$PM_{2.5}$ CONFORMITY REDESIGNATION

FOR STARK COUNTY, OHIO

Draft Report

April, 2012

Prepared By:

STARK COUNTY AREA TRANSPORTATION STUDY

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This report is the product of a study financed in part by the US Department of Transportation, Federal Highway Administration, Federal Transit Administration and the Ohio Department of Transportation. The contents of this report reflect the views of the Stark County Area Transportation Study, which is responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policy of the U. S. Department of Transportation. This report does not constitute a standard, specification, or regulation.

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SELECTED ABBREVIATIONS & ACRONYMS

SCATS – Stark County Area Transportation Study

CFR – Code of Federal Regulations

FHWA – Federal Highway Administration;

FTA – Federal Transit Administration;

LRTP – Long Range Transportation Plan

MOBILE6 – Mobile Source Emission Factor Model

MOU – Memorandum of Understanding

MOVES – Motor Vehicle Emission Simulator

MPO – Metropolitan Planning Organization

MVEB – Motor Vehicle Emissions Budget

NAAQS – National Ambient Air Quality Standard

NO_X – Nitrogen Oxides

ODOT – Ohio Department of Transportation

OEPA – Ohio Environmental Protection Agency

PM – Particulate Matter

$PM_{2.5}$ - Particulate Matter with an aerodynamic diameter less than 2.5 microns (often referred to as Fine Particulate Matter)

PM_{10} – Particulate Matter with an aerodynamic diameter less than 10 microns

SIP – State Implementation Plan

SO_2 – Sulfur Dioxide

STIP – Statewide Transportation Improvement Program

TAZs – Traffic Analysis Zones

TCM – Transportation Control Measure

TDM – Travel Demand Model

TIP – Transportation Improvement Program in a Metropolitan Planning Area

USEPA – United States Environmental Protection Agency

VHT – Vehicle Hours of Travel

VMT – Vehicle Miles of Travel

VOC – Volatile Organic Compounds

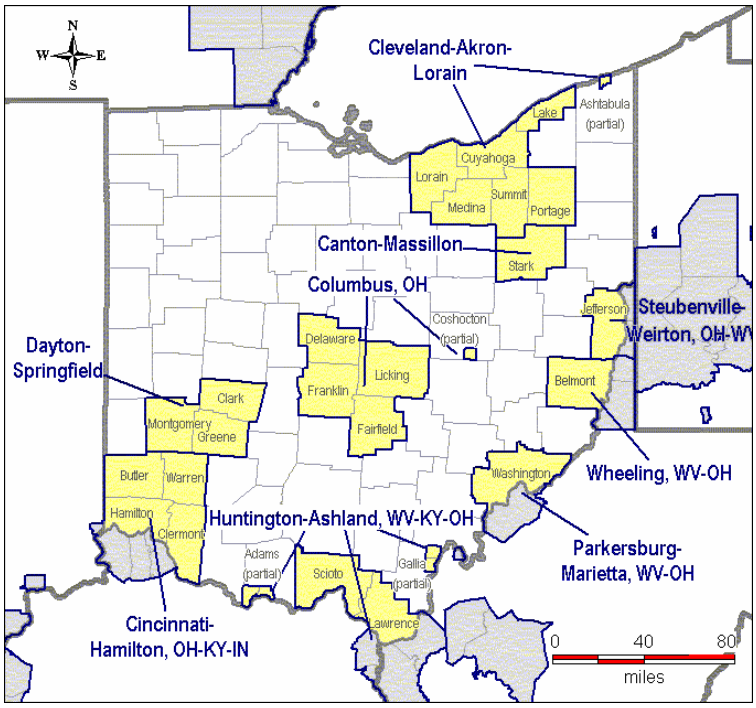
Transportation Air Quality Analysis and Technical Documentation For the Canton/Massillon Metropolitan Statistical Area State Implementation Plan Inventory Mobile Emission Estimates For the U.S. EPA 1997 Annual $PM_{2.5}$ National Ambient Air Quality Standard

INTRODUCTION

This memorandum documents the air quality analyses and underlying planning assumptions performed for the Annual $PM_{2.5}$ on-road mobile source emission inventories for the Canton/Massillon Metropolitan Statistical Area State Implementation Plan (SIP). The Ohio Department of Transportation (ODOT), Division of Transportation System Development-Modeling and Forecasting Section and the Stark County Area Transportation Study (SCATS) completed these analyses in coordination with the Ohio Environmental Protection Agency (OEPA).

The SCATS Region is comprised of Stark County, Ohio. The Canton/Massillon Metropolitan Statistical Area (MSA) was classified as nonattainment for $PM_{2.5}$ in the Federal Register on January 5, 2005. Although the MSA area also includes Carroll County, OEPA and USEPA concurred that only Stark County is designated as the nonattainment area within the MSA as Carroll County is rural in nature with a population of less than 30,000. SCATS is the MPO (Metropolitan Planning Organization) for this county. The SCATS MPO boundary and urban planning model cover the entire nonattainment area. This area is shown on the following map as prepared by the USEPA.

Figure 1 – Location of Massillon/Canton MSA



Map as shown at: http://www.epa.gov/pmdesignations/states/Ohio.htm

SCATS submitted the necessary Travel Demand Model networks along with all land use and socio-economic demographics. The ODOT Modeling and Forecasting section performed the MOVES runs to generate travel-demand-model-based emission factors as well as the complete air quality analyses for the metropolitan area.

ON-ROAD MOBILE EMISSION SUMMARY

Table 1 below presents a summary of the pollutant emissions including Fine Particulate Matter ($PM_{2.5}$), Nitrogen Oxides (NO_x), and Sulfur Dioxide (SO_2) modeled for the SCATS Region. The Model Years for the demonstration includes the Base Year 2005, Attainment Year 2008 (a leap year), Interim Year 2015, and Maintenance Year 2025.

Table 1
SCATS REGION ON-ROAD MOBILE EMISSIONS

Direct PM

Year	# Days	Model PM 2.5	**TOTAL PM 2.5 (tons/yr)**
2005	365	1.19	433.47
2008	366	0.78	286.14
2015	365	0.49	177.68
2025	365	0.24	88.26

NOX Precursors

Year	# Days	Model NOX	**TOTAL NOX (tons/yr)**
2005	365	38.37	14004.65
2008	366	29.99	10977.26
2015	365	18.54	6767.79
2025	365	11.13	4064.20

SO2

Year	# Days	Model SO2	**TOTAL SO2 (tons/yr)**
2005	365	0.52	191.33
2008	366	0.13	46.12
2015	365	0.06	20.84
2025	365	0.05	19.24

VMT

Year	# Days	Model VMT (daily)	**TOTAL VMT (annual)**
2005	365	7,880,843	2,876,507,695
2008	366	7,315,831	2,677,594,146
2015	365	7,675,289	2,801,480,485
2025	365	8,248,822	3,010,820,030

LATEST PLANNING ASSUMPTIONS

The annual $PM_{2.5}$ inventory runs meet the latest planning-assumption requirements. This report will present the latest population and land use data available that calibrated the modeling process used to calculate the vehicle emissions for the mobile-emissions budgets as well as the input values for U.S. EPA's most recent emissions software MOVES for this air-quality re-designation.

This re-designation effort will require the use of U.S. EPA's most recent emissions software MOVES for all mobile source-emission analyses, and the annual emissions estimates will be based a single-season approach. Since travel demand models produce average daily conditions, the daily emissions estimates are multiplied by 365 days to produce annual emissions estimates expressed in tons per year.

TRAVEL DEMAND MODELING - ANALYSIS YEARS

A Travel Demand Model (TDM) is the traditional forecasting tool used to examine potential changes in future travel patterns for a specific study area, in this case the Canton/Massillon Metropolitan Statistical Area. The SCATS MPO, with the assistance of ODOT Modeling & Forecasting, maintains a validated region-wide TDM that employs a four-step modeling process consisting of trip generation, trip distribution, mode choice, and route assignment performed with the Cube Voyager software package. The model outputs generated from the TDM are link-by-link directional traffic volumes for four time periods, morning, mid-day, evening, and night-time. The outputs are used for simulating Base Year and Horizon Year travel patterns generated by the LRTP transportation network.

The current SCATS TDM Validation Year is 2000. The model uses comparable Average Daily Traffic count data, updated socio-economic variables for each of the analysis years by either updating existing or known land use commitment for 2005 and 2008, or projecting 2015 and 2025 variables based on a straight-line extrapolation between the 2005 set of variables and the Horizon Year 2030 variables. These networks represent all planned federal-aid projects as well as any regionally significant projects found in the SCATS TIP and LRTP expected to be open for traffic by the end of each respective analysis year.

The interagency consultation process, established the following model years for the analysis that reflected the most recent correspondence from the U.S. EPA:

- Analysis Year 2005 – Baseline Emissions
- Analysis Year 2008 – Attainment Year
- Analysis Year 2015 – Interim Year
- Analysis Year 2025 – Maintenance Year

SOCIO-ECONOMIC DEMOGRAPHICS

Identifying projected growth centers and understanding urban and rural population changes are essential to determine future transportation needs in a given study area. Critical elements include an understanding of the past and anticipated future shifts in the region's economy, population, land use patterns, and other environmental factors over time. In turn, these factors are useful for predicting future transportation patterns and justifying transportation improvements over the next twenty years.

Travel forecasting procedures require the user to delineate the TDM study area into geographic areas called Traffic Analysis Zones (TAZs). Typically, TAZs are based on factors such as land use, area types (urban, suburban or rural), or political government units such as cities, villages, or townships. TAZs represent centers of travel generators or attractors based on a set of demographic variables. The SCATS

MPO collects and reviews the TDM independent variables that characterize current and future estimates of the metropolitan area's social and economic activity that may influence land-use development patterns. In all, there are 690 TAZs in the SCATS model. Figure 2 displays the SCATS MPO geography covered by the travel demand model including the Traffic Analysis Zone structure. The computer-based TDM for the SCATS highway network employs the following land use variables:

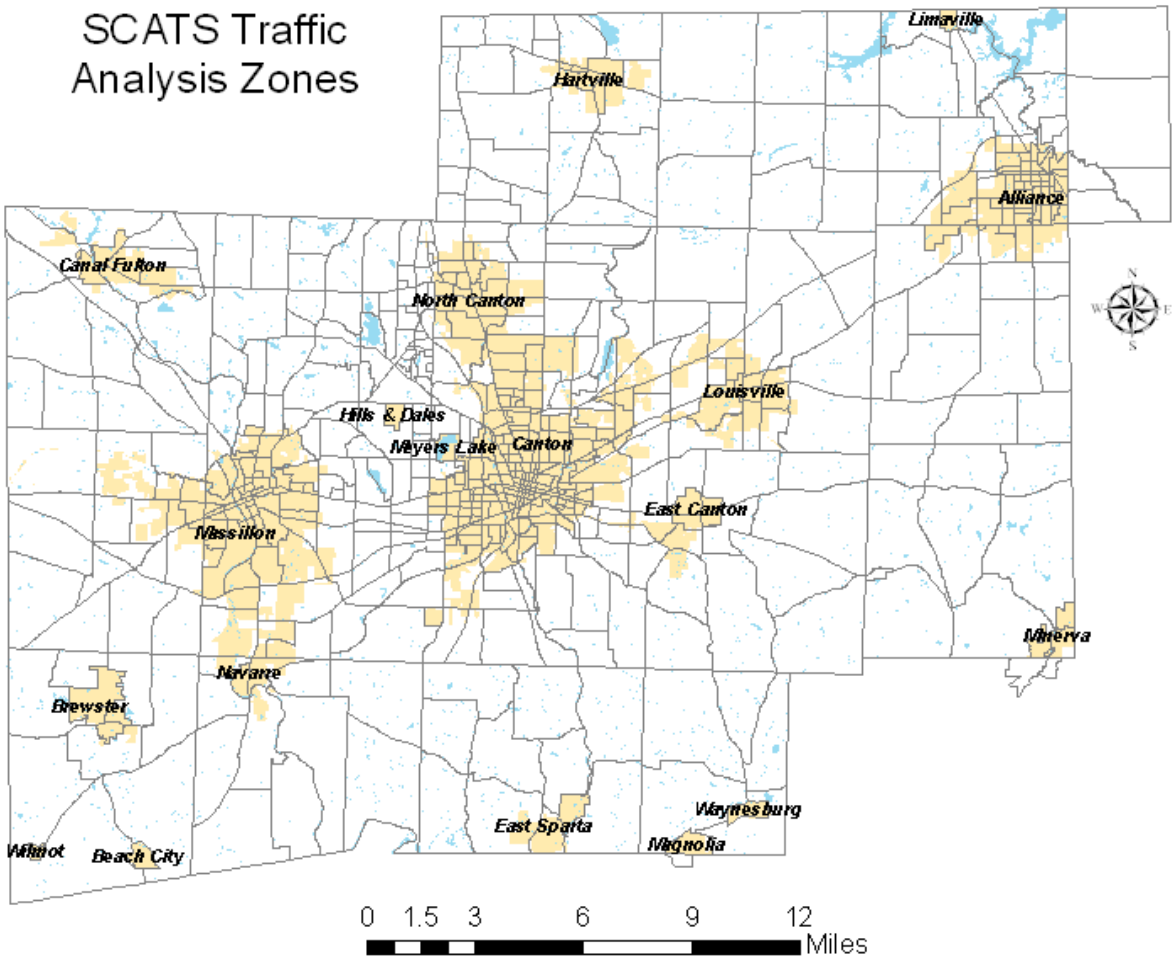
- [AREA_TYPE] ≡ Area Type
- [AVG_PARK] ≡ Average parking cost
- [ENROLL] ≡ School enrollment classified by Private [ENROLL_PRIV], Public [ENROLL_PUB] and Post-secondary [ENROLL_UNIV] schools
- [HOTEL_RM] ≡ Hotel Rooms
- [MED_HHINC] ≡ Median household income
- [POP] ≡ Population
- [POP_18] ≡ Population 18 years or less
- [POP_GRP] ≡ Population residing in Group Quarters
- [TOTEMP] ≡ Total Employment grouped by the North American Industrial Classification System (NAICS)
- [TOT_HH] ≡ Occupied housing
- [TOT_VEH] ≡ Vehicles available per household
- [WORKERS] ≡ Workers per household

Table 2 is a set of demographic variables developed for the most recent Long-Range Transportation Plan for the SCATS area compiled in May, 2009.

Table 2
SCATS REGION
REPRESENTATIVE SOCIO-ECONOMIC DEMOGRAPHIC VARIABLES 2005-2025

	2005	2008	2015	2025
Population	385,781	386,666	388,766	391,722
Households	151,905	153,165	156,113	160,315
Employment	177,027	185,276	204,919	232,490

Figure 2
SCATS GEOGRAPHIC AREA
COVERED BY TRAVEL DEMAND MODEL
AND TRAFFIC ANALYSIS ZONE STRUCTURE



EMISSION-FACTOR GENERATION

The MOVES model generated the emission factors for base year-2005 and attainment year-2008 representing the Transportation Improvement Program implemented in the SCATS Region. The model also generated emission factors for two future year scenarios 2015, and 2025.

Table 3 summarizes the settings used in the MOVES run specification file and the MOVES County-Data Manager. The subsequent tables provide the specific inputs that are not using the MOVES default values.

Table 3
MOVES INPUTS

RunSpec Parameter Settings	
MOVES Version	MOVES2010a
Scale	Custom Domain
MOVES Modeling Technique	Emission Factor Method Rates per Distance Rates per Vehicle
Time Span	Time Aggregation: Hour 1 Month representing average annual temperatures All hours of day selected 16 speed bins Weekdays only
Geographic Bounds	Stark County
Vehicles/Equipment	All source types, gasoline and diesel
Road Type	All road types including off-network
Pollutants and Processes	NO_X, All $PM_{2.5}$ categories, SO_2, Total Energy Consumption
Strategies	None
General Output	Units = grams, joules and miles
Output Emissions	Time = hour, Location = custom area, on-road emission rates by road type and source use type
Advance Performance	None

Table 3 (continued)
MOVES INPUTS

County Data Manager Sources	
Source Type Population	Combination of local and default data Local data from motor vehicle registration Default data used for source types 51, 52, 53, 61, and 62 Future year growth rate based on MPO model Household growth rate
Vehicle Type VMT	Combination of local and default data
	HPMSVTypeYear VMT = daily VMT from travel demand model monthVMTFraction = default dayVMTFraction=default hourVMTFraction=local
I/M Program	None
Fuel Formulation	Default
Fuel Supply	Default
Metereology Data	Local data obtained from NOAA National Climatic Data Center. Data will consist of monthly high and low temperatures and daily relative humidity for 2002.
Ramp Fraction	Using the base year travel demand model for VHT fractions.
	Future fractions will be assumed constant
Road Type Distribution	Use ODOT county summary VMT categorized by federal functional classes
Age Distribution	Combination of local and default data. Local data from motor vehicle registration Default data used for source types 41, 42, 43, 51, 52, 53, 61, and 62 The same age distribution will be used for all analysis years
Average Speed Distribution	Default
Alternative Fuel Type	Default

TEMPERATURE AND RELATIVE HUMIDITY

The single season approach for temperature and relative humidity uses weather data collected by the National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC). Temperature data for the MOVES emission factors came from the Akron Canton Airport and are shown in Table 4. Data entered into a spreadsheet, provided by U.S. EPA, converted the Mobile6 data to get the correct data for the MOVES model. Annual $PM_{2.5}$ emissions data were established using the single season methodology. The standard emissions modeling routines establish daily pollutant burdens. Annual direct $PM_{2.5}$, NO_x precursor, and SO_2 emissions for the $PM_{2.5}$ conformity tests were established by multiplying the daily model results by 365.

Table 4 – Temperature and Relative Humidity Data

Hour	Average Temperature	Average Relative Humidity
1	60.8	82
2	57.2	93
3	57.2	93
4	60.8	82
5	60.8	87
6	62.6	82
7	62.6	82
8	64.4	77
9	66.2	72
10	66.2	72
11	68.0	68
12	69.8	64
13	69.8	64
14	71.6	60
15	69.8	60
16	69.8	60
17	69.8	64
18	66.2	68
19	66.2	63
20	66.2	68
21	66.2	68
22	64.4	72
23	64.4	72
24	60.8	82

RAMP FRACTION

The Base-Year Travel Demand Model used the Vehicles Hour of Travel (VHT) fractions to derive the Ramp Fractions shown in Table 5. The future-year networks also used the base-year fractions.

Table 5
RAMP FRACTIONS

roadTypeID	roadDesc	rampFraction
2	Rural Restricted Access	0.05
4	Urban Restricted Access	0.13

SOURCE-TYPE POPULATION

A combination of local and MOVES default data is the Source-Type Population for vehicle classifications. The MOVES default values provided the data for Source-Type Population 51, 52, 53, 61, and 62 while local data from Ohio motor vehicle registrations accounted for all other Source-Type

Population needed to run the MOVES model. Table 6 shows the Source-Type Population identifications, the corresponding Source-Type Name, and the number of vehicles analyzed for Stark County.

Table 6
SOURCE-TYPE POPULATION FOR YEAR 2005

sourceTypeID	sourceTypeName	sourceTypePopulation
11	MotorCycle	24,199
21	Passenger Car	282,913
31	Passenger Truck	129,129
32	Light Commercial Truck	2,916
41	Intercity Bus	129
42	Transit Bus	19
43	School Bus	744
51	Refuse truck	86
52	Single Unit Short-haul Truck	182
53	Single Unit Long-haul Truck	138
54	Motor Home	418
61	Combination Short-haul Truck	1,063
62	Combination Long-haul Truck	1,223

VEHICLE-AGE DISTRIBUTION

A grouping of data from Ohio sources along with the MOVES model defaults make up the Vehicle-Age Distribution. MOVES default values included Vehicle-Type ID 41, 42, 51, 52, 53, 61, and 62. Local data from Ohio motor vehicle registrations accounted for all other Vehicle-Type ID. Table 7 shows the Vehicle-Age Distribution for Stark County.

Table 7

VEHICLE-AGE DISTRIBUTION FOR STARK COUNTY, OH

Year	Source Type	Age	Fraction		Year	Source Type	Age	Fraction
2005	11	0	0.0015		2005	21	0	0.0060
2005	11	1	0.0214		2005	21	1	0.0238
2005	11	2	0.0508		2005	21	2	0.0362
2005	11	3	0.0633		2005	21	3	0.0440
2005	11	4	0.0790		2005	21	4	0.0471
2005	11	5	0.0733		2005	21	5	0.0510
2005	11	6	0.0719		2005	21	6	0.0491
2005	11	7	0.0794		2005	21	7	0.0530
2005	11	8	0.0576		2005	21	8	0.0562
2005	11	9	0.0530		2005	21	9	0.0545
2005	11	10	0.0446		2005	21	10	0.0624
2005	11	11	0.0365		2005	21	11	0.0613
2005	11	12	0.0260		2005	21	12	0.0562
2005	11	13	0.0217		2005	21	13	0.0543
2005	11	14	0.0203		2005	21	14	0.0487
2005	11	15	0.0210		2005	21	15	0.0500
2005	11	16	0.0167		2005	21	16	0.0398
2005	11	17	0.0114		2005	21	17	0.0337
2005	11	18	0.0087		2005	21	18	0.0282
2005	11	19	0.0077		2005	21	19	0.0215
2005	11	20	0.0073		2005	21	20	0.0178
2005	11	21	0.0088		2005	21	21	0.0150
2005	11	22	0.0091		2005	21	22	0.0111
2005	11	23	0.0103		2005	21	23	0.0082
2005	11	24	0.0177		2005	21	24	0.0069
2005	11	25	0.0159		2005	21	25	0.0057
2005	11	26	0.0135		2005	21	26	0.0045
2005	11	27	0.0162		2005	21	27	0.0026
2005	11	28	0.0241		2005	21	28	0.0017
2005	11	29	0.0186		2005	21	29	0.0017
2005	11	30	0.0927		2005	21	30	0.0478

ROAD-TYPE DISTRIBUTION

The ODOT Division of Highways produced a summary of Vehicle Miles Traveled (VMT), categorized by federal functional class, for Stark County. This summary was used as the basis for the Road-Type-Distribution Fractions. Table 8 illustrates Road-Type Distribution.

Table 8
ROAD-TYPE DISTRIBUTION FOR STARK COUNTY NON-ATTAINMENT AREA

Source Type	Road Type	Road Description	Road-Type VMT Fraction		Source Type	Road Type	Road Description	Road-Type VMT Fraction
11	1	Off-Network	0		43	4	Urban Restricted Access	0.19
11	2	Rural Restricted Access	0.01		43	5	Urban Unrestricted Access	0.62
11	3	Rural Unrestricted Access	0.18		51	1	Off-Network	0
11	4	Urban Restricted Access	0.19		51	2	Rural Restricted Access	0.01
11	5	Urban Unrestricted Access	0.62		51	3	Rural Unrestricted Access	0.18
21	1	Off-Network	0		51	4	Urban Restricted Access	0.19
21	2	Rural Restricted Access	0.01		51	5	Urban Unrestricted Access	0.62
21	3	Rural Unrestricted Access	0.18		52	1	Off-Network	0
21	4	Urban Restricted Access	0.19		52	2	Rural Restricted Access	0.01
21	5	Urban Unrestricted Access	0.62		52	3	Rural Unrestricted Access	0.18
31	1	Off-Network	0		52	4	Urban Restricted Access	0.19
31	2	Rural Restricted Access	0.01		52	5	Urban Unrestricted Access	0.62
31	3	Rural Unrestricted Access	0.18		53	1	Off-Network	0
31	4	Urban Restricted Access	0.19		53	2	Rural Restricted Access	0.01
31	5	Urban Unrestricted Access	0.62		53	3	Rural Unrestricted Access	0.18
32	1	Off-Network	0		53	4	Urban Restricted Access	0.19
32	2	Rural Restricted Access	0.01		53	5	Urban Unrestricted Access	0.62
32	3	Rural Unrestricted Access	0.18		54	1	Off-Network	0
32	4	Urban Restricted Access	0.19		54	2	Rural Restricted Access	0.01
32	5	Urban Unrestricted Access	0.62		54	3	Rural Unrestricted Access	0.18
41	1	Off-Network	0		54	4	Urban Restricted Access	0.19
41	2	Rural Restricted Access	0.01		54	5	Urban Unrestricted Access	0.62
41	3	Rural Unrestricted Access	0.18		61	1	Off-Network	0
41	4	Urban Restricted Access	0.19		61	2	Rural Restricted Access	0.01
41	5	Urban Unrestricted Access	0.62		61	3	Rural Unrestricted Access	0.18
42	1	Off-Network	0		61	4	Urban Restricted Access	0.19
42	2	Rural Restricted Access	0.01		61	5	Urban Unrestricted Access	0.62
42	3	Rural Unrestricted Access	0.18		62	1	Off-Network	0
42	4	Urban Restricted Access	0.19		62	2	Rural Restricted Access	0.01
42	5	Urban Unrestricted Access	0.62		62	3	Rural Unrestricted Access	0.18
43	1	Off-Network	0		62	4	Urban Restricted Access	0.19
43	2	Rural Restricted Access	0.01		62	5	Urban Unrestricted Access	0.62
43	3	Rural Unrestricted Access	0.18					

POST PROCESSING

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

The first step in the process involves running postcms.exe to calculate hourly link volumes based on the percentage of the daily volume (travel demand model output) determined by a link's facility and area type. The analysis does not use the link speeds from the travel demand model. Using a link's volume-to-capacity ratio and link group code, a post-process to the model based on HCM methods estimates the link speeds.

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

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

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

The final step is to summarize link, vehicle, and intrazonal emissions for each pollutant, and analyzed year, and to multiply annual average daily emissions by 365 to produce an annual estimate.

APPENDIX A

INTERAGENCY CONSULTATION DOCUMENTATION

"Jennifer Hunter"
<Jennifer.Hunter@epa.state.oh.us>

04/11/2011 02:02 PM

To "Carolina Prado" <Carolina.Prado@epa.state.oh.us>, Dave.Moore1@dot.state.oh.us, Leigh.Oesterling@fhwa.dot.gov, morris.patricia@epamail.epa.gov, "Sarah VanderWielen" <Sarah.VanderWielen@epa.state.oh.us>

cc Mark.Byram@dot.state.oh.us, Nino.Brunello@dot.state.oh.us

Subject Re: Ozone Maintenance Plans - MOVES

Dave, Carolina forwarded this on to me. Add Sarah to this list - she is responsible for ozone where Carolina is PM2.5.

This is the last list Sarah generated that we worked on. I want to also add modeling the base year. In the last guidance we got from Pat it wasn't clear if that year would also be needed. However, b/c of the differences we are seeing between MOVES and MOBILE6 I'd like to have all the years in our submittals updated for clarity. We do compare base year and attainment year emissions to show there were real reductions.

I've attached the spreadsheet Sarah worked on that has your info below but the first tab also shows the base year used for each area and which counties were included.

One other nuance. In the next couple weeks we are going to work on some changes to RVP default values which will affect modeling for both Cinci and Cleve. We will be asking they be incorporated as the defaults in MOVES but that won't happen until after this work is done I am sure. Andy at OKI is already aware of this and the adjusted defaults. We still need to discuss with Cleve area. Once we work it up we will send it around to the IAC group for a thorough look see.

Also, we had a note in our spreadsheet that we would also need to MOVES based PM2.5 for the Canton area to be updated - since this is an area we haven't done for the redesignations. Carolina will work up dates/budgets for that and we will send around.

And on an unrelated/related note. We found out recently for the PM2.5 modeling we are doing for redesignation of the annual standard - that we will have to do different modeling and budgets for the 24-hr standard. This affects Cleve and Steuby. We were going to set up a call with you all and the affected MPOs in those areas after we finish a seasonal analysis we are doing. So we could better discuss what inputs and assumptions may need to change for the 24-hr modeling.

Thanks, Jen

>>> <Dave.Moore1@dot.state.oh.us> 4/11/2011 2:18 PM >>>

Jennifer,

One more question.

Canton Annual PM2.5 - analysis years: Attainment 2008 - Interim Budget 2015 - Maintenance Budget 2022?

Thanks
DM

-----"Jennifer Hunter" <Jennifer.Hunter@epa.state.oh.us> wrote: -----

To: Dave.Moore1@dot.state.oh.us, Patricia Morris/R5/USEPA/US@EPA
From: "Jennifer Hunter" <Jennifer.Hunter@epa.state.oh.us>
Date: 04/11/2011 01:29PM
cc: "Carolina Prado" <Carolina.Prado@epa.state.oh.us>
Subject: Re: Ozone Maintenance Plans - MOVES

I'm not sure how we tackle Canton. We aren't doing a redesignation at this time and the only budget established previously was under the attainment demonstration and was for 2009 for PM2.5 and NOx. Pat do we have to go back and update that budget or since it is in the past does it just go away? I feel like I have asked this question before. Dave/Pat - did we ever establish any other PM2.5 budgets for other conformity reasons?

Thanks, Jen

----- Forwarded by Dave Moore/SysPlanProgMgmt/CEN/ODOT on 04/11/2011 02:49 PM -----

Morris.Patricia@epamail.epa.gov

04/11/2011 02:43 PM

To "Jennifer Hunter" <Jennifer.Hunter@epa.state.oh.us>
cc Dave.Moore1@dot.state.oh.us, "Carolina Prado" <Carolina.Prado@epa.state.oh.us>
Subject Re: Ozone Maintenance Plans - MOVES

Jen,

For Canton, yes, the 2009 budget will continue to apply to future years so it will need to be updated. I have heard that USEPA may extend the grace period for MOVES but of course nothing is for certain. Have you heard about an extension of the grace period? If the grace period is extended it will allow more time to update the Canton budgets.

The PM2.5 attainment plan budget can be updated by running MOVES for the base year of modeling and again for the 2009 year. As long as the percent emissions decrease is as big as the submitted attainment demonstration then the new MOVES budget can be justified. The ozone maintenance plan budgets would also need to be updated.

Pat

Patricia Morris
Environmental Scientist
USEPA Region 5
(312) 353-8656
morris.patricia@epa.gov

From: Hunter, Jennifer [mailto:Jennifer.hunter@epa.state.oh.us]
Sent: Tuesday, June 14, 2011 10:09 AM
To: CBaker@akronohio.gov; PJividen@akronohio.gov; jrdutton@co.stark.oh.us; areser@oki.org; B Davis; ngill@morpc.org; aramirez@mvrpc.org; ssalameh@ntelos.net; tmazur@lacrpc.com; smapel@lcounty.com; mhilll@lcounty.com; randy.durst@movrc.org; sschmid@clarkcountyohio.gov; daniel@clarkcountyohio.gov; mikepap@bhjmpc.org; gedeon@tmacog.org; rsharma@belomar.org; krodi@eastgatecog.org; pompeo@eastgatecog.org; morris.patricia@epamail.epa.gov; frank.burkett@fhwa.dot.gov; Mark.byram@dot.state.oh.us; NINO.BRUNELLO@DOT.STATE.OH.US; Dave.moore1@dot.state.oh.us

Cc: Velalis, Tom; Kim, Myoungwoo; VanderWielen, Sarah; Prado, Carolina; Braun, Paul
Subject: MOVES Information/Updates

IAC Group,
A couple questions came up a few months back (courtesy of Andy at OKI) that lead OEPA to do a little research. There are two issues this email will address and provide additional information regarding inputs for MOVES related SIP/Conformity modeling. If you have any comments or concerns on the content and guidance within, please let me know by COB 6/24/11

1- There was a request for updated meteorology and question of what data should be used. First, recent NOAA data, or other SIP approvable data, should be used, the same as you have historically. A question was also raised in regards to the ozone SIP and the need to use temperatures from the 10 worst ozone days. If you are doing modeling that necessitates using the 10 worst ozone days, we have provided the attached list for all ozone monitors in Ohio with ozone data showing which days are the 10 worst between 2006 and 2010. If you would need any additional data or help on how to read this document just let me know.
2 – It has been brought to our attention that some of the default profile data for fuel characteristics is not what we believe to be appropriate. Specifically for the Cinci/Dayton area (low RVP requirements). Attached is a spreadsheet that identifies what the fuel characteristic defaults are and what should be used in their place. This only affects the Cinci-Dayton area. Defaults for the remainder of the state are still good. We will work with USEPA to get these defaults adjusted in the future.

Thanks, Jen

From: B Davis [mailto:BDavis@mpo.noaca.org]
Sent: Tuesday, June 14, 2011 10:24 AM
To: Hunter, Jennifer; CBaker@akronohio.gov; PJividen@akronohio.gov; jrdutton@co.stark.oh.us; Andy Reser; ngill@morpc.org; aramirez@mvrpc.org; ssalameh@ntelos.net; tmazur@lacrpc.com; smapel@lcounty.com; mhilll@lcounty.com; randy.durst@movrc.org; sschmid@clarkcountyohio.gov; daniel@clarkcountyohio.gov; mikepap@bhjmpc.org; gedeon@tmacog.org; rsharma@belomar.org; krodi@eastgatecog.org; pompeo@eastgatecog.org; morris.patricia@epamail.epa.gov; frank.burkett@fhwa.dot.gov; Mark.byram@dot.state.oh.us; NINO.BRUNELLO@DOT.STATE.OH.US; Dave.moore1@dot.state.oh.us
Cc: Velalis, Tom; Kim, Myoungwoo; VanderWielen, Sarah; Prado, Carolina; Braun, Paul; Leigh.Oesterling@dot.gov; V Nemalapuri; E Kang
Subject: RE: MOVES Information/Updates

Hi Jennifer et al.,

Your e-mail prompts me to ask a question related to a similar but perhaps separate issue. Existing Mobile6 based budgets must be updated to MOVES so that conformity determinations can continue post March 2012. I'm hoping that we (meaning NOACA) can complete the technical aspects of this effort by September of this year.

I'm guessing that the MOVES runs for the budget update efforts should mirror as closely as possible the inputs for the Mobile6 efforts. My question is how closely? For example should a 2020 network from the prior effort be used, or a current 2020 network? If we use a current network set, we will in effect not only be updating to MOVES but also revising the budgets at the same time.

Just thought I'd start the conversation,

Regards,

Bill Davis
NOACA
(216)-241-2414, Ext. 251

Andy Reser <ARESER@oki.org>

06/14/2011 10:38 AM

To B Davis <BDavis@mpo.noaca.org>, "Hunter, Jennifer" <Jennifer.hunter@epa.state.oh.us>, "CBaker@akronohio.gov" <CBaker@akronohio.gov>, "PJividen@akronohio.gov" <PJividen@akronohio.gov>, "jrdutton@co.stark.oh.us" <jrdutton@co.stark.oh.us>, "ngill@morpc.org" <ngill@morpc.org>, "aramirez@mvrpc.org" <aramirez@mvrpc.org>, "ssalameh@ntelos.net" <ssalameh@ntelos.net>, "tmazur@lacrpc.com" <tmazur@lacrpc.com>, "smapel@lcounty.com" <smapel@lcounty.com>, "mhilll@lcounty.com" <mhilll@lcounty.com>, "randy.durst@movrc.org" <randy.durst@movrc.org>, "sschmid@clarkcountyohio.gov" <sschmid@clarkcountyohio.gov>, "daniel@clarkcountyohio.gov" <daniel@clarkcountyohio.gov>, "mikepap@bhjmpc.org" <mikepap@bhjmpc.org>, "gedeon@tmacog.org" <gedeon@tmacog.org>, "rsharma@belomar.org" <rsharma@belomar.org>, "krodi@eastgatecog.org" <krodi@eastgatecog.org>, "pompeo@eastgatecog.org" <pompeo@eastgatecog.org>, "morris.patricia@epamail.epa.gov" <morris.patricia@epamail.epa.gov>, "frank.burkett@fhwa.dot.gov" <frank.burkett@fhwa.dot.gov>, "Mark.byram@dot.state.oh.us" <Mark.byram@dot.state.oh.us>, "NINO.BRUNELLO@DOT.STATE.OH.US" <NINO.BRUNELLO@dot.state.oh.us>, "Dave.moore1@dot.state.oh.us" <Dave.moore1@dot.state.oh.us>

cc "Velalis, Tom" <Tom.Velalis@epa.state.oh.us>, "Kim, Myoungwoo" <Myoungwoo.Kim@epa.state.oh.us>, "VanderWielen, Sarah" <Sarah.VanderWielen@epa.state.oh.us>, "Prado, Carolina" <Carolina.Prado@epa.state.oh.us>, "Braun, Paul" <Paul.Braun@epa.state.oh.us>, "Leigh.Oesterling@dot.gov" <Leigh.Oesterling@dot.gov>, V Nemalapuri <VNemalapuri@mpo.noaca.org>, E Kang <EKang@mpo.noaca.org>

Subject RE: MOVES Information/Updates

My opinion is that we should be using the most recent data/networks for the budget revision.

- Andy

Andrew J. Reser
Model Applications Coordinator
OKI Regional Council of Governments
720 East Pete Rose Way, Suite 420
Cincinnati, OH 45202
(513) 621-6300 ext. 146

>>> <Dave.Moore1@dot.state.oh.us> 6/14/2011 10:47 AM >>>

Per latest planning assumptions regs, ODOT concurs.

Additionally, ODOT Statewide Planning staff will assist in maintaining a thorough record of MOVES SIP update inputs, by area.

Thanks
DM

>>> <Leigh.Oesterling@dot.gov> 10/5/2011 2:26 PM >>>

Regional Conformity grace period extended by 12 months to March 2, 2013.
See message below. . .

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

Sent: Wednesday, October 05, 2011 2:19 PM

Subject: INFORMATION: EPA finalizes MOVES regional grace period extension

TO THE ATTENTION OF DIVISION AIR QUALITY AND PLANNING STAFF:

The purpose of this email is to inform you that EPA finalizes a conformity rule to extend the grace period that provides an additional 12 months before the MOVES model is required for regional emissions for transportation conformity determinations.

On March 2, 2010, EPA approved the MOVES model for regional conformity analysis and established a two-year grace period. As a result of the grace period extension, MOVES2010a is not required for new regional conformity analysis until **March 2, 2013.**

It is important to note that this extension does not affect EPA's previously established two year grace period for the use of MOVES2010a for carbon monoxide and particulate matter hot-spot analyses for project level conformity determinations. New hot-spot analyses will be required to use MOVES2010a after the end of the grace period on December 20, 2012.

A copy of the direct final rule and related material is available on EPA's website:
http://www.epa.gov/otaq/stateresources/transconf/conf-regs.htm

If you have questions related to this final rule, please contact Cecilia Ho at Cecilia.ho@dot.gov or at 202-366-9862.

"Dines, Jennifer" <Jennifer.Dines@epa.state.oh.us> 4/17/2012 9:04 AM >>>
Hello group, I want to start work on the redesignation of Stark County (Canton-Massilion nonattainment area) for the annual and 24-hour PM2.5 standard. We have not done the MOVES modeling for this area. It would essentially be the same process for all the other areas we've done recently. We need the following pollutants and years with documentation:

PM2.5, SO2, NOx
2005, 2008, 2015, 2025

Who would perform the modeling and who would do the documentation? And what sort of time would be needed to complete it? I'm about a week out of having all my documentation, other than mobile numbers, ready.

This would wrap up all PM2.5 redesignations for the State of Ohio (WOOO HOOO) and it would also eliminate the need for us to do a special update for the Stark area just for PM2.5.

Thanks, Jen

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

>>> "Byram, Mark" <Mark.Byram@dot.state.oh.us> 4/17/2012 12:59 PM >>>
Hi Jennifer:

ODOT Statewide Planning – Modeling & Forecasting Section will be providing the analysis for this. Nino Brunello will coordinate with Jeff Dutton and his staff to provide the documentation. Nino will provide you and the group with a timeline for completing the work by COB Thursday 4-17.

Respectfully,
Mark Byram, P.E.
Modeling & Forecasting Section
Office of Statewide Planning
Ohio Department of Transportation
(614)466-7825

>>> "Brunello, Nino" <Nino.Brunello@dot.state.oh.us> 4/19/2012 11:17 AM >>>
Jeff,

I completed all of the MOVES modeling, travel demand modeling, and air quality post-processing for your region. The attached spreadsheet has the final pollutant totals.

I also attached the documentation BHJ did for their report that can be used as a template for the SCATS documentation. The attached tables, and the tables I sent earlier that were for the Ozone document, should be enough to do replacement. All you need to do is revise the narrative parts. {Make sure to remove the 'revision history' page.}

If you have any questions or if I have left out some information, please let me know.

I am going to respond to Jennifer Dines (and the rest of the group) what I've done. Can you give her an expected completion time?

Thanks,

Nino

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

"Brunello, Nino" Nino.Brunello@dot.state.oh.us
Jeff,

Sorry, but I just noticed that I forgot to add the SO2 totals in the spreadsheet. I'll update it and resend. It won't take long.

Nino

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

"Brunello, Nino" Nino.Brunello@dot.state.oh.us
The SO2 totals are now in the table, and I also added the annual VMTs since they were reported in the BHJ document.

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

From: Dan Slicker
To: Dave Moore
Dave,

I can't stand air-quality stuff, whenever I see anything having to do with it, my brain partially shuts down. Until today, I didn't realize that we were dealing with two separate air-quality issues. Whenever I see "ozone", "PM2.5", "conformity", or "redesignation" my brain files it under "air quality", and I make I note that I'll have to send some networks down to Nino and plagiarize an air-quality document in the near future.

So, I have a few questions that need answers, so I can set my priorities.

1. When is the 8-Hour Ozone SIP document due?
2. When is the PM2.5 Redesignations for Stark County document due?
3. Do we need to do an interagency consultation for either of these?
4. Besides the TIP and T-Plan air-quality analyses, are there any other air-quality issues we need to deal with in the next 2 years?

Dan Slicker

Dan,

Responses below.

Thanks

DM

1. When is the 8-Hour Ozone SIP document due? We've missed a number of due dates for submitting this documentation to OEPA. The most recent date was April 1st. OEPA is ready to move (pun intended) on the MOVES based budget SIP revisions. As you know, SCATS' T-Plan conformity lapse date is 6/15/13. Conformity for the Plan Update will need to be coordinated with the new 2014-2017 TIP. Considering standard review/approval schedules the T-Plan Update and Conformity Determination documentation will need to be submitted to US DOT/EPA by 5/1/13. This conformity work needs to be MOVES based. So, the SIP revision must be fully approved or have budget adequacy finding in time for SCATS' T-Plan/TIP approval/conformity findings. So backing up some more, OEPA needs a minimum 45 days to incorporated SCATS' results in the SIP revision for submission to US EPA. US EPA needs a minimum 90 days to process the revision through the Federal Register process. The schedules/dates identified above put us somewhere in the Winter 2012/2013 timeframe. Accordingly, there's still time to accomplish the work, but schedules have a way of slipping.

   Should we even discuss the matter of the new .075 Ozone standard, potential revocation of the exiting 8-Hour standard, the matter of Stark attaining the new standard and whether any of the above matters if the new standard is implemented?

2. When is the PM2.5 Redesignations for Stark County document due? Similar schedules as above. Note, Stark County is a PM2.5 nonattainment area for both the 1997 annual and 2006 daily standards. Based on recent OEPA streams it appears the intent is for the 1997 and 2006 standard budgets to be exactly the same.
3. Do we need to do an interagency consultation for either of these? Interagency consultation on the current Stark County aq SIP efforts is warranted just to make sure everyone is on the same page.
4. Besides the TIP and T-Plan air-quality analyses, are there any other air-quality issues we need to deal with in the next 2 years? Once the SIPs are updated, likely just Plan/TIP conformity.

There are two other matters:

- OEPA is updating the "Conformity SIP". SCATS may want to review the conformity SIP MOU that was prepared circa 2008-2009 to re-familiarize themselves with this topic.
- Not really air quality SIP/Conformity related, but SCATS should review its current suballcated funds CMAQ projects to assure they all have affirmative CMAQ eligibility findings.

"Dines, Jennifer" Jennifer.Dines@epa.state.oh.us

I will offer that the PM2.5 redesignations is listed as one of the top priorities by our director and this is the last area to be done. I will also add that if we do not do the redesignation and update mobiles numbers via that mechanism we will have to do the same work to update old mobile6 to MOVES numbers for Stark county for PM2.5 via the previous attainment SIP. So it has to be done either way.
I believe Nino completed all the modeling in accordance with all procedures used across the state for all other redesignations and all that needs done is the write-up, which he provided a template for. So I don't think it will take much effort to complete that piece of the puzzle so the redesignation can move forward quickly. But if this is a problem please let me know as I am being asked routinely on the status and will need to be able to provide my management with an update.
Until I crunch the numbers from Nino's modeling I won't be able to have much of a meaningful consultation process on that issue. Typically we consult after I incorporate mobile numbers in with all the other pollutant sectors to determine our possible safety margin options if budgets are necessary. Then we typically discuss if that is agreeable.
Thanks,
Jennifer Dines
Manager, State Implementation Plan and Rulemaking Section
Division of Air Pollution Control
Ohio Environmental Protection Agency
Wk (614) 644-3696

Fax (614) 644-3681

>>> Jeffrey Dutton 4/24/2012 9:24 AM >>>
Good Morning Jennifer,

We plan to have the PM 2.5 analysis report to you by weeks end.

Jef

Jeff Dutton
SCATS Technical Director
Stark County Regional Planning Commission
201 3rd Street NE, Suite 201
Canton, Ohio 44702

From: Dan Slicker [mailto:dkslicker@co.stark.oh.us]
Sent: Friday, April 20, 2012 1:59 PM
To: Brunello, Nino
Cc: Jeffrey Dutton
Subject: Re: FW: FW: PM2.5 Redesignations for Stark County

Nino,

The BHJ document contains tables for Source Type Population, Vehicle Age Distribution, and Road Type Distribution. Do we need to produce similar tables? If so, do you have the necessary data? I can get the road-type data, but I'll need help with the source types and vehicle ages.

Dan

>>> "Brunello, Nino" <Nino.Brunello@dot.state.oh.us> 4/20/2012 2:32 PM >>>
The Vehicle Age Distribution and Road Type Distribution tables will be the same as the ones that are in the spreadsheet I sent you on the April 2nd for the ozone documentation. Those values are assumed to be constant. You just need to change the year on the Age Distribution table. I'll give you the Source Type Pop. What year are you using for your example?

From: Dan Slicker [mailto:dkslicker@co.stark.oh.us]
Sent: Friday, April 20, 2012 2:40 PM
To: Brunello, Nino
Subject: RE: FW: FW: PM2.5 Redesignations for Stark County

Thanks,

2005 would work.

Dan

"Brunello, Nino" Nino.Brunello@dot.state.oh.us
The 2005 MOVES vehicle population file is attached.

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

>>> "Dines, Jennifer" <Jennifer.Dines@epa.state.oh.us> 4/26/2012 8:25 AM >>>
Jeff or Nino, could one of you also take a quick look at the attached summary of how mobile emissions were derived and provide me with any edits. It will probably need to be Jeff….I used the OKI write-up as an example and SCATS may do a few things differently. I've got my document all ready to go except this last section and the analysis report.

Thanks again for all your help!

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

>>> "Brunello, Nino" <Nino.Brunello@dot.state.oh.us> 4/26/2012 8:39 AM >>>
After a quick scan, there are a lot of changes needed. OKI's methodology for using MOVES was done independent of what was used for the rest of the state. Jeff, let me take a crack at it first, and then I will pass it along to you. Okay?

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

>>> "Brunello, Nino" <Nino.Brunello@dot.state.oh.us> 4/26/2012 10:44 AM >>>
Jeff/Dan:

My updated summary is attached.

- I corrected all sections where the SCATS model if different from the OKI/MVRPC models.
- I removed all of the Massillon references; "Dayton-Springfield" was used because the MPOs have two separate models.
- Please check my usage of SCATS vs. Stark County; I tried to vary it to avoid too much repetition, but I may have used them when they may not be interchangeable.

Dan, please review and update the paragraph that lists the years for which you created complete variable data sets. Then you should also replace the parts that describe the variable trends.

Please let me know if you have any questions about my edits.

Thanks,

Nino

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