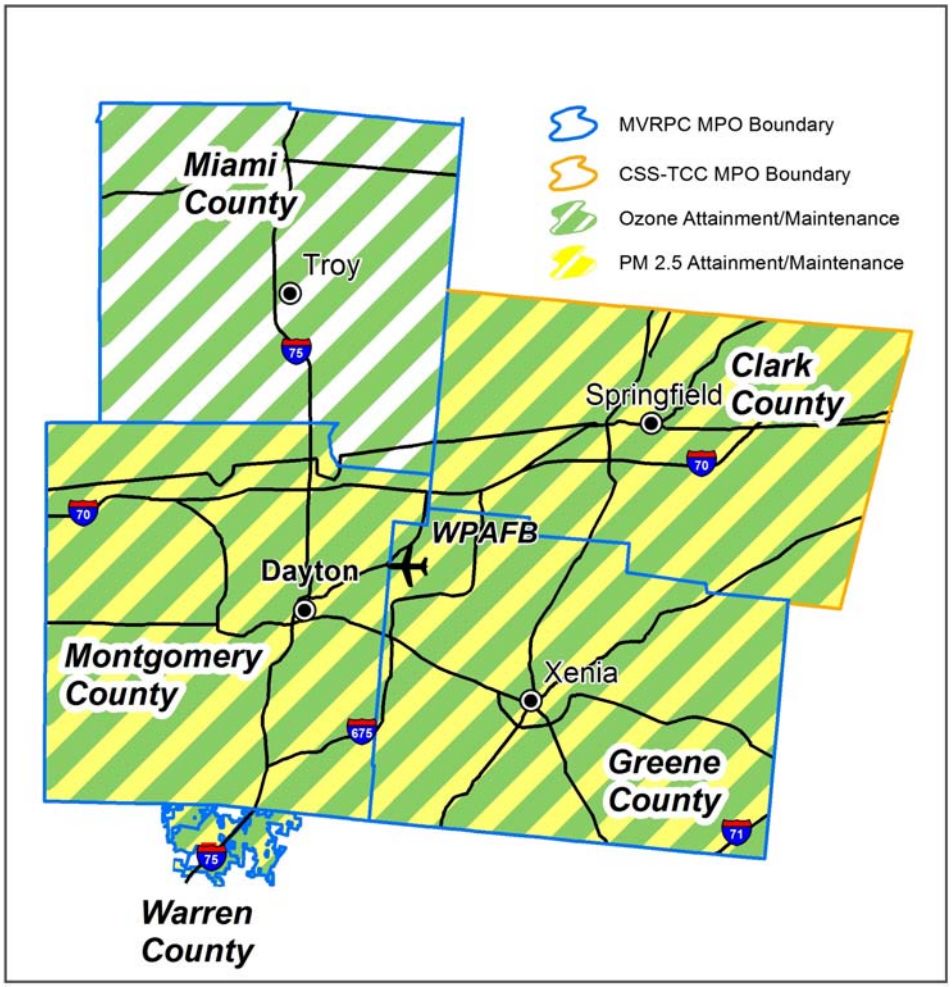
Technical Memorandum
MVRPC/Clark County-Springfield TCC SFY 2016-2019 TIP
Mobile Emissions Estimate

February 2015
(Updated March 2015)



By MVRPC and Ohio Department of Transportation

In coordination with Clark County-Springfield TCC

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1. Overview

This memorandum is intended to document the air quality analyses and underlying assumptions performed by the Ohio Department of Transportation (ODOT), Division of Planning – Modeling and Forecasting Section and the Miami Valley Regional Planning Commission (MVRPC) for the SFY 2016-2019 TIP regional emissions analysis of PM 2.5 and ozone precursors.

The D/S Region is comprised of the counties of Clark, Greene, Miami, and Montogomery in west-central Ohio. Three counties (Clark, Greene, and Montgomery) are designated attainment/maintenance for the Annual PM2.5 Standard. All four counties are designated attainment/maintenance for the 1997 Ozone Standard. Clark County Springfield Transportation Coordinating Committee (CCS-TCC) serves as the Metropolitan Planning Organization (MPO) for Clark County while MVRPC serves as the MPO for the remainder counties: Greene, Miami, and Montgomery.

The ODOT Modeling and Forecasting section performed the MOVES runs to generate travel demand model based emission factors as well as the complete air quality analyses for Clark County. Using ODOT generated emission factors, MVRPC completed the air quality analyses for Greene, Miami, and Montgomery Counties.

Latest Planning Assumptions

The annual PM2.5 and ozone regional emissions analysis meets the latest planning assumption requirement. As discussed in Section 2 of this report, the modeling process used to develop each MPO emissions is calibrated using the latest population and land use data available and is validated using corresponding traffic count data. Currently, the travel demand models are validated to year 2000 (CCS-TCC) or year 2005 (MVRPC) depending on available data.

US EPA's most recent emissions software, MOVES, is used for all mobile source emission analyses with MOVES inputs being established at various interagency consultation meetings between November 2010 and April 2012 (See **Appendix A**). It was also established at these meetings that annual emission estimates for PM 2.5 would be based on a single-season approach. Since travel demand models produce average daily conditions, the daily emissions estimates in **Appendix B.2** are multiplied by 365 days to produce annual emissions estimates expressed in tons per year. Final budgets were approved on September 26, 2013 (78 FR 59258) for PM 2.5 and revised MOVES based budgets were approved on October 24, 2013 (78 FR 63388) for ozone.

Additional interagency consulation meetings took place on January 2015 to address issues specific to the SFY 2016-2019 TIP conformity determination. Documentation of these discussions can also be found on **Appendix A**.

1997 Ozone Revocation Update – March 2015

On March 6, 2015, U.S. EPA published the final rule for the *Implementation of the 2008 NAAQS for Ozone: State Implementation Plan Requirements*, 80 FR 12264, effective April 6, 2015. The final rule revokes the 1997 ozone standard for all purposes including transportation conformity. Therefore, segments of this document that apply to the ozone emissions assumptions in Section 3 are no longer applicable as a regional emissions analysis for ozone is not needed.
The interagency consultation partners agree with this approach (see **Appendix A**).

On Road Mobile Emission Summary

Table 1 and 2 present a summary of emissions for the applicable counties in the D/S Region for the required precursors: direct PM and NOx for the PM 2.5 standard and VOC and NOx for the ozone standard. The results indicate that the 2040 Plans and TIPs demonstrate conformity to the PM2.5 and Ozone State Implementation Plans (SIPs) consistent with the April 2012 U.S. EPA Transportation Conformity Regulations.

The remainder of the document focuses on the assumptions behind the analyses.

Table 1 – Dayton/Springfield Region On-Road Mobile Emissions – PM 2.5

	PM 2.5					
	Tons / Year					
	2015 Budget	2020 Emissions	2022 Budget	2022 Emissions	2030 Emissions	2040 Emissions
GRE/MOT						
PM2.5		192.72		174.62	153.15	155.20
NOx		4,995.57		4,156.47	2,867.44	2,531.57
CLA						
PM2.5		45.99		41.68	37.52	39.13
NOx		1,293.01		1,087.55	790.41	728.39
Totals						
PM2.5	404.43	238.71	261.33	216.30	190.68	194.14
NOx	12,865.54	6,288.59	6,270.64	5,244.03	3,657.85	3,252.96

Table 2 – Dayton/Springfield Region On-Road Mobile Emissions – Ozone
(Regional Emissions Analysis No Longer Required for Ozone)

OZONE					
	Tons / Day				
	2018 Budget	2018 Emissions	2020 Emissions	2030 Emissions	2040 Emissions
MVRPC					
VOC		16.34	14.29	10.40	10.00
NOx		23.22	19.41	12.12	11.20
CCS-TCC					
VOC		3.10	2.72	2.04	2.02
NOx		4.94	4.14	2.68	2.54
Totals					
VOC	22.35	19.44	17.02	12.45	12.02
NOx	32.47	28.15	23.54	14.80	13.74

2. Urban Travel Demand Models

CCS-TCC and MVRPC maintain regional travel demand forecasting models for use in the urban transportation planning process. The models employ the traditional four step modeling process to project existing and future traffic volumes and travel patterns on the regional transportation network. The four step process consists of trip generation, trip distribution, modal split, and route assignment. Output from the urban models is link-by-link directional 24-hour traffic volumes.

During 2000-2002 MVRPC, in cooperation with the Ohio Kentucky Indiana Regional Council of Governments, updated its travel demand model. The new model includes the combined regions under the jurisdictions of OKI and MVRPC. In 2005, the combined model was updated again to incorporate the results of a household interview survey in the MVRPC Region, change the model interface to Cube Voyager, and improve model functionality. The changes primarily affected trip generation distribution functions in the MVRPC Region. In 2011 in preparation for the 2012 Transportation Plan Update the model was validated using circa 2005 traffic counts. The 2005 Cube Voyager model with the latest planning assumptions (networks and socio-economic data) is used to calculate 2018-2040 emissions in the MVRPC Region. MVRPC SFY 2016-2019 TIP emission analyses directory structure can be seen in Figure 1.

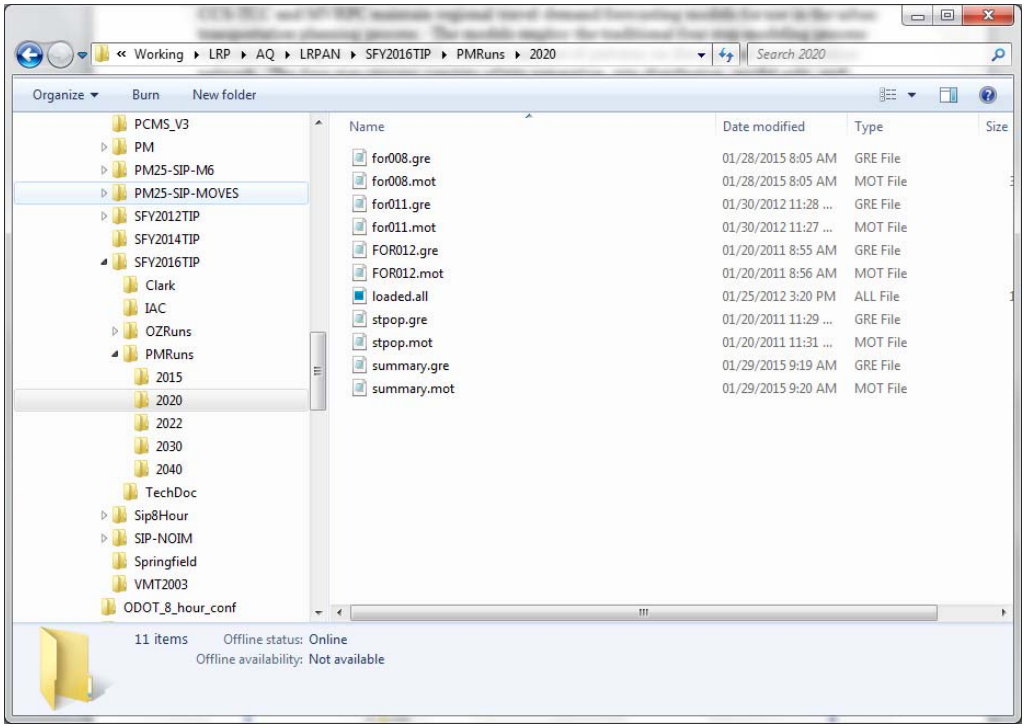

Figure 1 – MVRPC Emission Analyses Runs Directory Structure

Similarly, the Springfield Region also has a new travel demand model that combined with the latest planning assumptions was used to generate emissions in Clark County. The new travel demand model now covers all of Clark County and was validated in December 2005, more information is available at http://www.dot.state.oh.us/urban/data/to_docs/Springfield_model_userguide.doc. Figure 2 shows the directory structure or model run location. Due to the number of files and complexity, travel demand model run details have not been included in this technical memo.

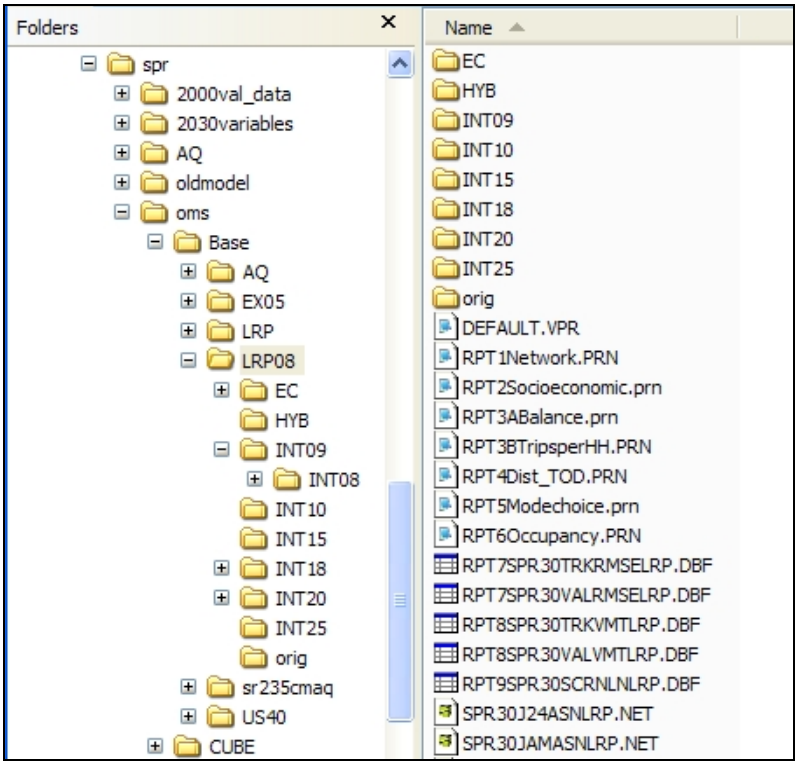

Figure 2 – CCS-TCC Travel Demand Model Run Directory Structure

Networks

Both CCS-TCC and MVRPC's modeled networks accurately reflect projects in their respective TIPs and 2040 Long Range Transportation Plans. Project lists can be found online as listed below:

CCS-TCC
http://www.clarktcc.com/LRP/2040%20LRP/LRP%20final.pdf

MVRPC
http://docs.mvrpc.org/lrtp/2012/LRTPProjectLists.pdf

Land use and Socio-economic Data

Both CCS-TCC and MVRPC's socio-economic model variables reflect the current and expected future regional land uses.

MVRPC's socio-economic variables were developed for the May 2012 2040 LRTP Update and are based on 2000/2010 Census variables and 2040 county-level Ohio Department of Development population projections with the exception of Greene County. In Greene County, the 2040 ODOD population projection was lower than the 2010 Census population count, MVRPC proposed an alternative projection that was accepted for use in the Transportation Plan by the interagency consultation partners.

On the employment side, adjustments were made primarily to account for manufacturing job loses between 2000 and 2010, recognizing that the local economy is moving away from a manufacturing base and to account for known planned development efforts.

Independent variables are available for 4 analysis years (2000, 2005, 2010, and 2040) and the travel demand model has the ability of interpolating data for any year between available data sets. A summary of MVRPC's socio-economic data is available in Table 3. As can be seen from the table, population, households, and employment are expected to make modest gains between 2010 and 2040. Both households and employment are expected to decline in the older urban areas of the region as the trend to develop in the suburban fringes and rural areas continues.

Table 3 – MVRPC Socio-Economic Variables

Variable	Area Type				
	CBD	Urban	Suburban	Rural	**Total**
# of TAZs	65	209	413	130	**817**
Acres	880	30,675	297,967	495,879	**825,401**
2005 Population					**805,816**
2005 Households	1,838	88,631	209,117	26,351	**325,937**
2005 Employment	27,942	95,363	304,111	14,574	**441,990**
2010 ODOD Population	-	-	-	-	**799,232**
2010 Households	2,151	77,584	220,039	27,856	**327,630**
2010 Employment	28,042	94,306	303,504	15,541	**441,393**
2040 ODOD Population	-	-	-	-	**820,227**
2040 Households	2,280	70,336	229,678	32,550	**334,844**
2040 Employment	29,653	87,835	329,415	16,730	**463,633**
2005 Persons per Household	1.30	2.33	2.41	2.66	**2.40**
2005 Workers per Household	0.61	1.11	1.27	1.41	**1.22**
2005 Autos per Household	0.63	1.42	1.82	2.26	**1.74**

Note: Includes Greene, Miami, and Montgomery Counties.

CCS-TCC's socio-economic variables were developed for the 2040 LRTP based on the 2000 Census variables, 2000 employment from QCEW, and 2030 population projections from the Ohio Department of Development. Projections were updated and extended to 2040 for the 2012 Plan based on 2010 census results and known employment changes including: school enrollment, hotels, educational and recreational employment, and area type. Independent variables (land use/socio-economic data) as provided by CCS-TCC are available for every analysis year. These variables are used by ODOT to generate new trip tables for the analysis years: 2018, 2020, 2022, 2030, and 2040.

Table 4 shows a summary of CCS-TCC's socio-economic data. This summary shows a slight decline in population, while households and employment show a moderate gain.

Table 4 – CCSTCC Socio-Economic Variables

	Area Type (2010)				
	CBD	Urban	Suburban	Rural	**Total**
# of TAZs	9	67	106	121	**303**
2010 Population	3,195	20,765	61,638	56,013	**141,611**
2010 Households	1,282	8,406	25,915	22,038	**57,641**
2010 Employment	2,641	11,662	27,842	14,140	**56,285**
	Area Type (2040)				
	CBD	Urban	Suburban	Rural	**Total**
# of TAZs	9	67	106	121	**303**
2040 Population	3,212	20,580	61,841	58,940	**144,573**
2040 Households	1,327	9,349	27,961	24,220	**62,857**
2040 Employment	2,816	13,172	29,058	17,203	**62,249**

VMT Trends

Figure 3 shows Vehicle Miles Traveled (VMT) trends for each of the analysis years 2018- 2040 for the MVRPC and CCS-TCC areas. These values represent un-factored travel demand model output. MVRPC includes the entire MPO area. For ozone runs, model VMT is factored to represent an average summer day using a seasonal factor of **1.08**.

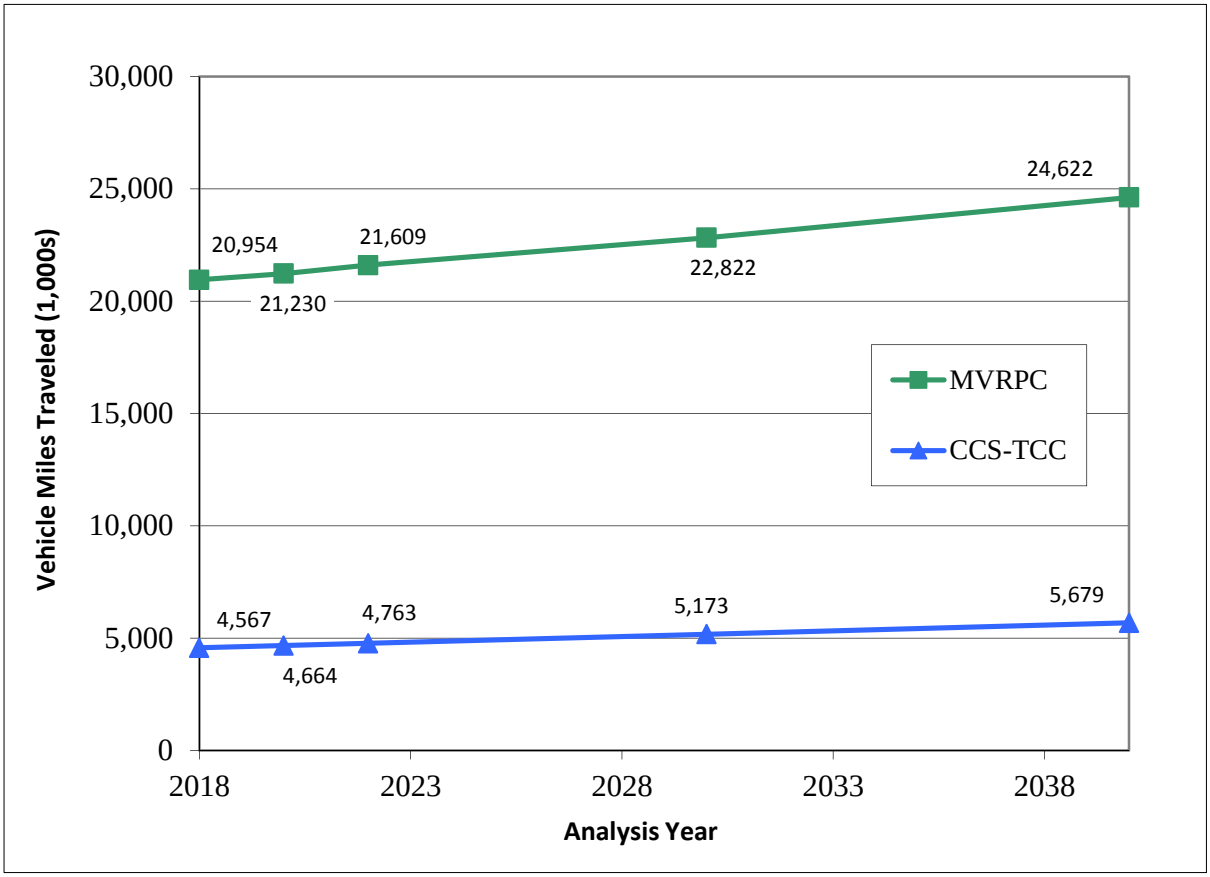

Figure 3 – Dayton/Springfield Region VMT Trends

3. Emission Factor Generation

Using MOVES, emission factor files were generated for years 2018, 2020, 2022, 2030, and 2040, representing the programs being implemented in the D/S Region and using the same assumptions that were agreed upon via interagency consultation for the PM 2.5 or ozone SIP respectively. Future year scenarios assume no I/M since the program was terminated in 2005. Tables 5-15 illustrate input and output files using year 2005 as an example. When assumptions differ between the PM 2.5 and ozone runs both versions are provided.

Technical Details

Table 5a and 5b summarize the settings used in the MOVES run specification file and the MOVES County-Data Manager. Further details in specific inputs that are not using default values are provided below.

Table 5a – MOVES Inputs – PM 2.5

RunSpec Parameter Settings	
MOVES Version	2010/08/26
Scale	Custom Domain
MOVES Modeling Technique	Emission Factor Method Rates per Distance Rates per Vehicle
Time Span	Time Aggregation: Hour 1 Month representing average annual temperatures All hours of day selected 16 speed bins Weekdays only
Geographic Bounds	Clark, Greene, and Montgomery Counties
Vehicles/Equipment	All source types, gasoline and diesel
Road Type	All road types including off-network
Pollutants and Processes	NO_x, All $PM_{2.5}$ categories, SO_2, Total Energy Consumption
Strategies	None
General Output	Units = grams, joules and miles
Output Emissions	Time = hour, Location = custom area, on-road emission rates by road type and source use type.
Advance Performance	None
County Data Manager Sources	
Source Type Population	Combination of local and default data Local data (2010) ODOT from motor vehicle registration Default data used for source types 41, 51, 54, 61, and 62 Future year growth rate based on MPO model Household growth rate.
Vehicle Type VMT	Combination of local and default data

	HPMSVTypeYear VMT = daily VMT from travel demand model monthVMTFraction = default dayVMTFraction=default hourVMTFraction=local
I/M Program	I/M program information applied for 2005 where applicable
Fuel Formulation	Default
Fuel Supply	Default Future runs will be modified for reformulated gas, RVP, etc. for summer analyses
Metereology Data	Local data obtained from NOAA National Climatic Data Center. Data will consist of monthly high and low temperatures and daily relative humidity for 2002.
Ramp Fraction	Using the base year travel demand model for VHT fractions. Future fractions will be assumed constant
Road Type Distribution	Use ODOT county summary VMT categorized by federal functional classes
Age Distribution	Combination of local and default data. Local data (2010) ODOT from motor vehicle registration Default data used for source types 41, 51, 54, 61, and 62 The same age distribution will be used for all analysis years
Average Speed Distribution	Default
Alternative Fuel Type	Default

Table 5b – MOVES Inputs – Ozone

RunSpec Parameter Settings	
MOVES Version	MOVES2010A
Scale	Custom Domain
MOVES Modeling Technique	Emission Factor Method Rates per Profile (grams/vehicle) Rates per Distance (grams/mile) Rates per Vehicle (grams/vehicle)
Time Span	Time Aggregation: Hour 1 Month representing average summer temperatures All hours of day selected 16 speed bins Weekdays only
Geographic Bounds	Clark, Greene, Miami, and Montgomery Counties
Vehicles/Equipment	All source types, gasoline and diesel
Road Type	All road types including off-network
Pollutants and Processes	Total Gaseous Hydrocarbons, Non-Methane Hydrocarbons, Volitile Organic Compounds, NO_x, NO, NO_2, Total Energy Consumption
Strategies	Default values with assumed CNG buses removed

General Output	Units = grams, joules and miles
Output Emissions	Time = hour, Location = custom area, on-road emission rates by road type and source use type.
Advance Performance	None
County Data Manager Sources	
Source Type Population	Combination of local and default data Local data (2010) ODOT from motor vehicle registration Default data used for source types 41, 51, 54, 61, and 62 Future year growth rate based on MPO model Household growth rate.
Vehicle Type VMT	Combination of local and default data HPMSVTypeYear VMT = daily VMT from travel demand model monthVMTFraction = default dayVMTFraction=default hourVMTFraction=local
I/M Program	I/M program information applied for 2002/2005 where applicable for all counties except Miami (Miami Co. is never had an I/M program)
Fuel Formulation	Default
Fuel Supply	Reformulated gas (7.8 RVP) for summer analyses
Metereology Data	Local data obtained from NOAA National Climatic Data Center. Data will consist of monthly high and low temperatures and daily relative humidity for 2002.
Ramp Fraction	Using the base year travel demand model for VHT fractions. Future fractions will be assumed constant
Road Type Distribution	Use ODOT county summary VMT categorized by federal functional classes
Age Distribution	Combination of local and default data. Local data (2010) ODOT from motor vehicle registration Default data used for source types 41, 51, 54, 61, and 62 The same age distribution will be used for all analysis years
Average Speed Distribution	Default
Alternative Fuel Type	Default

Temperature and Relative Humidity

Temperatures are representative of 2002 based on NOAA data from the National Climate Data Center website. Data for Wright Patterson AFB was used because it was the most complete compared to other airports in the non-attainment area. The single season PM 2.5 approach used average monthly hourly temperatures and the ozone runs used the average July hourly temperature. To get the correct format for MOVES, the data was entered into a spreadsheet provided by EPA which was designed to convert Mobile6 data to MOVES. Representative hourly temperatures and relative humidity distribution profiles can be seen in Table 6.

Table 6 – Temperature and Relative Humidity Data

	PM 2.5		Ozone	
Hour	Average Temperature	Average Relative Humidity	Average Temperature	Average Relative Humidity
1	47.9467	78	71.3367	78
2	46.8033	79	70.0883	78
3	45.905	80	69.1075	80
4	45.2517	79	68.3942	81
5	44.7617	81	67.8592	83
6	44.19	82	67.2350	85
7	43.7	82	66.7000	81
8	44.1083	77	67.1458	76
9	46.5583	71	69.8208	69
10	50.4783	66	74.1008	63
11	54.48	62	78.4700	58
12	57.91	58	82.2150	54
13	60.9317	57	85.5142	50
14	62.565	56	87.2975	48
15	63.1367	55	87.9217	47
16	63.3	55	88.1000	46
17	62.8917	57	87.6542	47
18	61.7483	58	86.4058	50
19	59.7883	62	84.2658	54
20	57.2567	66	81.5017	60
21	54.725	69	78.7375	66
22	52.52	72	76.3300	70
23	50.9683	75	74.6358	71
24	49.4167	76	72.9417	76

Ramp Fraction

Ramp fractions were derived using the base year travel demand model VHT fractions. Ramp fractions can be seen in Table 7. Base year fractions were assumed to apply to future years.

Table 7 – Ramp Fractions

roadTypeID	roadDesc	rampFraction
2	Rural Restricted Access	0.04
4	Urban Restricted Access	0.11

Source Type Population

Source type population is based on a combination of local and MOVES default data. Local data was provided by ODOT based on 2010 motor vehicle registration. Default data is used for source types 41, 51, 54, 61, and 62. Future year growth rate is based on MPO model household growth rate which is 0% in MVRPC. In Clark County cars are an independent variable to the travel demand model. The base year (2000) and the LP year (2040) are used to interpolate the number of cars for the needed analysis years in Clark County. Table 8 shows source type population for the analyzed counties in 2005. Miami County data is only used in the ozone emissions estimation. Also in the ozone calculations, the vehicle population is adjusted from average number of vehicles to the number of vehicles in a summer day. In the absence of data, a 1.08 factor, as agreed via interagency consultation and the same as for VMT is used. (Appendix A)

Table 8 – Source Type Population for year 2005

sourceTypeID	sourceTypeName	Clark	Greene	Miami	Montgomery
11	MotorCycle	8,341	9,014	7,967	25,096
21	Passenger Car	96,932	105,808	71,041	395,925
31	Passenger Truck	44,885	53,557	37,861	172,425
32	Light Commercial Truck	1,129	1,235	698	4,614
41	Intercity Bus	71	52	47	178
42	Transit Bus	17	14	7	66
43	School Bus	256	356	245	1,187
51	Refuse truck	44	36	28	138
52	Single Unit Short-haul Truck	68	46	26	119
53	Single Unit Long-haul Truck	133	124	238	169
54	Motor Home	214	172	136	665
61	Comb Short-haul Truck	877	478	443	1,789
62	Comb Long-haul Truck	1,009	550	510	2,058

I/M Program

The I/M program was turned "off" for analyses years after 2005.

Vehicle Age Distribution

Vehicle age distribution information was derived using Ohio Bureau of Motor Vehicle registration data for year 2010. The data was given to OEPA who supplied a VIN decoder that allowed ODOT to create correctly formatted MOVES inputs. MOVES default data is used for source types 41, 51, 54, 61, and 62. The registration data for all three counties in the non-attainment area were combined to create a regional vehicle age distribution file, see Table 9. The same age distribution will be used for all analysis years

Table 9 – Vehicle Age Distribution

yearid	sourcetypeid	ageid	ageFraction	sourcetypeid	ageid	ageFraction	sourcetypeid	ageid	ageFraction
2005	11	0	0.0018	21	17	0.0364	32	3	0.0708
2005	11	1	0.0214	21	18	0.0330	32	4	0.0678
2005	11	2	0.0551	21	19	0.0256	32	5	0.0341
2005	11	3	0.0702	21	20	0.0211	32	6	0.0268
2005	11	4	0.0831	21	21	0.0174	32	7	0.0330
2005	11	5	0.0782	21	22	0.0133	32	8	0.0332
2005	11	6	0.0617	21	23	0.0098	32	9	0.0367
2005	11	7	0.0775	21	24	0.0087	32	10	0.0497
2005	11	8	0.0569	21	25	0.0067	32	11	0.0525
2005	11	9	0.0506	21	26	0.0051	32	12	0.0406
2005	11	10	0.0429	21	27	0.0026	32	13	0.0411
2005	11	11	0.0328	21	28	0.0016	32	14	0.0348
2005	11	12	0.0241	21	29	0.0015	32	15	0.0745
2005	11	13	0.0205	21	30	0.0444	32	16	0.0526
2005	11	14	0.0215	31	0	0.0062	32	17	0.0408
2005	11	15	0.0164	31	1	0.0255	32	18	0.0354
2005	11	16	0.0136	31	2	0.0463	32	19	0.0267
2005	11	17	0.0124	31	3	0.0558	32	20	0.0215
2005	11	18	0.0089	31	4	0.0650	32	21	0.0245
2005	11	19	0.0082	31	5	0.0782	32	22	0.0156
2005	11	20	0.0079	31	6	0.0722	32	23	0.0135
2005	11	21	0.0086	31	7	0.0708	32	24	0.0102
2005	11	22	0.0091	31	8	0.0674	32	25	0.0107
2005	11	23	0.0125	31	9	0.0545	32	26	0.0066
2005	11	24	0.0186	31	10	0.0579	32	27	0.0039
2005	11	25	0.0172	31	11	0.0569	32	28	0.0014
2005	11	26	0.0147	31	12	0.0507	32	29	0.0007

yearid	sourcetypeid	ageid	ageFraction	sourcetypeid	ageid	ageFraction	sourcetypeid	ageid	ageFraction
2005	11	27	0.0169	31	13	0.0452	32	30	0.0094
2005	11	28	0.0249	31	14	0.0407	41	0	0.0000
2005	11	29	0.0168	31	15	0.0424	41	1	0.0282
2005	11	30	0.0950	31	16	0.0350	41	2	0.0466
2005	21	0	0.0063	31	17	0.0298	41	3	0.0791
2005	21	1	0.0237	31	18	0.0215	41	4	0.0819
2005	21	2	0.0347	31	19	0.0166	41	5	0.0819
2005	21	3	0.0428	31	20	0.0123	41	6	0.0636
2005	21	4	0.0439	31	21	0.0114	41	7	0.0734
2005	21	5	0.0478	31	22	0.0096	41	8	0.0381
2005	21	6	0.0504	31	23	0.0072	41	9	0.0678
2005	21	7	0.0527	31	24	0.0057	41	10	0.0664
2005	21	8	0.0548	31	25	0.0038	41	11	0.0438
2005	21	9	0.0523	31	26	0.0026	41	12	0.0297
2005	21	10	0.0571	31	27	0.0016	41	13	0.0226
2005	21	11	0.0570	31	28	0.0006	41	14	0.0212
2005	21	12	0.0519	31	29	0.0004	41	15	0.0480
2005	21	13	0.0518	31	30	0.0062	41	16	0.0367
2005	21	14	0.0489	32	0	0.0063	41	17	0.0155
2005	21	15	0.0535	32	1	0.0418	41	18	0.0071
2005	21	16	0.0432	32	2	0.0828	41	19	0.0353
2005	41	20	0.0226	43	6	0.0595	51	23	0.0086
2005	41	21	0.0056	43	7	0.0584	51	24	0.0086
2005	41	22	0.0056	43	8	0.0623	51	25	0.0000
2005	41	23	0.0071	43	9	0.0639	51	26	0.0086
2005	41	24	0.0085	43	10	0.0611	51	27	0.0043
2005	41	25	0.0155	43	11	0.0823	51	28	0.0000
2005	41	26	0.0127	43	12	0.0656	51	29	0.0000
2005	41	27	0.0014	43	13	0.0506	51	30	0.0385
2005	41	28	0.0056	43	14	0.0183	52	0	0.0043
2005	41	29	0.0042	43	15	0.0222	52	1	0.0343
2005	41	30	0.0243	43	16	0.0183	52	2	0.0343
2005	42	0	0.0103	43	17	0.0167	52	3	0.1159
2005	42	1	0.0000	43	18	0.0178	52	4	0.0730
2005	42	2	0.0515	43	19	0.0178	52	5	0.0472
2005	42	3	0.0412	43	20	0.0167	52	6	0.0472
2005	42	4	0.0309	43	21	0.0156	52	7	0.0815
2005	42	5	0.0928	43	22	0.0117	52	8	0.1373
2005	42	6	0.0309	43	23	0.0133	52	9	0.0429
2005	42	7	0.0412	43	24	0.0117	52	10	0.0386
2005	42	8	0.0412	43	25	0.0078	52	11	0.0472

yearid	sourcetypeid	ageid	ageFraction	sourcetypeid	ageid	ageFraction	sourcetypeid	ageid	ageFraction
2005	42	9	0.1237	43	26	0.0044	52	12	0.0386
2005	42	10	0.0412	43	27	0.0061	52	13	0.0343
2005	42	11	0.0412	43	28	0.0006	52	14	0.0129
2005	42	12	0.0515	43	29	0.0028	52	15	0.0258
2005	42	13	0.0515	43	30	0.0093	52	16	0.0258
2005	42	14	0.0515	51	0	0.0043	52	17	0.0172
2005	42	15	0.0412	51	1	0.0343	52	18	0.0258
2005	42	16	0.0412	51	2	0.0343	52	19	0.0258
2005	42	17	0.0103	51	3	0.1159	52	20	0.0129
2005	42	18	0.0412	51	4	0.0730	52	21	0.0043
2005	42	19	0.0515	51	5	0.0472	52	22	0.0043
2005	42	20	0.0206	51	6	0.0472	52	23	0.0086
2005	42	21	0.0000	51	7	0.0815	52	24	0.0086
2005	42	22	0.0309	51	8	0.1373	52	25	0.0000
2005	42	23	0.0103	51	9	0.0429	52	26	0.0086
2005	42	24	0.0106	51	10	0.0386	52	27	0.0043
2005	42	25	0.0103	51	11	0.0472	52	28	0.0000
2005	42	26	0.0103	51	12	0.0386	52	29	0.0000
2005	42	27	0.0000	51	13	0.0343	52	30	0.0385
2005	42	28	0.0103	51	14	0.0129	53	0	0.0043
2005	42	29	0.0000	51	15	0.0258	53	1	0.0343
2005	42	30	0.0107	51	16	0.0258	53	2	0.0343
2005	43	0	0.0534	51	17	0.0172	53	3	0.1159
2005	43	1	0.0361	51	18	0.0258	53	4	0.0730
2005	43	2	0.0400	51	19	0.0258	53	5	0.0472
2005	43	3	0.0539	51	20	0.0129	53	6	0.0472
2005	43	4	0.0523	51	21	0.0043	53	7	0.0815
2005	43	5	0.0495	51	22	0.0043	53	8	0.1373
2005	53	10	0.0386	54	26	0.0226	62	11	0.0716
2005	53	11	0.0472	54	27	0.0151	62	12	0.0508
2005	53	12	0.0386	54	28	0.0108	62	13	0.0339
2005	53	13	0.0343	54	29	0.0064	62	14	0.0329
2005	53	14	0.0129	54	30	0.1363	62	15	0.0277
2005	53	15	0.0258	61	0	0.0015	62	16	0.0195
2005	53	16	0.0258	61	1	0.0124	62	17	0.0102
2005	53	17	0.0172	61	2	0.0270	62	18	0.0080
2005	53	18	0.0258	61	3	0.0335	62	19	0.0052
2005	53	19	0.0258	61	4	0.0436	62	20	0.0058
2005	53	20	0.0129	61	5	0.0460	62	21	0.0056
2005	53	21	0.0043	61	6	0.0550	62	22	0.0026
2005	53	22	0.0043	61	7	0.0601	62	23	0.0009

yearid	sourcetypeid	ageid	ageFraction		sourcetypeid	ageid	ageFraction		sourcetypeid	ageid	ageFraction
2005	53	23	0.0086		61	8	0.0536		62	24	0.0017
2005	53	24	0.0086		61	9	0.0496		62	25	0.0017
2005	53	25	0.0000		61	10	0.0533		62	26	0.0013
2005	53	26	0.0086		61	11	0.0527		62	27	0.0002
2005	53	27	0.0043		61	12	0.0453		62	28	0.0004
2005	53	28	0.0000		61	13	0.0489		62	29	0.0002
2005	53	29	0.0000		61	14	0.0407		62	30	0.0013
2005	53	30	0.0385		61	15	0.0439				
2005	54	0	0.0048		61	16	0.0443				
2005	54	1	0.0148		61	17	0.0315				
2005	54	2	0.0268		61	18	0.0307				
2005	54	3	0.0365		61	19	0.0282				
2005	54	4	0.0423		61	20	0.0237				
2005	54	5	0.0482		61	21	0.0273				
2005	54	6	0.0504		61	22	0.0278				
2005	54	7	0.0431		61	23	0.0179				
2005	54	8	0.0413		61	24	0.0183				
2005	54	9	0.0418		61	25	0.0130				
2005	54	10	0.0499		61	26	0.0096				
2005	54	11	0.0487		61	27	0.0056				
2005	54	12	0.0454		61	28	0.0046				
2005	54	13	0.0336		61	29	0.0034				
2005	54	14	0.0355		61	30	0.0470				
2005	54	15	0.0381		62	0	0.0045				
2005	54	16	0.0292		62	1	0.0448				
2005	54	17	0.0235		62	2	0.0074				
2005	54	18	0.0171		62	3	0.1062				
2005	54	19	0.0148		62	4	0.1088				
2005	54	20	0.0169		62	5	0.1557				
2005	54	21	0.0209		62	6	0.0692				
2005	54	22	0.0234		62	7	0.0424				
2005	54	23	0.0230		62	8	0.0478				
2005	54	24	0.0200		62	9	0.0504				
2005	54	25	0.0188		62	10	0.0813				

Road Type Distribution

Road type distribution is based on the 2008 ODOT, county summary, HPMS VMT data categorized by federal functional class for the three county non-attainment area. Road type distribution can be seen in Table 10.

Table 10 – Road Type Distribution

sourceTypeID	roadTypeID	roadTypeVMTFraction		sourceTypeID	roadTypeID	roadTypeVMTFraction
11	1	0		43	4	0.29
11	2	0.06		43	5	0.52
11	3	0.13		51	1	0
11	4	0.29		51	2	0.06
11	5	0.52		51	3	0.13
21	1	0		51	4	0.29
21	2	0.06		51	5	0.52
21	3	0.13		52	1	0
21	4	0.29		52	2	0.06
21	5	0.52		52	3	0.13
31	1	0		52	4	0.29
31	2	0.06		52	5	0.52
31	3	0.13		53	1	0
31	4	0.29		53	2	0.06
31	5	0.52		53	3	0.13
32	1	0		53	4	0.29
32	2	0.06		53	5	0.52
32	3	0.13		54	1	0
32	4	0.29		54	2	0.06
32	5	0.52		54	3	0.13
41	1	0		54	4	0.29
41	2	0.06		54	5	0.52
41	3	0.13		61	1	0
41	4	0.29		61	2	0.06
41	5	0.52		61	3	0.13
42	1	0		61	4	0.29
42	2	0.06		61	5	0.52
42	3	0.13		62	1	0
42	4	0.29		62	2	0.06
42	5	0.52		62	3	0.13
43	1	0		62	4	0.29
43	2	0.06		62	5	0.52
43	3	0.13				

Vehicle Type VMT and VMT Fractions

The first component of the VMT inputs is the Yearly HPMS VMT, but the travel demand model was used instead of ODOT's HMPS data since it was felt that the model would better predict future year VMT. ODOT's CMS post-processor was run for each year to generate congestion reports, which includes total daily VMT. The vehicle type percentages of the total VMT were based on ODOT's weigh-in-motion (WIM) data. Since there are not enough WIM stations for lower class facilties in the non-attainment area, a statewide average of all ODOT WIM data collectors was used. Daily VMT was then converted to yearly. Yearly HPMS VMT for 2005 can be seen in Table 11. The same method was to generate all other analysis years

Table 11 – Yearly HPMS VMT for 2005

HPMSVtypeID	yearID	HPMSBaseYearVMT	baseYearOffNetVMT
10	2005	30590102	0
20	2005	5455503318	0
30	2005	1683283544	0
40	2005	17205399	0
50	2005	127192033	0
60	2005	301977250	0

Monthly and daily VMT fractions used MOVES default data. The hourly VMT fractions were derived from ODOT WIM data. Hourly VMT fractions vary for each of the five MOVES road types but do not change for each of the 16 MOVES source types. A representative sample of the hour VMT fraction input file can be seen in Table 12, the entire file is too large to include in this document.

Table 12 – Hourly VMT Fractions

sourceTypeID	roadTypeID	dayID	hourID	hourVMTFraction
11	1	2	1	0.0089
11	1	2	2	0.00564
11	1	2	3	0.00424
11	1	2	4	0.00427
11	1	2	5	0.00695
11	1	2	6	0.01798
11	1	2	7	0.03806
11	1	2	8	0.057
11	1	2	9	0.05773
11	1	2	10	0.05538
11	1	2	11	0.05554
11	1	2	12	0.05558
11	1	2	13	0.05584
11	1	2	14	0.06051

sourceTypeID	roadTypeID	dayID	hourID	hourVMTFraction
11	1	2	15	0.06765
11	1	2	16	0.07755
11	1	2	17	0.08428
11	1	2	18	0.0797
11	1	2	19	0.06012
11	1	2	20	0.04522
11	1	2	21	0.03646
11	1	2	22	0.02912
11	1	2	23	0.02142
11	1	2	24	0.01486
11	2	2	1	0.0089
11	2	2	2	0.00564
11	2	2	3	0.00424
11	2	2	4	0.00427
11	2	2	5	0.00695
11	2	2	6	0.01798
11	2	2	7	0.03806
11	2	2	8	0.057
11	2	2	9	0.05773
11	2	2	10	0.05538
11	2	2	11	0.05554
11	2	2	12	0.05558
11	2	2	13	0.05584
11	2	2	14	0.06051
11	2	2	15	0.06765
11	2	2	16	0.07755
11	2	2	17	0.08428
11	2	2	18	0.0797
11	2	2	19	0.06012
11	2	2	20	0.04522
11	2	2	21	0.03646
11	2	2	22	0.02912
11	2	2	23	0.02142
11	2	2	24	0.01486
11	3	2	1	0.00655
11	3	2	2	0.0037
11	3	2	3	0.00304
11	3	2	4	0.00363

sourceTypeID	roadTypeID	dayID	hourID	hourVMTFraction
11	3	2	5	0.00792
11	3	2	6	0.02343
11	3	2	7	0.04899
11	3	2	8	0.06319
11	3	2	9	0.05402
11	3	2	10	0.05121
11	3	2	11	0.0528
11	3	2	12	0.05608
11	3	2	13	0.05814
11	3	2	14	0.05875
11	3	2	15	0.06676
11	3	2	16	0.07812
11	3	2	17	0.08469
11	3	2	18	0.08152
11	3	2	19	0.05852
11	3	2	20	0.04343
11	3	2	21	0.03606
11	3	2	22	0.02829
11	3	2	23	0.01883
11	3	2	24	0.01233
11	4	2	1	0.00752
11	4	2	2	0.0044
11	4	2	3	0.00354
11	4	2	4	0.00374
11	4	2	5	0.00705
11	4	2	6	0.02123
11	4	2	7	0.054
11	4	2	8	0.0768
11	4	2	9	0.06545
11	4	2	10	0.05114
11	4	2	11	0.04692
11	4	2	12	0.04916
11	4	2	13	0.05112
11	4	2	14	0.0534
11	4	2	15	0.06105
11	4	2	16	0.07421
11	4	2	17	0.08321
11	4	2	18	0.08385
11	4	2	19	0.06062

sourceTypeID	roadTypeID	dayID	hourID	hourVMTFraction
11	4	2	20	0.04229
11	4	2	21	0.03442
11	4	2	22	0.0292
11	4	2	23	0.02137
11	4	2	24	0.01431
11	5	2	1	0.00678
11	5	2	2	0.00378
11	5	2	3	0.00295
11	5	2	4	0.0029
11	5	2	5	0.00498
11	5	2	6	0.01422
11	5	2	7	0.03449
11	5	2	8	0.05728
11	5	2	9	0.05435
11	5	2	10	0.04991
11	5	2	11	0.05261
11	5	2	12	0.06098
11	5	2	13	0.06457
11	5	2	14	0.06387
11	5	2	15	0.06812
11	5	2	16	0.07672
11	5	2	17	0.08274
11	5	2	18	0.08284
11	5	2	19	0.06344
11	5	2	20	0.04866
11	5	2	21	0.0407
11	5	2	22	0.03083
11	5	2	23	0.01966
11	5	2	24	0.01262

Output Emission Factors

Tables 13a-b show the first record in a MOVES sample output (rate per distance) emission file for PM 2.5 and ozone respectively. For any given month, day of week, hour of the day, pollutant, and process; the rate per distance varies by road type, and speed bin. Rates per distance emissions are applied to link and intrazonal VMT.

Table 13a – Sample Emission File (Rate per Distance) – PM 2.5

Heading:	MOVESScenarioID	MOVESRunID	yearID	monthID	dayID	hourID
Record:	OhioCustomDomain	5	2005	4	5	1
Heading:	linkID	pollutantID	processID	sourceTypeID	SCC	fuelTypeID
Record:	990570201	3	1	0		0
Heading:	modelYearID	roadTypeID	avgSpeedBinID	temperature	relHumidity	ratePerDistance
Record:	0	2	1	47.9467	78	19.2283

Table 13b – Sample Emission File (Rate per Distance) – Ozone

Heading:	MOVESScenarioID	MOVESRunID	yearID	monthID	dayID	hourID
Record:			2005	7	5	1
Heading:	linkID	pollutantID	processID	sourceTypeID	SCC	fuelTypeID
Record:		87	0	1		0
Heading:	modelYearID	roadTypeID	avgSpeedBinID	temperature	relHumidity	ratePerDistance
Record:	0	2	1			6.90740776

Table 14a-b show the first record in a MOVES sample output (rate per vehicle) emission file for for PM 2.5 and ozone respectively. The rate per vehicle varies for any combinations of month, day of week, hour of the day, pollutant, and process. Rates per vehicle emissions are applied to the vehicle source type population.

Table 14a – Sample Emission File (Rate per Vehicle) – PM2.5

Heading:	MOVESScenarioID	MOVESRunID	yearID	monthID	dayID
Record:	OhioCustomDomain	5	2005	4	5
Heading:	hourID	zoneID	pollutantID	processID	sourceTypeID
Record:	1	990570	3	2	0
Heading:	SCC	fuelTypeID	modelYearID	temperature	ratePerVehicle
Record:		0	0	47.9467	0.0678071

Table 14b – Sample Emission File (Rate per Vehicle) – Ozone

Heading:	MOVESScenarioID	MOVESRunID	yearID	monthID	dayID
Record:			2005	7	5
Heading:	hourID	zoneID	pollutantID	processID	sourceTypeID
Record:	1		87		1
Heading:	SCC	fuelTypeID	modelYearID	temperature	ratePerVehicle
Record:		0	0		0.27257887

Table 15 shows the first record in a MOVES sample output (rate per profile) emission. The rate per vehicle varies for any combinations of month, day of week, hour of the day, pollutant, and process. Rates per profile emissions are applied to the vehicle souce type population for ozone runs only.

Table 15 – Sample Emission File (Rate per Profile) – Ozone

Heading:	MOVESScenarioID	MOVESRunID	yearID	monthID	dayID
Record:			2005	0	5
Heading:	hourID	zoneID	pollutantID	processID	sourceTypeID
Record:	1		87	0	1
Heading:	SCC	fuelTypeID	modelYearID	temperature	ratePerVehicle
Record:		0	0		0.01774139

4. Post Processing

Total emissions were computed with the aid of several custom programs by ODOT. The process uses data on daily and directional traffic distributions as well as more up to date volume/delay functions from the 2000 Highway Capacity Manual (HCM). This process, described below and illustrated in Figure 4, also uses rewritten code able to handle the newer model network formats and MOVES generated emission factors.

The first step in the the process involves running postcms.exe to calculate hourly link volumes based on the percentage of the daily volume (travel demand model output) determined by a link's facility and area type. Link speeds from the travel demand model are not used in the analysis. The speeds are estimated as a post-process to the model based on HCM methods using a link's volume-to-capacity ratio and link group code. The daily to hourly volume conversion percentages and speed tables can be seen in **Appendix B.1.**

The second step (mmoves.exe) uses a combination of the MOVES emission factors and the hourly link volumes that are output of the postcms.exe program. The hourly volumes are multiplied by the MOVES emission factor for the corresponding hour of day, speed bin, and roadtype to calculate emissions for every network link for each hour. The final link on road vehicle emissions for the area is the sum of all individual link-hour emissions.

The third step, (vehcalm.exe), calculates vehicle-based emissions for each source type for each hour of the day. The vehicle source type is based on a combination of local and default data. The final vehicle emissions for each county are the sum of all individual hourly emissions for all vehicle types.

Intrazonal trips do not get loaded onto the network, so the fourth step in the process requires a separate method to account for those trips that use local roads to travel within a zone. The intracalm.exe program uses intrazonal trips to estimate VMT using the area in square miles and intrazonal trips of each zone. The zone is assumed circular and the radius of the circle is used as the average trip length for these intrazonal trips. Intrazonal emissions are then calculated by combining MOVES generated emissions with estimated intrazonal VMT. The emission rates are the same as those used to calculated link based emissions.

The final step is to summarize link, vehicle, and intrazonal emissions for each county, pollutant, and analyzed year, and to multiply annual average daily emissions by 365 to produce an annual estimate if appropriate. Daily summary emissions for each pollutant, county, and scenario year in the Dayton Springfield Region can be found in **Appendix B.2 and B.3** for PM 2.5 and ozone respectively.

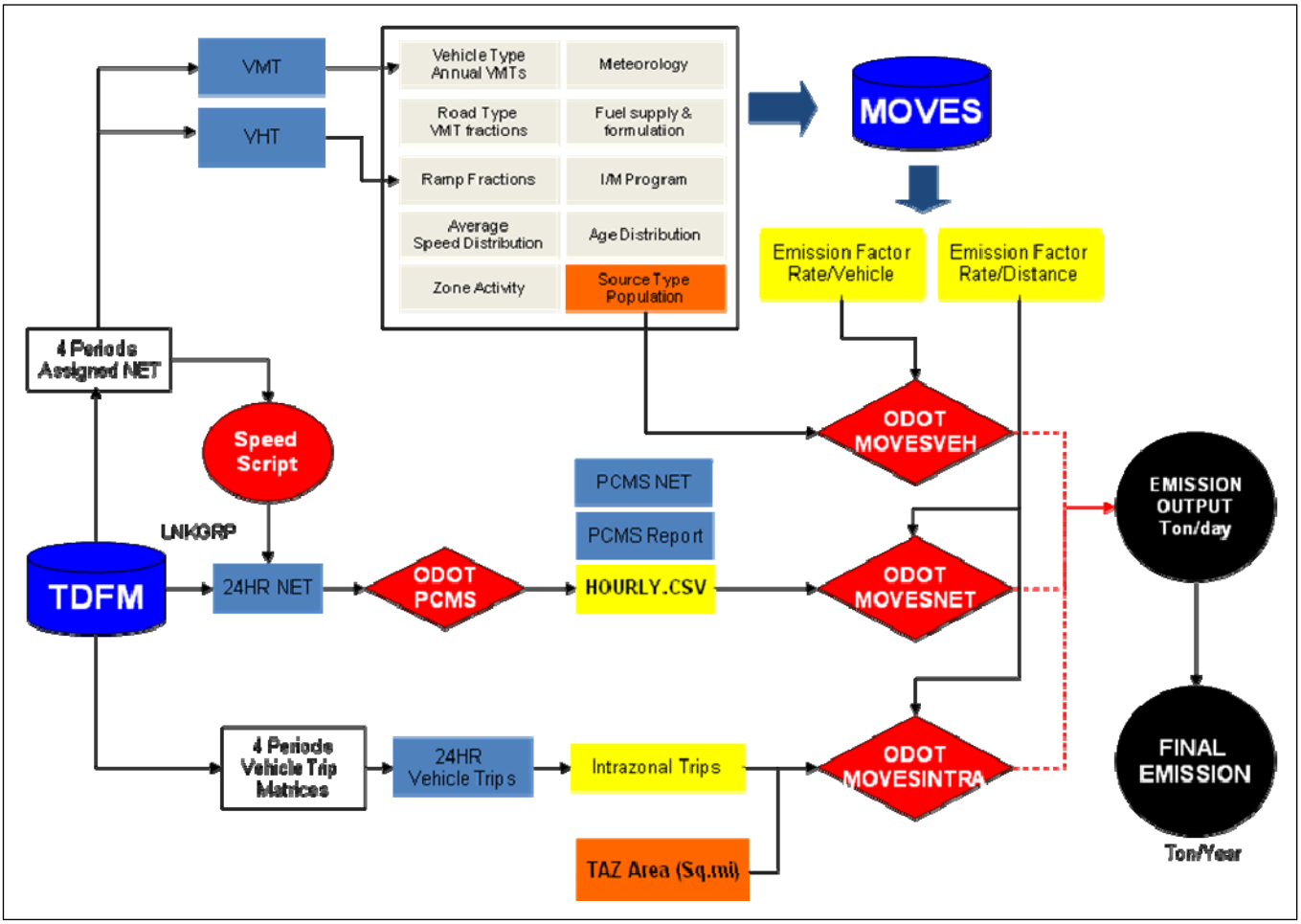

Figure 4 – Emission Calculation Process

5. Multiple MPO Coordination Issues

CCS-TCC, MVRPC, ODOT, and OEPA have a long history of working together in air quality issues, the Memorandum of Understanding, listed below, documents these working relationships.

- Memorandum of Understanding among the MVRPC, the CCS-TCC, the OKI Regional Council of Governments, the OEPA, the ODOT, the U.S. EPA-Region 5, the FHWA-Ohio Division, and the FTA-Region 5. The final memorandum was signed by all parties and completed on July 2014.

Appendix A

Interagency Consultation Documentation

11/8/10 Call
Interagency Consultation
Annual PM2.5 Redesignations Planning
Dayton-Springfield Area

Minutes

Participants:
Nino Brunello - ODOT
Ana Ramirez - MVRPC
Lamar Daniel – Clark County
Patricia Morris – USEPA Region 5
Carolina Prado – Ohio EPA

Call objective:

- Annual PM2.5 redesignation planning for the Dayton-Springfield nonattainment area.
- Model mobile emissions for PM2.5, NOx and SO2.
- Years to be model: 2005 (base nonattainment year), 2008 (attainment year), 2015 (interim budget year), and 2022 (maintenance budget year).
- Agree upon responsibilities and timing for the generation of on-road (mobile) emissions as part of the annual PM2.5 redesignation requirements for the Dayton-Springfield area.

Agreements:

- ODOT will develop the Emission Model database and submit it to MVRPC.
- MVRPC will develop the Travel Model database and combine it with the Emission Model to run MOVES.
- ODOT will develop Dayton-Springfield assumptions document similar to those used in the Columbus area assumptions protocol. MVRPC will assist as needed.
- MVRPC will provide final protocol write up on the procedures, steps and assumptions used to run MOVES and obtain mobile emissions.
- OEPA will review data and justify, if appropriate, insignificance of SO2.

Timeline:

November 17, 2010 – ODOT will submit assumptions protocol draft to OEPA for distribution for comments.
November 23, 2010 – All IAC group comments on protocol assumptions should be sent back to ODOT.

December 7, 2010 – ODOT will distribute final protocol assumptions.
Mid December 2010 – ODOT will have Emission Model completed.
Mid January 2010 – MVRPC will have mobile emissions runs completed and write-up. Will be provided to OEPA.

OEPA will provide notice to all persons on this list when draft redesignation request out for comment.

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*Margin of safety to be added to 2015 and 2022 mobile budgets will be discussed in next call.

Next Call Dayton-Springfield redesignation
Carolina Prado [Carolina.Prado@epa.state.oh.us]
Sent: Wed 11/10/2010 4:35 PM
To: ldaniel@clarkcountyohio.gov; Leigh.Oesterling@dot.gov; Nino.Brunello@dot.state.oh.us; Patricia Morris; Jennifer Hunter; aramirez@nvroc.org

IAC group,

Based on your responses to my previous email, our next PM2.5 redesignation call for the Dayton-Springfield area will on December 14, 2010 at 10:00am EST Please call 614 387-7405

Thanks,
Carolina

Carolina M. Prado
State Implementation Plan (SIP) Development Ohio EPA, Division of Air Pollution Control 614-644-2310 Carolina.Prado@epa.state.oh.us

Fine Particulate Matter ($PM_{2.5}$), Annual Standard

Several parameters have been identified for use in the preparation of this analysis. The parameters listed below will be applied in the base MOVES setup:

- Pollutants to be monitored: SO_2, NO_x, and $PM_{2.5}$
- Model years: 2005, 2008 (leap year), 2015, and 2022 (reflecting the most recent correspondence from EPA)
- MOVES modeling technique: Emission Factor method
    - Rates per Distance
    - Rates per Vehicle
    - (Rates per Profile are used only for VOCs)
- Scale: Custom domain
- Time Span:
    - Time aggregation: Hour
    - 1 month representing average annual temperatures
    - All hours of day selected
    - 16 speed bins
    - Weekdays only
- Geographic Bounds: Custom Domain – all counties in the MORPC area
- Vehicles/Equipment: All source types, gasoline and diesel
- Road Type: All road types including off-network
- Pollutants and Processes: NO_x, All $PM_{2.5}$ categories, SO_2, Total Energy Consumption
- Strategies: none
- General Output: Units = grams, joules and miles
- Output Emissions: Time = hour, Location = custom area, on-road emission rates by road type and source use type.
- Advanced Performance: none

The following assumptions will be applied within the County Data Manager portion of the MOVES software package. Each parameter is identified, along with the source data that will be applied (if applicable).

- Source Type Population: Combination of local and default data. Local data (2010) ODOT from motor vehicle registration data. Default data used for source types 41, 61, and 62. Future year growth rate based on MPO model variable Household growth rate
- Vehicle Type VMT: Combination of local and default data. HPMSVTypeYear VMT = daily VMT from travel demand model with EPA's daily to annual VMT converter applied. monthVMTFraction = default. dayVMTFraction=default. hourVMTFraction=local.
- I/M Programs: I/M program information will be applied for 2005 where applicable.

- Fuel Formulation: Modify diesel sulfur fraction to match previous MOBILE inputs. Future runs will also be modified for reformulated gas, RVP, etc. for summer analyses.
- Fuel Supply: Using MOVES default data.
- Meteorology Data: Local data obtained from NOAA National Climatic Data Center. Data will consist of monthly high and low temperatures and daily relative humidity.
- Ramp Fraction: Using the base year travel demand model for VHT fractions. Future fractions will be assumed constant.
- Road Type Distribution: Use ODOT (and some WVDOT) county summary VMT categorized by federal functional classes
- Age Distribution: Combination of local and default data. Local data (2010) ODOT from motor vehicle registration data (also some WVDO data). Default data used for source types 41, 51, 54, 61, and 62. The same age distribution will be used for all analysis years.
- Average Speed Distribution: Using MOVES default data. Data source does not matter because it is ignored when calculating emission rates.
- Alternative Fuel Vehicle Types: Default file will be modified to reflect any CNG buses.

-----Original Message-----
From: Carolina Prado [mailto:Carolina.Prado@epa.state.oh.us]
Sent: Tuesday, December 14, 2010 2:44 PM
To: ldaniel@clarkcountyohio.gov; Leigh.Oesterling@dot.gov; Dave Moore; Nino.Brunello@dot.state.oh.us; Patricia Morris; Ramirez, Ana; Andy Roth
Cc: Jennifer Hunter
Subject: NEXT CALL: Dayton-Springfield redesignation

Thanks for your participation in today's call.

We will have a follow-up call on January 18, 2011 (Tuesday) at 10:00 AM EST.
The call in number is 614-387-7405, no access code required.

Thanks,
Carolina

Carolina M. Prado
State Implementation Plan (SIP) Development
Ohio EPA, Division of Air Pollution Control
614-644-2310
Carolina.Prado@epa.state.oh.us

-----Original Message-----
From: Carolina Prado [mailto:Carolina.Prado@epa.state.oh.us]
Sent: Monday, January 24, 2011 12:23 PM
To: ldaniel@clarkcountyohio.gov; leigh.oesterling@dot.gov; Dave Moore; Nino.Brunello@dot.state.oh.us; Patricia Morris; Jennifer Hunter; smapel@lcounty.com; cparasa@morpc.org; ngill@morpc.org; Ramirez, Ana; Andy Roth
Subject: Follow up call PM2.5 redesigantion - Columbus and Dayton areas

Based on our 1/18 conference call we are in target to get all the mobile information by the end of January!!
We will like to setup a follow up call on February 8th* at 1:00PM only if we do not get the agreed information. MORPC and MVRPC are in charge of sending the final mobile numbers.

*During our last call we agreed on having a follow up call on Feb 7, unfortunately we had to move it one day due to the lack of enough phone lines.

Please call 614-644-4743)

Thanks,

Carolina M. Prado
State Implementation Plan (SIP) Development
Ohio EPA, Division of Air Pollution Control
614-644-2310
Carolina.Prado@epa.state.oh.us

Dayton-Springfield Ozone SIP MOVES Update
Minutes 8/24/2011

Attending: ODOT employees Dave Moore, Monica Drake, Mark Byram, Nino Brunello, and Andrew Shepler, Jennifer Hunter - OEPA, Pat Morris – US EPA, Ana Ramirez – MVRPC, Scott Schmidt – CCSTCC, Lamar Daniel – CCSTCC.

This air quality interagency consultation conference call was held to coordinate development of revision to the Dayton/Springfield 8-Hour Ozone SIP Maintenance Plan. The SIP revision will update the mobile source HC and NOx budgets to reflect US EPA's new MOVES software emission results. The SIP revision will be reviewed and approved via the federal register process.

Pat Morris confirmed that a full SIP revision is needed. She also confirmed that only the mobile source emissions will be updated, not point, area, etc.
Analysis years will be consistent with the existing Ozone SIP:

- 2002 - base year
- 2005 - attainment and budget year
- 2009 - interim non-budget analysis year
- 2018 - out year budget

Pat Morris confirmed that these four years are acceptable. When asked about using fewer years, Pat stated that it is helpful to have the runs for all four years.

Temperature and humidity inputs for the Ozone SIP Update will be consistent with the existing Ozone SIP, reflecting an average day in July. The existing SIP reflected temperature data from the ten hottest days of summer, 2002. Temperature minimum and maximum were provided by OEPA, correspondence is on file at ODOT and included in technical MPO memos. For MOBILE6 runs, hourly temperatures were established based on a daily profile ODOT developed from NOAA data. The MOBILE to MOVES translator applies a daily temperature profile in a similar manner and will be used for this SIP update.

Ana Ramirez asked Nino Brunello to prepare a protocol document recording the analysis input parameters to use as a guide for the technical documentation that MVRPC will produce. Nino agreed to transmit the document the week of August 29.

Latest Planning Assumptions:
Latest land use and population assumptions will be used. Therefore, 2018 forecasts will reflect the latest socio-economic conditions based on the 2010 Census and current Transportation Plan.

Emissions parameters will be consistent with the MOBILE based SIP runs, as follows:
2002 & 2005 will reflect E-check
2009 & 2018 will reflected RVP 7.8

A safety margin was not included in 2005. Pat Morris said that a safety margin could be added in future years if necessary. It was determined that the safety margins would be added if necessary after the runs are completed. 2005 will also be looked at prior to submission of the SIP.

Nino requested that for Ozone emissions, MOVES emission factors by source type (ie vehicle class) be used instead of the aggregated emission factors that have been used for PM2.5 analyses. This is a more detailed approach which should produce more accurate results, more defensible results. This request was approved. MVRPC agreed contingent on the results of comparisons between aggregate versus disaggregate emission factor methods. To insure deadlines are met, Nino will run the aggregate methodology first in case he runs into problems with the more detailed disaggregate methodology.

The schedule was discussed.

1) Emission factors will be provided to MVRPC by ODOT by mid-September.
2) Information would need to be submitted to OEPA & US EPA by mid-November.
3) The deadline for approved budgets is mid-February. OEPA will need three months to process.
4) US EPA will complete as much as possible concurrently with OEPA. Pat Morris stated that she will need 90 days and will need approval by OPEA to complete the budgets for approval.
5) The conformity finding needs to be complete by August 1, 2012.

The meeting concluded following the schedule discussion.

MOVES Ozone Inputs Technical Details

The summaries and the settings used in the MOVES run specification file and the MOVES County-Data Manager are shown below. Further details in specific inputs that are not using default values are provided below.

Parameters used for ozone analyses are similar to those used for PM analyses with the exception of: pollutants, additional profile emissions, analysis month, and the use of consecutive hourly temperature differences for calculation of the vapor venting process.

Instead of using average emission rates for the entire vehicle fleet, total emissions by individual source types will be calculated.

RunSpec Parameter Settings	
MOVES Version	MOVES2010A
Scale	Custom Domain
MOVES Modeling Technique	Emission Factor Method Rates per Profile (grams/vehicle) Rates per Distance (grams/mile) Rates per Vehicle (grams/vehicle)
Time Span	Time Aggregation: Hour 1 Month representing average summer temperatures All hours of day selected 16 speed bins Weekdays only
Geographic Bounds	Clark, Greene, Miami, and Montgomery Counties
Vehicles/Equipment	All source types, gasoline and diesel
Road Type	All road types including off-network
Pollutants and Processes	Total Gaseous Hydrocarbons, Non-Methane Hydrocarbons, Volitile Organic Compounds, NO_x, NO, NO_2, Total Energy Consumption
Strategies	None
General Output	Units = grams, joules and miles
Output Emissions	Time = hour, Location = custom area, on-road emission rates by road type and source use type.
Advance Performance	None

County Data Manager Sources	
Source Type Population	Combination of local and default data Local data (2010) ODOT from motor vehicle registration Default data used for source types 41, 51, 54, 61, and 62 Future year growth rate based on MPO model Household growth rate.
Vehicle Type VMT	Combination of local and default data HPMSVTypeYear VMT = daily VMT from travel demand model monthVMTFraction = default dayVMTFraction=default hourVMTFraction=local
I/M Program	I/M program information applied for 2002/2005 where applicable for all counties except Miami (Miami Co. is never had an I/M program)
Fuel Formulation	Default
Fuel Supply	Reformulated gas (RVP) for summer analyses
Metereology Data	Local data obtained from NOAA National Climatic Data Center. Data will consist of monthly high and low temperatures and daily relative humidity for 2002.
Ramp Fraction	Using the base year travel demand model for VHT fractions. Future fractions will be assumed constant
Road Type Distribution	Use ODOT county summary VMT categorized by federal functional classes
Age Distribution	Combination of local and default data. Local data (2010) ODOT from motor vehicle registration Default data used for source types 41, 51, 54, 61, and 62 The same age distribution will be used for all analysis years
Average Speed Distribution	Default
Alternative Fuel Type	Default

From: Brunello, Nino [mailto:Nino.Brunello@dot.state.oh.us]
Sent: Thursday, April 19, 2012 2:30 PM
To: PJividen@AkronOhio.gov; CBaker@akronohio.gov; Jeff Dutton; Bill Davis; Nick Gill (NGILL@morpc.org); Ramirez, Ana; Saleem Salameh; Lima (tmazur@lacrpc.com); smapel@lcounty.com; 'randy.durst@movrc.org' (randy.durst@movrc.org); sschmid@clarkcountyohio.gov; mikepap@bhjmpc.org; David Gedeon; rsharma@belomar.org; krodi@eastgatecog.org
Cc: Fred Durham; Dines, Jennifer; Patricia Morris (Morris.Patricia@epamail.epa.gov) (Morris.Patricia@epamail.epa.gov); Moore, Dave; Byram, Mark
Subject: FW: Ozone Summer Day Factors

All:

After discussions with ODOT, OEPA, WVDEP, and USEPA, we are of the opinion that there needs to be an additional seasonal factor for summer when calculating ozone pollutants.

There is currently an adjustment for increasing average daily VMT (+ 8%) which was used in previously when using Moblie6 to generate emission factors. With MOVES, there is a vehicle component used in addition to VMT, so there needs to be an adjustment from average number of vehicles to the number of vehicles in summer day. We propose to use the same 8% increase.

We need to have an inter-agency agreement on this, and would prefer to do it via email (to make it easier on all of us). Please respond with your approval and/or questions.

Thanks,

~~~~~~
Nino Brunello, P.E.
Modeling & Forecasting Section
Division of Planning
Ohio Department of Transportation
(614) 752-5742

From: Dines, Jennifer
Sent: Thursday, April 12, 2012 9:04 AM
To: Brunello, Nino; Durham, William F
Cc: Moore, Dave
Subject: RE: Ozone Summer Day Factors

Nino and Fred, talked to Pat and she agrees that BOTH VMT and number of vehicles should have the 1.08 factor applied.

Pat suggested we should have consultation on this. I told her ODOT is taking the lead on this project and I'd let Dave know……..she says email is fine.

Thanks,

Jennifer Dines
Manager, State Implementation Plan and Rulemaking Section
~~~~~~

Division of Air Pollution Control
Ohio Environmental Protection Agency
Wk (614) 644-3696
Fax (614) 644-3681

From: Brunello, Nino
Sent: Monday, April 09, 2012 12:59 PM
To: Dines, Jennifer; Durham, William F
Subject: RE: Ozone Summer Day Factors

Jennifer/Fred,

There is another item that needs to be discussed. Since we now calculate emission rates for both VMT and number of vehicles, does there need to be a summer adjustment factors for vehicles as well? This was not done with MOBILE, so we have nothing to follow. If I had to guess, I would think that there would be an increase, but I couldn't guess as to how many or what factor to use. Maybe just use 1.08 in absence of anything better? Thoughts?

~~~~~~

Nino Brunello, P.E.
Modeling & Forecasting Section
Division of Planning
Ohio Department of Transportation
(614) 752-5742

From: Dines, Jennifer
Sent: Monday, April 09, 2012 8:47 AM
To: Brunello, Nino; Durham, William F
Subject: RE: Ozone Summer Day Factors

I'm available

Jennifer Dines
Manager, State Implementation Plan and Rulemaking Section
Division of Air Pollution Control
Ohio Environmental Protection Agency
Wk (614) 644-3696
Fax (614) 644-3681

From: Brunello, Nino
Sent: Monday, April 09, 2012 8:30 AM
To: Durham, William F; Dines, Jennifer
Subject: RE: Ozone Summer Day Factors

I can call anytime. Will you both be around at 9:00? If not, when would be the next earliest time? (on the half hours)

-Nino
~~~~~~

From: Durham, William F [mailto:William.F.Durham@wv.gov]
Sent: Friday, April 06, 2012 8:50 AM
To: Brunello, Nino
Cc: Dines, Jennifer
Subject: Ozone Summer Day Factors

Nino:
I spoke with Jenn this morning and outlined the issue of Summer day VMT v. Average daily VMT.
We agreed that Pat Morris may be able to shed some light on the question.
Jenn & my calendars are open next Mon. and Tues. afternoon. Please give me a call & I'll patch Jenn in.
Fred

Ohio 2016-2019 STIP/TIPs
Air Quality Conformity Interagency Consultation
January 6, 2015 Conference Call Notes

An Ohio Air Quality Transportation Conformity Interagency Consultation conference call was held on January 6, 2015 to coordinate the transportation conformity processes for the 2016-2019 TIP for the following Ohio MPO/air quality areas:

- Canton (SCATS)
- Cincinnati (OKI)
- Cleveland (NOACA)/Akron (AMATS)
- Columbus (MORPC) /Newark (LCATS)
- Dayton (MVRPC)/Springfield (CCS-TCC)

The conference call proceedings followed the agenda, below and an accompanying *16-19 TIP conformity strategy.xlsx* spreadsheet. The conference call **outcomes** are recorded below.

Conference Call Participants:

Victor Botoson, AMATS	Chad Parasa, MORPC	Dave Moore, ODOT
Nino Brunello, ODOT	Cory Golden, CCS-TCC	Leigh Oesterling, FHWA
Bill Davis, NOACA	Matt Hill, LCATS	Amy Prater, AMATS
Jeff Dutton, SCATS	Drew Hurst, ODOT	Vince Rapp, ODOT
Karl Lucas, SCATS	Phyllis Jividen, AMATS	Andy Reser, OKI
Dan Slicker, SCATS	Tony Maietta, US EPA	Ana Ramirez, MVRPC
Jeff Dodson, SCATS	Mike Maleski, OEPA	Andy Johns, FHWA
Nick Gill, MORPC	Ed May, NOACA	

Agenda Items:

1. Review AQ status for respective areas
   Outcomes – The air quality status for the respective Ohio air quality areas was reviewed (*16-19 TIP conformity strategy.xlsx* spreadsheet, AQ Status Tab, columns D – G). Conference call participants confirm the accuracy of this information.

2. Confirm STIP/TIP air quality conformity strategy
   a. New analysis
   b. Reliance on previous analysis
      i. MPOs will confirm that recent TRAC Program project schedules updates are consistent with previous analyses.
   c. Confirm Youngstown, Toledo, Lima, as 1997 Ozone Standard areas, are exempt from conformity requirements

Outcomes – TIP transportation conformity can be established based on new regional emissions analyses or via reliance on previous conformity analyses (40 CRF 93.122(g). The strategy each Ohio air quality area will be employing for the 2016-2019 TIPs is recorded in *16-19 TIP conformity strategy.xlsx* spreadsheet, AQ Status Tab, column C. The conference call participants reviewed this information and following one correction for the Columbus/Newark are (revised to New Emissions Analysis) confirmed the accuracy of this information.

As a side note, FHWA also confirmed that the Lima, Toledo, and Youngstown regions, as solely 1997 Ozone standard areas, are exempt from transportation conformity.

Subsequent to this conference call, OKI provided email notice that upon further review of the region's 2016 – 2019 TIP projects, a new emissions analysis will need to be completed to demonstrate transportation air quality conformity. OKI also provided regional air quality status, budgets, and analysis years information to including on the *TIP conformity strategy.xlsx* spreadsheet, Cin Tab.

3. New analysis areas
    a. review conformity tests
    b. confirm applicable SIP budgets
    c. confirm analysis years
    d. latest planning assumptions
    e. latest emission modeling
        i. division of labor ODOT vs MPO for generating emissions
        ii. emissions for entire aq area
    f. Timely implementation of TCMs – Ohio SIPs do not include TCMs
    g. Schedules

Outcomes – This agenda item focused on reviewing the applicable Ozone and $PM_{2.5}$ SIP budgets and analysis years for MPOs that will be completing new regional conformity analyses 2016-2019 TIPs – Canton, Cleveland/Akron, Columbus/Newark, and Dayton/Springfield. The *16-19 TIP conformity strategy.xlsx* spreadsheet includes a tab, recording this information, for each of these air quality areas. The conference call participants reviewed the budgets and initial analysis year recommendations for each area. A good deal of discussion ensued regarding the appropriate first analysis year for the respective areas. Conference call participants were unable to achieve a consensus on this matter. US EPA agreed to research the matter and provide needed guidance. Following a series of telephone calls and email messages among FHWA-Ohio, US EPA-Region V, and OEPA, the following guidance was provided:

> **From:** Leigh.Oesterling@dot.gov [mailto:Leigh.Oesterling@dot.gov]
> **Sent:** Wednesday, January 21, 2015 8:58 AM
> **To:** Moore, Dave
> **Cc:** maietta.anthony@epa.gov; Maleski, Mike

Subject: Analysis Years for TIP Conformity - Follow-up to IAC mtg on 1/6/15

Dave,

Since our last IAC conference call on 1/6/15, I have coordinated with FHWA HQ, EPA Region 5, and Ohio EPA. While the conformity rule does not specify how to address budget years that are within one year of the first year of the plan, it does state that the regional emissions analysis are for the years in the "timeframe of the conformity determination." FHWA, EPA, and Ohio EPA, agree that a 2015 analysis year is outside of the 2016-2019 TIP timeframe, and therefore it is not appropriate to have an analysis year of 2015. EPA, Ohio EPA, and FHWA all concur that any year from 2016 to 2020 would be acceptable as the first analysis year, to be compared against 2015 budgets. Per the 1/6/2015 IAC meeting it is our understanding that the MPOs doing regional emissions analysis will likely use 2020 as their first analysis year.

We ask that a short explanation be included in the emissions analysis narrative to explain the selection of the analysis years, including or referencing information such as: 2020 represents the "build" condition of the 2016-2019 TIP, the reference to 40 CFR 23.118(d)(2) (see below), and the 1/6/2015 IAC meeting and the follow-up IAC communications, including this email.

40 CFR 23.118(d)(2): *the regional emissions analysis may be performed for any years in the timeframe of the conformity determination (as described under 93.106(d)) provided they are not more than 10 years apart and provided the analysis is performed for the attainment year (if it is in the timeframe of the transportation plan and conformity determination) and the last year of the timeframe of the conformity determination*

Thank you for your patience as we worked together to resolve this issue. Please "respond to all" if you have any questions or concerns,

Leigh

Leigh A. Oesterling, Planning & Environmental Team Leader
Federal Highway Administration – Ohio Division
200 N. High Street, Room 328
Columbus, OH 43215
(614) 280-6837
leigh.oesterling@dot.gov

The *16-19 TIP conformity strategy.xlsx* conformity year analysis tables have been updated to reflect the guidance referenced above. The respective areas' 2016 –

2019 TIP conformity analyses will be performed consistent with the analysis years identified in the updated *16-19 TIP conformity strategy.xlsx* spreadsheet.

Conference call participants coordinated work efforts, between ODOT and the MPOs, needed to prepare emission estimates for the respective areas – MOVES emissions factors, updated travel demand model analysis year networks, travel demand model runs. ODOT committed to providing needed MOVES emission factors by the first week of February, 2015.

4. STIP/TIP Conformity documentation
   Outcomes – conference call participants reviewed the standardized information that needs to be included in the TIP conformity documentation, including:
   - latest planning assumptions (MPO travel demand socio-economic variables)
   - latest emissions model – MOVES 2010A
   - interagency consultation results
   - document that Ohio SIPs do not include TCMs
   - analysis year network project lists
   - emission generation input/output documentation
   - Reminder that the final TIP public involvement effort needs to include the aq conformity documentation and results
   - Reminder that the TIPs need to demonstrate fiscal constraint
   - Reminder that the TIPs public information process needs to include response to any comments received

5. Include AQ conformity results in final STIP/TIP Public Involvement effort/event
   Outcomes – Agenda item addressed, above.

6. TIP approval resolutions to affirmatively make an MPO T-Plan/2016-2019 TIP conformity determination
   Outcomes –Reminder to MPO conference call participants that the MPO TIP approval resolution needs to include a “whereas” that the documenting the MPO Transportation Plan and the 2016-2019 TIP conform the region’s US EPA approved State Implementation Plan.

Dayton/Springfield 2016–2019 Transportation Improvement Program Conformity Analysis Summary

Ozone

Attainment status:	1997 8-Hour Ozone Maintenance Area
8-Hour Geography:	CLA, GRE, MIA, MOT Cos., OH
SIP Status:	Redesignation/Maintenance Plan approved, effective 8/13/07
Conformity Tests:	No longer required

$PM_{2.5}$

Attainment status:	1997 Standard $PM_{2.5}$ Nonattainment Area
Geography:	CLA, GRE, MOT Cos., OH
Conformity Tests:	Budget test based on budgets approved on 09/26/2013
Analysis Years:	2020 - 1st analysis year within timeframe of conformity determination 2022 Budget year 2030 Interim year 2040 Plan(s) horizon year

PM 2.5						
	Tons / Year					
	2015 Budget	2020 Emissions	2022 Budget	2022 Emissions	2030 Emissions	2040 Emissions
MVRPC						
PM2.5						
NOx						
CCS-TCC						
PM2.5						
NOx						
Totals						
PM2.5	404.43		261.33			
NOx	12,865.54		6270.64			

MVRPC 2016-2019 STIP/TIPs
Air Quality Conformity Interagency Consultation
Additional Ozone 1997 Issues

Wed 02/04/2015 11:53 AM

Ana,

Ohio EPA concurs with the analysis information below. Sorry for the late response.

Thanks,
Mike Maleski
Ohio EPA, Division of Air Pollution Control
614-644-1961

Tue 01/27/2015 10:03 AM

ODOT concurs.

Thanks
DM

From: Ramirez, Ana [mailto:ARamirez@mvrpc.org]
Sent: Tuesday, January 27, 2015 9:50 AM
To: Brunello, Nino; Golden, Cory; Anthony Maietta (Maietta.Anthony@epamail.epa.gov); Maleski, Mike; Andy Johns; Leigh Oesterling; Moore, Dave
Subject: Inter-Agency Consultation-1997 Ozone Dayton-Springfield Area

Good morning,

In the absence of guidance and to avoid getting caught in further litigation and risk missing the grace period for our new MOVES based ozone budgets, MVRPC has decided to conduct a regional ozone emissions analysis for the upcoming TIP. The table below documents the expected analysis years. Please let me know by COB Monday February 2, 2015 if you see any problems with the budgets, years, or tests described below. All other assumptions have been documented in the interagency consultation conference call notes from January 6, 2015.

Thanks,

Ana Ramirez

Ozone

Attainment status:	1997 8-Hour Ozone Maintenance Area
8-Hour Geography:	CLA, GRE, MIA, MOT Cos., OH
SIP Status:	Redesignation/Maintenance Plan approved, effective 8/13/07 New MOVES based budgets approved on 10/24/2013
Conformity Tests:	Pending further guidance, the following years would be analyzed.
Analysis Years:	2018 Budget year 2020 Interim year 2030 Interim year 2040 Plan(s) horizon year

OZONE					
	Tons / Day				
	2018 Budget	2018 Emissions	2020 Emissions	2030 Emissions	2040 Emissions
MVRPC					
VOC					
NOx					
CCS-TCC					
VOC					
NOx					
Totals					
VOC	22.35				
NOx	32.47				

1997 Ozone Standard Revocation - March 2015 Update

EPA Region 5 supports this approach

-Tony

Anthony Maietta
EPA Region 5
maietta.anthony@epa.gov
(312) 353-8777

From: Maleski, Michael [mailto:Michael.Maleski@epa.ohio.gov]
Sent: Monday, February 23, 2015 7:06 AM
To: Oesterling, Leigh; Moore, David; VBotosan@akronohio.gov; jrdutton@co.stark.oh.us; areser@oki.org; bdavis@mpo.noaca.org; ngill@morpc.org; aramirez@mvrpc.org; SSalameh@ntelos.net; tmazur@lacrpc.com; mschumaker@lacrpc.com; mhill@lcounty.com1; tracy.higgins@movrc.org; sschmid@clarkcountyohio.gov; mikepap@bhjmpc.org; gedeon@tmacog.org; rsharma@belomar.org; krodi@eastgatecog.org; Brunello, Antonino; Giaimo, Gregory; Turner, Natasha; Andy.Johns@dot.gov
Cc: Shepler, Andrew; Hurst, Andrew; Rapp, Vincent; Maietta, Anthony; Perry.J.Keller@wv.gov; William.F.Durham@wv.gov; Phinney, Scott; PJividen@akronohio.gov; rlane@mpo.noaca.org; rkoehler@oki.org
Subject: RE: The SIP Requirements Rule for the 2008 Ozone NAAQS Has Been Signed

Ohio EPA also supports ODOT's recommendations.

Mike Maleski
Ohio EPA, Division of Air Pollution Control
614-644-1961

From: Leigh.Oesterling@dot.gov [mailto:Leigh.Oesterling@dot.gov]
Sent: Monday, February 23, 2015 8:04 AM
To: Moore, David; VBotosan@akronohio.gov; jrdutton@co.stark.oh.us; areser@oki.org; bdavis@mpo.noaca.org; ngill@morpc.org; aramirez@mvrpc.org; SSalameh@ntelos.net; tmazur@lacrpc.com; mschumaker@lacrpc.com; mhill@lcounty.com1; tracy.higgins@movrc.org; sschmid@clarkcountyohio.gov; mikepap@bhjmpc.org; gedeon@tmacog.org; rsharma@belomar.org; krodi@eastgatecog.org; Brunello, Antonino; Giaimo, Gregory; Turner, Natasha; Andy.Johns@dot.gov
Cc: Shepler, Andrew; Hurst, Andrew; Rapp, Vincent; Maleski, Michael; Maietta.Anthony@epamail.epa.gov; Perry.J.Keller@wv.gov; William.F.Durham@wv.gov; Phinney, Scott; PJividen@akronohio.gov; rlane@mpo.noaca.org; rkoehler@oki.org
Subject: RE: The SIP Requirements Rule for the 2008 Ozone NAAQS Has Been Signed

FHWA Ohio Division supports ODOT's recommendations below.

Leigh A. Oesterling, Planning & Environmental Team Leader
Federal Highway Administration – Ohio Division
200 N. High Street, Room 328
Columbus, OH 43215
(614) 280-6837
leigh.oesterling@dot.gov

From: Moore, Dave [mailto:Dave.Moore1@dot.state.oh.us]
Sent: Monday, February 23, 2015 7:36 AM
To: Botosan, Victor (VBotosan@akronohio.gov); 'Jeff Dutton'; Andy Reser ; Bill Davis ; ngill@morpc.org; aramirez@mvrpc.org; 'Saleem Salameh'; 'tmazur@lacrpc.com'; 'M Schumaker'; mhill@lcounty.com; 'Tracy Higgins (tracy.higgins@movrc.org)'; sschmid@clarkcountyohio.gov; mikepap@bhjmpc.org; 'DGedeon'; rsharma@belomar.org; krodi@eastgatecog.org; Brunello, Nino; Giaimo, Greg; Turner, Natasha; Johns, Andy (FHWA)
Cc: Shepler, Andrew; Hurst, Andrew; Rapp, Vincent; Maleski, Mike; Anthony Maietta (Maietta.Anthony@epamail.epa.gov); Oesterling, Leigh (FHWA); Perry J Keller (Perry.J.Keller@wv.gov); Fred Durham ; Phinney, Scott; Jividen, Phyllis; rlane@mpo.noaca.org; rkoehler@oki.org
Subject: FW: The SIP Requirements Rule for the 2008 Ozone NAAQS Has Been Signed

All,

Ohio continues to work toward developing a new 2016 -2019 STIP/TIP, scheduled for a July 1, 2015 US DOT approval. An outstanding question with respect to the new STIP has been whether transportation conformity needed demonstrated for the 1997 Ozone standard. This question resulted from the December 23, 2014 D. C. Circuit Court's decision (NRDC versus US EPA) that US EPA lacked authority under the CAA to revoke the conformity requirements for the 1997 Ozone standard transportation conformity.

The email stream and web link below, confirm that US EPA, will soon publish an - Implementation of the 2008 NAAQS for Ozone: State Implementation Plan Requirements - Federal Register Notice final rule. This final rule will also "revoke the 1997 ozone NAAQS for all purposes". "The expectation is that the notice will be published in about 2 weeks. It will be effective 30 days after publication. So, the effective date will be in late-March or very early April."

Based on this pending US EPA rule making and the anticipated March/April 2015 effective date, ODOT is recommending that the Ohio 2016 – 2019 STIP/TIPs not include 1997 Ozone standard conformity determinations. ODOT also recommends that this email stream be included in the STIP/TIPs transportation conformity interagency consultation documentation.

ODOT welcomes comments on this matter from the STIP/TIP federal and state review agencies and the Ohio air quality area MPOs.

Thanks
Dave Moore

ODOT Statewide Planning Manager

From: Kapichak, Rudolph
Sent: Friday, February 13, 2015 2:30 PM
To: Becoat, gregory; Benjamin, Lynorae; Blakley, Pamela; Bonifacino, Gina; Brown, Steven; Castro, Marina; Cooke, Donald; Donaldson, Guy; Farngalo, Zuri; Fehn, Curt; Fernandez, Cristina; Garcia, Ariel; Hamilton, Heather; Kelly, Johnj; Khadr, Asrah; Laurita, Matthew; Leslie, Michael; Loutan, Reema; Mahdavi, Sarvy; Maietta, Anthony; Mastro, Donna; Mays, Rory; McHale, Mary; Myers, Dianna; OConnor, Karina; Pepple, Karl; Riley, Jeffrey; Russ, Timothy; Schoellkopf, Lynde; Sheckler, Kelly A.; Simcox, Alison; Smith, Suzanne; Somerville, Amanetta; Spann, Jane; Tax, Wienke; Vagenas, Ginger; Vaupel, Claudia; Velez-Rosa, Emlyn; Wong, Richard; Zeman, Melanie
Cc: Patulski, Meg; Berry, Laura; Larsen, Astrid; Dolce, Gary
Subject: The SIP Requirements Rule for the 2008 Ozone NAAQS Has Been Signed

Regional Contacts:

Earlier this afternoon the Administrator signed the final 2008 ozone NAAQS SIP requirements rule. Among other things the final rule revokes the 1997 ozone NAAQS for all purposes. The pre-proposal version of the notice can be found at: http://www.epa.gov/airquality/ozonepollution/pdfs/20150213fr.pdf

Revocation of the 1997 ozone NAAQS is discussed in section IV.A. of the notice which starts on page 126 of the proposal.

The expectation is that the notice will be published in about 2 weeks. It will be effective 30 days after publication. So, the effective date will be in late-March or very early April.

Rudy Kapichak
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Driving Innovation in Clean Transportation

Appendix B

Appendix B.1
Post Processing Default Distributions

HOUR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
PCTADT																								
URB FWY	0.9	0.6	0.5	0.6	0.9	2.2	5.2	7.3	6.4	5.2	4.9	5.1	5.3	5.5	6.1	7.2	8.0	7.9	5.8	4.2	3.4	2.9	2.2	1.5
URB ART	0.7	0.4	0.3	0.3	0.6	1.5	3.5	5.7	5.5	5.1	5.3	6.2	6.5	6.4	6.8	7.6	8.2	8.1	6.2	4.8	4.0	3.0	1.9	1.3
RUR FWY	1.4	1.1	0.9	1.0	1.3	2.2	3.7	5.2	5.4	5.4	5.6	5.6	5.7	6.0	6.5	7.1	7.5	7.0	5.6	4.5	3.8	3.2	2.5	2.0
RUR ART	0.8	0.5	0.4	0.5	1.0	2.4	4.8	6.2	5.5	5.3	5.5	5.8	6.0	6.0	6.7	7.6	8.1	7.7	5.6	4.2	3.5	2.8	1.9	1.3
PCTADT TRK																								
URB FWY	2.1	1.9	1.8	2.0	2.4	3.0	3.9	4.6	5.3	6.0	6.3	6.4	6.4	6.4	6.3	5.8	5.2	4.6	4.1	3.7	3.4	3.1	2.8	2.4
URB ART	1.1	0.9	1.0	1.2	1.6	2.3	3.9	5.9	6.9	6.7	7.1	7.6	7.4	7.2	7.4	7.2	6.0	5.0	3.7	2.8	2.3	1.9	1.5	1.3
RUR FWY	2.6	2.2	2.1	2.3	2.6	3.1	3.5	4.0	4.5	5.1	5.6	5.8	5.8	5.8	5.8	5.6	5.3	4.9	4.6	4.3	4.0	3.8	3.5	3.1
RUR ART	1.5	1.3	1.4	1.6	2.2	3.0	4.2	5.3	6.1	6.7	7.0	7.1	7.0	6.9	6.8	6.3	5.5	4.6	3.8	3.1	2.6	2.3	2.1	1.7
PCTDIR																								
URB FWY	38	40	40	46	56	64	70	70	68	62	58	52	52	52	50	46	38	38	46	52	46	42	42	40
URB ART	44	46	44	48	54	62	66	68	64	56	54	52	50	50	50	46	40	38	46	52	48	46	46	46
RUR FWY	44	46	48	54	60	68	68	64	58	54	52	50	50	52	52	48	42	40	44	48	48	44	46	44
RUR ART	40	42	44	48	58	66	72	68	60	56	54	50	50	50	50	46	40	38	46	50	46	44	44	44

LOS E VC	0	0.625	1.25	1.875	2.5	3.125	3.75	4.375	5	5.625	6.25	6.875	7.5	8.125	8.75	9.375	10	10.625	11.25	11.875	12.5	13.125	13.75	14.375
SPEEDVC																								
curve1	75	75	75	75	75	75	74.9	74.8	74.6	74.2	73.5	72.3	70.5	67.8	64.2	59.5	54	47.7	41.2	34.9	28.9	23.7	19.2	15.5
curve2	70	70	70	70	70	70	70	69.9	69.8	69.6	69.2	68.4	67.1	65.1	62.2	58.2	53	47	40.5	33.9	27.7	22.2	17.6	13.8
curve3	65	65	65	65	65	65	65	65	65	64.9	64.8	64.4	63.8	62.6	60.5	57	52	45.4	37.8	29.9	22.7	16.7	12.1	8.6
curve4	60	60	60	60	60	60	60	60	60	59.9	59.8	59.6	59.1	58.2	56.7	54.3	50.8	46.1	40.3	33.8	27.3	21.3	16.2	12.2
curve5	55	55	55	55	55	55	55	55	55	55	55	54.9	54.7	54.3	53.6	52.3	50	46.5	41.5	35.3	28.5	21.9	16.1	11.5
curve6	60	60	60	60	60	60	60	60	59.9	59.8	59.7	59.4	59.1	58.5	57.7	56.5	55	53.1	50.7	47.9	44.7	41.1	37.3	33.4
curve7	55	55	55	55	55	55	55	55	54.9	54.9	54.7	54.5	54.2	53.8	53.1	52.2	50.9	49.3	47.3	44.9	42.1	39	35.7	32.2
curve8	50	50	50	50	50	50	50	50	49.9	49.9	49.8	49.6	49.4	49	48.5	47.7	46.7	45.4	43.8	41.8	39.5	36.8	33.9	30.9
curve9	45	45	45	45	45	45	45	45	45	44.9	44.8	44.7	44.4	44.1	43.6	43	42.1	40.9	39.4	37.6	35.5	33.1	30.5	27.8
curve10	50	50	50	50	49.9	49.8	49.7	49.4	49	48.4	47.5	46.5	45.1	43.5	41.7	39.6	37.3	34.9	32.4	29.8	27.3	24.9	22.6	20.4
curve11	50	50	50	50	50	49.9	49.7	49.4	48.9	48	46.7	44.9	42.5	39.6	36.2	32.6	28.7	25	21.4	18.2	15.3	12.9	10.8	9
curve12	50	50	50	50	50	49.9	49.8	49.6	49.1	48.2	46.8	44.5	41.4	37.5	32.9	28	23.1	18.7	14.9	11.8	9.2	7.2	5.7	4.5
curve13	40	40	40	40	40	40	39.9	39.8	39.5	39.2	38.6	37.8	36.7	35.3	33.5	31.4	29	26.4	23.7	21.1	18.5	16.1	13.9	12
curve14	40	40	40	40	40	39.9	39.8	39.6	39.1	38.5	37.5	36.1	34.3	32.1	29.4	26.5	23.5	20.5	17.7	15.1	12.8	10.7	9	7.6
curve15	40	40	40	40	40	39.9	39.7	39.4	38.8	37.9	36.5	34.7	32.3	29.5	26.4	23.2	20	17	14.3	11.9	9.9	8.2	6.8	5.6
curve16	35	35	35	35	35	34.9	34.8	34.5	34	33.2	32.1	30.5	28.5	26.1	23.5	20.6	17.9	15.2	12.8	10.7	8.9	7.4	6.1	5.1
curve17	35	35	35	35	35	34.9	34.7	34.4	33.9	33.1	32	30.3	28.3	25.8	23.1	20.3	17.5	14.9	12.5	10.4	8.6	7.2	5.9	4.9
curve18	35	35	35	35	35	34.9	34.6	34.2	33.5	32.4	30.9	28.8	26.3	23.4	20.4	17.4	14.6	12.1	9.9	8.1	6.6	5.4	4.4	3.6
curve19	30	30	30	30	30	29.9	29.8	29.5	29	28.2	27.1	25.6	23.7	21.5	19.1	16.6	14.2	12	10	8.3	6.8	5.6	4.6	3.8
curve20	30	30	30	30	30	29.9	29.7	29.4	28.9	28.1	26.9	25.3	23.4	21.1	18.6	16.1	13.6	11.4	9.5	7.8	6.4	5.3	4.3	3.6
curve21	30	30	30	30	30	29.9	29.7	29.3	28.7	27.7	26.2	24.4	22.1	19.6	17	14.4	12	9.9	8.1	6.6	5.4	4.4	3.6	2.9

VC RATIO TO LOS CONVERSION (VALUE SHOWN IS LOWER LIMIT FOR THAT LOS)(URBAN ROADS USE SPEED BREAKS BELOW FOR LOS DETERMINATION) (ALL USE THE BASE VC'S TO DETERMINE EXCEEDANCE)

	BASE	RUR2	FWY
A	0.00	0.00	0.00
B	0.30	0.00	0.25
C	0.50	0.10	0.40
D	0.70	0.30	0.60
E	0.90	0.50	0.80
F	1.00	1.00	1.00
F+	1.10	1.10	1.10
F++	1.30	1.30	1.30

SPEED VC RATIO BREAKS FOR URBAN STREETS (HIGHEST SPEED FOR GIVEN LOS & FF SPEED)

FFS	B	C	D	E	F
>47	42.	34.	27.	21.	16.
>37	35.	28.	22.	17.	13.
>32	30.	24.	18.	14.	10.
<33	25.	19.	13.	9.	7.

LEVEL OF SERVICE THRESHOLD BY AREA

NUM	LOS	DEFINITION
1	F	CINCINNATI,CLEVELAND,COLUMBUS CENTRAL MPO COUNTIES (CUY,FRA,HAM)
2	E	OTHER TMA MPOS (AKRON,CANTON,DAYTON,TOLEDO,YOUNGSTOWN + NON-CENTRAL COUNTIES FROM 1)
3	E	OTHER MPOS & PARTS OF AREAS 1 & 2 OUTSIDE URBANIZED AREA
4	E	RURAL NON MPO COUNTIES

PEAK SPREADING MODEL INFO (SET MAX ITERATIONS TO 0 TO DISABLE PEAK SPREADING)
MAX VC RATIO FWY: 1.30
MAX VC RATIO ART: 1.30
MAX ITERATIONS : 1000

TRUCK PCE: 2.00

AQ SEASON FACTOR: 1.00

MODEL CLASS PARAMETERS (MAX 4 CLASSES, HOURS 0-23 W/ NO OVERLAP IN CLASS, ALLOCATE ENTIRE CLASS AS TRUCK(1) OR NOT(0))

CLS	TRK	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
CLS	BEG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CLS	END	23	23	0	0	0	0	0	0	0	0	0	0	0	0	0
CLS	NUM	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix B.2
PM2.5 EmissionSummaries

Clark County Daily Summary

	2020 (No I/M)	
CLARK	**NOX (tons/day)**	**PM 2.5 (tons/day)**
Link Emissions	2.5207	0.1041
Vehicle Emissions	1.0151	0.0215
Intrazonal Emissions	0.0067	0.0004
TOTAL	**3.5425**	**0.1260**

	2022 (No I/M)	
CLARK	**NOX (tons/day)**	**PM 2.5 (tons/day)**
Link Emissions	2.1069	0.0936
Vehicle Emissions	0.8673	0.0202
Intrazonal Emissions	0.0054	0.0004
TOTAL	**2.9796**	**0.1142**

	2030 (No I/M)	
CLARK	**NOX (tons/day)**	**PM 2.5 (tons/day)**
Link Emissions	1.5249	0.0848
Vehicle Emissions	0.6370	0.0177
Intrazonal Emissions	0.0036	0.0003
TOTAL	**2.1655**	**0.1028**

	2040 (No I/M)	
CLARK	**NOX (tons/day)**	**PM 2.5 (tons/day)**
Link Emissions	1.4422	0.0888
Vehicle Emissions	0.5503	0.0176
Intrazonal Emissions	0.0031	0.0003
TOTAL	**1.9956**	**0.1067**

Greene County Daily Summary

	2020 (No I/M)	
GREENE	**NOX (tons/day)**	**PM 2.5 (tons/day)**
Link Emissions	2.3798	0.1081
Vehicle Emissions	0.9846	0.0221
Intrazonal Emissions	0.0172	0.0009
TOTAL	**3.3816**	**0.1311**

	2022 (No I/M)	
GREENE	**NOX (tons/day)**	**PM 2.5 (tons/day)**
Link Emissions	1.9819	0.0978
Vehicle Emissions	0.8259	0.0206
Intrazonal Emissions	0.0133	0.0009
TOTAL	**2.8211**	**0.1193**

	2030 (No I/M)	
GREENE	**NOX (tons/day)**	**PM 2.5 (tons/day)**
Link Emissions	1.4012	0.0887
Vehicle Emissions	0.5714	0.0177
Intrazonal Emissions	0.0087	0.0008
TOTAL	**1.9813**	**0.1072**

	2040 (No I/M)	
GREENE	**NOX (tons/day)**	**PM 2.5 (tons/day)**
Link Emissions	1.3212	0.0942
Vehicle Emissions	0.4643	0.0170
Intrazonal Emissions	0.0079	0.0009
TOTAL	**1.7934**	**0.1121**

Montgomery County Daily Summary

	2020 (No I/M)	
MONTGOMERY	**NOX (tons/day)**	**PM 2.5 (tons/day)**
Link Emissions	6.8058	0.3178
Vehicle Emissions	3.4737	0.0778
Intrazonal Emissions	0.0254	0.0013
TOTAL	**10.3049**	**0.3969**

	2022 (No I/M)	
MONTGOMERY	**NOX (tons/day)**	**PM 2.5 (tons/day)**
Link Emissions	5.6331	0.2849
Vehicle Emissions	2.9139	0.0728
Intrazonal Emissions	0.0195	0.0014
TOTAL	**8.5665**	**0.3591**

	2030 (No I/M)	
MONTGOMERY	**NOX (tons/day)**	**PM 2.5 (tons/day)**
Link Emissions	3.8456	0.2489
Vehicle Emissions	2.0169	0.0623
Intrazonal Emissions	0.0122	0.0012
TOTAL	**5.8747**	**0.3124**

	2040 (No I/M)	
MONTGOMERY	**NOX (tons/day)**	**PM 2.5 (tons/day)**
Link Emissions	3.4925	0.2519
Vehicle Emissions	1.6395	0.0600
Intrazonal Emissions	0.0104	0.0012
TOTAL	**5.1424**	**0.3131**

Appendix B.3
Ozone EmissionSummaries

Clark County Daily Summary

	2018 (No I/M)	
CLARK	**VOC (tons/day)**	**NOX (tons/day)**
Link Emissions	0.7085	3.3515
Vehicle Emissions	2.3862	1.5746
Intrazonal Emissions	0.0030	0.0100
TOTAL	**3.0977**	**4.9361**

	2020 (No I/M)	
CLARK	**VOC (tons/day)**	**NOX (tons/day)**
Link Emissions	0.5925	2.7205
Vehicle Emissions	2.1299	1.4082
Intrazonal Emissions	0.0024	0.0080
TOTAL	**2.7248**	**4.1367**

	2030 (No I/M)	
CLARK	**VOC (tons/day)**	**NOX (tons/day)**
Link Emissions	0.4368	1.6970
Vehicle Emissions	1.6055	0.9744
Intrazonal Emissions	0.0017	0.0044
TOTAL	**2.0440**	**2.6758**

	2040 (No I/M)	
CLARK	**VOC (tons/day)**	**NOX (tons/day)**
Link Emissions	0.4389	1.6057
Vehicle Emissions	1.5770	0.9262
Intrazonal Emissions	0.0016	0.0038
TOTAL	**2.0175**	**2.5357**

Greene County Daily Summary

	2018 (No I/M)	
GREENE	**VOC (tons/day)**	**NOX (tons/day)**
Link Emissions	0.7338	3.1705
Vehicle Emissions	2.4794	1.6360
Intrazonal Emissions	0.0073	0.0246
TOTAL	**3.2205**	**4.8311**

	2020 (No I/M)	
GREENE	**VOC (tons/day)**	**NOX (tons/day)**
Link Emissions	0.6120	2.5760
Vehicle Emissions	2.1999	1.4545
Intrazonal Emissions	0.0059	0.0196
TOTAL	**2.8178**	**4.0501**

	2030 (No I/M)	
GREENE	**VOC (tons/day)**	**NOX (tons/day)**
Link Emissions	0.4463	1.5651
Vehicle Emissions	1.6107	0.9775
Intrazonal Emissions	0.0041	0.0108
TOTAL	**2.0611**	**2.5534**

	2040 (No I/M)	
GREENE	**VOC (tons/day)**	**NOX (tons/day)**
Link Emissions	0.4529	1.4776
Vehicle Emissions	1.5378	0.9032
Intrazonal Emissions	0.0040	0.0097
TOTAL	**1.9947**	**2.3905**

Miami County Daily Summary

	2018 (No I/M)	
MIAMI	**VOC (tons/day)**	**NOX (tons/day)**
Link Emissions	0.4988	2.2291
Vehicle Emissions	1.7245	1.1379
Intrazonal Emissions	0.0077	0.0260
TOTAL	**2.2310**	**3.3930**

	2020 (No I/M)	
MIAMI	**VOC (tons/day)**	**NOX (tons/day)**
Link Emissions	0.4139	1.8027
Vehicle Emissions	1.5301	1.0117
Intrazonal Emissions	0.0062	0.0206
TOTAL	**1.9502**	**2.8350**

	2030 (No I/M)	
MIAMI	**VOC (tons/day)**	**NOX (tons/day)**
Link Emissions	0.3047	1.1118
Vehicle Emissions	1.1203	0.6799
Intrazonal Emissions	0.0041	0.0110
TOTAL	**1.4291**	**1.8027**

	2040 (No I/M)	
MIAMI	**VOC (tons/day)**	**NOX (tons/day)**
Link Emissions	0.3113	1.0618
Vehicle Emissions	1.0697	0.6282
Intrazonal Emissions	0.0039	0.0094
TOTAL	**1.3849**	**1.6994**

Montgomery County Daily Summary

	2018 (No I/M)	
MONTGOMERY	**VOC (tons/day)**	**NOX (tons/day)**
Link Emissions	2.1395	9.1866
Vehicle Emissions	8.7411	5.7679
Intrazonal Emissions	0.0110	0.0373
TOTAL	**10.8916**	**14.9918**

	2020 (No I/M)	
MONTGOMERY	**VOC (tons/day)**	**NOX (tons/day)**
Link Emissions	1.7586	7.3641
Vehicle Emissions	7.7558	5.1278
Intrazonal Emissions	0.0089	0.0295
TOTAL	**9.5233**	**12.5214**

	2030 (No I/M)	
MONTGOMERY	**VOC (tons/day)**	**NOX (tons/day)**
Link Emissions	1.2301	4.3031
Vehicle Emissions	5.6785	3.4464
Intrazonal Emissions	0.0058	0.0154
TOTAL	**6.9144**	**7.7649**

	2040 (No I/M)	
MONTGOMERY	**VOC (tons/day)**	**NOX (tons/day)**
Link Emissions	1.1970	3.9130
Vehicle Emissions	5.4218	3.1844
Intrazonal Emissions	0.0054	0.0130
TOTAL	**6.6242**	**7.1104**