

Appendix C

AIR QUALITY ANALYSIS

Introduction

The purpose of this appendix is to document the manner in which mobile emissions have been forecasted for *Transportation Outlook 2040*.

Summit County and Portage County are part of the U.S. Census-designated eight-county Cleveland-Akron-Lorain Combined Statistical Area (CSA). This area includes: Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage, and Summit counties. Based on air quality readings, the United States Environmental Protection Agency (USEPA) designated this area as non-attainment for the 2008 8-hour ozone standard.

USEPA also designated several of the counties in this area (including Summit and Portage) as non-attainment for PM_{2.5} (particulate matter) under the 2006 standard. This area includes Cuyahoga, Lake, Lorain, Medina, Portage, and Summit Counties, and a portion of Ashtabula County.

Two Metropolitan Planning Organizations (MPOs) serve seven of these counties. The Northeast Ohio Areawide Coordinating Agency (NOACA) serves Cuyahoga, Geauga, Lake, Lorain, and Medina counties. The Akron Metropolitan Area Transportation Study (AMATS) serves Summit and Portage counties. The Erie Regional Planning Commission serves the City of Vermilion in Lorain County. Ashtabula County is not part of a Metropolitan Planning Organization.

New United States Department of Transportation (USDOT) conformity determinations are required every time a new Transportation Improvement Program (TIP) or Regional Transportation Plan is completed. New emissions analyses are required to meet the conformity rule requirement of using the latest planning assumptions. AMATS has updated its travel demand model to conduct this analysis taking into account the latest planning assumptions.

This conformity analysis reflects the aggregate regional mobile emissions generated by vehicles using the transportation system recommended in the Regional Transportation Plan and TIP. Conformity is demonstrated when the forecasted regional emissions are below the applicable State Implementation Plan (SIP) budgets that have been established by Ohio EPA.

Before analysis began an interagency consultation call took place on January 24, 2017. The notes from this call are listed beginning on page C-6.

Methodology

In order for the Cleveland-Akron-Lorain area to complete the regional emissions analysis, the overall level of pollution (both ozone and PM_{2.5}) resulting from mobile sources must be forecasted.

The ozone-related portion of this air quality analysis has to demonstrate that daily Volatile organic compounds (VOC) and nitrogen oxides (NO_x) emissions from mobile sources will not exceed those established in the budget contained in the SIP for ozone, which sets the allowable limits for each pollutant in the Cleveland-Akron-Lorain area. Those budgets were set in March 2013 and are listed in Table 1.

Similarly, the PM_{2.5}-related portion of this air quality analysis has to demonstrate that annual direct PM_{2.5} and nitrogen oxides (NO_x) emissions from mobile sources will not exceed those found in the budget established by the Ohio Environmental Protection Agency (OEPA). Those budgets were set in September 2013 and are listed in Table 2.

NOACA and ODOT are jointly responsible for travel demand modeling and air quality analysis for its area. Emissions for Ashtabula County are generated using current ODOT traffic volume data and growth rates.

The AMATS and ODOT are jointly responsible for travel demand modeling and air quality analysis for the Akron area. In May 2015, forecasted variables were approved as inputs to the model. In February 2017, AMATS updated its travel demand model. The air quality analyses documented in this appendix involve the use of the travel demand and emissions models to analyze future regional mobile source emissions. Trip tables have been created using the latest planning assumptions and are based on the most recent forecasts of land use and socioeconomic data produced by AMATS.

In order to determine mobile source impacts on regional ozone and PM_{2.5} levels, all non-exempt (in keeping with 40 CFR 93) TIP projects have been coded into the regional transportation plan travel demand model networks for the analysis years of 2020, 2030, and 2035 for ozone and 2022, 2030, and 2035 for PM_{2.5}. The projects coded in each network are listed in Exhibit C-1 through C-4. Once the AMATS travel demand model was run for each of the analysis years described above, the traffic assignment results were post-processed and input into MOVES2014.

The AMATS area results have been combined with the NOACA and Ashtabula County results to complete the conformity analysis for the entire Cleveland-Akron-Lorain ozone and PM_{2.5} non-attainment area. The conformity analysis results for the entire region are available for public comment at the March 30, 2017 Transportation Outlook public meeting.

Results

Table 1 shows the results of the MOVES2014 analysis for the entire Cleveland-Akron-Lorain ozone non-attainment area. This analysis must show that VOC and NO_x emissions from mobile sources will not exceed those established in the budget contained in the SIP, which sets the allowable limits for each pollutant. Table 1 confirms ozone precursor emissions do not exceed the budgets for either VOC or NO_x.

**TABLE 1
Cleveland-Akron-Lorain Mobile Source Ozone Precursor Emissions Forecasts**

Volatile Organic Compounds (VOC) (tons/day)					
	2020 Budget	2020 Emissions	2030 Budget	2030 Emissions	2040 Emissions
NOACA		21.13		13.57	7.57
AMATS		6.22		4.20	3.74
Ashtabula County		0.93		0.58	0.54
TOTAL	38.85	28.28	30.80	18.35	11.86
Nitrogen oxides (NOx) (tons/day)					
	2020 Budget	2020 Emissions	2030 Budget	2030 Emissions	2040 Emissions
NOACA		26.10		11.71	7.88
AMATS		9.37		5.24	4.17
Ashtabula County		1.56		0.84	0.72
TOTAL	61.56	37.03	43.82	17.80	12.77

Table 2 shows the results of the MOVES2014 analysis for the Cleveland-Akron-Lorain PM_{2.5} non-attainment area. This analysis must show that direct PM_{2.5} and NO_x emissions from mobile sources will not exceed those found in the 2015 budget. Table 2 confirms emissions do not exceed the budgets for both direct PM_{2.5} and NO_x.

**TABLE 2
Northeast Ohio Mobile Source PM_{2.5} and Precursor Emissions Forecasts**

Direct PM_{2.5} Emissions (Annual Tons)					
	2015 Budget	2022 Budget	2022 Emissions	2030 Emissions	2040 Emissions
NOACA			505.99	367.7	321.5
AMATS			133.4	106.36	107.2
Ashtabula County			2.19	1.68	1.68
TOTAL	1,371.35	880.89	641.58	475.74	430.38
Nitrogen oxides (NOx) Precursor (Annual Tons)					
	2015 Budget	2022 Budget	2022 Emissions	2030 Emissions	2040 Emissions
NOACA			11,532.80	6,329.25	4,107.97
AMATS			2,730.51	1,864.42	1,657.69
Ashtabula County			50.33	35.26	32.81
TOTAL	35,094.70	17,263.65	14,313.64	8,228.93	5,798.47

**EXHIBIT C-1
2020 NETWORK**

The 2020 Network includes all existing facilities plus the following projects:

PROJECT	LOCATION & TERMINI	TYPE OF WORK
Cleveland-Massillon Rd	NORTON - Weber Dr to I-76	Median turn lane
Cleveland-Massillon Rd	COPLEY TWP/FAIRLAWN - I-77 to Bywood Ave	Widen to 4 lanes and roundabout
I-76/US224	BARBERTON - State Rd/Wooster Rd Interchanges	Reconfigure Interchanges
Massillon Rd (SR 241)	GREEN - Raber Rd to SR 619	Widen to 5 lanes, Improve Safety
Massillon Rd (SR 241)	GREEN - At Corporate Woods Circle	Roundabout
SR 91	TWINSBURG - North of Glenwood Blvd to Cuyahoga County Line	Widen to 4 lanes
Tallmadge Ave (SR 261)	AKRON - N. Main St to SR 8	Road diet and realign Dayton

Note: All of these projects are assumed 2020 for ozone; however for PM_{2.5} they would move to 2022.

Please note that the following locations were added to all networks due to maintenance of traffic stripping:

I-76	AKRON - US 224 to I-77 (Kenmore Leg)	6 lanes w/ interchange modifications from MOT
I-77	SPRINGFIELD TWP/AKRON - Arlington Rd to I-277	8 lanes w/ interchange modifications from MOT

**EXHIBIT C-2
2022 NETWORK**

The 2022 Network includes those projects in the 2020 network plus the following projects:

PROJECT	LOCATION & TERMINI	TYPE OF WORK
I-76/I-77	AKRON - Central Interchange	Reconfigure Interchange
SR 8	AKRON - Perkins St to Glenwood Ave	Reconstruct bridge, Improve Perkins St ramp operation
SR 14	STREETSBORO - Portage Pointe to Diagonal Rd	Median turn lane
Tallmadge Rd	BRIMFIELD TWP - At I-76 Interchange	Reconfigure Interchange

Note: All of these projects are assumed 2022 for PM_{2.5}; however they would move to 2030 for ozone.

**EXHIBIT C-3
2030 NETWORK**

The 2030 Network includes those projects in the 2022 network plus the following projects:

PROJECT	LOCATION & TERMINI	TYPE OF WORK
Darrow Rd (SR 91)	HUDSON - Ravenna Rd to SR 303	Add a Bypass
Darrow Rd (SR 91)	TWINSBURG - At I-480 Interchange	Reconfigure Interchange
Evans Ave	AKRON - CSX Rail Line	RR Grade separation
Howe Rd	CUYAHOGA FALLS - At SR 8 Interchange	Reconfigure Interchange
Arlington Rd	GREEN - Boettler Rd to September Dr	Widen to 4 lanes with intersection improvements
I-77	SPRINGFIELD TWP/AKRON - Arlington Rd to I-277	Widen to 8 lanes
I-77	BATH TWP/RICHFIELD/RICHFIELD TWP - Ghent Rd to Cuyahoga County Line	Widen to 6 lanes

**EXHIBIT C-4
2040 NETWORK**

The 2040 Network includes those projects in the 2030 network plus the following projects:

PROJECT	LOCATION & TERMINI	TYPE OF WORK
Kent Rd (SR 59)	STOW - At Darrow Rd (SR 91)	Additional capacity, operational improvements, traffic study, enhance transit
Town Park Blvd	GREEN - Massillon Rd to Wise Rd	New Roadway
Town Park Blvd	GREEN - Lauby Rd to Wise Rd	New Roadway

**Cleveland & Akron MPOs Transportation Plan and TIP
Interagency Consultation Minutes**

Present: Akron Metropolitan Area Transportation Study (AMATS)
 Erie County Regional Planning Commission (ERPC)
 Northeast Ohio Areawide Coordinating Agency (NOACA)
 Federal Highway Administration, Ohio Division (FHWA)
 Ohio Department of Transportation, Statewide Planning (ODOT)
 Ohio Environmental Protection Agency (Ohio EPA)
 United States Environmental Protection Agency (U.S. EPA)

Logistics: January 24, 2017, 3:00 p.m., Conference Call

Purpose

A formal interagency consultation process is required in each nonattainment area to address technical and procedural issues related to air quality planning. The Cleveland, Akron, and Erie County Ohio MPOs (NOACA, AMATS and ERPC) are updating their Transportation Plans and 2018-2021 TIPs to accommodate reflect ODOT TRAC major new projects and new construction schedules for existing Plan projects. Plans' horizon year is 2040.

Conformity Analysis Summary

8-Hour Ozone

Attainment status: 2008 8-Hour Ozone standard – nonattainment area (Federal Register / Vol. 77, No. 98 / Monday, May 21, 2012)
 1997 8-Hour Ozone Standard - maintenance area (Federal Register Notice Final Rule 9/15/09)

SIP Status: **Federal Register** /Vol. 78, No. 53 /Tuesday, March 19, 2013 – direct final rule adequacy finding for MOVES based 1997 Ozone standard MVEBs
 No submittals required under 2008 8-Hour Ozone standard until approved budgets are received. The budgets found adequate for the 1997 standard will satisfy both 1997 and 2008 tests for the time being per USEPA.

8-Hour Geography: ATB, CUY, GEA, LAK, LOR, MED, POR, SUM Counties, OH

Conformity Tests: 1997 Standard 8-Hour budget tests

Analysis Years: 2015 1st Analysis year (a year in the current TIP)
 2020 Interim year
 2030 Interim year
 2040 Plan(s) horizon year

8-Hour Ozone Test	2020 8-Hour Budget	2020 Emissions	2030 8-Hour Budget	2030 Emissions	2040 Emissions
AMATS					
VOC					
NOx					
NOACA					
VOC					
NOx					
Ashtabula Co.					
VOC					
NOx					
Totals					
VOC	38.85		30.80		
NOx	61.56		43.82		

PM_{2.5}

Attainment/ **Federal Register** / Vol. 78, No. 144 / Friday, July 26, 2013 – Proposal to redesignate

SIP Status: Cleveland Area to attainment for 1997 and 2006 PM_{2.5} Standards – FR notice included an adequacy finding for the MOVES based MVEBs

Geography: CUY, LAK, LOR, MED, POR, & SUM Counties & Ashtabula Twp., ATB County, OH

Conformity Tests: Budget tests
 Analysis Years: 2015 PM_{2.5} Budget Year and year in current TIP
 2022 PM_{2.5} Budget Year
 2030 Interim year
 2040 Plan(s) horizon year

PM _{2.5} Test	2015 Budget	2020 Emissions	2022 Budget	2022 Emissions	2030 Emissions	2040 Emission
AMATS	tons / year					
Direct PM						
NOx						
NOACA						
Direct PM						
NOx						
Ashtabula Twp.						
Direct PM						
NOx						
Area Totals						
Direct PM	1,371.35		880.89			
NO	35,094.70		17,263.65			

PM_{2.5} 2012 Standard

Attainment status: PM_{2.5} Moderate Nonattainment Area (80 FR 2205 / January 14, 2015 – Cuyahoga and Lorain Counties designated moderate nonattainment area for 2012 Standards)
 SIP Status: Attainment demonstration not due at this time
 Geography: Cuyahoga and Lorain County, OH
 Conformity Tests: 1997/2006 SIP Maintenance Plan Budget - CUY & LOR subset - tests
 Analysis Years: 2021 Attainment year – 1st Analysis year
 2022 Budget year
 2030 Interim year
 2040 Plan(s) horizon year

PM _{2.5} Test	2015* Budget	2021 Emissions	2022* Budget	2022 Emissions	2030 Emissions	2040 Emissions
NOACA						
Direct PM	659.35		463.02			
NOx	18,202.07		8,957.18			
*Cuyahoga and Lorain County budget totals from the 1997/2006 PM _{2.5} SIP Maintenance Plan						

For additional detail on these topics, visit the USEPA Web site at:
<http://www.epa.gov/air/ozonepollution/> (general ozone information)
<http://www.epa.gov/ttn/naaqs/ozone/ozonetech/> (technical ozone information)
<http://www.epa.gov/air/particlepollution/fastfacts.html> (fast facts on particulate matter)
<http://www.epa.gov/air/particlepollution/basic.html> (general particulate matter information)
http://www.epa.gov/ttn/naaqs/standards/pm/s_pm_index.html (technical particulate matter information)

Discussion

- All parties agreed that MOVES2014 model will be used for the analysis
- The horizon year for the plan is 2040.
- NOACA is amending its Transportation Plan and 2016-2019 TIP to accommodate CUY IR 480-18.42 (L&R) Deck: PID 90591 and performed the required conformity analysis. The proposed amendment of NOACA's long-range transportation plan (Plan) and the Transportation Improvement Program (TIP) will be presented to the Board of Directors at its meeting on March 10, 2017.
- NOACA has reviewed old and new project lists and the TRAC major new projects and construction schedules for existing Plan projects. NOACA received confirmation from ODOT District 3 and 12 that their priorities are represented.
- CUY IR 480-18.42 (L&R) Deck: PID 90591 will be reflected in the 2022 network. There have been no other changes from the 2035 Plan.
- Analyses for ozone – current SIP budgets (d 2020) for analysis year networks 2020, 2022, 2035 and 2040
 - Consistent with the regulations, have existing networks for 2030 and plan horizon year of 2040
 - All agreed that analysis for 2035 is not needed.
- Tables for 2006 PM_{2.5} NAAQS – current SIP budgets for (1997, 2006), for analysis year networks 2020, 2022, 2030, and 2040
- Need to run analysis for 2012 PM_{2.5} NAAQS in Cuyahoga and Lorain Counties – using analysis years 2020, 2021, 2022, 2030 and 2040
- Send interagency consultation minutes to OEPA and US EPA for concurrence
- PM requires 2022 but not 2020
- Need to confirm with Tony Maietta at EPA that budgets are correct
- NOACA inquired if the current changes can be considered to be consistent with the LRTPs current fiscal constraint analysis. FHWA/ODOT responded that fiscal constraint can be handled that way for NOACA, but that it may not be possible to do the same for AMATS
- Ozone analysis for Ashtabula County and PM Ashtabula Township will be performed by ODOT
- There will also need to be concurring legislation passed by the Erie Regional Planning Commission (ERPC)
- Public involvement processes for each agency shall be followed. Public involvement of the TIP will be concurrent with the STIP public involvement. Public involvement will include the plan and TIP project documentation, interagency consultation minutes, and conformity analysis results
- Comments received as a result of public involvement will be addressed and added to the documentation
- NOACA and AMATS Boards will pass resolutions to adopt the plan and TIP amendments. Tentative dates for Board resolution are AMATS – May 18th (TAC) and 25th (Policy) and NOACA- June 9th. NOACA will coordinate with ERPC to secure its resolution.