

Appendix A

AIR QUALITY CONFORMITY ANALYSIS

Introduction

The purpose of this appendix is to document the manner in which mobile emissions have been forecasted for *Transportation Outlook 2045*.

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 for the 8-hour ozone standard as a maintenance area for the 2008 and nonattainment for the 2015 standard.

USEPA also designated several of the counties in this area (including Summit and Portage) as a maintenance area for PM_{2.5} (fine particulate matter) under the 2006 standard. This area includes Cuyahoga, Lake, Lorain, Medina, Portage, and Summit Counties, and a portion of Ashtabula County. In addition, Cuyahoga and Lorain Counties have been designated as a maintenance area under the 2012 standard for PM_{2.5}.

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 February 26, 2021. The notes from this call are listed beginning on page A-9.

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 January 2017 for the 2008 ozone and in June 2018 for the 2015 ozone standard. These are listed in Tables 1 and 2.

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 July 2013 for the 2006 PM_{2.5} standard and in January 2015 for the 2012 PM_{2.5} standard as listed in Tables 3 and 4.

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 December 2020, forecasted variables were approved as inputs to the model. In March 2021, 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 2021, 2030, 2040, 2045 and 2050 for ozone and 2022, 2030, 2040, 2045 and 2050 for PM_{2.5}. The projects coded in each network are listed in Exhibit A-1 through A-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 MOVES2014a. MOVES2014a is the latest version used in travel demand modeling for air quality analysis.

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 were available for public comment at the March 18, 2021 *Transportation Outlook 2045* public meeting.

Results

Table 1 shows the results of the MOVES2014a analysis for the entire Cleveland-Akron-Lorain 2008 ozone maintenance 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.

8-Hour Ozone

Attainment status: 2008 8-Hour Ozone standard – maintenance area (Federal Register / Vol. 82, No. 4 /Friday, January 6, 2017)
1997 8-Hour Ozone Standard - maintenance area (Federal Register Notice Final Rule Tuesday, September 15, 2009)

SIP Status: Federal Register /Vol. 78, No. 53 /Tuesday, March 19, 2013 – direct final rule adequacy finding for MOVES based 1997 Ozone standard MVEB
 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 U.S. EPA.

8-Hour Geography: Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage, Summit Counties, OH

Conformity Tests: 1997 Standard 8-Hour budget tests
 Analysis Years: 2021 1st Analysis year
 2030 Interim and SIP Budget year
 2040 Interim year
 2045 AMATS/ERPC Plan horizon year
 2050 NOACA Plan horizon year

**TABLE 1
 2008 8-Hour Ozone Standard**

| 8-Hour Ozone Test | 2021 Emissions | 2030 8-Hour Budget | 2030 Emissions | 2040 Emissions | 2045 Emissions | 2050 Emissions |
|--------------------------|----------------|--------------------|----------------|----------------|----------------|----------------|
| AMATS | tons / day | | | | | |
| VOC | 7.07 | | 3.26 | 2.95 | 3.05 | 2.96 |
| NOx | 9.74 | | 4.05 | 3.31 | 3.28 | 3.28 |
| NOACA | tons / day | | | | | |
| VOC | 21.88 | | 14.26 | 9.88 | 8.66 | 9.20 |
| NOx | 29.01 | | 15.54 | 8.95 | 8.74 | 8.29 |
| Ashtabula County | tons / day | | | | | |
| VOC | 1.16 | | 0.53 | 0.50 | 0.51 | 0.50 |
| NOx | 1.50 | | 0.62 | 0.52 | 0.51 | 0.52 |
| Totals | tons / day | | | | | |
| VOC | 30.11 | 30.80 | 17.01 | 12.47 | 12.22 | 12.66 |
| NOx | 40.25 | 43.82 | 19.42 | 12.78 | 12.53 | 12.09 |

Table 2 shows the results of the MOVES2014a analysis for the entire Cleveland-Akron-Lorain 2015 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 2 confirms ozone precursor emissions do not exceed the budgets for either VOC or NO_x.

8-Hour Ozone

Attainment status: 2015 8-Hour Ozone standard – marginal nonattainment area (Federal Register / Vol. 83, No. 107 / Monday, June 4, 2018)

SIP Status: Federal Register /Vol. 82, No. 4 /Friday, January 6, 2017 – direct final rule adequacy finding for Motor Vehicle Emission Simulator (MOVES) based 2008 ozone standard MVEB
No submittals required under 2008 8-Hour ozone standard until approved budgets are received. The budgets found adequate for 2008 standard will satisfy the 2015 tests, per U.S. EPA.

8-Hour Geography: Cuyahoga, Geauga, Lake, Lorain, Medina, Portage, Summit Counties, OH

Conformity Tests: 2008 Standard 8-Hour budget tests

Analysis Years: 2021 Attainment and 1st Analysis year
2030 Interim and SIP Budget year
2040 Interim year
2045 AMATS/ERPC Plan horizon year
2050 NOACA Plan horizon year

**TABLE 2
2015 8-Hour Ozone Standard**

| 8-Hour Ozone Test | 2021 Emissions | 2030 8-Hour Budget | 2030 Emissions | 2040 Emissions | 2045 Emissions | 2050 Emissions |
|--------------------------|----------------|--------------------|----------------|----------------|----------------|----------------|
| AMATS | tons / day | | | | | |
| VOC | 7.07 | | 3.26 | 2.95 | 3.05 | 2.96 |
| NOx | 9.74 | | 4.05 | 3.31 | 3.28 | 3.28 |
| NOACA | tons / day | | | | | |
| VOC | 21.88 | | 13.22 | 9.02 | 8.66 | 9.20 |
| NOx | 29.01 | | 14.75 | 8.95 | 8.74 | 8.29 |
| Totals | tons / day | | | | | |
| VOC | 28.95 | 30.80 | 16.48 | 11.97 | 11.71 | 12.16 |
| NOx | 38.75 | 43.82 | 18.80 | 12.26 | 12.02 | 11.57 |

Table 3 shows the results of the MOVES2014a analysis for the Cleveland-Akron-Lorain 2006 PM_{2.5} maintenance area. This analysis must show that direct PM_{2.5} and NO_x emissions from mobile sources will not exceed those found in the 2022 budget. Table 3 confirms emissions do not exceed the budgets for both direct PM_{2.5} and NO_x.

PM_{2.5} 2006 Standard

Attainment/ 2006 Annual PM_{2.5} Standard – maintenance area (Federal Register / Vol. 78, No. 144 / Friday, July 26, 2013)

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: Cuyahoga, Lake, Lorain, Medina, Portage, Summit Counties, OH, and Ashtabula Township (Ashtabula County, OH)

Conformity Tests: Budget tests

Analysis Years: 2022 PM_{2.5} Budget Year
2030 Interim year
2040 Interim year
2045 AMATS/ERPC Plan horizon year
2050 NOACA Plan horizon year

**TABLE 3
2006 PM_{2.5} Standard**

| PM _{2.5} Test | 2022 Budget | 2022 Emissions | 2030 Emissions | 2040 Emissions | 2045 Emissions | 2050 Emissions |
|------------------------|-------------|----------------|----------------|----------------|----------------|----------------|
| AMATS | tons/year | | | | | |
| Direct PM | | 111.92 | 90.78 | 93.92 | 88.26 | 89.61 |
| NOx | | 2,108.06 | 1,414.19 | 1,297.58 | 1,291.22 | 1,297.47 |
| NOACA | tons/year | | | | | |
| Direct PM | | 397.13 | 262.18 | 209.93 | 209.24 | 208.49 |
| NOx | | 10,447.02 | 4,721.64 | 2,988.83 | 2,930.40 | 2,891.73 |
| Ashtabula Twp | tons/year | | | | | |
| Direct PM | | 1.9 | 1.53 | 1.61 | 1.5 | 1.53 |
| NOx | | 33.8 | 22.78 | 20.88 | 20.77 | 20.7 |
| Totals | tons/year | | | | | |
| Direct PM | 880.89 | 510.95 | 354.49 | 305.46 | 299.0 | 299.63 |
| NOx | 17,263.65 | 12,588.88 | 6,158.61 | 4,307.29 | 4,242.39 | 4,209.9 |

Table 4 shows the results of the MOVES2014a analysis for the Cleveland-Akron-Lorain 2012 PM_{2.5} maintenance area. This analysis must show that direct PM_{2.5} and NO_x emissions from mobile sources will not exceed those found in the 2022 budget. Table 4 confirms emissions do not exceed the budgets for both direct PM_{2.5} and NO_x.

PM_{2.5} 2012 Standard

Attainment status: 2012 Annual PM_{2.5} Standard – maintenance area (80 FR 2205 / January 14, 2015)

SIP Status: Federal Register /Vol. 83, No. 246 /Wednesday, December 26, 2018 – approval of SIP and finding in support of MOVES based 2012 standard PM_{2.5} MVEB

Geography: Cuyahoga and Lorain County, OH
 Conformity Tests: 2012 SIP Maintenance Plan tests
 Analysis Years: 2022 PM_{2.5} Budget year
 2030 Interim year
 2040 Interim year
 2045 AMATS/ERPC Plan horizon year
 2050 NOACA Plan horizon year

TABLE 4
2012 PM_{2.5} Standard

| PM _{2.5} Test | 2022 Budget | 2022 Emissions | 2030 Budget | 2030 Emissions | 2040 Emissions | 2045 Emissions | 2050 Emissions |
|--------------------------|-------------|----------------|-------------|----------------|----------------|----------------|----------------|
| | tons/year | | | | | | |
| Direct PM _{2.5} | 406.79 | 290.22 | 270.57 | 186.73 | 149.28 | 148.61 | 148.04 |
| NOx | 9,432.04 | 7,492.24 | 4,907.54 | 3,152.17 | 1,971.1 | 1,928.35 | 1,899.30 |

For additional detail on these topics, visit the following U.S. EPA websites:

- <http://www.epa.gov/air/ozonepollution/> (general ozone information)
- <http://www.epa.gov/ttn/naags/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/naags/standards/pm/s_pm_index.html (technical particulate matter information)

EXHIBIT A-1
2021 NETWORK

The 2021 Network includes all existing facilities plus the following projects:

| PROJECT | LOCATION & TERMINI | TYPE OF WORK |
|-----------------------|---|---|
| Massillon Rd (SR 241) | GREEN - Raber Rd to SR 619 | Widen to 5 lanes, Improve Safety |
| I-76 | BARBERTON - At Wooster Rd Interchange | Removal of Wooster Rd ramps |
| 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 |

Note: All of these projects are assumed 2021 for ozone; however for PM_{2.5} they would move to 2022.

**EXHIBIT A-2
2022 NETWORK**

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

| PROJECT | LOCATION & TERMINI | TYPE OF WORK |
|------------------------|--|---|
| Cleveland-Massillon Rd | COPLEY TWP/FAIRLAWN - I-77 to Bywood Ave | Widen to 4 lanes and roundabout |
| I-76 | BARBERTON - At State Rd Interchange | Reconfigure interchange and add service roads |

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

**EXHIBIT A-3
2030 NETWORK**

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

| PROJECT | LOCATION & TERMINI | TYPE OF WORK |
|-----------------------------|--|--|
| Arlington Rd | GREEN - Boettler Rd to September Dr | Widen to 4 lanes with intersection improvements |
| Central Interchange "Braid" | AKRON - N of Central Interchange to Carroll St; Carroll St to Tallmadge Ave | "Braid" ramps between interchanges; Add an auxiliary lane in each direction from Carroll St to Tallmadge Ave (excluding SR 8 bridge project) |
| I-76 | AKRON - Kenmore Leg North Interchange | Add a lane to WB to SB ramp |
| I-76 | AKRON - Kenmore Leg South Interchange | Add a lane to SB to WB ramp and add a lane in WB direction from US 224 to State Interchange |
| I-76/I-77/SR 8 | AKRON - Central Interchange I-76 left off-ramps & SR 8 from I-77 split to Carroll St | Reconfigure Interchange and add auxiliary lanes to SR 8 |
| I-77/SR 8 | AKRON - I-277 to I-77 Split | Repave and restripe to add auxiliary lane in each direction |
| I-77 | BATH TWP/RICHFIELD/RICHFIELD TWP - Ghent Rd to Cuyahoga County Line | Widen to 6 lanes |
| Seiberling Way | AKRON - Eagle St to Englewood St | New road |
| SR 8 | AKRON - Perkins St to Glenwood Ave | Reconstruct bridge, Improve Perkins St ramp operation |
| Tallmadge Rd | BRIMFIELD TWP - At I-76 Interchange | Reconfigure Interchange |

**EXHIBIT A-4
2040 & 2045 NETWORKS**

The 2040 & 2045 Networks include those projects in the 2030 network plus no other projects.

eNEO2050 Long-Range Plan (LRP)

Air Quality Conformity Interagency Consultation Conference Call Minutes

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

Logistics: February 26, 2021, 1:30 p.m., Conference Call, follow-up discussions
via email

Purpose

A formal interagency consultation (IAC) process is required in each nonattainment and maintenance area to address technical and procedural issues related to air quality planning. The Cleveland, Akron, and Erie County, Ohio metropolitan planning organizations (MPOs) (NOACA, AMATS and ERPC) are updating their LRPs. The LRPs will replace their existing Plans, for which the horizon year was 2040. NOACA's LRP has horizon year of 2050, while AMATS and ERPC have a horizon year of 2045.

Discussion

- The IAC call began at 1:30 p.m.
- All parties agreed on the geographic scope of the analysis, which includes the five NOACA counties (Cuyahoga, Geauga, Lake, Lorain, and Medina), the two AMATS counties (Portage and Summit), and Ashtabula County
 - Ashtabula County not included in the nonattainment area for the 2015 ozone National Ambient Air Quality Standard (NAAQS), but it is part of the maintenance area for the 2008 NAAQS
 - All eight counties part of maintenance area for 2006 fine particulate matter (PM_{2.5}) NAAQS, but only Cuyahoga and Lorain are part of maintenance area for 2012 PM_{2.5} NAAQS
- Parties agreed on the applicable conformity tests and budgets
 - Ohio has not completed the State Implementation Plan (SIP) for the 2015 ozone
 - Based on U.S. EPA guidance, the MPOs will use the 2008 ozone budgets to analyze both the 2008 and 2015 ozone NAAQS

- MPOs will use the budgets for the 2006 and 2012 PM_{2.5} NAAQS for those analyses
- Parties settled upon the analysis years
 - NOACA recommended the following analysis years
 - Ozone: 2021 (attainment year for the 2015 NAAQS), 2030 (budget year for 2008 NAAQS), 2040 (interim year), 2045 (horizon year for AMATS & ERPC), and 2050 (horizon year for NOACA)
 - 2006 PM_{2.5} NAAQS: 2022 (budget year), 2030 (interim year), 2040 (interim year), 2045 (horizon year for AMATS & ERPC), and 2050 (horizon year for NOACA)
 - 2012 PM_{2.5} NAAQS: 2022 (budget year), 2030 (budget year), and 2040 (interim year), 2045 (horizon year for AMATS & ERPC), and 2050 (horizon year for NOACA)
 - All parties agreed that these are the appropriate analysis years
- Parties confirmed the geographic division for the analysis
 - NOACA will complete the conformity analysis for Cuyahoga, Geauga, Lake, Lorain, and Medina Counties
 - ODOT and AMATS would work together to run the analysis for Portage and Summit Counties
 - ODOT will also do the additional analysis for Ashtabula County
 - NOACA asked if ODOT will complete the post-processing for the NOACA region, and both agencies agreed to this
 - NOACA added that once post-processing is completed, ODOT will provide the final emissions totals to NOACA, and it will complete the conformity documentation
- U.S. EPA confirmed that MOVES2014a is still the version of record, as it is within the two-year grace period, so the MPOs/ODOT will use it to complete the modeling
- NOACA asked about the networks for the analysis
 - NOACA confirmed that it had last validated its travel demand model for the conformity analysis for the 2021-2024 TIP in February 2020
 - NOACA has not made any changes to the networks for 2021, 2022, 2030, or 2040 and proposes to use the VMT outputs from this last validation for emissions modeling
- Once the analysis is complete, NOACA will distribute the conformity documentation to AMATS and ERPC, so they can bring it to their Technical Advisory and Policy Committees for approval
- NOACA explained that it needs to get approval from its Board of Directors at its June 11, 2021 meeting
 - In order to meet this timeline, NOACA needs to get a recommendation for approval from its Planning and Programming Committee at its April 9 meeting
 - NOACA needs to have final results for committee materials by April 2
- AMATS, and ERPC will pass resolutions to adopt the conformity determination on their respective timelines
 - AMATS indicated they can get approval from their Technical Advisory and Policy Committees on May 13 and May 20, respectively
 - ERPC stated they can either get approval from their Technical Advisory and Policy Committees on April 22

- The MPOs confirmed that they will follow the public involvement programs outlined for their LRPs
- The IAC call concluded at 2:02 p.m.

| Organization | Activity | Date(s) |
|---------------------|--|---|
| NOACA | Public Involvement Process | April 21-May 19 |
| NOACA | Planning & Programming Committee Meeting | April 9 |
| NOACA | Board of Directors Meeting | June 11 |
| AMATS | Public Involvement Process | March 18-May 12 |
| AMATS | Technical Advisory Meeting | May 13 |
| AMATS | Policy Committee Meeting | May 20 |
| ERPC | Public Involvement Process | 30 days before April 22 (March 23) or May 27 (April 27) |
| ERPC | Technical Advisory & Policy Committee Meetings | April 22 or May 27 |
| U.S. DOT | Final Approval of Conformity Determination | |