Appendix 1: Air Quality Conformity

This document serves as an appendix to:

MORPC 2024-2027 TIP (Transportation Improvement Program)

and

LCATS 2024-2027 TIP (Transportation Improvement Program)

and

CORPO 2024-2027 TIP (Transportation Improvement Program)

This is also the air quality conformity for the:

MORPC 2024-2050 Metropolitan Transportation Plan

And

LCATS 2050 Metropolitan Transportation Plan

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Section I: Introduction

The Clean Air Act Amendments of 1990 expanded transportation's role in contributing to national clean air goals. The 1990 amendments expand the requirements of "transportation conformity" as:

> *Conformity to the (air quality implementation) plan's purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and achieving expeditious attainment of such standards; and that such activities will not (i) cause or contribute to any new violations of any standards in any area, (ii) increase the frequency or severity of any existing violation of any standard in any areas, or (iii) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.*

The CAAA defines nonattainment areas as geographic regions of the country that do not meet the National Ambient Air Quality Standards (NAAQS). In Ohio, the Ohio Environmental Protection Agency (Ohio EPA) is the lead agency for coordinating development of the State Implementation Plan (SIP). The SIP includes actions done on a statewide basis as well as actions done within each specific nonattainment area of the state to achieve the air quality standards.

Redesignation requests to attainment are SIP revisions that document that the NAAQS have been met and provide a maintenance plan to ensure meeting the standards for the next ten years. The first item of documentation contained in a redesignation request is three consecutive years of air quality monitoring data that meet the NAAQS. Second, an inventory of point source, area source and mobile source emissions is developed. The total of the three sources is certified as the attainment emission levels that will allow the air quality standards to be met. Next, emission projections for each source are made to the end of the maintenance period. It must be documented that the total emissions will not exceed the attainment emissions level. Any difference between the total future emissions and the total attainment level emissions is considered a safety margin.

Specifically for on road mobile emissions, budgets are established in the SIP. These budgets are the future projections plus any of the safety margins that the local area may choose to allocate.

One of the requirements is that plans, programs and projects do not delay the timely implementation of transportation control measures (TCMs) in the applicable SIP. Transportation conformity is the process of analyzing the projects included in the Transportation Plan to ensure they do not lead to violations in the air quality standards or delay obtaining the standard. The documentation of this process is called the conformity determination. This appendix is the transportation conformity documentation for the four-county Columbus ozone non-attianment area.

Section II: Background

1-Hour Ozone Standard

Under the CAAA Franklin, Delaware and Licking counties were designated a marginal nonattainment area for ozone. This designation was based on 1988 air quality data that violated the NAAQS for ozone. At ground level, ozone is formed by the reaction of volatile organic compounds (VOCs) and nitrogen oxides (NOx). The CAAA requires that VOC and NOx emissions be reduced to lower the amount of ground-level ozone. Since 1988 the nonattainment area has had no violations of the 1-hour standards. However, the area must comply with the nonattainment area requirements in the CAAA.

In January 1994, the Ohio EPA working with the Ohio Department of Transportation (ODOT), the Mid-Ohio Regional Planning Commission (MORPC), and the Licking County Area Transportation Study (LCATS) submitted a redesignation request to the United States Environmental Protection Agency (U.S. EPA) for the three-county nonattainment area. On April 11, 1994, the Ohio EPA provided additional information to U.S. EPA. On February 1, 1996, a direct final rule was published in the Federal Register approving the redesignation request. The approval was effective April 1, 1996.

8-Hour Ozone Standard

On April 15, 2004, U.S. EPA issued final designations with regard to the 8-hour ozone standard and final rules on conformity requirements for these areas. It resulted in expanding the Central Ohio non-attainment area to expand to six counties: Franklin, Delaware, Licking, Knox, Fairfield and Madison.

Ohio EPA submitted an ozone redesignation package to U.S. EPA in March 2009. In September 15, 2009 Federal Register, U.S. EPA approved the redesignation to attainment effective September 15, 2009. Ohio submitted the SIP revision requests to U.S. EPA on October 30, 2012, and December 12, 2012, respectively. On March 19, 2013, the 1997 Ozone standard SIP (MOVES based) motor vehicle emission budgets (MVEB) for the region are established.

The U.S. EPA promulgated a new 8- hour ozone standard in 2008 and on July 20, 2012, the 6-county region was redesignated marginal non-attainment. On December 21, 2016, U.S. EPA approved of redesignating the Columbus area to attainment of the 2008 ozone NAAQS (National Ambient Air Quality Standard). The maintenance plan submitted by Ohio EPA was also approved with new mobile source budgets as shown in in Table 1, which were used for conformity determination for the six county area.

Table 1: On Road Mobile Source Budgets for the Columbus 6 county 2008 8-Hour Ozone Maintenance Area (VOC, NOx)

[Tons per summer day]

Year	2020	2030
VOC	50.66	44.31
NOx	90.54	85.13

Source: Federal Register Vol. 81, No. 245, December 21, 2016

Effected on August 3, 2018, US EPA designated the Columbus region as a 2015 Ozone Standard marginal nonattainment area. The area, however, only includes four counties: Franklin, Delaware, Licking, and Fairfield. Madison and Knox Counties are now considered attainment. In 2019 The Ohio EPA submitted a redesignation request to U.S. EPA. The redesignation to attainment with approved MVEB via Federal Register notices on July 3, 2019 and August 21, 2019. Table 1a provides the MVEB for the 4 county 2016 ozone standard maintenance area.

Table 1a: On Road Mobile Source Budgets for the Columbus four county 2015 8-Hour Ozone Maintenance Area (VOC, NOx)

[Tons per summer day]

Year	2023	2030
VOC	28.67	22.03
NOx	29.28	20.98

Conformity determination will be based on comparisions to both set of MVEB shown in Table 1 and Table 1a.

PM2.5 Standards

April 14, 2005, U.S. EPA issued final designations with regard to the 1997 PM2.5 standard. Franklin, Delaware, Licking, Fairfield counties and Franklin Township in Coshocton County were designated as a non-attainment area for the annual PM2.5 standard. On November 7, 2013 U.S. EPA approved re-designation of the Columbus area to attainment of the 1997 annual PM 2.5 standard of 15 µg/m3 (15 micrograms per cubic meter) for fine particulate matter, FR 66845, Vol. 78, No. 216.

A new annual PM 2.5 standard was promulgated by U.S. EPA in 2012 which strengthened the annual fine particle standard to 12 micrograms per cubic meter (µg/m3). On December 18, 2014, the EPA issued final area designations for the 2012 annual national air quality standard for fine particulate matter (PM2.5) which showed counties in Central Ohio are in attainment of the standard.

On August 24, 2016, FR 58010, Vol 81 (effective on October 24, 2016) EPA finalized the rules that revokes the 1997 primary annual PM2.5 NAAQS in areas that are designated as attainment or maintenance for that NAAQS. As a result of the revocation and being an area meeting the current PM2.5 NAAQS, as an area that has already been redesignated to attainment for the 1997 annual PM2.5 NAAQS, transportation conformity for PM2.5 no longer applies central Ohio.

NOx Waiver

The CAAA allows the U.S. EPA administrator to issue a waiver of the NOx requirements if the administrator determines that additional reductions of NOx would not contribute to attainment of the air quality standards. A final rule approving a NOx waiver was published in the July 13, 1995, Federal Register. The NOx waiver removed the build/no-build test and the less than 1990 test that apply to NOx. However, an area that is redesignated to attainment must still meet the approved NOx budget for the conformity analysis. Thus, the NOx waiver is no longer applicable to the Columbus area.

Transportation Conformity Procedures

On November 24, 1993, U.S. EPA published regulations, 40 CFR 51 Subpart T, which define the specific process necessary to demonstrate conformity of transportation plans, TIPs and projects. Three updates to the conformity have also been finalized and incorporated into the Ohio Administrative Code (OAC). With the implementation regulations for the 8-hour ozone standard and the PM 2.5 standard, new procedures were established to demonstrate conformity for each of these pollutants. The conformity regulations identified three tests to be performed at various milestone or horizon years to show conformity. These are a budget test, a build/no build test and a no greater than 2002 baseline test. The test that must be satisfied depends upon the status of an area's SIP submittals. As an ozone area with approved on road mobile budgets, the budget test will be used.

This appendix documents the conformity determination process for the ozone maintenance area.

Multiple Metropolitan Planning Organizations

The six-county ozone area consist of two metropolitan planning organizations (MPOs), MORPC and LCATS with area outside of the two MPO's in Fairfield, Madison, and Knox Counties that are part of the Central Ohio Rural Planning Origanization (CORPO) Rural Transportation Planning Organization area. The MORPC transportation planning area consists of Franklin County, Delaware County, New Albany, Pataskala and Etna Township in Licking County, Violet and Bloom Townships in Fairfield County and Jerome Township in Union County. The LCATS transportation planning area covers the remainder of Licking County. The CORPO transportation planning area consists of Faifield, Knox, Madison, Marrion, Morrow, Pickaway and Union counties.

Each MPO and CORPO develops a transportation plan for its respective transportation study area. The conformity procedures require that the entire non-attainment area be considered as a whole. This requires that the transportation plans and any projects in the non-MPO area be considered together to make a conformity determination. This appendix documents the process used to combine the entire area to make a single conformity determination. This document serves as an appendix to the MORPC 2024-2050 Metropolitan Transportatin Plan, the LCATS 2050 Transportation Plan and the MORPC, LCATS and CORPO 2024-2027 Transportation Improvement Programs.

Latest Planning Assumptions

The Transportation Plans' conformity analysis readily meets this requirement. A 10/11/2000 U.S. DOT/U.S. EPA memorandum further emphasized the use of latest planning assumptions highlighting the following areas: 1) Model Validation; 2) Land Use, Population and Employment Projections; and 3) Travel and Congestion. The following addresses these issues.

1) Model Validation
   For the travel demand model in the maintenance area, model validation is a joint process between MORPC, LCATS and the ODOT Office of Technical Services. In December 2004, a new complete validated model was accepted and installed for use at MORPC. The new model covers all of the MORPC and LCATS area including portions of Pickaway, Madison and Union Counties along with additional portions of Fairfield County outside of the MORPC MPO area. Further, ODOT working with MORPC completed another model update in 2019 and

MORPC continuously updates the highway and transit network information and maintains accurate networks for future year analysis.

2) Future Networks
The Transportation Plan horizon year for MORPC and LCATS is 2050. Based on Interagency consultation for the ozone conformity analysis, the years 2030, 2040 and 2050 are being used. The Transportation Plans list the projects included and Section III lists the projects included for each analysis year.

3) Land Use, Population and Employment Projections
MORPC continually monitors land use, population and employment information. MORPC performs complete land use inventories every five years. The complete documentation of the process and future forecasts is provided in *Future Land use Scenario Methodology* appendix to the Transportation Plan. MORPC coordinates with LCATS for updates to the variables for their area.

4) Travel and Congestion
Based on the validated model, highway and transit changes since then, the most up-to-date land use, population and employment projections, 24-hour ADT volumes are produced. MOVES4 software is used to create the emission factors. ODOT in conjunction with MORPC and inter-agency consultation ensures the emission factors used in this process are based on the most up-to-date assumptions.

Urban Transportation Modeling Process

The MORPC model covers Franklin County, Delaware County, Licking County and portions of Fairfield, Pickaway, Madison and Union counties. The model employs activity-based modeling procedures. Output from the urban model is link-by-link directional 24-hour traffic volumes for the existing or future regional transportation network. These 24-hour traffic volumes provide the basis for performing the air quality analysis. ODOT, MORPC and LCATS jointly hold the models and provide extensive technical support for each other. The non-modeled areas in the Fairfield, Madison, Knox and Coshocton counties utilize Highway Performance Monitoring System (HPMS) data.

Air Quality Modeling Process

The Transportation Plan conformity demonstration for Ohio's urbanized nonattainment and maintenance areas utilize the capabilities of the urban transportation models to perform milestone year and Transportation Plan horizon year analyses required under the conformity regulations. The modeling process identifies the growth in vehicle miles of travel and changes in the travel patterns resulting from the projects proposed in the non-attainment or maintenance area transportation plans and programs.

Motor Vehicle Emissions Simulator (MOVES4) is the U.S. EPA official software for estimating emissions. Using MOVES4, emission factor files were generated for the analysis. Programs and corresponding MOVES4 parameters were developed in consultation with Ohio EPA.

Table 2 summarizes the settings used in the MOVES4 run specification file and the MOVES4 County-Data Manager. Further details in specific inputs that are not using default values are provided below.

Table 2 – MOVES4 Inputs

RunSpec Parameter Settings	
MOVES Version	MOVES4
Scale	County Scale: Franklin County, OH
MOVES4 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 July temperatures All hours of day selected 16 speed bins Weekdays only
Geographic Bounds	Franklin, Delaware, Licking, Fairfield, Madison & Knox 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 = local dayVMTFraction=default hourVMTFraction=local
I/M Program	None
Fuel Formulation	Default

Fuel Supply	Default Future runs modified for reformulated gas, RVP, etc. for summer analyses
Metereology Data	Local data obtained from NOAA National Climatic Data Center. Data 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 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 used for all analysis years
Average Speed Distribution	Default
Alternative Fuel Type	Default

Temperature and Relative Humidity

Temperatures used for the Ozone analysis are representative of the month of July in 2002 based on NOAA data from the National Climate Data Center website. Data for Port Columbus International Airport was used because it was the most complete compared to other airports in the non-attainment area. To get the correct format for MOVES4, the data was entered into a spreadsheet provided by U.S. EPA which was designed to convert Mobile6 data to MOVES4. An average July hourly temperature and relative humidity distribution profile can be seen in Table 3.

Table 3 – July Temperature and Relative Humidity Data for Ozone Analysis

Hour	Temperature	Relative Humidity
1	72.0	78.0
2	70.8	80.0
3	69.8	82.0
4	69.1	84.0
5	68.6	86.0
6	68.0	85.0
7	67.5	81.0
8	67.9	75.0
9	70.5	69.0
10	74.7	63.0
11	78.9	59.0
12	82.6	54.0
13	85.8	52.0
14	87.5	51.0
15	88.1	50.0
16	88.3	48.0
17	87.9	50.0
18	86.7	51.0
19	84.6	54.0
20	81.9	60.0
21	79.2	64.0
22	76.9	69.0
23	75.2	73.0
24	73.6	76.0

Ramp Fraction

Ramp fractions were derived using the base year travel demand model VHT fractions. Ramp fractions can be seen in Table 4. Base year fractions were assumed to apply to future years.

Table 4 – Ramp Fractions

RoadTypeID	Road Description	Ramp Fraction
2	Rural Restricted Access	0.02
4	Urban Restricted Access	0.13

Source Type Population

Source type population is based on a combination of local and MOVES4 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 growth in cars which is an independent variable to the travel demand model. Table 5 shows source type population for the analyzed counties in 2008.

Table 5 – Source Type Population for year 2008

Source Type	sourceTypeName	Franklin	Delaware	Licking	Fairfield	Madison & Knox
11	MotorCycle	55,222	6,868	8,999	2,444	3,565
21	Passenger Car	878,901	97,120	128,334	35,905	43,829
31	Passenger Truck	383,900	44,774	58,759	16,550	31,914
32	Light Commercial Truck	11,553	1,348	1,768	498	1,280
41	Intercity Bus	294	66	83	23	66
42	Transit Bus	79	18	22	6	35
43	School Bus	1,582	357	446	126	405
51	Refuse truck	228	39	49	13	37
52	Single Unit Short-haul Truck	205	35	44	12	1,553
53	Single Unit Long-haul Truck	264	44	57	15	198
54	Motor Home	1,102	184	235	65	181
61	Comb Short-haul Truck	3,144	653	905	154	780
62	Comb Long-haul Truck	3,616	750	1,040	178	897

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 Ohio EPA who supplied a VIN decoder that allowed ODOT to create correctly formatted MOVES4 inputs. MOVES4 default data is used for source types 41, 51, 54, 61, and 62. The registration data for most populous four counties were obtained in the non-attainment area and combined to create a regional vehicle age distribution file. This data is applied to all six counties in the region. The same age distribution will be used for all analysis years.

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 facilities in the non-attainment area, a statewide average of all ODOT WIM data collectors was used. Daily VMT was then converted to yearly. The same method was used to generate all other analysis years.

Output Emission Factors

Table 6 shows the first record in a MOVES4 sample output (rate per distance) emission file for year 2008. 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 6 – Sample Emission File (Rate per Distance)

Heading:	MOVESScenarioID	MOVESRunID	yearID	monthID	dayID	hourID
Record:	OhioCustomDomain	6	2008	7	5	1
Heading:	linkID	pollutantID	processID	sourceTypeID	SCC	fuelTypeID
Record:	390490201	3	0	1		0
Heading:	modelYearID	roadTypeID	avgSpeedBinID	temperature	relHumidity	ratePerDistance
Record:	0	2	1	48.9333	73	12.9489

Table 7 shows the first record in a MOVES4 sample output (rate per vehicle) emission file for year 2008. 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 7 – Sample Emission File (Rate per Vehicle)

Heading:	MOVESScenarioID	MOVESRunID	yearID	monthID	dayID
Record:	OhioCustomDomain	6	2008	7	5
Heading:	hourID	zoneID	pollutantID	processID	sourceTypeID
Record:	1	39049	3	0	2
Heading:	SCC	fuelTypeID	modelYearID	temperature	ratePerVehicle
Record:		0	0	48.9333	0.054967

Analysis Years

The analysis years for transportation conformity must include the Transportation Plan horizon year, any milestone years, and any interim years (to be less than ten years between analysis years). The Transportation Plan horizon year for MORPC and LCATS is 2050. The analysis years were determined, through the interagency consultation process. Thus, the years 2030, 2040 and 2050 are used for the ozone conformity analysis, since the future budget years established are 2023, 2020 and 2030.

Air Quality Consultation Process

The 1990 Clean Air Act amendments required identification of the consultation procedures that Ohio's air quality and transportation agencies will follow in the conformity process. To fulfill this requirement, the Ohio EPA has adopted Ohio Administrative Code 3745-101-04 to define the interagency consultation procedures used on air quality issues. These rules define a "straw man" process, whereby the lead agencies in the conformity process assume responsibility for preparing and distributing draft documents, with supporting information, and ensuring that each affected party involved in the conformity process is included in the consultation process. In addition, a Memorandum of Understanding (MOU) between MORPC, LCATS, ODOT and Ohio EPA has been signed to clarify OAC 3745-101-04 for the Columbus maintenance area. As a result of SAFETEA-LU Ohio EPA led the process to update MOU. This process concluded with signatures from all parties obtained in February/March 2008. These were reaffirmed with updated signatures in 2014.

The Columbus ozone area Transportation Plan's conformity process employed the consultation procedures embodied in the rules. The procedures used in the current air quality analysis are comparable to the previous TIP and Transportation Plan conformity determinations. As necessary air quality consultation reports on conformity process for the Transportation Plan are prepared and distributed to MORPC's TAC and Transportation Policy committees, LCATS Policy Committee, ODOT, Ohio EPA, FHWA, FTA, and U.S. EPA. In addition, MORPC has had various telephone conversations and e-mail correspondence with Ohio EPA, ODOT and FHWA. Ohio EPA has also discussed various issues of transportation conformity with U.S. EPA. Documentation is provided in attachments to this appendix.

Section III: Quantitative Analysis

Projects Included in the Air Quality Analysis

Every location-specific project listed in the Metropolitan Transportation Plans are included in the Transportation Plan networks and listed in the following project listing. MORPC meets with the local agencies to identify potential MTP projects. We also compile projects based on the local agencies' Capital Improvement Plans and any local thoroughfare and/or comprehensive plans. Thus, both federally funded and non-federally funded projects are included. Our model network includes all the projects that can be coded on the regional network. These listings include intersection improvements and other minor network changes which are potentially exempt projects as defined the conformity regulations (40 CFR in sections 93.126 and 93.127).There are no TCM's in the SIP for the Columbus area. Thus, the projects included in the transportation plans are consistent with those stated in the SIP. The following tables (Tables 8-10) identify the projects that are included in the analysis for the years 2030, 2040 and 2050 respectively.

Table 8: Additional Projects identified for year 2030

Plan Project ID	Project Description (2030)
8	Cosgray Rd. extension from Alton & Darby Creek Rd. s. of Davis Rd. to Scioto & Darby Creek Rd. at Cosgray Rd., New Roadway 2 lane(s) each direction with complete street facilities
23	Tuttle Crossing Blvd. extension from Avery Rd. to Wilcox Rd., New Roadway 2 lane(s) each direction with complete street facilities
58	I-70 (East Freeway) at Brice Rd., Interchange modification
60	I-70 (East Freeway) at SR 256 and at Taylor Rd./SR 204, Interchange modification
80	I-270 (South Outerbelt) at US 33 (Southeast Freeway), Reconfigure slip, loop and/or directional interchange ramps
81	US 33 (Southeast Freeway) from Gender Rd. (SR 674) to Hill Rd./Diley Rd., Convert 4 lane roadway to 4 lane freeway
82	US 33 (Southeast Freeway) from Hamilton Rd. (SR 317) to Gender Rd. (SR 674), Convert 4 lane roadway to 4 lane freeway
83	US 33 (Southeast Freeway) at Bixby Rd., New interchange
88	Home Rd. extension from Green Meadows Dr. to Lewis Center Rd. (east of railroad), New Roadway 2 lane(s) each direction with complete street facilities
92	Broad St. (SR 16) from McNaughten Rd. to Taylor Rd., Widen road from 4 lanes to 6 lanes total both directions with complete street facilities

96	Sawmill Pkwy. extension from US 42 at Sawmill Pkwy. (s. of Slack Rd.) to Section Line Rd. (south of Airport Rd.), New Roadway 1 lane(s) each direction with complete street facilities
135	I-70 (East Freeway) at I-270 (East Outerbelt), Reconfigure slip, loop and/or directional interchange ramps
189	I-70/I-71 (South Innerbelt) at I-71S/SR 315 (west interchange), Reconfigure slip, loop and/or directional interchange ramps
212	Dublin-Granville Rd. (SR 161) at Karl Rd., Add/Modify turn lanes and add complete street facilities
270	I-70/I-71 (South Innerbelt) from I-71S/SR 315 (west interchange) to I-70E/I-71N (east interchange), Widen freeway from 6 lanes to 10 lanes total both directions
271	I-70 (East Freeway) from I-71 (East Innerbelt) to Kelton Ave., Widen freeway from 8 lanes to 10 lanes total both directions
324	Sunbury Pkwy. (west section) from US 36/SR 37 to Four Winds Dr. extension (future), New Roadway 2 lane(s) each direction with complete street facilities
347	US 33 (College Ave.) at Petzinger Rd., New interchange
377	US 33 at Pickerington Rd., New interchange
384	I-71 at Sunbury Parkway, New interchange
404	I-70 at Etna Pkwy, New interchange
414	US 33 (Columbus-Lancaster Rd) from Hill Rd/Diley Rd to US-33/Carroll Interchange, Convert 4 lane roadway to 4 lane freeway
435	Perimeter Dr. from Holt Rd./Perimeter Loop Dr. to Emerald Pkwy, Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
457	Market St. extension from Reynoldsburg-New Albany Rd./High St. to 3rd St. extension, New Roadway 1 lane(s) each direction with complete street facilities
464	SR-161 from I-270 to US-62, Widen freeway from 4 lanes to 6 lanes total both directions
469	Beech Rd/Clark State Rd. at Morse Rd., Construct roundabout with complete street facilities
692	SR 605 at Walnut St., Construct roundabout with complete street facilities
751	Merrick Pkwy from Troy Rd. to Current Eastern Terminus, New Roadway 1 lane(s) each direction with complete street facilities
765	Lewis Center Rd. at Worthington Rd./Rome Corners Rd., Construct roundabout with complete street facilities
766	Sunbury Rd. at Agler Rd./Cassady Ave., Add/Modify turn lanes and add complete street facilities
787	I-70 from I-270 to Brice Rd.., Widen freeway from 6 lanes to 8 lanes total both directions
788	I-70 from Brice Rd. to SR 256, Widen freeway from 6 lanes to 8 lanes total both directions
789	I-270 at Easton Way, Modify ramp termni intersection(s)
852	SR 204 at Milnor Rd., Construct roundabout with complete street facilities

960	Livingston Ave. from I-70 to Brice Rd., Modify 4 lane roadway to 2 lanes with addition of complete street facilities
1119	Dublin-Granville Rd. at Linworth Rd., Add/Modify turn lanes and add complete street facilities
1120	Dublin-Granville Rd. at Olentangy River Rd., Add/Modify turn lanes and add complete street facilities
1182	Alum Creek Dr. from SR 317 to Groveport Rd., Widen road from 4 lanes to 6 lanes total both directions with complete street facilities
1192	John Shields Pkwy from Village Pkwy to Dublin Center Dr., New Roadway 1 lane(s) each direction with complete street facilities
1206	Wilson Rd. South from Rider Rd. to Cheshire Rd., New Roadway 2 lane(s) each direction with complete street facilities
1351	Cassady Ave from CSX Railroad to 7th Ave., Add turn lanes and complete street facilities to 2 lane roadway
1358	E. Broad St at Hamilton Rd, Add/Modify turn lanes and add complete street facilities
1374	Bale Kenyon Rd from E. Powell Rd to Orange Rd, Add turn lanes and complete street facilities to 2 lane roadway
1380	E. Broad St from I-270 to Outerbelt St, Widen road from 5 lanes to 6 lanes total both directions with complete street facilities
1409	SR-315 at Jewett Rd., Add/Modify turn lanes and add complete street facilities
1414	Cleveland Ave. at Hudson St., Add/Modify turn lanes and add complete street facilities
1425	Cooke Rd. from I-71 to Cleveland Ave., Add turn lanes and complete street facilities to 2 lane roadway
1426	Ferris Rd. from Karl Rd. to Westerville Rd., Add turn lanes and complete street facilities to 2 lane roadway
1490	Hamilton Rd. from SR-161 to Central College Rd., Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
1644	US-23 at Williams Rd., Add/Modify turn lanes and add complete street facilities
1718	SR-605 at Fancher Rd., Add/Modify turn lanes and add complete street facilities
1725	E Wilson Bridge Rd. at N High St./US-23, Add/Modify turn lanes and add complete street facilities
1726	Dublin Granville Rd./SR-161 at Busch Blvd., Add/Modify turn lanes and add complete street facilities
1728	SR-161 at Sharon Woods Blvd/Tamarack Blvd., Add/Modify turn lanes and add complete street facilities
1729	Riverside Dr./US-33 at Hayden Rd., Add/Modify turn lanes and add complete street facilities
1748	Hilliard-Rome Rd. at Renner Rd., Add/Modify turn lanes and add complete street facilities
1758	E Broad St. at Rosehill Rd., Add/Modify turn lanes and add complete street facilities

1809	Sancus Blvd. from Worthington Woods Blvd. to Syracuse Ln., Add turn lanes and complete street facilities to 2 lane roadway
1838	Eichhorn St. Extension from current terminus to 3500 ' west, New Roadway 1 lane(s) each direction with complete street facilities
1841	Green Chapel Rd. from US-62 to Clover Valley Rd., Add turn lanes and complete street facilities to 2 lane roadway
1842	Green Chapel Rd. from Clover Valley Rd. to Mink St., Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
1843	Mink St. from SR-161 eastbound ramps to Green Chapel Rd., Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
1844	Harrison Rd. extension from Clover Valley Rd. to Mink St., New Roadway 1 lane(s) each direction with complete street facilities
1845	Clover Valley Rd. from Jug St. to Green Chapel Rd., Add turn lanes and complete street facilities to 2 lane roadway
1846	Beech Rd. from Innovation Corridor Way to Jug St., Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
1851	Frank Rd at Hardy Parkway St. and Brown Rd, Add/Modify turn lanes and add complete street facilities
1855	Trabue Rd from Lake Shore Dr to Riverside Dr, Add turn lanes and complete street facilities to 4 lane roadway
1878	SR-605 at Fancher Rd, Add/Modify turn lanes and add complete street facilities
1905	Merrick Parkway from Troy Rd to CSX RR, Add/Modify turn lanes and add complete street facilities
1912	Taylor Station at Claycraft Rd, Add/Modify turn lanes and add complete street facilities
1923	Hayden Run Rd at Britton Parkway, Construct roundabout with complete street facilities
1927	N Cassady Ave from I-670 to Agler Rd, Add turn lanes and complete street facilities to 2 lane roadway
2022	I-71 at Big Darby Creek, Widen freeway from 0 lanes to 0 lanes total both directions
2027	SR-315 at Hyatts Rd, Add/Modify turn lanes and add complete street facilities
2028	SR 204 at Tollgate Rd, Add/Modify turn lanes and add complete street facilities
2030	Summit St at 3rd and 8th Ave, Add/Modify turn lanes and add complete street facilities
2031	SR-665 at Lambert Rd, Add/Modify turn lanes and add complete street facilities
2032	SR-161 at Beech Rd, Modify ramp termni intersection(s)
2041	Hyland Croy Rd from Brand Rd to Park Mill Dr, Add turn lanes and complete street facilities to 2 lane roadway
2046	Big Walnut Rd from South Old 3C Rd to Tussic St, Add turn lanes and complete street facilities to 2 lane roadway

2047	Cheshire Rd from Piatt Rd to South Old State, Add turn lanes and complete street facilities to 2 lane roadway
2049	Cheshire Rd at Golf Course Rd, Construct roundabout with complete street facilities
2050	Cheshire Rd from Winterbourne Dr to Piatt Rd, New railroad grade seperated bridge
2051	Fancher Rd at Harlem Rd, Construct roundabout with complete street facilities
2052	Home Rd from Liberty Rd to SR-315, Add turn lanes and complete street facilities to 2 lane roadway
2053	Hyatts Rd from Steitz Rd to Sawmill Pkwy, Add turn lanes and complete street facilities to 2 lane roadway
2056	S County Line Rd at Fancher Rd, Construct roundabout with complete street facilities
2057	S County Line Rd at Center Village, Construct roundabout with complete street facilities
2058	S Old State Rd at Hollenback Rd, Construct roundabout with complete street facilities
2059	SR 3 at Lewis Center Rd, Add/Modify turn lanes and add complete street facilities
2060	Sunbury Rd at Big Walnut Rd, Construct roundabout with complete street facilities
2061	Merrick Pkwy from US 23 west to Proposed CSX RR Crossing, New Roadway 1 lane(s) each direction with complete street facilities
2062	1st Ave from Grandview Ave to Ashland Ave, Add turn lanes and complete street facilities to 2 lane roadway
2065	Basil-Western Rd from Kings Crossing/Hill Rd to Amanda-Northern Rd, Add turn lanes and complete street facilities to 2 lane roadway
2066	Central College Rd from Lee Rd to Sandimark Pl, Add turn lanes and complete street facilities to 2 lane roadway
2068	Polaris Pkwy from Gemini Pl to 1004' south of S Old State Rd, Add turn lanes and complete street facilities to 4 lane roadway
2069	Avery Rd from Hayden Run Rd to Tuttle Crossing Extension, Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
2070	Cleveland Ave at E Dunedin Rd, Add/Modify turn lanes and add complete street facilities
2071	SR-161 at Olentangy River, Add/Modify turn lanes and add complete street facilities
2074	Rohr Rd from Bixby Rd to West of Shook Rd, Add turn lanes and complete street facilities to 2 lane roadway
2147	I-270 at I-71 (North Outerbelt), Interchange modification
2190	E 5th Ave at Cassady Ave, Add/Modify turn lanes and add complete street facilities
LCATS	Mt Vernon Rd. from Channel St. to Riverview; Add/Modify turn lanes and complete street facilities to 2 lane roadway
LCATS	SR-16 at York Rd, Construct roundabout with complete streets facilities
LCATS	Thornwood Dr. from Beaver Run Rd to Lees Rd; Add/Modify turn lanes and complete street facilities to 2 lane roadway

LCATS	Canyon Rd. Extension from Refugee Rd. to US40; New Roadway 1 lane(s) each direction with complete street facilities
LCATS	Canyon Rd. from Beaver Run Rd. to Refugee Rd; Add/Modify turn lanes and complete street facilities to 2 lane roadway
LCATS	I-70 from SR-158 to SR-79, Widen freeway from 4 lanes to 6 lanes total both directions
LCATS	SR-161 from Beech Rd to Columbus Rd, Widen freeway from 4 lanes to 6 lanes total both directions
LCATS	SR-161 from Columbus Rd to Thornwood Crossing, Widen freeway from 4 lanes to 6 lanes total both directions
LCATS	High St at Newark St, Add/Modify turn lanes and add complete street facilities
LCATS	Licking Valley at Main St, Construct roundabout with complete streets facilities
LCATS	Canal Rd. from Cumberland Rd to Hebron city line; Add/Modify turn lanes and complete street facilities to 2 lane roadway
LCATS	SR-79 (Walnut Rd) from Park Ave. to Buckeye lake city line; Add/Modify turn lanes and complete street facilities to 2 lane roadway

Table 9: Additional Projects identified for year 2040

Plan Project ID	Project Description (2040)
1	Lockbourne Rd. from SR 104 (Frank-Refugee Freeway) to Livingston Ave. (US 33), Add turn lanes and complete street facilities to 2 lane roadway
3	Williams Rd. from Alum Creek Dr. to Hamilton Rd., Add turn lanes and complete street facilities to 2 lane roadway
12	Sunbury Rd. from Agler Rd. to Morse Rd., Add turn lanes and complete street facilities to 2 lane roadway
17	Veterans Pkwy. from US 23 at US 42 to US 36/SR 37, New Roadway 2 lane(s) each direction with complete street facilities
18	Galloway Rd.-Hilliard Rome Rd. connector from Broad St. (US 40) to Feder Rd., New Roadway 2 lane(s) each direction with complete street facilities
33	Gender Rd. from US 33 (Southeast Freeway) to Brice Rd., Add turn lanes and complete street facilities to 2 lane roadway
48	Sunbury Rd. from Morse Rd. to SR 161, Add turn lanes and complete street facilities to 2 lane roadway
55	Sunbury Rd. from Leonard Ave. to Agler Rd., Add turn lanes and complete street facilities to 2 lane roadway

56	Broad St. (SR 16) from Etna Pkwy. to SR 310 (east leg), Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
62	Williams Rd. from Heer Park to Alum Creek Dr., Add turn lanes and complete street facilities to 2 lane roadway
64	I-70 (East Freeway) from SR 256 (Baltimore-Reynoldsburg Rd.) to SR 158, Widen freeway from 4 lanes to 6 lanes total both directions
95	Valleyside Dr. from US 36 (William St.) to SR 37 (Central Ave.) at Lexington Blvd., New Roadway 1 lane(s) each direction with complete street facilities
111	SR 310 (Hazelton-Etna Rd.) from US 40 (National Rd.) to Mill Street Rd., Add turn lanes and complete street facilities to 2 lane roadway
122	Johnstown Rd. from Goshen La. to Stygler Rd., Add turn lanes and complete street facilities to 2 lane roadway
155	Bixby Rd. from US 33 (Southeast Freeway) to Winchester Pk., Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
157	Mink St. from National Rd. (US 40) to Broad St. (SR 16), Add turn lanes and complete street facilities to 2 lane roadway
158	Mink St. from Broad St. (SR 16) to Morse Rd., Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
162	Glenn Rd. from Curve Rd. to US 36/SR 37, Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
173	Waggoner Rd. from Broad St. (SR 16) to Havens Corners Rd., Add turn lanes and complete street facilities to 2 lane roadway
176	SR 317 (London-Groveport Rd.) from Alum Creek Dr. to Main St. (Groveport Rd.), Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
180	Georgesville Rd. from Hall Rd. to Clime Rd. (south leg), Add turn lanes and complete street facilities to 4 lane roadway
183	Stygler Rd. from Johnstown Rd. to US 62, Add turn lanes and complete street facilities to 2 lane roadway
199	Livingston Ave. (US 33) at Alum Creek Dr., Add/Modify turn lanes and add complete street facilities
208	High St. (US 23) at Obetz Rd., Add/Modify turn lanes and add complete street facilities
209	Morse Rd. at Westerville Rd. (SR 3), Add/Modify turn lanes and add complete street facilities
218	Ebright-Bixby interchange connector from Ebright Rd. (north of rail line) to Bixby-Sims connector (future), New Roadway 2 lane(s) each direction with complete street facilities
220	Big Walnut Rd. at Old 3C Hwy., Add/Modify turn lanes and add complete street facilities
221	Big Walnut Rd. at Tussic Street Rd., Add/Modify turn lanes and add complete street facilities
239	Winchester Pike at Ebright Rd./Shannon Rd., Add/Modify turn lanes and add complete street facilities

248	Avery-Muirfield Dr. at Perimeter Dr. & Perimeter Loop Dr., Construct roundabout with complete street facilities
254	William St. (US 36) at Channing St., Add/Modify turn lanes and add complete street facilities
255	William St. (US 36/US 42) at Lake St. (US 42), Add/Modify turn lanes and add complete street facilities
256	William St. (US 36) at Curtis St., Add/Modify turn lanes and add complete street facilities
258	Central Ave. (SR 37) at Locust Curve Dr., Add/Modify turn lanes and add complete street facilities
259	US 23 (Columbus Pk.) at Cottswold Dr., Add/Modify turn lanes and add complete street facilities
260	US 23 (Columbus Pk.) at Cheshire Rd., Add/Modify turn lanes and add complete street facilities
268	Walnut St. at Bevelhymer Rd., Add/Modify turn lanes and add complete street facilities
323	Four Winds Dr. (south extension) from 3B's & K Rd. (north of Cheshire Rd.) to US 36/SR 37, New Roadway 2 lane(s) each direction with complete street facilities
343	Shanahan Rd. from US 23 (Columbus Pk.) to Piatt Rd., Add turn lanes and complete street facilities to 2 lane roadway
380	SR 161 from US-62 to Beech Road, Widen freeway from 4 lanes to 6 lanes total both directions
381	I-270 at Broad Street (west outerbelt), Interchange modification
383	I-71 at TR 109 (Big Walnut Road), New interchange
399	I-70 from I-670 to Broad St (US 40), Widen freeway from 4 lanes to 6 lanes total both directions
400	I-70 at Livingston Ave., Interchange modification
401	I-70 from Livingston Ave to US 33, Widen freeway from 6 lanes to 8 lanes total both directions
416	US 33 at Hamilton Rd./Williams Rd., Interchange modification
417	US 33 at SR 104 (Frank-Refugee Freeway), Interchange modification
418	US 33 from SR 104 to I-270, Widen freeway from 4 lanes to 6 lanes total both directions
419	US 33/SR 161 from Dublin-Plain City Rd (SR 161/Post Rd) to Avery-Muirfield Dr, Widen freeway from 4 lanes to 6 lanes total both directions
429	Cosgray Rd. from Fishel Drive South to SR 161 (Post Rd.), Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
455	Walnut St. extension from US 62 (Johnstown Rd.) to Beech Rd., New Roadway 1 lane(s) each direction with complete street facilities
474	Dublin-Granville Rd. (SR-161) from Sawmill Rd. to Aeros Dr., Add turn lanes and complete street facilities to 2 lane roadway
486	Kinnear Rd. extension from Olentangy River Rd. to Cannon Dr., New Roadway 1 lane(s) each direction with complete street facilities

542	US 62/SR 3 (Harrisburg Pk.) from Eakin Rd./Hopkins Ave. to Brown Rd., Add turn lanes and complete street facilities to 2 lane roadway
564	Wilcox Rd. at Hayden Run Rd., Add/Modify turn lanes and add complete street facilities
633	Big Walnut Rd. from Africa Rd. to Worthington Rd., Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
682	Rickenbacker Pkwy Extension from Ashville Pike to Pontious Rd., New Roadway 2 lane(s) each direction with complete street facilities
694	Africa Rd. from County Line Rd. to Westar Rd., Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
722	SR 674 Realignment from Gender Rd. to Winchester Southern Rd., New Roadway 2 lane(s) each direction with complete street facilities
723	Refugee Rd. at Pickerington Rd., Construct roundabout with complete street facilities
746	Jeg's Blvd. extension from US 42 to Sawmill Pkwy., New Roadway 1 lane(s) each direction with complete street facilities
767	Mound St. at Central Ave./Harrisburg Pk., Add/Modify turn lanes and add complete street facilities
772	Main St. from I-270 to McNaughten Rd., Add turn lanes and complete street facilities to 4 lane roadway
775	Livingston Ave. from Front St. to High St., Convert from 2 one-way lanes to 2 lanes total both directions with complete street facilities
782	Refugee Rd. from Mink Rd. to SR 310, Add turn lanes and complete street facilities to 2 lane roadway
783	Etna Pkwy from US 40 to SR 16, Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
792	Groveport Rd. from Swisher Rd. to SR 317, Add turn lanes and complete street facilities to 2 lane roadway
808	Cleveland Ave. from County Line Rd. to Polaris Pkwy., Widen road from 4 lanes to 6 lanes total both directions with complete street facilities
810	County Line Rd. from Cleveland Ave. to Africa Rd., Widen road from 4 lanes to 6 lanes total both directions with complete street facilities
819	Tech Center Dr. extension from Science Blvd. to Taylor Station Rd., New Roadway 1 lane(s) each direction with complete street facilities
838	I-70 at Hamilton Rd., Modify ramp termni intersection(s)
850	Richardson - Ebright Connector from Richardson Rd. to Ebright Rd., New Roadway 1 lane(s) each direction with complete street facilities
854	SR 204 at Taylor rd., Add/Modify turn lanes and add complete street facilities
872	US 23 from City of Columbus municipal boundary to City of Delaware municipal boundary, Widen road from 4 lanes to 6 lanes total both directions with complete street facilities

877	Depot St. extension (north) from Case Ave. to Adventure Park Dr., New Roadway 1 lane(s) each direction with complete street facilities
878	Sharp St. extension (west) from N. Liberty St. to Depot St. (proposed), New Roadway 1 lane(s) each direction with complete street facilities
879	Sharp St. extension (east) from existing Sharp St. end to Grace Dr., New Roadway 1 lane(s) each direction with complete street facilities
925	Village Center Pkwy extension from Existing Village Center Pkwy to SR 161, New Roadway 1 lane(s) each direction with complete street facilities
936	Dempsey Rd. from I-270 to Sunbury Rd., Add turn lanes and complete street facilities to 2 lane roadway
941	SR-315 at John Herrick Dr./12th Ave., Interchange modification
945	Phillipi Rd. at Railroad crossing, New railroad grade seperated bridge
947	Northwest Blvd. at Chambers Rd., Add/Modify turn lanes and add complete street facilities
956	Grandview Ave. extension from Mckinley Ave. to Broad St., New Roadway 2 lane(s) each direction with complete street facilities
961	Main St. from High St. to Grant Ave., Convert from 2 one-way lanes to 2 lanes total both directions with complete street facilities
948	Grandview Ave. at Fifth Ave., Add/Modify turn lanes and add complete street facilities
963	Northwest Blvd. from 3rd Ave to North Star Rd, Modify 4 lane roadway to 2 lanes with addition of complete street facilities
965	Long St. from SR 315 to I-71, Convert from 3 one-way lanes to 4 lanes total both directions with complete street facilities
966	Spring St. from SR 315 to I-71, Convert from 3 one-way lanes to 4 lanes total both directions with complete street facilities
1107	Sullivant Ave. at Hague Ave., Add/Modify turn lanes and add complete street facilities
1116	Science Blvd. extension from Tech Center Dr. to Taylor Rd., New Roadway 1 lane(s) each direction with complete street facilities
1118	Houchard Rd. from Industrial Pkwy to McKitrick Rd., New Roadway 1 lane(s) each direction with complete street facilities
1183	Blaney Rd. (CR-15) Extension/Realignment from Home Rd. to US 42, New Roadway 2 lane(s) each direction with complete street facilities
1190	Long Rd. from Columbus St. to Diley Rd., Add turn lanes and complete street facilities to 2 lane roadway
1196	Shier Rings Rd from Shamrock Ct to Metro Pl N, New Roadway 1 lane(s) each direction with complete street facilities
1198	Research Pkwy from SR161/Post Rd to Shier Rings Rd and Eiterman Rd, New Roadway 2 lane(s) each direction with complete street facilities

1199	Advancement Avenue from Eiterman Rd to Darree Fields, New Roadway 1 lane(s) each direction with complete street facilities
1202	Dublin-Granville Rd. (SR-161) from Aeros Dr to Hutchinson St, Add turn lanes and complete street facilities to 2 lane roadway
1203	Dublin-Granville Rd. (SR-161) from Strathaven Dr. to Olentangy River Rd., Add turn lanes and complete street facilities to 2 lane roadway
1223	Demorest Rd. from Southwest Blvd. to Big Run South Rd., Add turn lanes and complete street facilities to 2 lane roadway
1228	Grove City - Broadway Connector from Grove City Rd. to Broadway (US 62), New Roadway 1 lane(s) each direction with complete street facilities
1233	Demorest Connector from Demorest Rd. at Rensch Rd. to Demorst Dr. at US-62, New Roadway 1 lane(s) each direction with complete street facilities
1243	Hoover Connector from Hoover Rd. to London-Groveport Connector (proposed), New Roadway 1 lane(s) each direction with complete street facilities
1248	Holton - Buckeye Connector from Holton Rd. to Buckeye Pkwy., New Roadway 1 lane(s) each direction with complete street facilities
1353	Demorest Rd. from Southwest Blvd. to Grove City Rd., Add turn lanes and complete street facilities to 2 lane roadway
1361	Liberty St at Seldom Seen Rd, Add/Modify turn lanes and add complete street facilities
1362	Broadway at Demorest, Add/Modify turn lanes and add complete street facilities
1364	SR-161 at Cleveland Ave, Add/Modify turn lanes and add complete street facilities
1372	US 23 at Hyatts Rd, Add/Modify turn lanes and add complete street facilities
1395	Holt Rd. Extension from Grove City Rd. to Rensch Rd., New Roadway 1 lane(s) each direction with complete street facilities
1397	South Connector from Harrisburg Pike/US-62 to Bill Lotz Way/Haughn Rd. Extension (proposed), New Roadway 1 lane(s) each direction with complete street facilities
1400	North Meadows to Haughn Connector (overpass) from Hoover Rd. to Haughn Connector, New Roadway 1 lane(s) each direction with complete street facilities
1406	US-36 at CR-605, Add/Modify turn lanes and add complete street facilities
1410	Livingston Ave. at SR-317, Add/Modify turn lanes and add complete street facilities
1416	E Mound St. at S 3rd St., Add/Modify turn lanes and add complete street facilities
1421	I-270 (East Outerbelt) at E Broad St, Modify ramp termni intersection(s)
1424	Cleveland Ave. at Innis Rd., Add/Modify turn lanes and add complete street facilities
1481	Souder Ave. extension from Dublin Rd. to Twin Rivers Dr., New Roadway 1 lane(s) each direction with complete street facilities
1494	Old State Rd. from Lazelle Rd. to Polaris Pkwy, Widen road from 2 lanes to 4 lanes total both directions with complete street facilities

1496	Polaris Pkwy (SR-750) from Powell Rd. to Capella Dr., Widen road from 4 lanes to 6 lanes total both directions with complete street facilities
1498	Brice Rd. at Shannon Rd., Add/Modify turn lanes and add complete street facilities
1501	Dublin-Granville Rd. (SR-161) at Sawmill Rd., Add/Modify turn lanes and add complete street facilities
1502	Refugee Rd. at Hines Rd., Add/Modify turn lanes and add complete street facilities
1504	Roberts Rd. at Spindler Rd. & Frazell Rd., Add/Modify turn lanes and add complete street facilities
1649	Groveport Rd. at Williams Rd., Add/Modify turn lanes and add complete street facilities
1717	US-42 at SR-257/Klondike Rd., Add/Modify turn lanes and add complete street facilities
1724	Polaris Pkwy/SR 750 at S Old State Rd., Add/Modify turn lanes and add complete street facilities
1735	Cleveland Ave. at Morse Rd., Add/Modify turn lanes and add complete street facilities
1738	Westerville Rd./SR-3 at Ferris Rd./Walnut Creek Dr., Add/Modify turn lanes and add complete street facilities
1740	Sunbury Rd. at Innis Rd./McCutcheon Rd., Add/Modify turn lanes and add complete street facilities
1742	Westerville Rd. at Oakland Park Ave., Add/Modify turn lanes and add complete street facilities
1747	Hilliard-Rome Rd. at Westchester Woods Blvd., Add/Modify turn lanes and add complete street facilities
1752	N High St. at E 5th Ave., Add/Modify turn lanes and add complete street facilities
1753	5th Ave. at Summit St./US-23, Add/Modify turn lanes and add complete street facilities
1761	Sullivant Ave. at S Central Ave., Add/Modify turn lanes and add complete street facilities
1765	Livingston Ave. at Nelson Rd., Add/Modify turn lanes and add complete street facilities
1766	Livingston Ave. at Noe Bixby Rd./Woodcrest Rd., Add/Modify turn lanes and add complete street facilities
1767	Brice Rd. at Livingston Ave., Add/Modify turn lanes and add complete street facilities
1777	Georgesville Rd. at Clime Rd., Add/Modify turn lanes and add complete street facilities
1779	Stringtown Rd. at Marlane Dr., Add/Modify turn lanes and add complete street facilities
1784	Scioto Darby Creek Rd. from Leap Rd. to Dublin Rd., Add turn lanes and complete street facilities to 2 lane roadway
1787	SR-310 (Hazelton-Etna Rd.) from I-70 (East Freeway) to Blacklick Eastern Rd. (SR-204), Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
1788	Winchester Pike from Hamilton Rd. to Gender Rd., Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
1789	Twin Rivers Dr. from Goodale Blvd. to Dublin Rd. (US-33), Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
1790	Souder Ave. from Broad St. to Dublin Rd. (US-33), Widen road from 2 lanes to 4 lanes total both directions with complete street facilities

1791	US-33 (Southeast Freeway) from I-270 to Fairfield County Line, Widen freeway from 4 lanes to 6 lanes total both directions
1792	US-42 from SR-736 to Industrial Pkwy (CR-1), Add turn lanes and complete street facilities to 2 lane roadway
1794	US-42 from Bell Rd/Wells Rd. (CR-19) to Watkins Rd. (CR-104), Add turn lanes and complete street facilities to 2 lane roadway
1795	US-42 from Watkins Rd. (CR-104) to Section Line Rd. (CR-5), Add turn lanes and complete street facilities to 2 lane roadway
1796	US-42 from Section Line Rd. (CR-5) to US-23, Add turn lanes and complete street facilities to 2 lane roadway
1800	Linworth Rd. from Wilson Bridge Rd. to Hard Rd., Add turn lanes and complete street facilities to 2 lane roadway
1803	Groveport Rd. from Parsons Ave. to SR-104, Add turn lanes and complete street facilities to 2 lane roadway
1806	McCutcheon Rd. from Stelzer Rd. to Sunbury Rd., Add turn lanes and complete street facilities to 2 lane roadway
1807	McNaughten Rd. from Livingston Ave. to Main St., Add turn lanes and complete street facilities to 2 lane roadway
1808	Rathmell Rd. from US-23 to Alum Creek Dr., Add turn lanes and complete street facilities to 2 lane roadway
1811	Sullivant Ave. from Georgesville Rd. to Norton Rd., Add turn lanes and complete street facilities to 2 lane roadway
1812	Ulry Rd. from Dublin-Granville Rd. to Warner Rd., Add turn lanes and complete street facilities to 2 lane roadway
1814	Wilson Rd. from Trabue Rd. to Roberts Rd., Add turn lanes and complete street facilities to 2 lane roadway
1815	Roberts Rd. from Wilson Rd. to Dublin Rd., Add turn lanes and complete street facilities to 2 lane roadway
1816	Allen Rd. from US-33 to Stemen Rd., Add turn lanes and complete street facilities to 2 lane roadway
1818	Etna Pkwy extension from US-40 to Blacklick-Eastern Rd. (SR-204), New Roadway 1 lane(s) each direction with complete street facilities
1820	Delaware NE Bypass (Eastern Leg) from Byxbe Pkwy (Proposed) to US-36, New Roadway 2 lane(s) each direction with complete street facilities
1847	Beech Rd. from Jug St. to US-62, Add turn lanes and complete street facilities to 2 lane roadway
1848	Miller Rd. from Beech Rd. to Clover Valley Rd., Add turn lanes and complete street facilities to 2 lane roadway

1860	Frank Rd from Harrisburg Pike to Harmon Ave, Add turn lanes and complete street facilities to 4 lane roadway
1862	Havens Corner Rd from Hamilton Rd to Waggoner Rd, Add turn lanes and complete street facilities to 2 lane roadway
1871	New Road over I-270 from Tuller Rd to Emerald Pkwy, New grade seperated bridge
1882	SR-161 from Cleveland Ave to I-71, Add turn lanes and complete street facilities to 4 lane roadway
1894	1st Ave from Grandview Ave to Virginia Ave, Add turn lanes and complete street facilities to 2 lane roadway
1914	Helmbright Dr at Taylor Rd, Add/Modify turn lanes and add complete street facilities
1939	S High St at Greenlawn, Add/Modify turn lanes and add complete street facilities
2133	Berlin Station Rd from Braumiller Rd to Curve Rd, Add turn lanes and complete street facilities to 2 lane roadway
2145	US-23 from SR-229 to Coover Rd, Convert 4 lane roadway to 6 lane freeway
2165	SR-37 from Sandusky St to Troy Rd, Add turn lanes and complete street facilities to 2 lane roadway
2166	US-36 from Liberty St to Pennick Ave, Add turn lanes and complete street facilities to 2 lane roadway
2172	Troy Rd from SR-192 to Pennsylvania Ave, Add turn lanes and complete street facilities to 2 lane roadway
2174	US-23 at E Central Ave (SR-37), Interchange modification
2187	US-23 from SR-317 to Pickaway County Line, Convert 4 lane roadway to 4 lane freeway
2188	US-23 at SR-229, New interchange
LCATS	SR-13 at US-62, Construct roundabout with complete streets facilities
LCATS	SR-13 at US-40, Construct roundabout with complete streets facilities
LCATS	US-62 from FRA-LIC county line to Johnstown, Add/Modify turn lanes and complete street facilities to 2 lane roadway
LCATS	W Main St from Coffman Rd to Thornwood Dr, Add turn lanes and complete street facilities to 2 lane roadway

Table 10: Additional Projects identified for year 2050

Plan Project ID	Project Description (2050)
19	Hall Rd. from Galloway Rd. to Georgesville Rd., Add turn lanes and complete street facilities to 2 lane roadway
30	Broad St. (SR 16) from Taylor Rd. to Etna Pkwy., Widen road from 2 lanes to 4 lanes total both directions with complete street facilities

39	Trabue Rd./Renner Rd. from Hilliard-Rome Rd. to Conrail overpass, Add turn lanes and complete street facilities to 2 lane roadway
42	Avery Rd. from Britton-Cosgray connector to Tuttle Crossing Blvd. extension, Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
50	Sinclair Rd. from Freeway Dr. South to SR 161 (Dublin-Granville Rd.), Add turn lanes and complete street facilities to 2 lane roadway
59	Courtright Rd. from Refugee Rd. to Livingston Ave., Add turn lanes and complete street facilities to 2 lane roadway
63	Groveport Rd. from Watkins Rd. to Williams Rd., Add turn lanes and complete street facilities to 2 lane roadway
97	Home Rd. from Section Line Rd. to Olentangy River Rd., Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
102	SR 665 (London-Groveport Rd.) from US 62 (Harrisburg Pk.) to Gateway West Dr., Add turn lanes and complete street facilities to 2 lane roadway
130	Avery Rd. from Hayden Run Rd. (south of) to Britton-Cosgray connector, Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
148	Rings-Tuttle Crossing connector from Rings Rd. (at Rings Rd. relocation) to Tuttle Crossing Blvd., New Roadway 1 lane(s) each direction with complete street facilities
151	Hill Rd. relocation from Busey Rd. at Hill Rd. (s. leg) to Hill Rd. north of Busey Rd., New Roadway 1 lane(s) each direction with complete street facilities
152	Hill Rd. from Hill Rd. relocation (n. of Busey Rd.) to Columbus St. (SR 256), Add turn lanes and complete street facilities to 2 lane roadway
153	Busey Rd. from Bowen Rd. to Allen Rd., Add turn lanes and complete street facilities to 2 lane roadway
175	Bixby-Sims connector from Bixby Rd. (west of US 33) to Sims Rd. (at Winchester Blvd. extension), New Roadway 2 lane(s) each direction with complete street facilities
177	Groveport Rd. from Williams Rd. to Alum Creek Dr., Add turn lanes and complete street facilities to 2 lane roadway
197	Cleveland Ave. at Oakland Park Ave., Add/Modify turn lanes and add complete street facilities
223	Hills Miller Rd. at Troy Rd., Add/Modify turn lanes and add complete street facilities
224	Cheshire Rd. at Africa Rd., Add/Modify turn lanes and add complete street facilities
225	Cheshire Rd. at Galena Rd./Rome Corners Rd., Add/Modify turn lanes and add complete street facilities
250	Columbus St. (Wright Rd.) from Diley Rd. to Hill Rd. (SR 256), Add turn lanes and complete street facilities to 2 lane roadway
261	Glenn Pkwy. from Berlin Station Rd. to Glenn Rd. (south of US 36/SR 37), New Roadway 2 lane(s) each direction with complete street facilities

348	Cheshire Rd. from Domigan Rd. to US 36/SR 37 (Cherry St.), Add turn lanes and complete street facilities to 2 lane roadway
354	McCorkle Blvd. extension from Broadway Ave. to Old County Line Rd., New Roadway 1 lane(s) each direction with complete street facilities
395	I-70 at I-270 (West Outerbelt), Reconfigure slip, loop and/or directional interchange ramps
402	I-70 from US 33 to Hamilton Rd, Widen freeway from 6 lanes to 8 lanes total both directions
403	I-70 from Hamilton Rd to I-270, Widen freeway from 6 lanes to 8 lanes total both directions
413	SR 104 at Alum Creek Dr, Interchange modification
423	High St (Canal Winchester) at US 33, New Roadway 1 lane(s) each direction with complete street facilities
424	Avery-Muirfield Dr. from US 33 to Post Rd, Widen road from 4 lanes to 6 lanes total both directions with complete street facilities
427	Cosgray Rd. from Tuttle Crossing Blvd. (proposed) to Shier Rings Rd., Add turn lanes and complete street facilities to 2 lane roadway
428	Cosgray Rd. from Shier Rings Rd. to Fishel Drive South, Add turn lanes and complete street facilities to 2 lane roadway
430	Eiterman Rd. from Bobcat Way to Shier Rings Rd., Add turn lanes and complete street facilities to 2 lane roadway
433	Hyland-Croy Rd. from Post Rd. to Brock Rd., Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
440	Shier Rings Rd. from Eiterman Rd. to Avery Rd., Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
442	Tuttle Crossing Blvd. extension from Cosgray Rd. to Avery Rd., New Roadway 2 lane(s) each direction with complete street facilities
454	Hamilton Rd. from Central College Rd. to Harlem Rd., New Roadway 2 lane(s) each direction with complete street facilities
468	Kitzmiller Rd. at Smith's Mill Rd., Construct roundabout with complete street facilities
484	Champion Ave./Governors Pl. from Broad St. to Long St.., Convert from 2 one-way lanes to 2 lanes total both directions with complete street facilities
485	Ohio Ave. from Broad St. to Long St., Convert from 2 one-way lanes to 2 lanes total both directions with complete street facilities
539	Johnstown Rd. from Stygler Rd. to Olde Ridenour Rd., Add turn lanes and complete street facilities to 2 lane roadway
540	Johnstown Rd. from Olde Ridenour Rd. to James Rd., Add turn lanes and complete street facilities to 2 lane roadway
669	SR-665 from SR-104 to Scioto St., Widen road from 2 lanes to 4 lanes total both directions with complete street facilities

743	Pollock Rd. from Pollock/US 23 intersection to US 23 to the south, Add/Modify turn lanes and add complete street facilities
785	US 23 at SR 665/SR 317, New interchange
791	Groveport Rd. at Richardson Rd./Groveport Park entrance, Add/Modify turn lanes and add complete street facilities
811	Altair Pkwy extension from Altair Pkwy (existing) to State St. (at Hoff Rd.), New Roadway 1 lane(s) each direction with complete street facilities
812	Westar Blvd. extension from Westar Blvd. (existing) to County Line Rd. (at Thompson Ave.), New Roadway 1 lane(s) each direction with complete street facilities
825	Hill Rd. at Basil-Western Rd., Construct roundabout with complete street facilities
836	I-70 - US 33 Connector (SE) from I-70 (East Freeway) to US 33 (SE), New Roadway 2 lane(s) each direction with complete street facilities
841	SR 317/Hamilton Rd. at Venture Place/Homer Ohio Ln., Add/Modify turn lanes and add complete street facilities
875	West Case St. (proposed) from Big Bear Ave. to Traditions Way, New Roadway 1 lane(s) each direction with complete street facilities
876	Village Pointe Dr. extension from Case Ave. to West Case St. (Proposed), New Roadway 1 lane(s) each direction with complete street facilities
880	Hall St. extension from Scioto St. to Sharp St. (proposed), New Roadway 1 lane(s) each direction with complete street facilities
881	Depot St. extension (south) from Powell City Hall to Liberty St., New Roadway 1 lane(s) each direction with complete street facilities
921	John Shields Pkwy. from Riverside Dr. to Shawan Falls Dr. (proposed), New Roadway 1 lane(s) each direction with complete street facilities
922	Shawan Falls Dr. extension from Existing Shawan Falls Dr. to John Shields Pkwy (proposed), New Roadway 1 lane(s) each direction with complete street facilities
923	Post Rd. realignment and extension from Kilgour Pl. to Shawan Falls Dr., New Roadway 1 lane(s) each direction with complete street facilities
937	Schrock Rd. at Cooper Rd., Add/Modify turn lanes and add complete street facilities
944	I-71 at Hudson St., Modify ramp termni intersection(s)
946	Cleveland Ave. at Weber Rd., Add/Modify turn lanes and add complete street facilities
949	Grandview Ave. at Third Ave., Add/Modify turn lanes and add complete street facilities
951	Fifth Ave. from US 33 to High St., Modify 4 lane roadway to 2 lanes with addition of complete street facilities
957	Hague Ave. extension from Briggs Rd. to Alkire Rd. (via Riverbend Rd.), New Roadway 1 lane(s) each direction with complete street facilities

962	Cassady - Stelzer Connector from Cassady Ave. to Stelzer Rd., New Roadway 1 lane(s) each direction with complete street facilities
1111	Long St. from Olentangy Trail to I-71, Modify 3 lane roadway to 2 lanes with addition of complete street facilities
1114	Jetway Blvd. extension from Jetway Blvd. end to Agler Rd., New Roadway 1 lane(s) each direction with complete street facilities
1184	Ravenhill Pkwy extension from Existing western terminus to Mitchell-Dewitt Rd., New Roadway 1 lane(s) each direction with complete street facilities
1188	Watkins-California Rd. realignment from Watkins-California Rd. to US 42, New Roadway 1 lane(s) each direction with complete street facilities
1194	Blaney Rd. (CR-15) Extension/Realignment from US 42 to Crottinger Rd., New Roadway 2 lane(s) each direction with complete street facilities
1200	Technology Way from Fisher Dr S to Intersection of Eiterman Rd and SR161, New Roadway 2 lane(s) each direction with complete street facilities
1214	US-42 - US-23 Connector from US-42 to US-23, New Roadway 1 lane(s) each direction with complete street facilities
1221	South Section Line Rd at Hyatts Rd Intersection, Add/Modify turn lanes and add complete street facilities
1225	London Groveport Rd (SR 665) from Hoover Rd to Rickenbacker International Airport, Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
1235	SR-665/South Connector from London Groveport Rd. to South Connector to Gateway West, New Roadway 1 lane(s) each direction with complete street facilities
1238	Seeds - Hoover Connector from Seeds Rd. to Hoover Rd., New Roadway 1 lane(s) each direction with complete street facilities
1239	London-Groveport Connector from London Groveport Rd. to Seeds - Hoover Connector (Proposed), New Roadway 1 lane(s) each direction with complete street facilities
1245	London-Groveport - Borror Connector from London Groveport Rd. to Borror Rd., New Roadway 1 lane(s) each direction with complete street facilities
1247	Hawthorne Pkwy Extension from Hawthrone Pkwy. to Jackson Pike (SR 104), New Roadway 1 lane(s) each direction with complete street facilities
1253	US-36 Bypass from US-36 East of Sunbury to US-36 West of Sunbury, New Roadway 1 lane(s) each direction with complete street facilities
1366	Forest Dr at Smith's Mill Rd, Add/Modify turn lanes and add complete street facilities
1368	Olentangy St at Beech Ridge, Add/Modify turn lanes and add complete street facilities
1392	SR-161 from Cosgray Rd. to Franklin County Line, Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
1394	Meadow Grove Dr. extension from Holton Rd. to Tournament Way, New Roadway 1 lane(s) each direction with complete street facilities

1396	Holt Rd. Extension (phase 2) from Rensch Rd. to Harrisburg Pike/US-62, New Roadway 1 lane(s) each direction with complete street facilities
1399	Bill Lotz Way/Haughn Rd. Extension from Gateway West Dr. to Haughn Connector, New Roadway 1 lane(s) each direction with complete street facilities
1404	US-36 at Wilson Rd., Add/Modify turn lanes and add complete street facilities
1408	US-23 at SR-750, Add/Modify turn lanes and add complete street facilities
1412	Broad St. at Raynoldsburg-New Albany Rd., Add/Modify turn lanes and add complete street facilities
1418	Westerville Rd. at Albert Ave., Add/Modify turn lanes and add complete street facilities
1472	Agler Rd. Extension from Sunbury Rd to Cleveland Ave., New Roadway 2 lane(s) each direction with complete street facilities
1478	West Campus Rd. extension from Hamilton Rd. extension (future) to New Albany Rd. West, New Roadway 1 lane(s) each direction with complete street facilities
1479	West Campus Rd. extension from Lee Rd. to Hamilton Rd. extension (future), New Roadway 1 lane(s) each direction with complete street facilities
1488	Trabue Rd./Renner Rd. from Alton Darby to Hilliard-Rome Rd., Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
1647	SR-104 from SR-665 to Pickaway County Line (continue to SR-762), Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
1650	SR 204/Blacklick Eastern Rd. from Summerfield Way to Violet Twp Line (east), Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
1714	SR-315 at I-670, Reconfigure slip, loop and/or directional interchange ramps
1715	Pickerington Rd. realignment from South of Pickerington Church of Nazerene to Existing Pickerington Rd. northeast of Ault Rd., New Roadway 2 lane(s) each direction with complete street facilities
1732	Morse Rd. at Karl Rd., Add/Modify turn lanes and add complete street facilities
1733	Morse Rd. at Tamarack Blvd., Add/Modify turn lanes and add complete street facilities
1734	Morse Rd. at Northtowne Blvd/Walford St., Add/Modify turn lanes and add complete street facilities
1739	Cleveland Ave. at Huy Rd., Add/Modify turn lanes and add complete street facilities
1741	McCutcheon Rd. at Stelzer Rd., Add/Modify turn lanes and add complete street facilities
1754	E 11th Ave. at Cleveland Ave/SR-3, Add/Modify turn lanes and add complete street facilities
1783	US-33 from Post Rd./SR-161 to US-42, Widen freeway from 4 lanes to 6 lanes total both directions
1785	Pontious Rd. from Rickenbacker Pkwy (proposed) to Rohr Rd., Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
1786	Broad St. from Hamilton Rd. to I-270 (East Outerbelt), Widen road from 4 lanes to 6 lanes total both directions with complete street facilities

1793	US-42 from Industrial Pkwy (CR-1) to Bell Rd./Wells Rd. (CR-19), Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
1821	Lewis Center Rd. from Home Rd. extension to S. Old State Rd., Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
1822	Lewis Center Rd. from S. Old State Rd. to Africa Rd., Widen road from 2 lanes to 4 lanes total both directions with complete street facilities
1837	Greengate Blvd. Extension from Diley Rd. to Hill Rd., New Roadway 1 lane(s) each direction with complete street facilities
1873	New Road over US-33 from SR-161 to Avery-Muirfield Dr, New grade seperated bridge
1929	Ganton Parkway from Existing Terminus to Reynoldsburg-New Albany Rd, New Roadway 1 lane(s) each direction with complete street facilities
1973	Summit St from E Hudson to I-670, Convert from 2 one-way lanes to 2 lanes total both directions with complete street facilities
1974	N 4th St from E Hudson St to I-670, Convert from 2 one-way lanes to 2 lanes total both directions with complete street facilities
2184	I-71 from Gemini Pl to US-36, Widen freeway from 6 lanes to 8 lanes total both directions

Conformity Analysis for Ozone

The conformity analysis consists of comparing the pollutant burden in the non-attainment area resulting from the projects listed in the MORPC and LCATS Transportation Plans to the approved emission budgets.

Figure 1: Columbus / Newark six county 2008 8-Hour ozone Maintenance Area

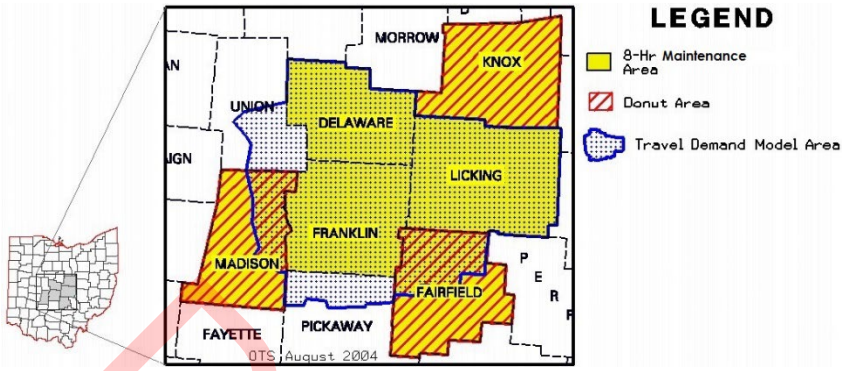
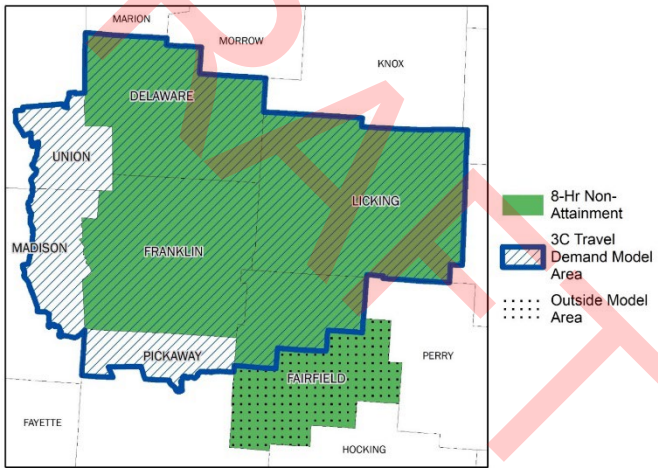


Figure 1a: Columbus / Newark four county 2015 8-Hour Non-Attainment Area



The ozone area has established budgets for VOC and NOx for the six county area with regard to the 2008 ozone standard and for the 4 county area with regard to the 2015 ozone standard. Thus, the conformity test requirements is the budget test with the budgets being the values shown previously in Table 1 for the six county area and in Table1a for the four county area.

The Regional model is used in evaluating emissions for the Franklin, Delaware and Licking counties. Modeled portions of Fairfield, and Madison Counties are also evaluated by using Regional model. The VOC and NOx emissions modeled are summarized in the following Tables.

Emission estimates summary of results is presented in the next sections.

Areas within The Regional Travel Demand Model

Table 11: Emission Estimations for On-Road Mobile Sources - Franklin County

Franklin County	2030	2040	2050
VMT (miles/day)	38,896,639	42,835,124	45,201,261
VOC (tons/day)	9.692	6.864	6.326
NOx (tons/day)	7.843	3.520	3.216

Table 12: Emission Estimations for On-Road Mobile Sources - Delaware County

Delaware County	2030	2040	2050
VMT (miles/day)	7,499,559	9,376,066	10,307,652
VOC (tons/day)	1.759	1.466	1.397
NOx (tons/day)	1.364	0.708	0.673

Table 13: Emission Estimations for On-Road Mobile Sources - Licking County

Licking County	2030	2040	2050
VMT (miles/day)	6,660,004	7,594,496	8,018,387
VOC (tons/day)	1.574	1.157	1.062
NOx (tons/day)	1.243	0.577	0.527

Areas partially within The Regional Travel Demand Model

Counties that are partially within regional travel demand model are Fairfield County, and Madison County. Tables 14a, and 14b, summarize emissions estimates for Fairfield County, for the areas within and outside travel demand model area, respectively. Results presented in Table 14a is for the area covered by the travel demand model. Table 14b is for the area not covered by the travel demand model, obtained by using HPMS data. Table 14c presents the emissions for the entire Fairfield County, which is simply sum of emissions from Tables 14a, and 14b.

Table 14a: Emission Estimations for Fairfield County within the Travel Demand Model Area

Fairfield County	2030	2040	2050
VMT (miles/day)	2,586,051	2,981,321	3,253,345
VOC (tons/day)	0.637	0.476	0.448
NOx (tons/day)	0.495	0.232	0.217

Table 14b: Emission Estimations for Fairfield County outside of the Travel Demand Model Area- using HPMS data

Fairfield County	2030	2040	2050
VMT (miles/day)	2,561,688	2,947,200	3,336,187
VOC (tons/day)	0.467	0.350	0.332
NOx (tons/day)	0.446	0.203	0.192

Table 14c: Emission Estimations for Fairfield County

Fairfield County	2030	2040	2050
VMT (miles/day)	5,147,739	5,928,521	6,589,532
VOC (tons/day)	1.104	0.826	0.780
NOx (tons/day)	0.940	0.435	0.408

Tables 15a, and 15b, summarize emissions estimates for Madison County, for the areas within and outside travel demand area, respectively. Results presented in Table 15a is for the area covered by the travel demand model. Table 15b is for the area not covered by the travel demand model, obtained based on HPMS VMT. Table 15c presents the emissions for the entire Madison county, which is simply sum of emissions from Tables 15a, and 15b.

Table 15a: Emission Estimations for Madison County within the Travel Demand Model Area

Madison County	2030	2040	2050
VMT (miles/day)	1,418,621	1,576,839	1,716,513
VOC (tons/day)	0.287	0.205	0.195
NOx (tons/day)	0.231	0.106	0.101

Table 15b: Emission Estimations for Madison County outside of the Travel Demand Model Area - using HPMS data

Madison County	2030	2040	2050
VMT (miles/day)	2,888,182	3,232,507	3,569,851
VOC (tons/day)	0.438	0.326	0.312
NOx (tons/day)	0.393	0.181	0.175

Table 15c: Emission Estimations for Madison County

Madison County	2030	2040	2050
VMT (miles/day)	4,306,803	4,809,346	5,286,364
VOC (tons/day)	0.725	0.531	0.507
NOx (tons/day)	0.624	0.287	0.275

Area outside Regional Travel Demand Model

Table 16, summarizes emissions estimates for Knox County, and the results presented in this Table used methodology based on HPMS data.

Table 16: Emission Estimations for Knox County – using only HPMS

Knox County	2030	2040	2050
VMT (miles/day)	1,282,084	1,315,826	1,350,851
VOC (tons/day)	0.303	0.221	0.206
NOx (tons/day)	0.209	0.095	0.089

Emissions Summary for the Columbus/Central Ohio Area

Tables 17 and 18, summarize VOC and NOx emissions estimates respectively for the analysis years. The summary presented in the following tables is from the aforementioned in Tables 11 through 16.

Table 17: VOC Emission Inventory Summary (tons/day)

VOC	2030	2040	2050
Franklin	9.692	6.864	6.326
Delaware	1.759	1.466	1.397
Licking	1.574	1.157	1.062
Fairfield	1.104	0.826	0.780
Madison	0.725	0.531	0.507
Knox	0.303	0.221	0.206
Total	**15.157**	**11.065**	**10.278**

Table 18: NOx Emission Inventory Summary (tons/day)

NOx	2030	2040	2050
Franklin	7.843	3.520	3.216
Delaware	1.364	0.708	0.673
Licking	1.243	0.577	0.527
Fairfield	0.940	0.435	0.408
Madison	0.624	0.287	0.275
Knox	0.209	0.095	0.089
Total	**12.224**	**5.621**	**5.189**

Conformity Determination for Ozone

Table 19 and 19a illustrates that the emissions for VOC and NO_x are less than their corresponding six county and 4 county budgets. Thus, the MORPC and LCATS Transportation Plans are in conformity with the requirements of the CAAA and the SIP.

Table 19: Air Quality Analysis for the Columbus 6 County 2008 8-hour Ozone Maintenance Area

	VOC (tons/day)	Budget (tons/day)	NOx (tons/day)	Budget (tons/day)
2030	15.157	44.31	12.224	85.13
2040	11.065	44.31	5.621	85.13
2050	10.278	44.31	5.189	85.13

Table 19a: Air Quality Analysis for the Columbus 4 County 2015 8-hour Ozone Non-Attainment Area

	VOC (tons/day)	Budget (tons/day)	NOx (tons/day)	Budget (tons/day)
2030	14.129	22.03	11.391	20.98
2040	10.313	22.03	5.240	20.98
2050	9.565	22.03	4.825	20.98

Attachment A-Technical Air Quality Information

Appendix A – Model Script, Figures illustrating Data

Ozone Analysis Reports Data

CUBE VOYAGER PROGRAM SCRIPT FOR COMPUTING VOC & NOx EMISSIONS

```
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;Output TXT Report File: {cm3rpto,filename,"Output TXT Report File",x,"..\..\Ozone\output\fra20.rpt","Report File
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;Output CSV Hourly File: {cm3hro,filename,"Output CSV Hourly File (Needed for benefits calc but very big)",x,"NONE","Report File
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;Note: {cm3junkname,note,"Optional Air Quality Files, Leave Blank When Not Doing Air Quality Calculations"}
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;Input area file: {cm3afile,filename,"Input Area File",x,"..\..\TripTables\TAZ_areain.txt","Text File (*.txt; *.prn)|*.txt; *.prn"}
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*if exist hourly.rpt DEL hourly.rpt
*if exist cmstext.rpt DEL cmstext.rpt
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ASD 3 4
ATB 4 4
ATH 5 4
AUG 6 4
BEL 7 3
BRO 8 4
BUT 9 2
CAR10 4
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CLE13 2
CLI14 4
COL15 4
COS16 4
CRA17 4
CUY18 1
DAR19 4
DEF20 4
DEL21 2
ERI22 3
FAI23 4
FAY24 4
FRA25 1
FUL26 4
GAL27 4
GEA28 2
GRE29 2
GUE30 4
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HAN32 4
HAR33 4
HAS34 4
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HIG36 4
HOC37 4
HOL38 4
HUR39 4
JAC40 4
JEF41 3
KNO42 4
LAK43 2
LAW44 3
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LOG46 4
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LUC48 2
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PAU63 4
PER64 4
PIC65 4
PIK66 4
POR67 2
PRE68 4
PUT69 4
RIC70 3
ROS71 4
SAN72 4
SCI73 4
SEN74 4
SHE75 4
STA76 2
SUM77 2
TRU78 2
TUS79 4
UNI80 4
VAN81 4
VIN82 4
WAR83 2
WAS84 3
WAY85 4
WIL86 4
WOO87 2
WYA88 4
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15      16      17      18      19      20      21      22      23
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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       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: {cm3tpce}

AQ SEASON FACTOR: {cm3aqfact}
ENDCOPY

rrmode='{cm3rmode}'
if(rrmode='NORMAL')
COPY FILE=dailyb.dat

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
ENDCOPY
   volff='li.1.{cm3volf}'
   trkfff='{cm3trkf}'
   if (trkfff == 'NONE')
    trkff='_zero'
   else
    trkff='li.1.{cm3trkf}'
   endif
   vol1s='_zero'
   vol2s='_zero'
   vol3s='_zero'
   vol4s='_zero'
   vol5s='_zero'
   vol6s='_zero'
   vol7s='_zero'
   vol8s='_zero'
   vol9s='_zero'
   vol10s='_zero'
   vol11s='_zero'
   vol12s='_zero'
```

```
   vol13s='_zero'
   vol14s='_zero'
   vol15s='_zero'
   vol16s='_zero'
elseif(rrmode='4PERIOD_OMS')
COPY FILE=dailyb.dat

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       0       0       0       1       1       1       1       0       0       0       0       0       0       0
0
CLS BEG       18       6       9      14      18       6       9      14       0       0       0       0       0       0       0
0
CLS END        5       8      13      17       5       8      13      17       0       0       0       0       0       0       0
0
CLS NUM        1       1       1       1       3       3       3       3       0       0       0       0       0       0       0
0
ENDCOPY
   volff='_zero'
   trkff='_zero'
   vol1s='li.1.volnt_aut'
   vol2s='li.1.volam_aut'
   vol3s='li.1.volmd_aut'
   vol4s='li.1.volpm_aut'
   vol5s='li.1.volnt_trk'
   vol6s='li.1.volam_trk'
   vol7s='li.1.volmd_trk'
   vol8s='li.1.volpm_trk'
   vol9s='_zero'
   vol10s='_zero'
   vol11s='_zero'
   vol12s='_zero'
   vol13s='_zero'
   vol14s='_zero'
   vol15s='_zero'
   vol16s='_zero'
elseif(rrmode='4PERIOD_SW')
COPY FILE=dailyb.dat

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       0       0       0       1       1       1       1       0       0       0       0       0       0       0
0
CLS BEG       19       7      10      16      19       7      10      16       0       0       0       0       0       0       0
0
CLS END        6       9      15      18       6       9      15      18       0       0       0       0       0       0       0
0
CLS NUM        1       1       1       1       3       3       3       3       0       0       0       0       0       0       0
0
ENDCOPY
```

```
   volff='_zero'
   trkff='_zero'
   vol1s='li.1.evvol_aut'
   vol2s='li.1.amvol_aut'
   vol3s='li.1.mdvol_aut'
   vol4s='li.1.pmvol_aut'
   vol5s='li.1.evvol_trk'
   vol6s='li.1.amvol_trk'
   vol7s='li.1.mdvol_trk'
   vol8s='li.1.pmvol_trk'
   vol9s='_zero'
   vol10s='_zero'
   vol11s='_zero'
   vol12s='_zero'
   vol13s='_zero'
   vol14s='_zero'
   vol15s='_zero'
   vol16s='_zero'
elseif(rrmode='4PERIOD_MARKETSEGMENTS_SW')
COPY FILE=dailyb.dat

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       0       0       0       1       1       1       1       0       0       0       0       0       0       0
0
CLS BEG       19       7      10      16      19       7      10      16      19       7      10      16      19       7      10
16
CLS END        6       9      15      18       6       9      15      18       6       9      15      18       6       9      15
18
CLS NUM        1       1       1       1       3       3       3       3       2       2       2       2       4       4       4
4
ENDCOPY
   volff='_zero'
   trkff='_zero'
   vol1s='li.1.evvol_autwk'
   vol2s='li.1.amvol_autwk'
   vol3s='li.1.mdvol_autwk'
   vol4s='li.1.pmvol_autwk'
   vol5s='li.1.evvol_trkhv'
   vol6s='li.1.amvol_trkhv'
   vol7s='li.1.mdvol_trkhv'
   vol8s='li.1.pmvol_trkhv'
   vol9s='li.1.evvol_autnw'
   vol10s='li.1.amvol_autnw'
   vol11s='li.1.mdvol_autnw'
   vol12s='li.1.pmvol_autnw'
   vol13s='li.1.evvol_trklt'
   vol14s='li.1.amvol_trklt'
   vol15s='li.1.mdvol_trklt'
```

```
   vol16s='li.1.pmvol_trklt'
endif

*if exist daily.dat del daily.dat
*copy dailya.dat+dailyb.dat daily.dat
*del dailya.dat
*del dailyb.dat
RUN PGM=NETWORK
  NETI={cm3neti.q}
  LINKO=templnk.txt, format = TXT, include = a(6),b(6),junk1(1),junk1(4),junks(1),moffpspd(4),
        ctoll(4),junkb(1),lanes(1),twidth(2),junkb(1),terrain(1),junk1(1),junkb(1),
        cap(6),vol(6),loneway(1),boffpspd(4),ttoll(4),junkb(1),blanes(1),areatype(1),admclass(1),
        junkb(1),bterrain(1),junk1(1),junkb(1),bcap(6),bvol(6),medturn(1),pcttrk(2),junk1(2),
        funclass(2),lnkgrp(2),mpostspd(2),jurisdic(1),county(3),rtenumb(5),junk1(7),nhs(1),
        fedfunc(2),trkvol(5),junkp(1),junk1(30),junk1(30),junk1(30),junk1(21),mdist(6),
        vol1(6),vol2(6),vol3(6),vol4(6),vol5(6),vol6(6),vol7(6),vol8(6),vol9(6),vol10(6),vol11(6),
        vol12(6),vol13(6),vol14(6),vol15(6),vol16(6)
  NODEO=tempnod.txt, format = TXT, include = junkn(1),n(6),x(11),y(11)
  PHASE=NODEMERGE
   junkn='N'
  ENDPHASE
  PHASE=LINKMERGE
   _zero=0
   junk1=0
   junks='S'
   junkp='P'
   fffff='{cm3pri}'
/*;commented out 04/02/2012

if(fffff=='SW')
   if(li.1.admclass==1 && li.1.district <13 && li.1.district>0)
    junkp='P' ;state system
   elseif(li.1.district<13 && li.1.district>0)
    junkp='G' ;non-state
   else
    junkp='U' ;out of state
   endif
elseif(fffff='OMS')
   if(li.1.admclass<6)
     junkp='P'
   else
     junkp='G'
   endif
endif
*/;commented out 04/02/2012

jurisdic=' '
nhs=0
```

```
fedfunc=li.1.fedfuncl

   junkb=' '
   ctoll=0; =cartoll*10
   ttoll=0; =trktoll*10
   mdist = LI.1.DIST*1000
   moffpspd=li.1.offpspd*100
   mpeakspd=li.1.peakspd*100
   cap=li.1.{cm3capf}*{cm3kfact}
   loneway='1' ; el_oneway change
   bcap=0
   bvol=0
   boffpspd=0
   bpeakspd=0
   blanes=0
   bterrain=0
   mpostspd=round(li.1.postspd)
   vol=@volff@
   trkvol=@trkff@
   vol1=@vol1s@
   vol2=@vol2s@
   vol3=@vol3s@
   vol4=@vol4s@
   vol5=@vol5s@
   vol6=@vol6s@
   vol7=@vol7s@
   vol8=@vol8s@
   vol9=@vol9s@
   vol10=@vol10s@
   vol11=@vol11s@
   vol12=@vol12s@
   vol13=@vol13s@
   vol14=@vol14s@
   vol15=@vol15s@
   vol16=@vol16s@
  ENDPHASE
ENDRUN
aqmode='{cm3aqtype}'
if(aqmode=='MOBILE')
*copy {cm3effile.q} tempef.txt
*N:\AQ\MOVES\utils\postcms10.exe templnk.txt tempcms.txt N tempef.txt {cm3rmode}
*del tempef.txt
else
*N:\AQ\MOVES\utils\postcms10.exe templnk.txt tempcms.txt N NONE {cm3rmode}
endif
if(aqmode=='MOVES')
*copy {cm3effile.q} tempef.txt
if(rrmode='NORMAL' && trkfff == 'NONE')
```

```
*N:\AQ\MOVES\utils\movesnet.exe hourly.rpt tempef.txt cmstext.rpt {cm3aqfact}
else
*N:\AQ\MOVES\utils\movesnet.exe hourly.rpt tempef.txt cmstext.rpt {cm3aqfact} 1 {cm3tpce} 3
endif
endif

RUN PGM=NETWORK
  NETI[1]={cm3neti.q}
  LINKI[2]=tempcms.txt var=a,1-6,b,8-13,
         cVMT,97-111,cTRKVMT,113-128,cVOLPERLANE,130-137,cCONINDEX,139-146,
         cVCRATIO,148-155,cPEAKHOUR,157-160,cVHT,162-169,cCONGDELAY,171-178,
         cPHYSDELAY,180-187,cSPDLIMDELAY,189-196,cDELAYRATIO,198-205,
         cDIR1HRSEXCEED,229-232,cDIR2HRSEXCEED,234-237,cPKVMT,253-267,cEXCEEDVMT,269-283,
         cEXCEEDPKVMT,285-299,cLOS,317,1,,,1,
         select=(substr(record,1,1)!= 'A')
  NODEI[2]=tempnod.txt var=n,2-7, x,8-18, y,19-29
  NETO={cm3neto.q}
  MERGE RECORD=F
ENDRUN

iiztype='{cm3iztype}'
if(iiztype=='TEXT')
*copy {cm3ifile.q} tempif.txt
elseif(iiztype=='OMSTABLE')

RUN PGM=MATRIX
FILEO PRINTO[1] = tempif.txt
FILEI MATI[1] = {cm3ifile.q}
MW[1]=mi.1.5+mi.1.10+mi.1.15
jloop
if(j=i)
print list=i(4.0),mw[1][j](6.0),printo=1
endif
endjloop
ENDRUN

endif

if(iiztype!='NONE')
*copy {cm3afile.q} tempaf.txt

if(aqmode=='MOBILE')
*copy {cm3ieffile.q} tempief.txt
*N:\AQ\MOVES\utils\intracal2.exe tempif.txt summary.rpt tempaf.txt tempief.txt
*del tempief.txt

elseif(aqmode=='MOVES')
*N:\AQ\MOVES\utils\movesintra.exe tempif.txt tempef.txt tempaf.txt cmstext.rpt {cm3aqfact}
```

```
*del tempef.txt
endif

*del tempaf.txt
*DEL tempif.txt
endif

if(aqmode=='MOVES')
*copy {cm3ieffile.q} tempief.txt
*copy {cm3vfile.q} tempveh.txt
*N:\AQ\MOVES\utils\movesveh.exe tempveh.txt tempief.txt cmstext.rpt {cm3aqfact}
*del tempveh.txt
*del tempief.txt
endif

if(aqmode=='MOVES')
*echo MOVES BASED EMISSIONS REPORT > tempcom.txt
elseif(aqmode=='MOBILE')
*echo MOBILE BASED EMISSIONS REPORT >> tempcom.txt
else
*echo NO EMISSIONS ANALYSIS CONDUCTED >> tempcom.txt
endif
*echo {cm3aqcom} >> tempcom.txt
*echo Loaded Network:              {cm3neti} >> tempcom.txt
*echo Network Emission Factors:    {cm3effile} >> tempcom.txt
if(aqmode=='MOVES')
*echo Vehicle Emission Factors:    {cm3ieffile} >> tempcom.txt
*echo Vehicle Population      :    {cm3vfile} >> tempcom.txt
else
*echo Intrazonal Emission Factors: {cm3ieffile} >> tempcom.txt
endif
*echo Intrazonal Trips  :          {cm3ifile} >> tempcom.txt
*echo Area File (sq mi):           {cm3afile} >> tempcom.txt
*echo Volume Field Used:           {cm3volf} >> tempcom.txt
*echo Truck Volume Field Used:     {cm3trkf} >> tempcom.txt
*echo Capacity Field Used:         {cm3capf} >> tempcom.txt
*echo ---------------------------------------- >> tempcom.txt
*copy /B tempcom.txt+cmstext.rpt {cm3rpto.q}
*if exist {cm3sumo.q} del {cm3sumo.q}
*rename summary.rpt {cm3sumo.q}
*del tempcom.txt
*del cmstext.rpt
*DEL tempnod.txt
*DEL templnk.txt
*DEL tempcms.txt
hhro=rightstr('{cm3hro}',4)
if(hhro=='NONE')
*del hourly.rpt
```

```
else
*if exist {cm3hro.q} del {cm3hro.q}
*rename hourly.rpt {cm3hro.q}
endif
```

Appendix – MORPC Travel Demand Model Emissions Run Report for 2030

Ozone Analysis

```
MOVES BASED EMISSIONS REPORT
Ozone Analysis with MOVES - MORPC
Loaded Network:              ..\..\3C Model Results\2030\MOR30J24ASN_BASE.NET
Network Emission Factors:    ..\..\Ozone_upd\factors\MORPC_2030_ozone_3source_rpd.csv
Vehicle Emission Factors:    ..\..\Ozone_upd\factors\MORPC_2030_ozone_3source_rpv.csv
Vehicle Population      :    ..\..\Ozone_upd\factors\Source_Type_Pop_2030_MORPC_on-Model.csv
Intrazonal Trips  :          ..\..\3C Model Results\2030\DEL2030.txt
Area File (sq mi):           ..\..\3C Model Results\3C_TAZ_areain.txt
Volume Field Used:           VOL24_TOT
Truck Volume Field Used:     NONE
Capacity Field Used:         CAPHRAM
----------------------------------------
 CMS/AQ REPORT
 POSTCMS10, UPDATED DEC 2009, GTG
 DATE:03/05/2024 TIME:14:04:47

 PARAMETER FILE DUMP (DAILY.DAT FILE)

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       1     2.5     5.4     7.3     6.2       5     4.8       5     5.2     5.5     6.2
7.3       8       8     5.8     4.1     3.4     2.9     2.2     1.6
URB ART      0.6     0.4     0.3     0.4     0.7       2       4     6.3     5.7       5     5.1     5.8     6.2     6.2     6.8
7.7     8.3     8.2     6.1     4.5     3.6     2.8     1.9     1.2
RUR FWY      1.2       1     0.9       1     1.4     2.6     4.4     5.4     5.1     5.2     5.5     5.7     5.9     6.2     6.7
7.3     7.4       7     5.4     4.3     3.5     2.9     2.3     1.7
RUR ART      0.8     0.6     0.5     0.7     1.2     2.7     5.2     6.4     5.6     5.2     5.2     5.5     5.7     5.9     6.4
7.5     8.1     7.9     5.6     4.1     3.3     2.7     1.9     1.3
PCTADT T
URB FWY      1.8     1.6     1.6     1.8     2.2     3.1     4.2     4.9     5.6     6.2     6.5     6.6     6.5     6.5     6.4
6     5.3     4.6     4.2     3.6     3.2     2.9     2.5     2.2
URB ART      0.9     0.8     0.9     1.1     1.6     2.6     4.6     6.3     7.1     7.3     7.3     7.3     7.3     7.3     7.3
7     5.8     4.7     3.4     2.7     2.2     1.8     1.5     1.2
RUR FWY      2.1     1.9     1.8       2     2.4     3.2     4.1     4.5     4.9     5.5     5.8       6     6.1     6.1       6
5.8     5.5     5.1     4.6     4.2     3.7     3.3       3     2.5
RUR ART      1.5     1.4     1.4     1.7     2.3     3.1     4.6     5.4     6.2     6.6     6.8     6.9     6.8     6.8     6.6
6.2     5.5     4.6     3.7     3.1     2.6     2.4     2.1     1.8
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
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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
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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
curve22        55    54.9    54.4    53.2    51.1    47.9    44.0    39.5    34.9    30.4    26.2    22.4    19.2    16.4    14.0
12.0    10.4     9.0     7.8     6.8     6.0     5.3     4.7     4.1

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: 2.0

AQ SEASON FACTOR: 1.08

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
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CLS NUM         1        3        0        0        0        0        0        0        0        0        0        0        0        0
0
```

MOVES NETWORK LINK EMISSIONS OUTPUT

COUNTY	MONTH	VMT	HC	NOX	SO2	PM2.5
ADA	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
ALL	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
ASD	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
ATB	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
ATH	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
AUG	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
BEL	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
BRO	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
BUT	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
CAR	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
CHP	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
CLA	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
CLE	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
CLI	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
COL	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
COS	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
CRA	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
CUY	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
DAR	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
DEF	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
DEL	JANUARY	6905981.	0.0000	0.0000	0.0000	0.0000
ERI	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
FAI	JANUARY	2366827.	0.0000	0.0000	0.0000	0.0000
FAY	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
FRA	JANUARY	35904904.	0.0000	0.0000	0.0000	0.0000
FUL	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
GAL	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
GEA	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
GRE	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
GUE	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
HAM	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
HAN	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
HAR	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
HAS	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
HEN	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
HIG	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
HOC	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
HOL	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
HUR	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
JAC	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
JEF	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
KNO	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
LAK	JANUARY	0.	0.0000	0.0000	0.0000	0.0000

LAW	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
LIC	JANUARY	6128911.	0.0000	0.0000	0.0000	0.0000
LOG	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
LOR	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
LUC	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MAD	JANUARY	1308672.	0.0000	0.0000	0.0000	0.0000
MAH	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MAR	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MED	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MEG	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MER	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MIA	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MOE	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MOT	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MRG	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MRW	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MUS	JANUARY	84213.	0.0000	0.0000	0.0000	0.0000
NOB	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
OTT	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
PAU	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
PER	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
PIC	JANUARY	933399.	0.0000	0.0000	0.0000	0.0000
PIK	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
POR	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
PRE	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
PUT	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
RIC	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
ROS	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
SAN	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
SCI	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
SEN	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
SHE	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
STA	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
SUM	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
TRU	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
TUS	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
UNI	JANUARY	2125575.	0.0000	0.0000	0.0000	0.0000
VAN	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
VIN	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
WAR	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
WAS	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
WAY	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
WIL	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
WOO	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
WYA	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
XXX	JANUARY	275592.	0.0000	0.0000	0.0000	0.0000
TOT	JANUARY	56015568.	0.0000	0.0000	0.0000	0.0000
ADA	APRIL	0.	0.0000	0.0000	0.0000	0.0000

ALL	APRIL	0.	0.0000	0.0000	0.0000	0.0000
ASD	APRIL	0.	0.0000	0.0000	0.0000	0.0000
ATB	APRIL	0.	0.0000	0.0000	0.0000	0.0000
ATH	APRIL	0.	0.0000	0.0000	0.0000	0.0000
AUG	APRIL	0.	0.0000	0.0000	0.0000	0.0000
BEL	APRIL	0.	0.0000	0.0000	0.0000	0.0000
BRO	APRIL	0.	0.0000	0.0000	0.0000	0.0000
BUT	APRIL	0.	0.0000	0.0000	0.0000	0.0000
CAR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
CHP	APRIL	0.	0.0000	0.0000	0.0000	0.0000
CLA	APRIL	0.	0.0000	0.0000	0.0000	0.0000
CLE	APRIL	0.	0.0000	0.0000	0.0000	0.0000
CLI	APRIL	0.	0.0000	0.0000	0.0000	0.0000
COL	APRIL	0.	0.0000	0.0000	0.0000	0.0000
COS	APRIL	0.	0.0000	0.0000	0.0000	0.0000
CRA	APRIL	0.	0.0000	0.0000	0.0000	0.0000
CUY	APRIL	0.	0.0000	0.0000	0.0000	0.0000
DAR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
DEF	APRIL	0.	0.0000	0.0000	0.0000	0.0000
DEL	APRIL	6905981.	0.0000	0.0000	0.0000	0.0000
ERI	APRIL	0.	0.0000	0.0000	0.0000	0.0000
FAI	APRIL	2366827.	0.0000	0.0000	0.0000	0.0000
FAY	APRIL	0.	0.0000	0.0000	0.0000	0.0000
FRA	APRIL	35904904.	0.0000	0.0000	0.0000	0.0000
FUL	APRIL	0.	0.0000	0.0000	0.0000	0.0000
GAL	APRIL	0.	0.0000	0.0000	0.0000	0.0000
GEA	APRIL	0.	0.0000	0.0000	0.0000	0.0000
GRE	APRIL	0.	0.0000	0.0000	0.0000	0.0000
GUE	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HAM	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HAN	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HAR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HAS	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HEN	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HIG	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HOC	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HOL	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HUR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
JAC	APRIL	0.	0.0000	0.0000	0.0000	0.0000
JEF	APRIL	0.	0.0000	0.0000	0.0000	0.0000
KNO	APRIL	0.	0.0000	0.0000	0.0000	0.0000
LAK	APRIL	0.	0.0000	0.0000	0.0000	0.0000
LAW	APRIL	0.	0.0000	0.0000	0.0000	0.0000
LIC	APRIL	6128911.	0.0000	0.0000	0.0000	0.0000
LOG	APRIL	0.	0.0000	0.0000	0.0000	0.0000
LOR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
LUC	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MAD	APRIL	1308672.	0.0000	0.0000	0.0000	0.0000

MAH	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MAR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MED	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MEG	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MER	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MIA	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MOE	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MOT	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MRG	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MRW	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MUS	APRIL	84213.	0.0000	0.0000	0.0000	0.0000
NOB	APRIL	0.	0.0000	0.0000	0.0000	0.0000
OTT	APRIL	0.	0.0000	0.0000	0.0000	0.0000
PAU	APRIL	0.	0.0000	0.0000	0.0000	0.0000
PER	APRIL	0.	0.0000	0.0000	0.0000	0.0000
PIC	APRIL	933399.	0.0000	0.0000	0.0000	0.0000
PIK	APRIL	0.	0.0000	0.0000	0.0000	0.0000
POR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
PRE	APRIL	0.	0.0000	0.0000	0.0000	0.0000
PUT	APRIL	0.	0.0000	0.0000	0.0000	0.0000
RIC	APRIL	0.	0.0000	0.0000	0.0000	0.0000
ROS	APRIL	0.	0.0000	0.0000	0.0000	0.0000
SAN	APRIL	0.	0.0000	0.0000	0.0000	0.0000
SCI	APRIL	0.	0.0000	0.0000	0.0000	0.0000
SEN	APRIL	0.	0.0000	0.0000	0.0000	0.0000
SHE	APRIL	0.	0.0000	0.0000	0.0000	0.0000
STA	APRIL	0.	0.0000	0.0000	0.0000	0.0000
SUM	APRIL	0.	0.0000	0.0000	0.0000	0.0000
TRU	APRIL	0.	0.0000	0.0000	0.0000	0.0000
TUS	APRIL	0.	0.0000	0.0000	0.0000	0.0000
UNI	APRIL	2125575.	0.0000	0.0000	0.0000	0.0000
VAN	APRIL	0.	0.0000	0.0000	0.0000	0.0000
VIN	APRIL	0.	0.0000	0.0000	0.0000	0.0000
WAR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
WAS	APRIL	0.	0.0000	0.0000	0.0000	0.0000
WAY	APRIL	0.	0.0000	0.0000	0.0000	0.0000
WIL	APRIL	0.	0.0000	0.0000	0.0000	0.0000
WOO	APRIL	0.	0.0000	0.0000	0.0000	0.0000
WYA	APRIL	0.	0.0000	0.0000	0.0000	0.0000
XXX	APRIL	275592.	0.0000	0.0000	0.0000	0.0000
TOT	APRIL	56015568.	0.0000	0.0000	0.0000	0.0000
ADA	JULY	0.	0.0000	0.0000	0.0000	0.0000
ALL	JULY	0.	0.0000	0.0000	0.0000	0.0000
ASD	JULY	0.	0.0000	0.0000	0.0000	0.0000
ATB	JULY	0.	0.0000	0.0000	0.0000	0.0000
ATH	JULY	0.	0.0000	0.0000	0.0000	0.0000
AUG	JULY	0.	0.0000	0.0000	0.0000	0.0000
BEL	JULY	0.	0.0000	0.0000	0.0000	0.0000

BRO	JULY	0.	0.0000	0.0000	0.0000	0.0000
BUT	JULY	0.	0.0000	0.0000	0.0000	0.0000
CAR	JULY	0.	0.0000	0.0000	0.0000	0.0000
CHP	JULY	0.	0.0000	0.0000	0.0000	0.0000
CLA	JULY	0.	0.0000	0.0000	0.0000	0.0000
CLE	JULY	0.	0.0000	0.0000	0.0000	0.0000
CLI	JULY	0.	0.0000	0.0000	0.0000	0.0000
COL	JULY	0.	0.0000	0.0000	0.0000	0.0000
COS	JULY	0.	0.0000	0.0000	0.0000	0.0000
CRA	JULY	0.	0.0000	0.0000	0.0000	0.0000
CUY	JULY	0.	0.0000	0.0000	0.0000	0.0000
DAR	JULY	0.	0.0000	0.0000	0.0000	0.0000
DEF	JULY	0.	0.0000	0.0000	0.0000	0.0000
DEL	JULY	7458460.	0.4818	1.0696	0.0000	0.0000
ERI	JULY	0.	0.0000	0.0000	0.0000	0.0000
FAI	JULY	2556174.	0.1741	0.3846	0.0000	0.0000
FAY	JULY	0.	0.0000	0.0000	0.0000	0.0000
FRA	JULY	38777296.	2.6578	6.1744	0.0000	0.0000
FUL	JULY	0.	0.0000	0.0000	0.0000	0.0000
GAL	JULY	0.	0.0000	0.0000	0.0000	0.0000
GEA	JULY	0.	0.0000	0.0000	0.0000	0.0000
GRE	JULY	0.	0.0000	0.0000	0.0000	0.0000
GUE	JULY	0.	0.0000	0.0000	0.0000	0.0000
HAM	JULY	0.	0.0000	0.0000	0.0000	0.0000
HAN	JULY	0.	0.0000	0.0000	0.0000	0.0000
HAR	JULY	0.	0.0000	0.0000	0.0000	0.0000
HAS	JULY	0.	0.0000	0.0000	0.0000	0.0000
HEN	JULY	0.	0.0000	0.0000	0.0000	0.0000
HIG	JULY	0.	0.0000	0.0000	0.0000	0.0000
HOC	JULY	0.	0.0000	0.0000	0.0000	0.0000
HOL	JULY	0.	0.0000	0.0000	0.0000	0.0000
HUR	JULY	0.	0.0000	0.0000	0.0000	0.0000
JAC	JULY	0.	0.0000	0.0000	0.0000	0.0000
JEF	JULY	0.	0.0000	0.0000	0.0000	0.0000
KNO	JULY	0.	0.0000	0.0000	0.0000	0.0000
LAK	JULY	0.	0.0000	0.0000	0.0000	0.0000
LAW	JULY	0.	0.0000	0.0000	0.0000	0.0000
LIC	JULY	6619224.	0.4310	0.9741	0.0000	0.0000
LOG	JULY	0.	0.0000	0.0000	0.0000	0.0000
LOR	JULY	0.	0.0000	0.0000	0.0000	0.0000
LUC	JULY	0.	0.0000	0.0000	0.0000	0.0000
MAD	JULY	1413365.	0.0786	0.1815	0.0000	0.0000
MAH	JULY	0.	0.0000	0.0000	0.0000	0.0000
MAR	JULY	0.	0.0000	0.0000	0.0000	0.0000
MED	JULY	0.	0.0000	0.0000	0.0000	0.0000
MEG	JULY	0.	0.0000	0.0000	0.0000	0.0000
MER	JULY	0.	0.0000	0.0000	0.0000	0.0000
MIA	JULY	0.	0.0000	0.0000	0.0000	0.0000

MOE	JULY	0.	0.0000	0.0000	0.0000	0.0000
MOT	JULY	0.	0.0000	0.0000	0.0000	0.0000
MRG	JULY	0.	0.0000	0.0000	0.0000	0.0000
MRW	JULY	0.	0.0000	0.0000	0.0000	0.0000
MUS	JULY	90950.	0.0043	0.0097	0.0000	0.0000
NOB	JULY	0.	0.0000	0.0000	0.0000	0.0000
OTT	JULY	0.	0.0000	0.0000	0.0000	0.0000
PAU	JULY	0.	0.0000	0.0000	0.0000	0.0000
PER	JULY	0.	0.0000	0.0000	0.0000	0.0000
PIC	JULY	1008071.	0.0506	0.1060	0.0000	0.0000
PIK	JULY	0.	0.0000	0.0000	0.0000	0.0000
POR	JULY	0.	0.0000	0.0000	0.0000	0.0000
PRE	JULY	0.	0.0000	0.0000	0.0000	0.0000
PUT	JULY	0.	0.0000	0.0000	0.0000	0.0000
RIC	JULY	0.	0.0000	0.0000	0.0000	0.0000
ROS	JULY	0.	0.0000	0.0000	0.0000	0.0000
SAN	JULY	0.	0.0000	0.0000	0.0000	0.0000
SCI	JULY	0.	0.0000	0.0000	0.0000	0.0000
SEN	JULY	0.	0.0000	0.0000	0.0000	0.0000
SHE	JULY	0.	0.0000	0.0000	0.0000	0.0000
STA	JULY	0.	0.0000	0.0000	0.0000	0.0000
SUM	JULY	0.	0.0000	0.0000	0.0000	0.0000
TRU	JULY	0.	0.0000	0.0000	0.0000	0.0000
TUS	JULY	0.	0.0000	0.0000	0.0000	0.0000
UNI	JULY	2295621.	0.1339	0.2929	0.0000	0.0000
VAN	JULY	0.	0.0000	0.0000	0.0000	0.0000
VIN	JULY	0.	0.0000	0.0000	0.0000	0.0000
WAR	JULY	0.	0.0000	0.0000	0.0000	0.0000
WAS	JULY	0.	0.0000	0.0000	0.0000	0.0000
WAY	JULY	0.	0.0000	0.0000	0.0000	0.0000
WIL	JULY	0.	0.0000	0.0000	0.0000	0.0000
WOO	JULY	0.	0.0000	0.0000	0.0000	0.0000
WYA	JULY	0.	0.0000	0.0000	0.0000	0.0000
XXX	JULY	297640.	0.0252	0.0664	0.0000	0.0000
TOT	JULY	60496816.	4.0360	9.2579	0.0000	0.0000

MOVES INTRAZONAL EMISSIONS OUTPUT

MONTH	VMT	HC	NOX	SO2	PM2.5
JANUARY	38054.	0.0000	0.0000	0.0000	0.0000
APRIL	38054.	0.0000	0.0000	0.0000	0.0000
JULY	41099.	0.0043	0.0112	0.0000	0.0000

MOVES VEHICLE BASED EMISSIONS OUTPUT

MONTH	VEHICLES	HC	NOX	SO2	PM2.5
JANUARY	2529559.	0.0000	0.0000	0.0000	0.0000
APRIL	2529559.	0.0000	0.0000	0.0000	0.0000
JULY	2731924.	10.6665	2.4528	0.0000	0.0000

Appendix – MORPC Travel Demand Model Emission Run Report for 2040

Ozone Analysis

```
MOVES BASED EMISSIONS REPORT
Ozone Analysis with MOVES - MORPC
Loaded Network:              ..\..\3C Model Results\2040\MOR40J24ASN_BASE.NET
Network Emission Factors:    ..\..\Ozone_upd\factors\MORPC_2040_ozone_3source_rpd.csv
Vehicle Emission Factors:    ..\..\Ozone_upd\factors\MORPC_2040_ozone_3source_rpv.csv
Vehicle Population      :    ..\..\Ozone_upd\factors\Source_Type_Pop_2040_MORPC_on-Model.csv
Intrazonal Trips  :          ..\..\3C Model Results\2040\DEL2040.txt
Area File (sq mi):           ..\..\3C Model Results\3C_TAZ_areain.txt
Volume Field Used:           VOL24_TOT
Truck Volume Field Used:     NONE
Capacity Field Used:         CAPHRAM
-----------------------------------------
 CMS/AQ REPORT
 POSTCMS10, UPDATED DEC 2009, GTG
 DATE:03/05/2024 TIME:15:11:45

 PARAMETER FILE DUMP (DAILY.DAT FILE)

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       1     2.5     5.4     7.3     6.2       5     4.8       5     5.2     5.5     6.2
7.3       8       8     5.8     4.1     3.4     2.9     2.2     1.6
URB ART      0.6     0.4     0.3     0.4     0.7       2       4     6.3     5.7       5     5.1     5.8     6.2     6.2     6.8
7.7     8.3     8.2     6.1     4.5     3.6     2.8     1.9     1.2
RUR FWY      1.2       1     0.9       1     1.4     2.6     4.4     5.4     5.1     5.2     5.5     5.7     5.9     6.2     6.7
7.3     7.4       7     5.4     4.3     3.5     2.9     2.3     1.7
RUR ART      0.8     0.6     0.5     0.7     1.2     2.7     5.2     6.4     5.6     5.2     5.2     5.5     5.7     5.9     6.4
7.5     8.1     7.9     5.6     4.1     3.3     2.7     1.9     1.3
PCTADT T
URB FWY      1.8     1.6     1.6     1.8     2.2     3.1     4.2     4.9     5.6     6.2     6.5     6.6     6.5     6.5     6.4
6     5.3     4.6     4.2     3.6     3.2     2.9     2.5     2.2
URB ART      0.9     0.8     0.9     1.1     1.6     2.6     4.6     6.3     7.1     7.3     7.3     7.3     7.3     7.3     7.3
7     5.8     4.7     3.4     2.7     2.2     1.8     1.5     1.2
RUR FWY      2.1     1.9     1.8       2     2.4     3.2     4.1     4.5     4.9     5.5     5.8       6     6.1     6.1       6
5.8     5.5     5.1     4.6     4.2     3.7     3.3       3     2.5
RUR ART      1.5     1.4     1.4     1.7     2.3     3.1     4.6     5.4     6.2     6.6     6.8     6.9     6.8     6.8     6.6
6.2     5.5     4.6     3.7     3.1     2.6     2.4     2.1     1.8
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
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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
curve22        55    54.9    54.4    53.2    51.1    47.9    44.0    39.5    34.9    30.4    26.2    22.4    19.2    16.4    14.0
12.0    10.4     9.0     7.8     6.8     6.0     5.3     4.7     4.1

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: 2.0

AQ SEASON FACTOR: 1.08

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

 MOVES NETWORK LINK EMISSIONS OUTPUT
 COUNTY MONTH      VMT         HC         NOX         SO2         PM2.5
 ADA    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 ALL    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 ASD    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 ATB    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 ATH    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 AUG    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 BEL    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 BRO    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 BUT    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 CAR    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 CHP    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 CLA    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 CLE    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 CLI    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 COL    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 COS    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 CRA    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 CUY    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 DAR    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 DEF    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 DEL    JANUARY     8627892.    0.0000     0.0000     0.0000     0.0000
 ERI    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 FAI    JANUARY     2727429.    0.0000     0.0000     0.0000     0.0000
 FAY    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 FRA    JANUARY    39543892.    0.0000     0.0000     0.0000     0.0000
 FUL    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 GAL    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 GEA    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 GRE    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 GUE    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 HAM    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 HAN    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 HAR    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 HAS    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 HEN    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 HIG    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 HOC    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 HOL    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 HUR    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 JAC    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 JEF    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 KNO    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
 LAK    JANUARY           0.    0.0000     0.0000     0.0000     0.0000
```

LAW	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
LIC	JANUARY	6984017.	0.0000	0.0000	0.0000	0.0000
LOG	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
LOR	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
LUC	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MAD	JANUARY	1454373.	0.0000	0.0000	0.0000	0.0000
MAH	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MAR	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MED	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MEG	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MER	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MIA	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MOE	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MOT	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MRG	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MRW	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MUS	JANUARY	91975.	0.0000	0.0000	0.0000	0.0000
NOB	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
OTT	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
PAU	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
PER	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
PIC	JANUARY	1077025.	0.0000	0.0000	0.0000	0.0000
PIK	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
POR	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
PRE	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
PUT	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
RIC	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
ROS	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
SAN	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
SCI	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
SEN	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
SHE	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
STA	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
SUM	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
TRU	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
TUS	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
UNI	JANUARY	2519028.	0.0000	0.0000	0.0000	0.0000
VAN	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
VIN	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
WAR	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
WAS	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
WAY	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
WIL	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
WOO	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
WYA	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
XXX	JANUARY	310950.	0.0000	0.0000	0.0000	0.0000
TOT	JANUARY	63321164.	0.0000	0.0000	0.0000	0.0000
ADA	APRIL	0.	0.0000	0.0000	0.0000	0.0000

ALL	APRIL	0.	0.0000	0.0000	0.0000	0.0000
ASD	APRIL	0.	0.0000	0.0000	0.0000	0.0000
ATB	APRIL	0.	0.0000	0.0000	0.0000	0.0000
ATH	APRIL	0.	0.0000	0.0000	0.0000	0.0000
AUG	APRIL	0.	0.0000	0.0000	0.0000	0.0000
BEL	APRIL	0.	0.0000	0.0000	0.0000	0.0000
BRO	APRIL	0.	0.0000	0.0000	0.0000	0.0000
BUT	APRIL	0.	0.0000	0.0000	0.0000	0.0000
CAR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
CHP	APRIL	0.	0.0000	0.0000	0.0000	0.0000
CLA	APRIL	0.	0.0000	0.0000	0.0000	0.0000
CLE	APRIL	0.	0.0000	0.0000	0.0000	0.0000
CLI	APRIL	0.	0.0000	0.0000	0.0000	0.0000
COL	APRIL	0.	0.0000	0.0000	0.0000	0.0000
COS	APRIL	0.	0.0000	0.0000	0.0000	0.0000
CRA	APRIL	0.	0.0000	0.0000	0.0000	0.0000
CUY	APRIL	0.	0.0000	0.0000	0.0000	0.0000
DAR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
DEF	APRIL	0.	0.0000	0.0000	0.0000	0.0000
DEL	APRIL	8627892.	0.0000	0.0000	0.0000	0.0000
ERI	APRIL	0.	0.0000	0.0000	0.0000	0.0000
FAI	APRIL	2727429.	0.0000	0.0000	0.0000	0.0000
FAY	APRIL	0.	0.0000	0.0000	0.0000	0.0000
FRA	APRIL	39543892.	0.0000	0.0000	0.0000	0.0000
FUL	APRIL	0.	0.0000	0.0000	0.0000	0.0000
GAL	APRIL	0.	0.0000	0.0000	0.0000	0.0000
GEA	APRIL	0.	0.0000	0.0000	0.0000	0.0000
GRE	APRIL	0.	0.0000	0.0000	0.0000	0.0000
GUE	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HAM	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HAN	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HAR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HAS	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HEN	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HIG	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HOC	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HOL	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HUR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
JAC	APRIL	0.	0.0000	0.0000	0.0000	0.0000
JEF	APRIL	0.	0.0000	0.0000	0.0000	0.0000
KNO	APRIL	0.	0.0000	0.0000	0.0000	0.0000
LAK	APRIL	0.	0.0000	0.0000	0.0000	0.0000
LAW	APRIL	0.	0.0000	0.0000	0.0000	0.0000
LIC	APRIL	6984017.	0.0000	0.0000	0.0000	0.0000
LOG	APRIL	0.	0.0000	0.0000	0.0000	0.0000
LOR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
LUC	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MAD	APRIL	1454373.	0.0000	0.0000	0.0000	0.0000

MAH	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MAR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MED	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MEG	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MER	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MIA	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MOE	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MOT	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MRG	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MRW	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MUS	APRIL	91975.	0.0000	0.0000	0.0000	0.0000
NOB	APRIL	0.	0.0000	0.0000	0.0000	0.0000
OTT	APRIL	0.	0.0000	0.0000	0.0000	0.0000
PAU	APRIL	0.	0.0000	0.0000	0.0000	0.0000
PER	APRIL	0.	0.0000	0.0000	0.0000	0.0000
PIC	APRIL	1077025.	0.0000	0.0000	0.0000	0.0000
PIK	APRIL	0.	0.0000	0.0000	0.0000	0.0000
POR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
PRE	APRIL	0.	0.0000	0.0000	0.0000	0.0000
PUT	APRIL	0.	0.0000	0.0000	0.0000	0.0000
RIC	APRIL	0.	0.0000	0.0000	0.0000	0.0000
ROS	APRIL	0.	0.0000	0.0000	0.0000	0.0000
SAN	APRIL	0.	0.0000	0.0000	0.0000	0.0000
SCI	APRIL	0.	0.0000	0.0000	0.0000	0.0000
SEN	APRIL	0.	0.0000	0.0000	0.0000	0.0000
SHE	APRIL	0.	0.0000	0.0000	0.0000	0.0000
STA	APRIL	0.	0.0000	0.0000	0.0000	0.0000
SUM	APRIL	0.	0.0000	0.0000	0.0000	0.0000
TRU	APRIL	0.	0.0000	0.0000	0.0000	0.0000
TUS	APRIL	0.	0.0000	0.0000	0.0000	0.0000
UNI	APRIL	2519028.	0.0000	0.0000	0.0000	0.0000
VAN	APRIL	0.	0.0000	0.0000	0.0000	0.0000
VIN	APRIL	0.	0.0000	0.0000	0.0000	0.0000
WAR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
WAS	APRIL	0.	0.0000	0.0000	0.0000	0.0000
WAY	APRIL	0.	0.0000	0.0000	0.0000	0.0000
WIL	APRIL	0.	0.0000	0.0000	0.0000	0.0000
WOO	APRIL	0.	0.0000	0.0000	0.0000	0.0000
WYA	APRIL	0.	0.0000	0.0000	0.0000	0.0000
XXX	APRIL	310950.	0.0000	0.0000	0.0000	0.0000
TOT	APRIL	63321164.	0.0000	0.0000	0.0000	0.0000
ADA	JULY	0.	0.0000	0.0000	0.0000	0.0000
ALL	JULY	0.	0.0000	0.0000	0.0000	0.0000
ASD	JULY	0.	0.0000	0.0000	0.0000	0.0000
ATB	JULY	0.	0.0000	0.0000	0.0000	0.0000
ATH	JULY	0.	0.0000	0.0000	0.0000	0.0000
AUG	JULY	0.	0.0000	0.0000	0.0000	0.0000
BEL	JULY	0.	0.0000	0.0000	0.0000	0.0000

BRO	JULY	0.	0.0000	0.0000	0.0000	0.0000
BUT	JULY	0.	0.0000	0.0000	0.0000	0.0000
CAR	JULY	0.	0.0000	0.0000	0.0000	0.0000
CHP	JULY	0.	0.0000	0.0000	0.0000	0.0000
CLA	JULY	0.	0.0000	0.0000	0.0000	0.0000
CLE	JULY	0.	0.0000	0.0000	0.0000	0.0000
CLI	JULY	0.	0.0000	0.0000	0.0000	0.0000
COL	JULY	0.	0.0000	0.0000	0.0000	0.0000
COS	JULY	0.	0.0000	0.0000	0.0000	0.0000
CRA	JULY	0.	0.0000	0.0000	0.0000	0.0000
CUY	JULY	0.	0.0000	0.0000	0.0000	0.0000
DAR	JULY	0.	0.0000	0.0000	0.0000	0.0000
DEF	JULY	0.	0.0000	0.0000	0.0000	0.0000
DEL	JULY	9318124.	0.4240	0.4848	0.0000	0.0000
ERI	JULY	0.	0.0000	0.0000	0.0000	0.0000
FAI	JULY	2945624.	0.1373	0.1580	0.0000	0.0000
FAY	JULY	0.	0.0000	0.0000	0.0000	0.0000
FRA	JULY	42707404.	1.9885	2.4203	0.0000	0.0000
FUL	JULY	0.	0.0000	0.0000	0.0000	0.0000
GAL	JULY	0.	0.0000	0.0000	0.0000	0.0000
GEA	JULY	0.	0.0000	0.0000	0.0000	0.0000
GRE	JULY	0.	0.0000	0.0000	0.0000	0.0000
GUE	JULY	0.	0.0000	0.0000	0.0000	0.0000
HAM	JULY	0.	0.0000	0.0000	0.0000	0.0000
HAN	JULY	0.	0.0000	0.0000	0.0000	0.0000
HAR	JULY	0.	0.0000	0.0000	0.0000	0.0000
HAS	JULY	0.	0.0000	0.0000	0.0000	0.0000
HEN	JULY	0.	0.0000	0.0000	0.0000	0.0000
HIG	JULY	0.	0.0000	0.0000	0.0000	0.0000
HOC	JULY	0.	0.0000	0.0000	0.0000	0.0000
HOL	JULY	0.	0.0000	0.0000	0.0000	0.0000
HUR	JULY	0.	0.0000	0.0000	0.0000	0.0000
JAC	JULY	0.	0.0000	0.0000	0.0000	0.0000
JEF	JULY	0.	0.0000	0.0000	0.0000	0.0000
KNO	JULY	0.	0.0000	0.0000	0.0000	0.0000
LAK	JULY	0.	0.0000	0.0000	0.0000	0.0000
LAW	JULY	0.	0.0000	0.0000	0.0000	0.0000
LIC	JULY	7542738.	0.3347	0.3948	0.0000	0.0000
LOG	JULY	0.	0.0000	0.0000	0.0000	0.0000
LOR	JULY	0.	0.0000	0.0000	0.0000	0.0000
LUC	JULY	0.	0.0000	0.0000	0.0000	0.0000
MAD	JULY	1570723.	0.0593	0.0724	0.0000	0.0000
MAH	JULY	0.	0.0000	0.0000	0.0000	0.0000
MAR	JULY	0.	0.0000	0.0000	0.0000	0.0000
MED	JULY	0.	0.0000	0.0000	0.0000	0.0000
MEG	JULY	0.	0.0000	0.0000	0.0000	0.0000
MER	JULY	0.	0.0000	0.0000	0.0000	0.0000
MIA	JULY	0.	0.0000	0.0000	0.0000	0.0000

MOE	JULY	0.	0.0000	0.0000	0.0000	0.0000
MOT	JULY	0.	0.0000	0.0000	0.0000	0.0000
MRG	JULY	0.	0.0000	0.0000	0.0000	0.0000
MRW	JULY	0.	0.0000	0.0000	0.0000	0.0000
MUS	JULY	99333.	0.0032	0.0038	0.0000	0.0000
NOB	JULY	0.	0.0000	0.0000	0.0000	0.0000
OTT	JULY	0.	0.0000	0.0000	0.0000	0.0000
PAU	JULY	0.	0.0000	0.0000	0.0000	0.0000
PER	JULY	0.	0.0000	0.0000	0.0000	0.0000
PIC	JULY	1163187.	0.0409	0.0452	0.0000	0.0000
PIK	JULY	0.	0.0000	0.0000	0.0000	0.0000
POR	JULY	0.	0.0000	0.0000	0.0000	0.0000
PRE	JULY	0.	0.0000	0.0000	0.0000	0.0000
PUT	JULY	0.	0.0000	0.0000	0.0000	0.0000
RIC	JULY	0.	0.0000	0.0000	0.0000	0.0000
ROS	JULY	0.	0.0000	0.0000	0.0000	0.0000
SAN	JULY	0.	0.0000	0.0000	0.0000	0.0000
SCI	JULY	0.	0.0000	0.0000	0.0000	0.0000
SEN	JULY	0.	0.0000	0.0000	0.0000	0.0000
SHE	JULY	0.	0.0000	0.0000	0.0000	0.0000
STA	JULY	0.	0.0000	0.0000	0.0000	0.0000
SUM	JULY	0.	0.0000	0.0000	0.0000	0.0000
TRU	JULY	0.	0.0000	0.0000	0.0000	0.0000
TUS	JULY	0.	0.0000	0.0000	0.0000	0.0000
UNI	JULY	2720551.	0.1110	0.1259	0.0000	0.0000
VAN	JULY	0.	0.0000	0.0000	0.0000	0.0000
VIN	JULY	0.	0.0000	0.0000	0.0000	0.0000
WAR	JULY	0.	0.0000	0.0000	0.0000	0.0000
WAS	JULY	0.	0.0000	0.0000	0.0000	0.0000
WAY	JULY	0.	0.0000	0.0000	0.0000	0.0000
WIL	JULY	0.	0.0000	0.0000	0.0000	0.0000
WOO	JULY	0.	0.0000	0.0000	0.0000	0.0000
WYA	JULY	0.	0.0000	0.0000	0.0000	0.0000
XXX	JULY	335826.	0.0188	0.0264	0.0000	0.0000
TOT	JULY	68386856.	3.1165	3.7309	0.0000	0.0000

MOVES INTRAZONAL EMISSIONS OUTPUT

MONTH	VMT	HC	NOX	SO2	PM2.5
JANUARY	53650.	0.0000	0.0000	0.0000	0.0000
APRIL	53650.	0.0000	0.0000	0.0000	0.0000
JULY	57942.	0.0040	0.0055	0.0000	0.0000

MOVES VEHICLE BASED EMISSIONS OUTPUT

MONTH	VEHICLES	HC	NOX	SO2	PM2.5
JANUARY	2718164.	0.0000	0.0000	0.0000	0.0000
APRIL	2718164.	0.0000	0.0000	0.0000	0.0000
JULY	2935617.	7.6304	1.6763	0.0000	0.0000

Appendix – MORPC Travel Demand Model Emission Run Report for 2050

Ozone Analysis

```
MOVES BASED EMISSIONS REPORT
Ozone Analysis with MOVES - MORPC
Loaded Network:              ..\..\3C Model Results\2050\MOR50J24ASN_BASE.NET
Network Emission Factors:    ..\..\Ozone_upd\factors\MORPC_2050_ozone_3source_rpd.csv
Vehicle Emission Factors:    ..\..\Ozone_upd\factors\MORPC_2050_ozone_3source_rpv.csv
Vehicle Population      :    ..\..\Ozone_upd\factors\Source_Type_Pop_2050_MORPC_on-Model.csv
Intrazonal Trips  :          ..\..\3C Model Results\2050\DEL2050.txt
Area File (sq mi):           ..\..\3C Model Results\3C_TAZ_areain.txt
Volume Field Used:           VOL24_TOT
Truck Volume Field Used:     NONE
Capacity Field Used:         CAPHRAM
-----------------------------------------
 CMS/AQ REPORT
 POSTCMS10, UPDATED DEC 2009, GTG
 DATE:03/05/2024 TIME:15:24:01

 PARAMETER FILE DUMP (DAILY.DAT FILE)

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       1     2.5     5.4     7.3     6.2       5     4.8       5     5.2     5.5     6.2
7.3       8       8     5.8     4.1     3.4     2.9     2.2     1.6
URB ART      0.6     0.4     0.3     0.4     0.7       2       4     6.3     5.7       5     5.1     5.8     6.2     6.2     6.8
7.7     8.3     8.2     6.1     4.5     3.6     2.8     1.9     1.2
RUR FWY      1.2       1     0.9       1     1.4     2.6     4.4     5.4     5.1     5.2     5.5     5.7     5.9     6.2     6.7
7.3     7.4       7     5.4     4.3     3.5     2.9     2.3     1.7
RUR ART      0.8     0.6     0.5     0.7     1.2     2.7     5.2     6.4     5.6     5.2     5.2     5.5     5.7     5.9     6.4
7.5     8.1     7.9     5.6     4.1     3.3     2.7     1.9     1.3
PCTADT T
URB FWY      1.8     1.6     1.6     1.8     2.2     3.1     4.2     4.9     5.6     6.2     6.5     6.6     6.5     6.5     6.4
6     5.3     4.6     4.2     3.6     3.2     2.9     2.5     2.2
URB ART      0.9     0.8     0.9     1.1     1.6     2.6     4.6     6.3     7.1     7.3     7.3     7.3     7.3     7.3     7.3
7     5.8     4.7     3.4     2.7     2.2     1.8     1.5     1.2
RUR FWY      2.1     1.9     1.8       2     2.4     3.2     4.1     4.5     4.9     5.5     5.8       6     6.1     6.1       6
5.8     5.5     5.1     4.6     4.2     3.7     3.3       3     2.5
RUR ART      1.5     1.4     1.4     1.7     2.3     3.1     4.6     5.4     6.2     6.6     6.8     6.9     6.8     6.8     6.6
6.2     5.5     4.6     3.7     3.1     2.6     2.4     2.1     1.8
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
```

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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
```

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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
curve22        55    54.9    54.4    53.2    51.1    47.9    44.0    39.5    34.9    30.4    26.2    22.4    19.2    16.4    14.0
12.0    10.4     9.0     7.8     6.8     6.0     5.3     4.7     4.1

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: 2.0

AQ SEASON FACTOR: 1.08

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
```

MOVES NETWORK LINK EMISSIONS OUTPUT

COUNTY	MONTH	VMT	HC	NOX	SO2	PM2.5
ADA	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
ALL	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
ASD	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
ATB	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
ATH	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
AUG	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
BEL	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
BRO	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
BUT	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
CAR	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
CHP	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
CLA	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
CLE	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
CLI	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
COL	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
COS	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
CRA	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
CUY	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
DAR	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
DEF	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
DEL	JANUARY	9481082.	0.0000	0.0000	0.0000	0.0000
ERI	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
FAI	JANUARY	2977128.	0.0000	0.0000	0.0000	0.0000
FAY	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
FRA	JANUARY	41729892.	0.0000	0.0000	0.0000	0.0000
FUL	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
GAL	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
GEA	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
GRE	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
GUE	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
HAM	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
HAN	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
HAR	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
HAS	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
HEN	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
HIG	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
HOC	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
HOL	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
HUR	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
JAC	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
JEF	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
KNO	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
LAK	JANUARY	0.	0.0000	0.0000	0.0000	0.0000

LAW	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
LIC	JANUARY	7374231.	0.0000	0.0000	0.0000	0.0000
LOG	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
LOR	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
LUC	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MAD	JANUARY	1583410.	0.0000	0.0000	0.0000	0.0000
MAH	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MAR	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MED	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MEG	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MER	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MIA	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MOE	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MOT	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MRG	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MRW	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
MUS	JANUARY	99776.	0.0000	0.0000	0.0000	0.0000
NOB	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
OTT	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
PAU	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
PER	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
PIC	JANUARY	1180582.	0.0000	0.0000	0.0000	0.0000
PIK	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
POR	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
PRE	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
PUT	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
RIC	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
ROS	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
SAN	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
SCI	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
SEN	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
SHE	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
STA	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
SUM	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
TRU	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
TUS	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
UNI	JANUARY	2823065.	0.0000	0.0000	0.0000	0.0000
VAN	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
VIN	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
WAR	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
WAS	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
WAY	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
WIL	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
WOO	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
WYA	JANUARY	0.	0.0000	0.0000	0.0000	0.0000
XXX	JANUARY	338283.	0.0000	0.0000	0.0000	0.0000
TOT	JANUARY	67568864.	0.0000	0.0000	0.0000	0.0000
ADA	APRIL	0.	0.0000	0.0000	0.0000	0.0000

ALL	APRIL	0.	0.0000	0.0000	0.0000	0.0000
ASD	APRIL	0.	0.0000	0.0000	0.0000	0.0000
ATB	APRIL	0.	0.0000	0.0000	0.0000	0.0000
ATH	APRIL	0.	0.0000	0.0000	0.0000	0.0000
AUG	APRIL	0.	0.0000	0.0000	0.0000	0.0000
BEL	APRIL	0.	0.0000	0.0000	0.0000	0.0000
BRO	APRIL	0.	0.0000	0.0000	0.0000	0.0000
BUT	APRIL	0.	0.0000	0.0000	0.0000	0.0000
CAR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
CHP	APRIL	0.	0.0000	0.0000	0.0000	0.0000
CLA	APRIL	0.	0.0000	0.0000	0.0000	0.0000
CLE	APRIL	0.	0.0000	0.0000	0.0000	0.0000
CLI	APRIL	0.	0.0000	0.0000	0.0000	0.0000
COL	APRIL	0.	0.0000	0.0000	0.0000	0.0000
COS	APRIL	0.	0.0000	0.0000	0.0000	0.0000
CRA	APRIL	0.	0.0000	0.0000	0.0000	0.0000
CUY	APRIL	0.	0.0000	0.0000	0.0000	0.0000
DAR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
DEF	APRIL	0.	0.0000	0.0000	0.0000	0.0000
DEL	APRIL	9481082.	0.0000	0.0000	0.0000	0.0000
ERI	APRIL	0.	0.0000	0.0000	0.0000	0.0000
FAI	APRIL	2977128.	0.0000	0.0000	0.0000	0.0000
FAY	APRIL	0.	0.0000	0.0000	0.0000	0.0000
FRA	APRIL	41729892.	0.0000	0.0000	0.0000	0.0000
FUL	APRIL	0.	0.0000	0.0000	0.0000	0.0000
GAL	APRIL	0.	0.0000	0.0000	0.0000	0.0000
GEA	APRIL	0.	0.0000	0.0000	0.0000	0.0000
GRE	APRIL	0.	0.0000	0.0000	0.0000	0.0000
GUE	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HAM	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HAN	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HAR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HAS	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HEN	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HIG	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HOC	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HOL	APRIL	0.	0.0000	0.0000	0.0000	0.0000
HUR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
JAC	APRIL	0.	0.0000	0.0000	0.0000	0.0000
JEF	APRIL	0.	0.0000	0.0000	0.0000	0.0000
KNO	APRIL	0.	0.0000	0.0000	0.0000	0.0000
LAK	APRIL	0.	0.0000	0.0000	0.0000	0.0000
LAW	APRIL	0.	0.0000	0.0000	0.0000	0.0000
LIC	APRIL	7374231.	0.0000	0.0000	0.0000	0.0000
LOG	APRIL	0.	0.0000	0.0000	0.0000	0.0000
LOR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
LUC	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MAD	APRIL	1583410.	0.0000	0.0000	0.0000	0.0000

MAH	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MAR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MED	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MEG	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MER	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MIA	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MOE	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MOT	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MRG	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MRW	APRIL	0.	0.0000	0.0000	0.0000	0.0000
MUS	APRIL	99776.	0.0000	0.0000	0.0000	0.0000
NOB	APRIL	0.	0.0000	0.0000	0.0000	0.0000
OTT	APRIL	0.	0.0000	0.0000	0.0000	0.0000
PAU	APRIL	0.	0.0000	0.0000	0.0000	0.0000
PER	APRIL	0.	0.0000	0.0000	0.0000	0.0000
PIC	APRIL	1180582.	0.0000	0.0000	0.0000	0.0000
PIK	APRIL	0.	0.0000	0.0000	0.0000	0.0000
POR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
PRE	APRIL	0.	0.0000	0.0000	0.0000	0.0000
PUT	APRIL	0.	0.0000	0.0000	0.0000	0.0000
RIC	APRIL	0.	0.0000	0.0000	0.0000	0.0000
ROS	APRIL	0.	0.0000	0.0000	0.0000	0.0000
SAN	APRIL	0.	0.0000	0.0000	0.0000	0.0000
SCI	APRIL	0.	0.0000	0.0000	0.0000	0.0000
SEN	APRIL	0.	0.0000	0.0000	0.0000	0.0000
SHE	APRIL	0.	0.0000	0.0000	0.0000	0.0000
STA	APRIL	0.	0.0000	0.0000	0.0000	0.0000
SUM	APRIL	0.	0.0000	0.0000	0.0000	0.0000
TRU	APRIL	0.	0.0000	0.0000	0.0000	0.0000
TUS	APRIL	0.	0.0000	0.0000	0.0000	0.0000
UNI	APRIL	2823065.	0.0000	0.0000	0.0000	0.0000
VAN	APRIL	0.	0.0000	0.0000	0.0000	0.0000
VIN	APRIL	0.	0.0000	0.0000	0.0000	0.0000
WAR	APRIL	0.	0.0000	0.0000	0.0000	0.0000
WAS	APRIL	0.	0.0000	0.0000	0.0000	0.0000
WAY	APRIL	0.	0.0000	0.0000	0.0000	0.0000
WIL	APRIL	0.	0.0000	0.0000	0.0000	0.0000
WOO	APRIL	0.	0.0000	0.0000	0.0000	0.0000
WYA	APRIL	0.	0.0000	0.0000	0.0000	0.0000
XXX	APRIL	338283.	0.0000	0.0000	0.0000	0.0000
TOT	APRIL	67568864.	0.0000	0.0000	0.0000	0.0000
ADA	JULY	0.	0.0000	0.0000	0.0000	0.0000
ALL	JULY	0.	0.0000	0.0000	0.0000	0.0000
ASD	JULY	0.	0.0000	0.0000	0.0000	0.0000
ATB	JULY	0.	0.0000	0.0000	0.0000	0.0000
ATH	JULY	0.	0.0000	0.0000	0.0000	0.0000
AUG	JULY	0.	0.0000	0.0000	0.0000	0.0000
BEL	JULY	0.	0.0000	0.0000	0.0000	0.0000

BRO	JULY	0.	0.0000	0.0000	0.0000	0.0000
BUT	JULY	0.	0.0000	0.0000	0.0000	0.0000
CAR	JULY	0.	0.0000	0.0000	0.0000	0.0000
CHP	JULY	0.	0.0000	0.0000	0.0000	0.0000
CLA	JULY	0.	0.0000	0.0000	0.0000	0.0000
CLE	JULY	0.	0.0000	0.0000	0.0000	0.0000
CLI	JULY	0.	0.0000	0.0000	0.0000	0.0000
COL	JULY	0.	0.0000	0.0000	0.0000	0.0000
COS	JULY	0.	0.0000	0.0000	0.0000	0.0000
CRA	JULY	0.	0.0000	0.0000	0.0000	0.0000
CUY	JULY	0.	0.0000	0.0000	0.0000	0.0000
DAR	JULY	0.	0.0000	0.0000	0.0000	0.0000
DEF	JULY	0.	0.0000	0.0000	0.0000	0.0000
DEL	JULY	10239569.	0.4125	0.4289	0.0000	0.0000
ERI	JULY	0.	0.0000	0.0000	0.0000	0.0000
FAI	JULY	3215298.	0.1320	0.1372	0.0000	0.0000
FAY	JULY	0.	0.0000	0.0000	0.0000	0.0000
FRA	JULY	45068284.	1.8707	2.0572	0.0000	0.0000
FUL	JULY	0.	0.0000	0.0000	0.0000	0.0000
GAL	JULY	0.	0.0000	0.0000	0.0000	0.0000
GEA	JULY	0.	0.0000	0.0000	0.0000	0.0000
GRE	JULY	0.	0.0000	0.0000	0.0000	0.0000
GUE	JULY	0.	0.0000	0.0000	0.0000	0.0000
HAM	JULY	0.	0.0000	0.0000	0.0000	0.0000
HAN	JULY	0.	0.0000	0.0000	0.0000	0.0000
HAR	JULY	0.	0.0000	0.0000	0.0000	0.0000
HAS	JULY	0.	0.0000	0.0000	0.0000	0.0000
HEN	JULY	0.	0.0000	0.0000	0.0000	0.0000
HIG	JULY	0.	0.0000	0.0000	0.0000	0.0000
HOC	JULY	0.	0.0000	0.0000	0.0000	0.0000
HOL	JULY	0.	0.0000	0.0000	0.0000	0.0000
HUR	JULY	0.	0.0000	0.0000	0.0000	0.0000
JAC	JULY	0.	0.0000	0.0000	0.0000	0.0000
JEF	JULY	0.	0.0000	0.0000	0.0000	0.0000
KNO	JULY	0.	0.0000	0.0000	0.0000	0.0000
LAK	JULY	0.	0.0000	0.0000	0.0000	0.0000
LAW	JULY	0.	0.0000	0.0000	0.0000	0.0000
LIC	JULY	7964170.	0.3135	0.3359	0.0000	0.0000
LOG	JULY	0.	0.0000	0.0000	0.0000	0.0000
LOR	JULY	0.	0.0000	0.0000	0.0000	0.0000
LUC	JULY	0.	0.0000	0.0000	0.0000	0.0000
MAD	JULY	1710083.	0.0577	0.0644	0.0000	0.0000
MAH	JULY	0.	0.0000	0.0000	0.0000	0.0000
MAR	JULY	0.	0.0000	0.0000	0.0000	0.0000
MED	JULY	0.	0.0000	0.0000	0.0000	0.0000
MEG	JULY	0.	0.0000	0.0000	0.0000	0.0000
MER	JULY	0.	0.0000	0.0000	0.0000	0.0000
MIA	JULY	0.	0.0000	0.0000	0.0000	0.0000

MOE	JULY	0.	0.0000	0.0000	0.0000	0.0000
MOT	JULY	0.	0.0000	0.0000	0.0000	0.0000
MRG	JULY	0.	0.0000	0.0000	0.0000	0.0000
MRW	JULY	0.	0.0000	0.0000	0.0000	0.0000
MUS	JULY	107758.	0.0031	0.0035	0.0000	0.0000
NOB	JULY	0.	0.0000	0.0000	0.0000	0.0000
OTT	JULY	0.	0.0000	0.0000	0.0000	0.0000
PAU	JULY	0.	0.0000	0.0000	0.0000	0.0000
PER	JULY	0.	0.0000	0.0000	0.0000	0.0000
PIC	JULY	1275028.	0.0401	0.0402	0.0000	0.0000
PIK	JULY	0.	0.0000	0.0000	0.0000	0.0000
POR	JULY	0.	0.0000	0.0000	0.0000	0.0000
PRE	JULY	0.	0.0000	0.0000	0.0000	0.0000
PUT	JULY	0.	0.0000	0.0000	0.0000	0.0000
RIC	JULY	0.	0.0000	0.0000	0.0000	0.0000
ROS	JULY	0.	0.0000	0.0000	0.0000	0.0000
SAN	JULY	0.	0.0000	0.0000	0.0000	0.0000
SCI	JULY	0.	0.0000	0.0000	0.0000	0.0000
SEN	JULY	0.	0.0000	0.0000	0.0000	0.0000
SHE	JULY	0.	0.0000	0.0000	0.0000	0.0000
STA	JULY	0.	0.0000	0.0000	0.0000	0.0000
SUM	JULY	0.	0.0000	0.0000	0.0000	0.0000
TRU	JULY	0.	0.0000	0.0000	0.0000	0.0000
TUS	JULY	0.	0.0000	0.0000	0.0000	0.0000
UNI	JULY	3048910.	0.1096	0.1149	0.0000	0.0000
VAN	JULY	0.	0.0000	0.0000	0.0000	0.0000
VIN	JULY	0.	0.0000	0.0000	0.0000	0.0000
WAR	JULY	0.	0.0000	0.0000	0.0000	0.0000
WAS	JULY	0.	0.0000	0.0000	0.0000	0.0000
WAY	JULY	0.	0.0000	0.0000	0.0000	0.0000
WIL	JULY	0.	0.0000	0.0000	0.0000	0.0000
WOO	JULY	0.	0.0000	0.0000	0.0000	0.0000
WYA	JULY	0.	0.0000	0.0000	0.0000	0.0000
XXX	JULY	365346.	0.0181	0.0227	0.0000	0.0000
TOT	JULY	72974376.	2.9562	3.2041	0.0000	0.0000

MOVES INTRAZONAL EMISSIONS OUTPUT

MONTH	VMT	HC	NOX	SO2	PM2.5
JANUARY	63040.	0.0000	0.0000	0.0000	0.0000
APRIL	63040.	0.0000	0.0000	0.0000	0.0000
JULY	68083.	0.0041	0.0050	0.0000	0.0000

MOVES VEHICLE BASED EMISSIONS OUTPUT

MONTH	VEHICLES	HC	NOX	SO2	PM2.5
JANUARY	2999576.	0.0000	0.0000	0.0000	0.0000
APRIL	2999576.	0.0000	0.0000	0.0000	0.0000
JULY	3239542.	7.0297	1.7898	0.0000	0.0000

Appendix – MORPC HPMS VMT and Emissions (Outside of Travel Demand Model Area)

2030

```
MOVES BASED HPMS EMISSIONS REPORT
You should enter a comment to add to the AQ report indicating reason and analyst
Input VMT File:              I:\ut\mpo\model\col\aq\2024\ozone\off-model\FAI_Off-Model_VMT_2030.csv
Network Emission Factors:    I:\ut\mpo\model\col\aq\2024\ozone\off-model\MORPC_2030_ozone_3source_rpd.csv
Vehicle Emission Factors:    I:\ut\mpo\model\col\aq\2024\ozone\off-model\MORPC_2030_ozone_3source_rpv.csv
Vehicle Population:          I:\ut\mpo\model\col\aq\2024\ozone\off-model\FAI_Off-Model_source_type_pop_2030.csv
----------------------------------------
 DATE:03/05/2024 TIME:10:45:30

 PARAMETER FILE DUMP (DAILY.DAT FILE)

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

 AQ SEASON FACTOR: 1.08000004

 MOVES HPMS EMISSIONS OUTPUT
        MONTH     VMT       HC         NOX        CO2        PM2.5
        JANUARY     2371933.    0.0000    0.0000      0.00    0.0000
        APRIL       2371933.    0.0000    0.0000      0.00    0.0000
        JULY        2561688.    0.1539    0.3738      0.00    0.0000
 MOVES VEHICLE BASED EMISSIONS OUTPUT
        MONTH     VEHICLES  HC         NOX        CO2        PM2.5
        JANUARY       74218.    0.0000    0.0000      0.00    0.0000
        APRIL         74218.    0.0000    0.0000      0.00    0.0000
        JULY          80155.    0.3130    0.0720      0.00    0.0000

MOVES BASED HPMS EMISSIONS REPORT
You should enter a comment to add to the AQ report indicating reason and analyst
Input VMT File:              I:\ut\mpo\model\col\aq\2024\ozone\off-model\KNO_Off-Model_VMT_2030.csv
Network Emission Factors:    I:\ut\mpo\model\col\aq\2024\ozone\off-model\MORPC_2030_ozone_3source_rpd.csv
Vehicle Emission Factors:    I:\ut\mpo\model\col\aq\2024\ozone\off-model\MORPC_2030_ozone_3source_rpv.csv
Vehicle Population:          I:\ut\mpo\model\col\aq\2024\ozone\off-model\KNO_Off-Model_source_type_pop_2030.csv
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 DATE:03/05/2024 TIME:10:49:43
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 PARAMETER FILE DUMP (DAILY.DAT FILE)

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

 AQ SEASON FACTOR: 1.08000004

 MOVES HPMS EMISSIONS OUTPUT
        MONTH     VMT       HC         NOX        CO2        PM2.5
        JANUARY     1187115.    0.0000    0.0000       0.00    0.0000
        APRIL       1187115.    0.0000    0.0000       0.00    0.0000
        JULY        1282084.    0.0677    0.1552       0.00    0.0000
 MOVES VEHICLE BASED EMISSIONS OUTPUT
        MONTH     VEHICLES  HC         NOX        CO2        PM2.5
        JANUARY       55771.    0.0000    0.0000       0.00    0.0000
        APRIL         55771.    0.0000    0.0000       0.00    0.0000
        JULY          60233.    0.2352    0.0541       0.00    0.0000

MOVES BASED HPMS EMISSIONS REPORT
You should enter a comment to add to the AQ report indicating reason and analyst
Input VMT File:              I:\ut\mpo\model\col\aq\2024\ozone\off-model\MAD_Off-Model_VMT_2030.csv
Network Emission Factors:    I:\ut\mpo\model\col\aq\2024\ozone\off-model\MORPC_2030_ozone_3source_rpd.csv
Vehicle Emission Factors:    I:\ut\mpo\model\col\aq\2024\ozone\off-model\MORPC_2030_ozone_3source_rpv.csv
Vehicle Population:          I:\ut\mpo\model\col\aq\2024\ozone\off-model\MAD_Off-Model_source_type_pop_2030.csv
----------------------------------------
 DATE:03/05/2024 TIME:10:52:25

 PARAMETER FILE DUMP (DAILY.DAT FILE)

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
```

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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

 AQ SEASON FACTOR: 1.08000004

 MOVES HPMS EMISSIONS OUTPUT
        MONTH     VMT       HC        NOX       CO2       PM2.5
        JANUARY     2674242.    0.0000    0.0000      0.00    0.0000
        APRIL       2674242.    0.0000    0.0000      0.00    0.0000
        JULY        2888182.    0.1463    0.3262      0.00    0.0000
 MOVES VEHICLE BASED EMISSIONS OUTPUT
        MONTH     VEHICLES  HC        NOX       CO2       PM2.5
        JANUARY       69155.    0.0000    0.0000      0.00    0.0000
        APRIL         69155.    0.0000    0.0000      0.00    0.0000
        JULY          74687.    0.2916    0.0671      0.00    0.0000
```

2040

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MOVES BASED HPMS EMISSIONS REPORT
You should enter a comment to add to the AQ report indicating reason and analyst
Input VMT File:              I:\ut\mpo\model\col\aq\2024\ozone\off-model\FAI_Off-Model_VMT_2040.csv
Network Emission Factors:    I:\ut\mpo\model\col\aq\2024\ozone\off-model\MORPC_2040_ozone_3source_rpd.csv
Vehicle Emission Factors:    I:\ut\mpo\model\col\aq\2024\ozone\off-model\MORPC_2040_ozone_3source_rpv.csv
Vehicle Population:          I:\ut\mpo\model\col\aq\2024\ozone\off-model\FAI_Off-Model_source_type_pop_2040.csv
----------------------------------------
 DATE:03/05/2024 TIME:10:47:14

 PARAMETER FILE DUMP (DAILY.DAT FILE)

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

 AQ SEASON FACTOR: 1.08000004

 MOVES HPMS EMISSIONS OUTPUT
        MONTH     VMT       HC        NOX       CO2       PM2.5
        JANUARY     2728889.    0.0000    0.0000      0.00    0.0000
        APRIL       2728889.    0.0000    0.0000      0.00    0.0000
        JULY        2947200.    0.1179    0.1515      0.00    0.0000
 MOVES VEHICLE BASED EMISSIONS OUTPUT
```

```
        MONTH     VEHICLES  HC        NOX       CO2       PM2.5
        JANUARY      82731.    0.0000    0.0000      0.00    0.0000
        APRIL        82731.    0.0000    0.0000      0.00    0.0000
        JULY         89349.    0.2322    0.0510      0.00    0.0000

MOVES BASED HPMS EMISSIONS REPORT
You should enter a comment to add to the AQ report indicating reason and analyst
Input VMT File:              I:\ut\mpo\model\col\aq\2024\ozone\off-model\KNO_Off-Model_VMT_2040.csv
Network Emission Factors:    I:\ut\mpo\model\col\aq\2024\ozone\off-model\MORPC_2040_ozone_3source_rpd.csv
Vehicle Emission Factors:    I:\ut\mpo\model\col\aq\2024\ozone\off-model\MORPC_2040_ozone_3source_rpv.csv
Vehicle Population:          I:\ut\mpo\model\col\aq\2024\ozone\off-model\KNO_Off-Model_source_type_pop_2040.csv
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 DATE:03/06/2024 TIME:10:09:37

 PARAMETER FILE DUMP (DAILY.DAT FILE)

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

 AQ SEASON FACTOR: 1.08000004

 MOVES HPMS EMISSIONS OUTPUT
        MONTH     VMT       HC        NOX       CO2       PM2.5
        JANUARY     1218357.    0.0000    0.0000      0.00    0.0000
        APRIL       1218357.    0.0000    0.0000      0.00    0.0000
        JULY        1315826.    0.0468    0.0566      0.00    0.0000
 MOVES VEHICLE BASED EMISSIONS OUTPUT
        MONTH     VEHICLES  HC        NOX       CO2       PM2.5
        JANUARY      61991.    0.0000    0.0000      0.00    0.0000
        APRIL        61991.    0.0000    0.0000      0.00    0.0000
        JULY         66950.    0.1740    0.0382      0.00    0.0000

MOVES BASED HPMS EMISSIONS REPORT
You should enter a comment to add to the AQ report indicating reason and analyst
Input VMT File:              I:\ut\mpo\model\col\aq\2024\ozone\off-model\MAD_Off-Model_VMT_2040.csv
Network Emission Factors:    I:\ut\mpo\model\col\aq\2024\ozone\off-model\MORPC_2040_ozone_3source_rpd.csv
Vehicle Emission Factors:    I:\ut\mpo\model\col\aq\2024\ozone\off-model\MORPC_2040_ozone_3source_rpv.csv
Vehicle Population:          I:\ut\mpo\model\col\aq\2024\ozone\off-model\MAD_Off-Model_source_type_pop_2040.csv
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 DATE:03/05/2024 TIME:10:53:32

 PARAMETER FILE DUMP (DAILY.DAT FILE)

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

 AQ SEASON FACTOR: 1.08000004

 MOVES HPMS EMISSIONS OUTPUT
        MONTH     VMT       HC        NOX       CO2       PM2.5
        JANUARY     2993062.    0.0000    0.0000      0.00    0.0000
        APRIL       2993062.    0.0000    0.0000      0.00    0.0000
        JULY        3232507.    0.1105    0.1337      0.00    0.0000
 MOVES VEHICLE BASED EMISSIONS OUTPUT
        MONTH     VEHICLES  HC        NOX       CO2       PM2.5
        JANUARY       76874.    0.0000    0.0000      0.00    0.0000
        APRIL         76874.    0.0000    0.0000      0.00    0.0000
        JULY          83024.    0.2158    0.0474      0.00    0.0000
```

2050

```
MOVES BASED HPMS EMISSIONS REPORT
You should enter a comment to add to the AQ report indicating reason and analyst
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Vehicle Emission Factors:    I:\ut\mpo\model\col\aq\2024\ozone\off-model\MORPC_2050_ozone_3source_rpv.csv
Vehicle Population:          I:\ut\mpo\model\col\aq\2024\ozone\off-model\FAI_Off-Model_source_type_pop_2050.csv
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 DATE:03/05/2024 TIME:10:48:15

 PARAMETER FILE DUMP (DAILY.DAT FILE)

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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

 AQ SEASON FACTOR: 1.08000004

 MOVES HPMS EMISSIONS OUTPUT
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        JANUARY     3089062.    0.0000    0.0000      0.00    0.0000
        APRIL       3089062.    0.0000    0.0000      0.00    0.0000
        JULY        3336187.    0.1184    0.1373      0.00    0.0000
 MOVES VEHICLE BASED EMISSIONS OUTPUT
        MONTH     VEHICLES  HC         NOX        CO2        PM2.5
        JANUARY       91100.    0.0000    0.0000      0.00    0.0000
        APRIL         91100.    0.0000    0.0000      0.00    0.0000
        JULY          98388.    0.2135    0.0544      0.00    0.0000

MOVES BASED HPMS EMISSIONS REPORT
You should enter a comment to add to the AQ report indicating reason and analyst
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Vehicle Emission Factors:    I:\ut\mpo\model\col\aq\2024\ozone\off-model\MORPC_2050_ozone_3source_rpv.csv
Vehicle Population:          I:\ut\mpo\model\col\aq\2024\ozone\off-model\KNO_Off-Model_source_type_pop_2050.csv
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 DATE:03/05/2024 TIME:10:51:22

 PARAMETER FILE DUMP (DAILY.DAT FILE)

HOUR          0       1       2       3       4       5       6       7       8       9      10      11      12      13      14
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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

 AQ SEASON FACTOR: 1.08000004

 MOVES HPMS EMISSIONS OUTPUT
        MONTH     VMT        HC         NOX        CO2        PM2.5
        JANUARY     1250788.    0.0000    0.0000      0.00    0.0000
        APRIL       1250788.    0.0000    0.0000      0.00    0.0000
        JULY        1350851.    0.0428    0.0470      0.00    0.0000
```

```
 MOVES VEHICLE BASED EMISSIONS OUTPUT
        MONTH     VEHICLES  HC         NOX        CO2        PM2.5
        JANUARY       69575.    0.0000    0.0000      0.00    0.0000
        APRIL         69575.    0.0000    0.0000      0.00    0.0000
        JULY          75141.    0.1631    0.0415      0.00    0.0000

MOVES BASED HPMS EMISSIONS REPORT
You should enter a comment to add to the AQ report indicating reason and analyst
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Vehicle Emission Factors:    I:\ut\mpo\model\col\aq\2024\ozone\off-model\MORPC_2050_ozone_3source_rpv.csv
Vehicle Population:          I:\ut\mpo\model\col\aq\2024\ozone\off-model\MAD_Off-Model_source_type_pop_2050.csv
----------------------------------------
 DATE:03/05/2024 TIME:10:54:20

 PARAMETER FILE DUMP (DAILY.DAT FILE)

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

 AQ SEASON FACTOR: 1.08000004

 MOVES HPMS EMISSIONS OUTPUT
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        JANUARY     3305417.    0.0000    0.0000      0.00    0.0000
        APRIL       3305417.    0.0000    0.0000      0.00    0.0000
        JULY        3569851.    0.1099    0.1231      0.00    0.0000
 MOVES VEHICLE BASED EMISSIONS OUTPUT
        MONTH     VEHICLES  HC         NOX        CO2        PM2.5
        JANUARY       86275.    0.0000    0.0000      0.00    0.0000
        APRIL         86275.    0.0000    0.0000      0.00    0.0000
        JULY          93177.    0.2022    0.0515      0.00    0.0000
```

Attachment B-Consultation Correspondence

*Correspondance specific to the SFY 24-27 TIP conformity documentation to be added for final Draft TIP in March

From: Nick Gill
Sent: Wednesday, June 15, 2022 8:54 AM
To: ANTHONY.HILL@dot.ohio.gov; paul.braun@epa.ohio.gov; Kane, Mark (FTA) <Mark.Kane@dot.gov>; mhill@lcounty.com; Maietta.Anthony@epamail.epa.gov; Nathaniel.Brugler@dot.ohio.gov; Andrew.Shepler@dot.ohio.gov; frank.burkett@dot.gov; Jordan.Whisler@dot.ohio.gov; velyjha.southern@dot.gov
Cc: Maietta, Anthony <maietta.anthony@epa.gov>; Nino.Brunello@dot.ohio.gov; Sam.Granato@dot.ohio.gov; Greg.Giaimo@dot.ohio.gov; Maria Schaper <mschaper@morpc.org>; Zhuojun.Jiang@dot.ohio.gov
Subject: Air Conformity Interagency Consultation for a MORPC MTP Amendment - 2022

Hello All,

This email is for the purpose of conducting the interagency consultation for an amendment to the MORPC 2020-2050 Metropolitan Transportation Plan.

We are initiating this MTP amendment primarily to add a widening of a portion of SR 161 in the New Albany area as a result of the Intel announcement. Part of the planned widening is included in the current MTP while a portion of it is not. We will also be reviewing other planned improvements in the area to ensure those are properly reflected in the 2020-2050 MTP.

Our timeline for this amendment and updated conformity determination is as follows:

- Through June 24 – Identify all needed projects to include in amendment – new projects and changes in analysis year in current MTP
- July 1 - interagency email with updated conformity document and notice of upcoming public comment period.
- July 5 thru August 12– Public comment period
- August 29 & 31 – MTP amendment Resolution presented to MORPC CAC and TAC respectively
- September 8 – MORPC Transportation Policy Committee Approval

We will also be coordinating with LCATS on any necessary amendment to their MTP with adoption during their September Board meeting.

Specifically with regard to AQ conformity. We will rerun the conformity analysis and prepare and updated conformity document. The analysis will reflect needed roadway network adjustments and the additional committed employment from the Intel project. Otherwise all of parameters from the AQ conformity determination from the August 2021 MTP amendment are the same including use of MOVES for the emission factors since we are still within the grace period with regard to transitioning to the latest USEPA emissions model.

Thank you in advance for your attention and please contact me with any questions or clarifications you may need.

Nick

Nicholas T. Gill
Transportation Director | **Mid-Ohio Regional Planning Commission**
T: 614.233.4151 | ngill@morpc.org
111 Liberty Street, Suite 100 | Columbus, OH 43215

From: Nick Gill
Sent: Wednesday, August 25, 2021 9:00 AM
To: ANTHONY.HILL@dot.ohio.gov; paul.braun@epa.ohio.gov; Kane, Mark (FTA) <Mark.Kane@dot.gov>; mhill@lcounty.com; Maietta.Anthony@epamail.epa.gov; Nathaniel.Brugler@dot.ohio.gov; Andrew.Shepler@dot.ohio.gov; frank.burkett@dot.gov; Jordan.Whisler@dot.ohio.gov; velyjha.southern@dot.gov
Cc: Maietta, Anthony <maietta.anthony@epa.gov>; Nino.Brunello@dot.ohio.gov; Sam.Granato@dot.ohio.gov; Greg.Giaimo@dot.ohio.gov; Maria Schaper <mschaper@morpc.org>
Subject: Air Conformity Interagency Consultation for a MORPC MTP Amendment

Hello All,

This email is for the purpose of conducting the interagency consultation for an amendment to the MORPC 2020-2050 Metropolitan Transportation Plan.

The attached is the information with regard to the MTP amendment. It is also on our website at https://www.morpc.org/mtp2050/. The information was presented to our committees in August with a comment period running throughout August. We are preparing to adopt the MTP amendment during our September meeting cycle.

In short, the amendment is to 1) add a Bus Rapid Transit (BRT) corridor to the MTP; 2) specify BRT as the mode for three other corridors that were previously in the MTP listed as “high capacity transit”; and 3) adjust the time frame for one of these corridors previously included in the MTP. These changes are the result of planning studies that have been completed by the City of Columbus and COTA through the LinkUs initiative since the 2020-2050 MTP was adopted in May of 2020.

Specifically with regard to AQ conformity. We reran the conformity analysis and prepared the attached updated document. The analysis reflects the additional BRT corridor, adjusted time frame of one corridor and general refinements of the network coding most specifically regarding the coding of the BRT in the network to reflect the latest planning assumption resulting from the planning studies completed by Columbus and COTA. Otherwise all of parameters from the AQ conformity determination from May 2020 are the same including use of MOVES for the emission factors since we are still within the grace period with regard to transitioning to the latest USEPA emissions model.

Thank you in advance for your attention and please contact me with any questions or clarifications you may need.

Nick

Nicholas T. Gill
Assistant Director, Transportation and Infrastructure Development | **Mid-Ohio Regional Planning Commission**
T: 614.233.4151 | ngill@morpc.org
111 Liberty Street, Suite 100 | Columbus, OH 43215

Given continued concerns and rapidly changing conditions due to COVID-19, MORPC offices are currently open to the public, but on a limited basis for preplanned meetings. In taking such steps, we are protecting the health and safety of our staff, members, and the general public. During this time, MORPC will continue to provide services to our members and community partners remotely. For updates and other information visit our website at www.morpc.org/covid19. Thank you for your patience and understanding as we navigate through these unique challenges.

From: Nick Gill
Sent: Tuesday, April 7, 2020 10:10 AM
To: ANTHONY.HILL@dot.ohio.gov; paul.braun@epa.ohio.gov; Kane, Mark (FTA) <Mark.Kane@dot.gov>; mhill@lcounty.com; Maietta.Anthony@epamail.epa.gov; Nathaniel.Brugler@dot.ohio.gov; Andrew.Shepler@dot.ohio.gov; frank.burkett@dot.gov
Cc: Maietta, Anthony <maietta.anthony@epa.gov>; noel.mehlo@dot.gov; Nino.Brunello@dot.ohio.gov; Sam.Granato@dot.ohio.gov; Mark.Byram@dot.ohio.gov; Greg.Giaimo@dot.ohio.gov
Subject: Columbus Air Quality Conformity

All,

I'm sure most of you are already aware. But just in case, we have completed the draft AQ conformity document for the Columbus ozone maintenance area. The AQ conformity document is for the SFY 2024-2027 TIPs for MORPC and LCATS and their respective new Metropolitan Transportation Plans.

It is attached or you can access from either of these two links (it is the same document)

MORPC MTP page: https://www.morpc.org/mtp2050/
MORPC TIP page: https://www.morpc.org/program-service/transportation-improvement-program/

Any Questions, let me know

Thanks
Nick

Nicholas T. Gill
Assistant Director, Transportation and Infrastructure Development | **Mid-Ohio Regional Planning Commission**
T: 614.233.4151 | ngill@morpc.org
111 Liberty Street, Suite 100 | Columbus, OH 43215

From: ANTHONY.HILL@dot.ohio.gov <ANTHONY.HILL@dot.ohio.gov>
Sent: Tuesday, February 4, 2020 10:33 AM
To: Andy Reser <ARESER@oki.org>; Dave.Moore1@dot.ohio.gov; Nick Gill <NGILL@morpc.org>; paul.braun@epa.ohio.gov; Kane, Mark (FTA) <Mark.Kane@dot.gov>; mhill@lcounty.com; aramirez@mvrpc.org; Maietta.Anthony@epamail.epa.gov; Nathaniel.Brugler@dot.ohio.gov; Andrew.Shepler@dot.ohio.gov; frank.burkett@dot.gov
Cc: Maietta, Anthony <maietta.anthony@epa.gov>; noel.mehlo@dot.gov; Brett Porter <BPorter@oki.org>; Nino.Brunello@dot.ohio.gov; Sam.Granato@dot.ohio.gov; Mark.Byram@dot.ohio.gov; Greg.Giaimo@dot.ohio.gov
Subject: RE: Air Conformity Interagency Consultation for the Columbus and Cincinnati Regions

Hello All,

Attached is the finalized interagency consultation document with meeting minutes. Please integrate the document into the appropriate TIPS. If you have any questions, please contact me or call Dave.

Have a great day,

Anthony Hill

Transportation Planner
ODOT Office of Statewide Planning & Research
1980 W. Broad Street, Columbus, Ohio 43223
(p) 614.752.2965
transportation.ohio.gov

From: Dave.Moore1@dot.ohio.gov [mailto:Dave.Moore1@dot.ohio.gov]
Sent: Wednesday, January 22, 2020 1:42 PM
To: ANTHONY.HILL@dot.ohio.gov; Nick Gill <NGILL@morpc.org>; Andy Reser

<ARESER@oki.org>; paul.braun@epa.ohio.gov; Kane, Mark (FTA) <Mark.Kane@dot.gov>; mhill@lcounty.com; aramirez@mvrpc.org; Maietta.Anthony@epamail.epa.gov; Nathaniel.Brugler@dot.ohio.gov; Andrew.Shepler@dot.ohio.gov; frank.burkett@dot.gov
Cc: Maietta, Anthony <maietta.anthony@epa.gov>; noel.mehlo@dot.gov; Brett Porter <BPorter@oki.org>; Nino.Brunello@dot.ohio.gov; Sam.Granato@dot.ohio.gov; Mark.Byram@dot.ohio.gov; Greg.Giaimo@dot.ohio.gov
Subject: RE: Air Conformity Interagency Consultation for the Columbus and Cincinnati Regions

All,

Preparing for Friday's OKI & MORPC/LCATS 2021 – 2024 TIP air quality interagency consultation call please see the attached documents:

Conference call agenda

Cincinnati conformity summary

Columbus conformity summary

Thanks

DM

-----Original Appointment-----
From: Hill, Anthony
Sent: Monday, January 6, 2020 10:23 AM
To: Hill, Anthony; Nick Gill; Andy Reser; Braun, Paul; Kane, Mark (FTA); mhill@lcounty.com1; aramirez@mvrpc.org; Maietta.Anthony@epamail.epa.gov; Moore, David; Brugler, Nathaniel; Shepler, Andrew; Burkett, Frank (FHWA)
Cc: Maietta, Anthony; Mehlo, Noel; Brett Porter; Brunello, Antonino; Granato, Samuel; Byram, Mark; Giaimo, Gregory
Subject: Air Conformity Interagency Consultation for the Columbus and Cincinnati Regions
When: Friday, January 24, 2020 10:00 AM-11:30 AM (UTC-05:00) Eastern Time (US & Canada).
Where: Sykpe call and in person meeting at DOT CEN 3A Room

Hello All,

The Columbus/Cincinnati Regions Air conformity Interagency Consultation meeting will take place 01/24/2020 at 10am. If you are in the Columbus area, we will be meeting in ODOT Central Office Room 3A. For all others, please call into the Skype number listed below.

If you have any questions, please fell free to contact myself or Dave Moore.

Thank you and have a good day,

Anthony Hill

Transportation Planner
ODOT Office of Statewide Planning & Research
1980 W. Broad Street, Columbus, Ohio 43223
(p) 614.752.2965
transportation.ohio.gov

Join Skype Meeting

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Join by phone

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Conference ID: 790950
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Air Quality Interagency Consultation
Cincinnati and Columbus Air Quality Areas Ohio 2021-2024 TIP
January 24, 2020 Conference Call
Agenda

1. Overview:
    a. Ohio is developing its SFY 2021 -2024 S/TIP
    b. This conference call will review the procedures by which the Cincinnati and Columbus/Newark MPOs will demonstrate transportation air quality conformity for their respective SFY 2021 -2024 TIPs - See respective MPO's Conformity Summaries
    c. Cincinnati – OKI
        i. OKI will demonstrate transportation conformity for its existing 2040 Transportation Plan and new SFY 2021 -2024 TIP

ii. OKI is also currently conducting an update to its Transportation Plan with a 2050 horizon year

d. Columbus/Newark – MORPC/LCATS
   i. MORPC & LCATS will demonstrate transportation conformity for updated 2050 Transportation Plans and new SFY 2021 -2024 TIPs

2. Review OKI and MORPC/LCATS Conformity Criteria and Procedures – See attached Conformity Summaries
   a. Attainment status
   b. Geography
   c. Latest planning assumptions
   d. Latest emissions model
   e. Timely implementation of TCMS
   f. Conformity networks
   g. Budget tests/analysis years
   h. Public involvement processes – include conformity results
   i. MPO conformity determinations

Air Quality Interagency Consultation
Cincinnati and Columbus Air Quality Areas Ohio 2021-2024 TIP
January 24, 2020 Conference Call
Meeting Minutes

Call Participants:

MPOs

Ohio Department of Transportation (ODOT)
Dave Moore, Anthony Hill, Nino Brunello, Greg Giaimo, Mark Byram and Nate Brugler

Licking County Area Transportation Study (LCATS)
Matt Hill, Alex Nouanesengsy and Greg Huss

Mid-Ohio Regional Planning Commission (MORPC)
Nick Gill

Miami Valley Regional Planning Commission (MVRPC)
Ana Ramirez

Ohio-Kentucky-Indiana Regional Council of Governments (OKI)
Andy Reser, Brett Porter and Bob Koehler

Federal

Federal Highway Administration (FHWA)
Noel Mehlo

Federal Transit Administration (FTA)
Stewart McKenzie and Mark Kane

Environmental Protection Agency (EPA)
Anthony Maietta

Ohio is in the process of updating the S/TIP for the SFY 2021-2024 cycle. This conference call was conducted to review the processes and parameters by which the OKI and MORPC/LCATS MPO regions will demonstrate transportation conformity for their new MPO 2021-2024 TIPs.

ODOT initiated the call by welcoming the participants and providing a brief overview of the OKI and MORPC/LCATS 2021-2024 TIP conformity processes.

- OKI will be affecting a conformity analysis/determination for its existing 2040 Transportation Plan and new 2021-2024 TIP
    - OKI is concurrently working on a 2050 Transportation Plan update scheduled for completion in June 2020. Transportation conformity for OKI's 2050 Transportation Plan update will be initiated separate from 2021-2024 TIP development and conformity process.
- MORPC and LCATS are finalizing 2050 Transportation Plan Updates.
    - MORPC and LCATS will be affecting a conformity analysis/determination for their updated 2050 Transportation Plans and new 2021-2024 TIPs.

The floor was handed over to OKI to review the enclosed ***OKI Conformity Summary***. OKI staff discussed the following conformity criteria:

- The OKI region is a 2008 Standard Ozone Maintenance Area and a 2015 Ozone Standard nonattainment area.
- OKI staff reviewed the respective 2008 and 2015 Ozone standard geographies
- Transportation conformity will be demonstrated based on 2008 SIP Budget tests.
    - OKI advised that a correction to the Northern Kentucky region's NOX and VOC budgets in the ***OKI Conformity Summary*** document was needed. Note, the enclosed updated ***OKI Conformity Summary*** (attached document reflects the needed correction)
    - Budget analysis years will be 2020/2030/2040
    - OKI emission estimates will be developed using the agency's latest planning assumptions
        - OKI emission estimates will be established using MOVES2014b
        - ODOT provides OKI emission estimates for Clinton County. ODOT emission estimates will be established using MOVES2014a
    - The Ohio SIP does not contain any TCMs
    - Lastly, OKI staff reviewed the agency's upcoming TIP, conformity, and public involvement schedules. Conformity process and results documentation will be included in the OKI's TIP Public Involvement processes.
    - The interagency consultation partners concurred with the OKI conformity process bullet points above.

MORPC then took over the discussion to talk about their enclosed ***MORPC Conformity Summary***. MORPC staff discussed the following conformity criteria:

- MORPC/LCATS region is a maintenance area for 2008 and 2015 Ozone.
- MORPC staff reviewed the respective 2008 and 2015 Ozone standard geographies
- Transportation conformity will be demonstrated based on 2008 and 2015 SIP budget tests
    - Budget analysis years are: 2008 Ozone – 2020/30/40/50 2015 Ozone – 2023/2030/40/50
- MORPC emission estimates will be developed with the agency's latest planning assumptions
    - Emission estimates be established using MOVES2014a
- The Ohio SIP does not contain any TCMs
- Lastly, MORPC staff reviewed the agency's upcoming TIP, conformity, and public involvement schedules. Conformity process and results documentation will be included in the MORPC's TIP Public Involvement processes.

- Once again, the collective group concurred with MORPC's analysis and plan.

Finally, ODOT summarized the totality of the statewide conformity efforts

- Conformity Efforts are as follows:
  - 1997 Ozone Orphan Areas was completed through email
    - Toledo, Lima, Dayton, Parkersburg, Wheeling, and Youngstown
  - SCATS & BHJ areas completed through email
  - NOACA, OKI & Columbus through conference calls.
- All areas of the state have gone through the Air Quality Interagency Consultation process now.
- This was agreed upon by all present

The meeting was adjourned.

Columbus & Newark MPOs 2050 Transportation Plan Update

Conformity Analysis Summary

The Columbus and Newark, Ohio MPOs (MORPC & LCATS) are advancing a new regional conformity determination on their new 2020-2050 Transportation Plans (MTPs) and 2021-2024 TIPs

Interagency consultation topics

- Designations
  - 2015 Ozone Standard (DEL, FAI, FRA, LIC Counties, OH) – Maintenance area with approved Motor Vehicle Emission Budgets (MVEB) – 84FR31814 (July 3, 2019) & 84FR43508 (August 21, 2019)
  - 2008 Ozone Standard (DEL, FAI, FRA, KNO, LIC, MAD Counties, OH)– Maintenance area with approved MVEB
  - PM2.5 Standards – In attainment, no transportation conformity requirement

- Latest planning assumptions
  - MORPC and LCATS document their most recent work to maintain regional travel demand model variables current

- Latest emission modeling
  - This conformity determination will be a new emissions analyses

- Conformity Tests – Analysis years per tables below
  - 2015 Ozone Standard - conformity will be demonstrated based on MVEB established in the redesignation to attainment
  - 2008 Ozone Standard - conformity will be demonstrated based on MVEB established in the redesignation to attainment (still required despite new 2015 MVEB per 12/17/19 phone call with Anthony @ USEPA Region 5)

- MORPC and LCATS to provide lists of nonexempt fiscally constrained MTP/TIP projects and identification of the respective projects' conformity analysis year network. Any projects that are outside of the respective MPO boundaries will also be identified.

- Conformity analysis schedule
    - AQ conformity runs – **January 2020**
    - Draft Document – **Early February 2020**
    - Public Involvement effort w/AQ conformity results – **Late-February to April 10**
    - MTP/TIP Conformity Determination Board approval - **May**

2015 Ozone Standard Analysis:
2023 – 2015 Ozone Standard SIP budget year
2030 – 2015 Ozone Standard SIP budget year
2040 - Interim analysis year
2050 - MTP(s) horizon year
Geography - DEL, FAI, FRA, LIC Counties, OH

Ozone Tons/Day						
	2023 Budget	2023 Emissions	2030 Budget	2030 Emissions	2040 Emissions	2050 Emissions
VOC	28.67		22.03			
NOx	29.28		20.98			

2008 Ozone Standard Analysis:
2020 – 2008 Ozone Standard SIP budget year
2030 – 2008 Ozone Standard SIP budget year
2040 - Interim analysis year
2050 - MTP(s) horizon year
Geography - DEL, FAI, FRA, KNO, LIC, MAD Counties, OH

Ozone Tons/Day						
	2020 Budget	2020 Emissions	2030 Budget	2030 Emissions	2040 Emissions	2050 Emissions
VOC	50.66		44.31			
NOx	90.54		85.13			