	0.05373	0.06108	0.06108	0.09999	0.09999	0.09999	0.08585	0.08585	0.08585	0.08585	0.06441	0.06441
14	0.07087	0.05450	0.06320	0.06320	0.08642	0.08642	0.08642	0.08522	0.08522	0.08522	0.08522	0.06370	0.06370
15	0.07746	0.06569	0.06814	0.06814	0.05929	0.05929	0.05929	0.07746	0.07746	0.07746	0.07746	0.06097	0.06097
16	0.08492	0.07760	0.07651	0.07651	0.02950	0.02950	0.02950	0.06634	0.06634	0.06634	0.06634	0.05701	0.05701
17	0.09161	0.08719	0.07960	0.07960	0.03178	0.03178	0.03178	0.04335	0.04335	0.04335	0.04335	0.05174	0.05174
18	0.08559	0.08567	0.07374	0.07374	0.01840	0.01840	0.01840	0.02907	0.02907	0.02907	0.02907	0.04678	0.04678
19	0.06853	0.06563	0.05453	0.05453	0.01205	0.01205	0.01205	0.01877	0.01877	0.01877	0.01877	0.04132	0.04132
20	0.05037	0.04573	0.03910	0.03910	0.01186	0.01186	0.01186	0.01297	0.01297	0.01297	0.01297	0.03641	0.03641
21	0.03534	0.04006	0.02941	0.02941	0.00968	0.00968	0.00968	0.01062	0.01062	0.01062	0.01062	0.03189	0.03189
22	0.02179	0.02890	0.02185	0.02185	0.00617	0.00617	0.00617	0.00800	0.00800	0.00800	0.00800	0.02903	0.02903
23	0.01194	0.02050	0.01367	0.01367	0.00484	0.00484	0.00484	0.00616	0.00616	0.00616	0.00616	0.02556	0.02556
24	0.00619	0.01278	0.00798	0.00798	0.00351	0.00351	0.00351	0.00508	0.00508	0.00508	0.00508	0.02256	0.02256

Table 9: Hour VMT Fractions for Road Type 4 (Urban Restricted Access)

	SourceTypeID												
HourID	11	21	31	32	41	42	43	51	52	53	54	61	62
1	0.01148	0.01045	0.00904	0.00904	0.01865	0.01865	0.01865	0.00910	0.00910	0.00910	0.00910	0.01942	0.01942
2	0.00718	0.00625	0.00563	0.00563	0.01634	0.01634	0.01634	0.00801	0.00801	0.00801	0.00801	0.01987	0.01987
3	0.00637	0.00497	0.00465	0.00465	0.01578	0.01578	0.01578	0.00784	0.00784	0.00784	0.00784	0.01865	0.01865
4	0.00738	0.00584	0.00588	0.00588	0.01618	0.01618	0.01618	0.00868	0.00868	0.00868	0.00868	0.01982	0.01982
5	0.01081	0.00986	0.01090	0.01090	0.02213	0.02213	0.02213	0.01175	0.01175	0.01175	0.01175	0.02325	0.02325
6	0.02355	0.02316	0.02635	0.02635	0.02998	0.02998	0.02998	0.02040	0.02040	0.02040	0.02040	0.02946	0.02946
7	0.04618	0.04951	0.05424	0.05424	0.03938	0.03938	0.03938	0.04353	0.04353	0.04353	0.04353	0.03756	0.03756
8	0.05672	0.07884	0.06745	0.06745	0.05039	0.05039	0.05039	0.06595	0.06595	0.06595	0.06595	0.04462	0.04462
9	0.04932	0.06383	0.06141	0.06141	0.05896	0.05896	0.05896	0.07563	0.07563	0.07563	0.07563	0.05158	0.05158
10	0.04061	0.04665	0.05363	0.05363	0.05816	0.05816	0.05816	0.07907	0.07907	0.07907	0.07907	0.05532	0.05532
11	0.04151	0.04281	0.05126	0.05126	0.06160	0.06160	0.06160	0.08247	0.08247	0.08247	0.08247	0.05831	0.05831
12	0.04652	0.04523	0.05298	0.05298	0.06443	0.06443	0.06443	0.08206	0.08206	0.08206	0.08206	0.05894	0.05894
13	0.05180	0.04785	0.05480	0.05480	0.06376	0.06376	0.06376	0.08081	0.08081	0.08081	0.08081	0.05759	0.05759
14	0.05667	0.05022	0.05769	0.05769	0.06256	0.06256	0.06256	0.08118	0.08118	0.08118	0.08118	0.05717	0.05717
15	0.06719	0.05804	0.06568	0.06568	0.06195	0.06195	0.06195	0.07951	0.07951	0.07951	0.07951	0.05734	0.05734
16	0.08100	0.07156	0.07869	0.07869	0.06095	0.06095	0.06095	0.07277	0.07277	0.07277	0.07277	0.05672	0.05672
17	0.08639	0.08385	0.08214	0.08214	0.05773	0.05773	0.05773	0.05634	0.05634	0.05634	0.05634	0.05519	0.05519
18	0.08433	0.08745	0.07569	0.07569	0.05102	0.05102	0.05102	0.03717	0.03717	0.03717	0.03717	0.05311	0.05311
19	0.06460	0.06044	0.05437	0.05437	0.04510	0.04510	0.04510	0.02493	0.02493	0.02493	0.02493	0.04872	0.04872
20	0.04695	0.04248	0.03740	0.03740	0.03849	0.03849	0.03849	0.01881	0.01881	0.01881	0.01881	0.04321	0.04321
21	0.03738	0.03533	0.02932	0.02932	0.03223	0.03223	0.03223	0.01625	0.01625	0.01625	0.01625	0.03903	0.03903
22	0.03166	0.03134	0.02500	0.02500	0.02821	0.02821	0.02821	0.01425	0.01425	0.01425	0.01425	0.03551	0.03551
23	0.02460	0.02516	0.02035	0.02035	0.02427	0.02427	0.02427	0.01245	0.01245	0.01245	0.01245	0.03177	0.03177
24	0.01982	0.01891	0.01546	0.01546	0.02178	0.02178	0.02178	0.01104	0.01104	0.01104	0.01104	0.02783	0.02783

Table 10: Hour VMT Fractions for Road Type 5 (Urban Unrestricted Access)

	SourceTypeID												
HourID	11	21	31	32	41	42	43	51	52	53	54	61	62
1	0.00923	0.00853	0.00607	0.00607	0.01268	0.01268	0.01268	0.00372	0.00372	0.00372	0.00372	0.01064	0.01064
2	0.00553	0.00485	0.00377	0.00377	0.00995	0.00995	0.00995	0.00381	0.00381	0.00381	0.00381	0.01243	0.01243
3	0.00473	0.00379	0.00331	0.00331	0.00695	0.00695	0.00695	0.00442	0.00442	0.00442	0.00442	0.01215	0.01215
4	0.00470	0.00442	0.00424	0.00424	0.01136	0.01136	0.01136	0.00563	0.00563	0.00563	0.00563	0.01447	0.01447
5	0.00819	0.00794	0.00872	0.00872	0.01539	0.01539	0.01539	0.00866	0.00866	0.00866	0.00866	0.02105	0.02105
6	0.02254	0.02039	0.02387	0.02387	0.02569	0.02569	0.02569	0.01918	0.01918	0.01918	0.01918	0.02992	0.02992
7	0.04352	0.04783	0.05420	0.05420	0.04483	0.04483	0.04483	0.04181	0.04181	0.04181	0.04181	0.04368	0.04368
8	0.06021	0.07215	0.06754	0.06754	0.06919	0.06919	0.06919	0.07315	0.07315	0.07315	0.07315	0.05887	0.05887
9	0.05563	0.05670	0.06437	0.06437	0.07471	0.07471	0.07471	0.08809	0.08809	0.08809	0.08809	0.06409	0.06409
10	0.04858	0.04665	0.06033	0.06033	0.08040	0.08040	0.08040	0.09213	0.09213	0.09213	0.09213	0.06809	0.06809
11	0.04960	0.04682	0.05907	0.05907	0.07741	0.07741	0.07741	0.09440	0.09440	0.09440	0.09440	0.07034	0.07034
12	0.05731	0.05160	0.06157	0.06157	0.07533	0.07533	0.07533	0.09114	0.09114	0.09114	0.09114	0.06983	0.06983
13	0.06078	0.05553	0.06267	0.06267	0.07398	0.07398	0.07398	0.08956	0.08956	0.08956	0.08956	0.06854	0.06854
14	0.06092	0.05622	0.06299	0.06299	0.07800	0.07800	0.07800	0.09127	0.09127	0.09127	0.09127	0.06712	0.06712
15	0.06499	0.06076	0.06679	0.06679	0.07610	0.07610	0.07610	0.09057	0.09057	0.09057	0.09057	0.06513	0.06513
16	0.07244	0.07155	0.07518	0.07518	0.07280	0.07280	0.07280	0.07754	0.07754	0.07754	0.07754	0.06052	0.06052
17	0.07735	0.08037	0.07570	0.07570	0.05264	0.05264	0.05264	0.04643	0.04643	0.04643	0.04643	0.05577	0.05577
18	0.07708	0.08323	0.06849	0.06849	0.03477	0.03477	0.03477	0.02603	0.02603	0.02603	0.02603	0.05065	0.05065
19	0.06360	0.06379	0.05264	0.05264	0.02851	0.02851	0.02851	0.01733	0.01733	0.01733	0.01733	0.04028	0.04028
20	0.04831	0.04623	0.03728	0.03728	0.02206	0.02206	0.02206	0.01125	0.01125	0.01125	0.01125	0.03107	0.03107
21	0.03832	0.03866	0.02923	0.02923	0.01741	0.01741	0.01741	0.00766	0.00766	0.00766	0.00766	0.02685	0.02685
22	0.03050	0.03251	0.02362	0.02362	0.01371	0.01371	0.01371	0.00624	0.00624	0.00624	0.00624	0.02319	0.02319
23	0.02145	0.02360	0.01706	0.01706	0.01394	0.01394	0.01394	0.00533	0.00533	0.00533	0.00533	0.01938	0.01938
24	0.01451	0.01591	0.01132	0.01132	0.01219	0.01219	0.01219	0.00465	0.00465	0.00465	0.00465	0.01596	0.01596

Table 11: Age Distribution for 2019 MOVES5 Run

	SourceTypeID												
AgeID	11	21	31	32	41	42	43	51	52	53	54	61	62
0	0.210969	0.026737	0.014506	0.035512	0.064302	0.054574	0.062222	0.049424	0.058853	0.061234	0.061510	0.053563	0.043178
1	0.192115	0.053018	0.050066	0.073407	0.062673	0.053191	0.060645	0.048172	0.057361	0.044353	0.059951	0.053563	0.032158
2	0.157347	0.066554	0.058207	0.078647	0.062485	0.053032	0.060464	0.048028	0.057190	0.050987	0.059772	0.054105	0.041265
3	0.135977	0.061032	0.051985	0.065665	0.062423	0.052979	0.060403	0.047980	0.057133	0.050491	0.059712	0.057558	0.065889
4	0.105845	0.065980	0.078055	0.079362	0.061737	0.052397	0.059740	0.047452	0.056505	0.049493	0.059056	0.056418	0.058129
5	0.075091	0.064563	0.073391	0.073287	0.055917	0.047458	0.054108	0.042979	0.051178	0.033033	0.053488	0.048929	0.041815
6	0.047681	0.060839	0.074713	0.064772	0.046837	0.039751	0.045321	0.035999	0.042867	0.030134	0.044802	0.036603	0.039543
7	0.033103	0.064939	0.080665	0.072156	0.042579	0.036137	0.041201	0.032727	0.038970	0.040005	0.040729	0.034074	0.039717
8	0.019728	0.065000	0.064383	0.059769	0.046827	0.039743	0.045312	0.035992	0.042858	0.030849	0.044793	0.035809	0.022026
9	0.011847	0.067713	0.068911	0.068900	0.053438	0.045353	0.051709	0.041073	0.048909	0.014470	0.051117	0.052629	0.020266
10	0.005325	0.060751	0.064803	0.058817	0.053271	0.045212	0.051548	0.040945	0.048756	0.019955	0.050958	0.062452	0.030244
11	0.002538	0.052437	0.055815	0.051075	0.040795	0.053620	0.041108	0.031356	0.039149	0.039824	0.030273	0.047826	0.023061
12	0.001301	0.052980	0.050114	0.042400	0.033192	0.048994	0.038293	0.025512	0.029448	0.043045	0.046610	0.038913	0.081480
13	0.000612	0.042526	0.038638	0.032614	0.027735	0.045609	0.033375	0.054598	0.031640	0.046978	0.029167	0.032515	0.051631
14	0.000248	0.044814	0.039004	0.033051	0.036429	0.037775	0.043086	0.063266	0.036444	0.039375	0.034780	0.042708	0.045993
15	0.000153	0.032730	0.035770	0.028287	0.028351	0.033295	0.021016	0.039565	0.035789	0.030531	0.033520	0.033237	0.026816
16	0.000067	0.027060	0.024410	0.019672	0.023588	0.027913	0.025367	0.034157	0.025999	0.027066	0.023315	0.027654	0.025264
17	0.000030	0.019745	0.016248	0.013518	0.017564	0.024497	0.020683	0.014635	0.019796	0.025978	0.020675	0.020591	0.017042
18	0.000013	0.015721	0.012994	0.010679	0.020119	0.025048	0.026689	0.040196	0.019374	0.030802	0.015546	0.023587	0.028214
19	0.000006	0.010933	0.009734	0.008337	0.022579	0.036661	0.030145	0.034228	0.022734	0.032023	0.020363	0.026470	0.045715
20	0.000002	0.009717	0.009659	0.007861	0.022641	0.028197	0.017388	0.027008	0.028940	0.030807	0.026594	0.026543	0.037260
21	0.000001	0.006084	0.007545	0.005360	0.021297	0.022441	0.020903	0.036743	0.025509	0.016505	0.023847	0.024967	0.025324
22	0.000001	0.004720	0.004359	0.003176	0.022137	0.020761	0.021174	0.029424	0.021171	0.018681	0.023292	0.025952	0.018453
23	0.000000	0.003466	0.003260	0.002819	0.018775	0.017685	0.018686	0.036737	0.025574	0.014555	0.017364	0.022011	0.020882
24	0.000000	0.003405	0.002806	0.002124	0.016580	0.015344	0.016222	0.019537	0.018134	0.017582	0.018639	0.019438	0.019875
25	0.000000	0.002067	0.001898	0.001429	0.013046	0.011961	0.012527	0.020286	0.010153	0.011714	0.018907	0.015295	0.015788
26	0.000000	0.001524	0.001010	0.000913	0.005207	0.011471	0.004628	0.005879	0.015824	0.010166	0.012386	0.006104	0.012765
27	0.000000	0.000741	0.000827	0.000854	0.004438	0.006255	0.003427	0.006619	0.008243	0.008712	0.007312	0.005202	0.009319
28	0.000000	0.000821	0.000651	0.000655	0.003853	0.002715	0.004023	0.005865	0.007845	0.009862	0.004020	0.004518	0.007441
29	0.000000	0.000749	0.000285	0.000238	0.005020	0.007381	0.003956	0.001470	0.008291	0.011111	0.000530	0.005885	0.008605
30	0.000000	0.000626	0.000365	0.000344	0.000362	0.000221	0.001543	0.000614	0.000669	0.009046	0.000872	0.000651	0.007976
31	0.000000	0.000607	0.000352	0.000331	0.000346	0.000211	0.001234	0.000512	0.000644	0.009511	0.000813	0.000604	0.006549
32	0.000000	0.000588	0.000339	0.000318	0.000329	0.000201	0.000926	0.000409	0.000619	0.008826	0.000755	0.000558	0.007002
33	0.000000	0.000569	0.000326	0.000304	0.000313	0.000191	0.000617	0.000307	0.000595	0.008503	0.000697	0.000511	0.004916
34	0.000000	0.000550	0.000313	0.000291	0.000296	0.000181	0.000309	0.000205	0.000570	0.008038	0.000639	0.000465	0.004295
35	0.000000	0.000531	0.000300	0.000278	0.000280	0.000171	0.000000	0.000102	0.000545	0.006766	0.000581	0.000418	0.002665
36	0.000000	0.000512	0.000287	0.000265	0.000263	0.000161	0.000000	0.000000	0.000520	0.006075	0.000523	0.000372	0.002364
37	0.000000	0.000493	0.000273	0.000251	0.000247	0.000151	0.000000	0.000000	0.000495	0.005427	0.000465	0.000325	0.002286
38	0.000000	0.000474	0.000260	0.000238	0.000230	0.000141	0.000000	0.000000	0.000471	0.005156	0.000407	0.000279	0.002234
39	0.000000	0.000455	0.000247	0.000225	0.000214	0.000131	0.000000	0.000000	0.000446	0.003962	0.000349	0.000232	0.002139
40	0.000000	0.005233	0.002227	0.001800	0.001284	0.000785	0.000000	0.000000	0.003790	0.038368	0.000872	0.000465	0.002417

Table 12: Age Distribution for 2030 MOVES5 Run

	SourceTypeID												
AgeID	11	21	31	32	41	42	43	51	52	53	54	61	62
0	0.055900	0.046984	0.060080	0.060080	0.047625	0.047625	0.047625	0.048567	0.048567	0.048567	0.048567	0.045991	0.045991
1	0.056429	0.047355	0.059850	0.060455	0.048574	0.048256	0.048351	0.048802	0.048677	0.048677	0.049634	0.047600	0.047643
2	0.055236	0.047340	0.059013	0.060349	0.048919	0.048371	0.048511	0.048609	0.048376	0.048376	0.050325	0.048506	0.048562
3	0.052692	0.048300	0.058646	0.060837	0.048584	0.047930	0.048119	0.048140	0.047804	0.047804	0.050358	0.048398	0.048453
4	0.050019	0.048746	0.057780	0.060923	0.047828	0.047007	0.047244	0.047298	0.046879	0.046879	0.050287	0.047542	0.047660
5	0.047076	0.048725	0.055840	0.059971	0.047039	0.045990	0.046323	0.046221	0.045765	0.045765	0.049880	0.046970	0.047184
6	0.012282	0.017959	0.036402	0.015184	0.046028	0.044682	0.045159	0.044639	0.044166	0.044166	0.003908	0.046698	0.047040
7	0.027410	0.028923	0.048794	0.035265	0.044705	0.043068	0.043692	0.042617	0.042147	0.042147	0.013551	0.046325	0.046753
8	0.027515	0.026864	0.045600	0.038168	0.021248	0.019182	0.038063	0.033338	0.055510	0.055510	0.005728	0.063528	0.030132
9	0.020221	0.030017	0.049561	0.040699	0.024757	0.046467	0.041779	0.033785	0.037544	0.037544	0.001884	0.044826	0.020347
10	0.017235	0.039862	0.051253	0.043204	0.028408	0.050747	0.046429	0.052543	0.044069	0.044069	0.033454	0.065923	0.034655
11	0.017689	0.046961	0.053754	0.053286	0.038890	0.078958	0.046036	0.045765	0.041564	0.041564	0.014666	0.059065	0.031352
12	0.022413	0.052295	0.049511	0.044245	0.033264	0.060601	0.044419	0.039536	0.029462	0.029462	0.014532	0.040800	0.022697
13	0.021619	0.065106	0.049546	0.040721	0.037701	0.061832	0.044243	0.034913	0.032941	0.032941	0.012540	0.028659	0.028308
14	0.022186	0.056234	0.041319	0.037220	0.038150	0.059574	0.037412	0.037622	0.031899	0.031899	0.007100	0.044261	0.044249
15	0.025815	0.056229	0.038716	0.035793	0.033269	0.045714	0.034796	0.030067	0.030221	0.030221	0.003518	0.035081	0.038219
16	0.026684	0.047673	0.028660	0.030972	0.028157	0.039342	0.030066	0.023898	0.019368	0.019368	0.019082	0.026216	0.026915
17	0.024908	0.044804	0.023002	0.023967	0.026279	0.030027	0.025539	0.024083	0.017384	0.017384	0.013750	0.024759	0.024913
18	0.024227	0.032771	0.018536	0.018160	0.019551	0.028599	0.026390	0.021135	0.022166	0.022166	0.008474	0.022045	0.024311
19	0.017084	0.023700	0.017644	0.020319	0.019424	0.022319	0.027808	0.014840	0.016710	0.016710	0.008395	0.010502	0.013194
20	0.015383	0.019293	0.011920	0.012688	0.020253	0.023542	0.025775	0.010847	0.007669	0.007669	0.003311	0.007415	0.011793
21	0.026797	0.017427	0.008887	0.010201	0.020296	0.019276	0.018260	0.016462	0.010146	0.010146	0.008163	0.008605	0.017226
22	0.029859	0.018114	0.012036	0.015492	0.020039	0.013981	0.016493	0.012787	0.019921	0.019921	0.024267	0.005773	0.012855
23	0.036662	0.018679	0.012624	0.017195	0.019191	0.009203	0.014752	0.036808	0.020661	0.020661	0.019143	0.017095	0.044115
24	0.035944	0.012884	0.008575	0.014407	0.022097	0.007505	0.012904	0.028479	0.022038	0.022038	0.020544	0.012698	0.027348
25	0.034130	0.012227	0.009267	0.015036	0.013252	0.002885	0.011540	0.022058	0.018168	0.018168	0.046974	0.012482	0.023833
26	0.026495	0.008543	0.007297	0.013711	0.012781	0.001711	0.012336	0.016083	0.013499	0.013499	0.037221	0.006784	0.013592
27	0.033147	0.007998	0.006488	0.011882	0.015885	0.002321	0.008307	0.014777	0.011768	0.011768	0.036871	0.006805	0.012524
28	0.025248	0.005696	0.004895	0.009299	0.015172	0.001560	0.009621	0.011827	0.010879	0.010879	0.035009	0.004783	0.008326
29	0.020107	0.005156	0.003660	0.008656	0.013543	0.000791	0.009267	0.011773	0.012687	0.012687	0.030151	0.007003	0.013481
30	0.017991	0.003792	0.002608	0.006610	0.014303	0.000358	0.007700	0.012493	0.012706	0.012706	0.050772	0.010289	0.021360
31	0.014098	0.003154	0.002523	0.005706	0.014385	0.000102	0.006510	0.009489	0.012012	0.012012	0.068055	0.008065	0.017157
32	0.011792	0.001932	0.001514	0.003860	0.013056	0.000126	0.005286	0.005900	0.006328	0.006328	0.011722	0.006562	0.011402
33	0.009562	0.001904	0.001436	0.004320	0.009116	0.000079	0.004754	0.004152	0.006897	0.006897	0.029026	0.005869	0.008123
34	0.008806	0.001181	0.000554	0.002936	0.008397	0.000099	0.003876	0.004504	0.005280	0.005280	0.038821	0.006351	0.009058
35	0.007106	0.001473	0.000667	0.003263	0.007766	0.000074	0.003856	0.005028	0.006271	0.006271	0.029902	0.007382	0.008429
36	0.006992	0.000873	0.000484	0.002064	0.006841	0.000038	0.002070	0.002697	0.004021	0.004021	0.021155	0.005522	0.006545
37	0.005896	0.000896	0.000406	0.001152	0.006177	0.000014	0.002369	0.002126	0.003428	0.003428	0.009780	0.004304	0.005214
38	0.003666	0.000539	0.000203	0.000816	0.003969	0.000007	0.001919	0.001884	0.002889	0.002889	0.008301	0.002790	0.003721
39	0.003061	0.000708	0.000260	0.000601	0.005298	0.000010	0.002415	0.001948	0.003145	0.003145	0.002741	0.002714	0.002903
40	0.002617	0.000681	0.000189	0.000284	0.009784	0.000029	0.001986	0.001463	0.038368	0.038368	0.008439	0.007017	0.002417

Table 13: Age Distribution for 2035 MOVES5 Run

	SourceTypeID												
AgeID	11	21	31	32	41	42	43	51	52	53	54	61	62
0	0.055136	0.052340	0.055488	0.055488	0.045151	0.045151	0.045151	0.046271	0.046271	0.046271	0.046271	0.043078	0.043078
1	0.055062	0.052202	0.054674	0.054922	0.044809	0.044636	0.044729	0.045636	0.045493	0.045493	0.046737	0.043174	0.043247
2	0.054139	0.052267	0.054156	0.054680	0.044637	0.044300	0.044442	0.045158	0.044878	0.044878	0.047231	0.043346	0.043491
3	0.051439	0.052670	0.053940	0.054777	0.044458	0.043959	0.044167	0.044717	0.044308	0.044308	0.047400	0.043396	0.043608
4	0.048754	0.052738	0.053504	0.054708	0.044387	0.043785	0.044052	0.044366	0.043826	0.043826	0.047640	0.043725	0.044007
5	0.046250	0.052939	0.052822	0.054445	0.044667	0.043841	0.044218	0.044151	0.043505	0.043505	0.047838	0.044551	0.044923
6	0.043956	0.052928	0.051998	0.054096	0.044972	0.043752	0.044265	0.043829	0.043103	0.043103	0.048348	0.045313	0.045825
7	0.041356	0.052312	0.050451	0.053076	0.044720	0.043185	0.043790	0.043134	0.042351	0.042351	0.048492	0.045380	0.046007
8	0.039451	0.052581	0.049109	0.052322	0.043588	0.041823	0.042541	0.041965	0.041150	0.041150	0.047754	0.044128	0.044887
9	0.037450	0.052205	0.047359	0.051200	0.042124	0.040073	0.040907	0.040511	0.039688	0.039688	0.046951	0.042239	0.043183
10	0.035246	0.051236	0.044754	0.049194	0.040922	0.038593	0.039555	0.039123	0.038314	0.038314	0.046091	0.041019	0.042130
11	0.009196	0.018518	0.028512	0.012150	0.039542	0.036926	0.038026	0.037337	0.036561	0.036561	0.003572	0.040079	0.041370
12	0.020522	0.029215	0.037347	0.027522	0.037925	0.035032	0.036273	0.035220	0.034496	0.034496	0.012257	0.039065	0.040502
13	0.020601	0.025810	0.034123	0.029068	0.017793	0.015362	0.031152	0.027217	0.044909	0.044909	0.005123	0.052635	0.025704
14	0.015140	0.026290	0.036276	0.030261	0.020471	0.036634	0.033712	0.027252	0.030031	0.030031	0.001667	0.036486	0.017092
15	0.012904	0.031433	0.036411	0.031109	0.023199	0.039373	0.036939	0.041880	0.034854	0.034854	0.029299	0.052727	0.028683
16	0.013244	0.033037	0.037073	0.037161	0.031356	0.060317	0.036111	0.036040	0.032500	0.032500	0.012706	0.046415	0.025553
17	0.016781	0.032637	0.033163	0.029893	0.026480	0.045553	0.034345	0.030759	0.022774	0.022774	0.012455	0.031491	0.018217
18	0.016187	0.036847	0.032245	0.026663	0.029621	0.045750	0.033718	0.026827	0.025166	0.025166	0.010627	0.021727	0.022368
19	0.016611	0.029929	0.026157	0.023642	0.029591	0.043383	0.028105	0.028561	0.024091	0.024091	0.005952	0.032954	0.034423
20	0.019328	0.028483	0.024068	0.022289	0.025311	0.032496	0.025579	0.022408	0.022431	0.022431	0.002901	0.025425	0.029052
21	0.019979	0.023238	0.017531	0.018950	0.021146	0.027522	0.021784	0.017594	0.014211	0.014211	0.015568	0.018657	0.020141
22	0.018649	0.021205	0.013867	0.014433	0.019487	0.020663	0.018239	0.017517	0.012609	0.012609	0.011099	0.017306	0.018361
23	0.018139	0.015156	0.011035	0.010788	0.014310	0.019370	0.018575	0.015185	0.015892	0.015892	0.006765	0.015131	0.017638
24	0.012791	0.010762	0.010383	0.011918	0.014034	0.014869	0.019289	0.010531	0.011841	0.011841	0.006629	0.007077	0.009423
25	0.011517	0.008642	0.006939	0.007355	0.014537	0.015556	0.017747	0.007649	0.005402	0.005402	0.002600	0.004951	0.008357
26	0.020064	0.007728	0.005126	0.005854	0.014378	0.012534	0.012391	0.011466	0.007064	0.007064	0.006340	0.005641	0.012015
27	0.022356	0.007970	0.006889	0.008816	0.014012	0.008941	0.011028	0.008796	0.013708	0.013708	0.018641	0.003715	0.008825
28	0.027449	0.008174	0.007175	0.009710	0.013330	0.005837	0.009791	0.025163	0.014134	0.014134	0.014623	0.010900	0.030048
29	0.026912	0.005616	0.004847	0.008086	0.015148	0.004683	0.008439	0.019229	0.014900	0.014900	0.015520	0.007948	0.018332
30	0.025553	0.005311	0.005215	0.008399	0.008966	0.001771	0.007436	0.014707	0.012139	0.012139	0.035097	0.007667	0.015723
31	0.019837	0.003699	0.004088	0.007622	0.008590	0.001041	0.007889	0.010656	0.008965	0.008965	0.027654	0.004128	0.008896
32	0.024818	0.003451	0.003620	0.006574	0.010535	0.001390	0.005235	0.009669	0.007724	0.007724	0.027088	0.004065	0.008066
33	0.018903	0.002450	0.002719	0.005121	0.009930	0.000918	0.005973	0.007642	0.007057	0.007057	0.025437	0.002803	0.005277
34	0.015055	0.002210	0.002024	0.004744	0.008804	0.000462	0.005710	0.007559	0.008179	0.008179	0.021784	0.004066	0.008475
35	0.013470	0.001620	0.001436	0.003606	0.009175	0.000205	0.004674	0.007921	0.008095	0.008095	0.036271	0.005862	0.013213
36	0.010555	0.001343	0.001383	0.003098	0.009106	0.000058	0.003892	0.005940	0.007562	0.007562	0.048079	0.004508	0.010442
37	0.008829	0.000820	0.000826	0.002086	0.008208	0.000070	0.003136	0.003670	0.003960	0.003960	0.008234	0.003633	0.006883
38	0.007159	0.000805	0.000781	0.002323	0.005655	0.000043	0.002779	0.002550	0.004264	0.004264	0.020160	0.003188	0.004824
39	0.006594	0.000498	0.000300	0.001571	0.005139	0.000053	0.002231	0.002731	0.003226	0.003226	0.026662	0.003384	0.005292
40	0.002617	0.000681	0.000189	0.000284	0.009784	0.000090	0.001986	0.001463	0.038368	0.038368	0.008439	0.007017	0.002417

Table 14: Fuel Supply for 2019 MOVES5 Run

fuelRegionID	fuelYearID	monthGroupID	fuelFormulationID	marketShare	marketShareCV
1470011000	2019	7	90	1	0.5
1470011000	2019	7	8009	1	0.5
1470011000	2019	7	25003	1	0.5
1470011000	2019	7	27002	1	0.5
1470011000	2019	7	28001	1	0.5

Table 15: Fuel Formulation for 2019 MOVES5 Run

fuelFormulationID	fuelSubtypeID	RVP	sulfurLevel	ETOHVolume	MTBEVolume	ETBEVolume	TAMEVolume	aromaticContent	olefinContent	benzeneContent	e200	e300	BioDieselEsterVolume	CetaneIndex	PAHContent	T50	T90
10	10	6.9	30	0	0	0	0	26.1	5.6	1	41.09	83.09	0	0	0	218	329
20	20	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	30	0	7.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	51	7.7	11	85	0	0	0	0	0	0	999	999	0	0	0	999	999
90	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	10	8.7	338	0	0	0	0	26.4	11.9	1.64	50	83	0	0	0	199.82	329.41
97	10	6.6	150	0	0	0	0	24	11	0.8	52	84	0	0	0	195.74	324.86
98	12	8.8	30	10	0	0	0	25.77	8.44	0.65	47.61	84.89	0	0	0	212.28	321.72
99	12	8.8	30	10	0	0	0	25.77	8.44	0.65	47.61	84.89	0	0	0	212.28	321.72
8009	12	7	6.89	10	0	0	0	16.82	5.09	0.499	46.59	86.83	0	0	0	211.67	315.3
8309	10	7	6.89	0	0	0	0	19.02	3.49	0.499	39.59	87.03	0	0	0	225.95	314.62
8609	15	6.85	6.55	15	0	0	0	15.98	4.84	0.474	56.41	87.04	0	0	0	164.33	312.49
25003	21	0	6	0	0	0	0	0	0	0	0	0	3.5	0	0	0	0
27002	51	7.7	8	74	0	0	0	0	0	0.16	999	999	0	0	0	999	999
28001	30	0	7.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 16: Meteorology Data for 2019, 2030, and 2035 MOVES5 Runs

monthID	zoneID	hourID	temperature(F)	relHumidity(%)
7	180890	1	67.8	78.9
7	180890	2	66.6	80.3
7	180890	3	65.8	81.4
7	180890	4	65.0	82.6
7	180890	5	64.4	83.6
7	180890	6	64.0	84.3
7	180890	7	66.1	82.0
7	180890	8	69.6	75.7
7	180890	9	73.2	69.1
7	180890	10	76.2	63.7
7	180890	11	78.7	59.3
7	180890	12	80.6	56.0
7	180890	13	82.1	53.5
7	180890	14	82.9	52.2
7	180890	15	83.3	51.5
7	180890	16	83.1	51.5
7	180890	17	82.7	52.0
7	180890	18	81.6	53.5
7	180890	19	79.7	56.2
7	180890	20	77.0	61.1
7	180890	21	73.9	67.0
7	180890	22	71.8	71.3
7	180890	23	70.2	74.3
7	180890	24	68.9	77.0

Appendix B

Lake and Porter Counties, Indiana, Maintenance Area Interagency Consultation Group Meeting Minutes/Summary

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Interagency Consultation Group (ICG) Conference Call Minutes

For the MOVES3 to MOVES5 MVEB Replacement Update
Related to the Lake and Porter Counties, Indiana, Maintenance Area under the 2008 8-Hour Ozone Standard

ICG Conference Call Date and Time

- December 18, 2025, at 9:30am Eastern

ICG Attendees

- Shawn Seals (IDEM), Anthony Maietta (EPA), Jay Mitchell (INDOT), Erica Tait (FHWA), Paige Story (FHWA), Cecilia Crenshaw (FTA), and Scott Weber (NIRPC)

ICG Discussion Topics and Conclusions

- For the Ozone MVEB Replacement submittal, various mobile source margins of safety were discussed.
    - After discussion, the consensus of the ICG was that as long as the 20% mobile source margin of safety for VOC and NO_x emissions does not result in an exceedance of the all-sources margins of safety, it was reasonable and appropriate for inclusion in MVEB replacement submittal.