

**Air Quality Conformity Analysis
for the
Berrien County, Michigan 2015 Ozone NAAQS Nonattainment Area
January 3, 2023**

Final

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1.0 Conformity

1.1 Introduction

Transportation conformity provisions of the Clean Air Act Amendments require metropolitan planning organizations (MPOs) to make a determination that the Long-Range Transportation Plan (LRTP), Transportation Improvement Program (TIP), and projects conform to the State Implementation Plan (SIP), and that regional emissions will not negatively impact the region's ability to meet the National Ambient Air Quality Standards (NAAQS).

Conformity to the SIP means that the region's LRTPs and TIPs 1) will not cause any new violations of the NAAQS; 2) will not increase the frequency or severity of existing violation; and 3) will not delay attaining the NAAQS. A demonstration is conducted by comparing emission estimates generated from implementation of LRTPs and TIPs for analysis years to the motor vehicle emission budgets (MVEBs) contained in the maintenance SIP.

The purpose of this report is to document the process and findings of the transportation conformity analysis for the nonattainment and maintenance areas.

1.2 Nonattainment and Maintenance Areas

Berrien County is the nonattainment area. Within the boundary are the MPO of Twin Cities Area Transportation Study (TwinCATS) and part of the Niles-Buchanan-Cass Area Transportation Study (NATS) MPO, as well as the rural projects contained in the State Transportation Improvement Program (STIP).

Findings of the transportation conformity analysis are for projects within Berrien County. There were no new projects for the 2050 TwinCATS LRTP. Projects have not changed since the previous analysis for the 2023 to 2026 TIPs and are included in the modeling. The Michigan Transportation Conformity Interagency Workgroup (MITC-IAWG) have reviewed all projects for this analysis as part of the analysis for the 2023 to 2026 TIPs and amendments to date. Thus, there were no new projects to be reviewed or included in this analysis. Projects for this analysis are contained in:

- TwinCATS 2050 LRTP,
- TwinCATS 2023-2026 TIP and amendments,
- NATS 2045 LRTP in Berrien County,
- NATS 2023-2026 TIP and amendments in Berrien County, and
- STIP 2023-2026 and amendments in Berrien County.

1.3 Conformity Finding

The staff of the Southwest Michigan Planning Commission (SWMPC), representing the two MPOs, finds that the LRTPs and TIPs conform to the SIP for the 2015 ozone standard and the 1997 ozone standard based on the results of this conformity analysis. This report makes the determination that the region’s transportation plans and programs satisfy all applicable criteria and procedures in the conformity regulations.

This conformity analysis document is subject to a public comment period from January 3 to 17, 2023. Comments are recognized, considered, and responses provided in Appendix B.

The Southwest Michigan Planning Commission on January 18, 2023, made a formal conformity determination, through a resolution, supporting the conformity determination.

1.4 Results of Conformity Analysis

Conformity is demonstrated when the analysis-year emissions are equal to or less than the SIP budget. For the 2015 and 1997 ozone standards, as shown in Table 1, the emissions results for the analysis years show that the volatile organic compounds (VOC) and nitrogen oxides (NOx) emissions are lower than the SIP budgets; thus, conformity for the ozone standards are demonstrated.

Table 1: Results of 2015 and 1997 Ozone Standard Conformity Analysis

Analysis Year	Emissions (tons/day)	
	VOC	NOx
SIP Budget	9.16	15.9
2023	1.80	2.48
2025	1.64	2.02
2035	1.10	1.02
2045	0.97	0.85
2050	0.95	0.84

2.0 Background and Attainment Status

2.1 Background

The federal Clean Air Act Amendments of 1990 (CAAA) established rules to improve the air, protect public health, and protect the environment. The act requires the U.S. Environmental Protection Agency (EPA) to set, review, and revise the National Ambient Air Quality Standards (NAAQS) periodically.

The Clean Air Act links together air quality planning and transportation planning through the transportation conformity process. Air quality planning is controlled by Michigan's SIP, which includes the state's plans for attaining or maintaining the NAAQS. The main transportation planning tools are the metropolitan LRTP and the metropolitan TIP. Transportation conformity ensures that federal funding and approval are given to highway and transit activities that are consistent with the SIP and that these activities will not affect Michigan's ability to achieve the NAAQS.

Transportation activities that are subject to conformity are LRTPs, TIPs, and all non-exempt federal projects that receive Federal Highway Administration (FHWA) or Federal Transit Administration (FTA) funding or approval. The conformity process ensures emissions from LRTP, TIP, or projects are within acceptable levels specified within the SIP and meet the goals of the SIP.

Transportation conformity only applies to on-road sources and transportation-related pollutants: ozone, particulate matter (particulate sizes 2.5 and 10), nitrogen dioxide, and carbon monoxide.

In addition to emissions that are directly emitted, regulations specifically require certain precursor pollutants to be addressed. Precursor pollutants are those pollutants that contribute to the formation of other pollutants. For example, ozone is not directly emitted but created when NOx and VOC react with sunlight.

When the EPA revises an NAAQS, all areas of the country are evaluated to determine if monitored levels of the pollutant are at or below the standard; these areas are classified as attainment. If the pollutant level is above the standard, these areas are classified as nonattainment. MPOs in areas classified as nonattainment or maintenance must conduct conformity analysis on their transportation programs.

2.2 Attainment Status

On April 15, 2004, the EPA issued final designations of areas not attaining the 1997 ozone NAAQS (also referred to as 1997 ozone standard). Berrien County was designated a nonattainment area.

On May 16, 2007, the EPA redesignated the area attainment/maintenance, approving and finding adequate motor vehicle emissions budgets for VOC and NOx for the year 2018. The area was placed into maintenance, requiring conformity emission to be compared to the MVEBs contained in the SIP, referred to as SIP budgets.

On July 20, 2012, the EPA designated all of Michigan as attainment for the strengthened 2008 ozone NAAQS.

On July 20, 2013, the EPA partially revoked the 1997 ozone standard, withdrawing the requirement to do transportation conformity for areas that were in maintenance. On April 6, 2015, the EPA completely revoked the 1997 ozone standard, which resulted in removal of all transportation conformity requirements.

On April 23, 2018, the FHWA started requiring areas in the country to conduct conformity if they were a maintenance area for the 1997 ozone standard and attainment for the 2008 ozone standard when the 1997 ozone NAAQS was revoked. This was to comply with the court's decision in *South Coast Air Quality Management District v. EPA*. Later, this was amended to require MPOs to have a conformity in place on Feb. 16, 2019, and conduct conformity going forward.

On Aug. 3, 2018, the EPA designated Berrien County as nonattainment for the strengthened 2015 ozone NAAQS (also referred to as 2015 ozone standard).

On Oct. 7, 2022, the EPA published the notice to reclassify the Berrien County 2015 ozone nonattainment area from marginal to moderate for failure to attain the NAAQS by August 3, 2021, with an effective date of Nov. 7, 2022. Therefore, the area now has more stringent CAA requirements to follow to assist in attaining the NAAQS. The area must now attain the standard by August 3, 2024.

2.3 SIP Budgets

Berrien County has existing maintenance budgets from the 1997 ozone standard maintenance SIP. Regulations require use of these budgets to test both ozone standards. Emissions generated must be equal to or less than the SIP budgets, also referred to as MVEB. The MVEB is the portion of the total allowable emissions allocated to highway and transit vehicle use in the maintenance or nonattainment area. By showing emissions are below the MVEB, the LRTP and TIPs are conforming to the SIP.

3.0 Interagency Consultation

Consultation with federal, state, and local transportation authorities is conducted through the Michigan Transportation Conformity Interagency Workgroup (MITC-IAWG). Issues discussed include evaluating and choosing emission models and methods, determining regionally significant project definition and projects, procedures for future MITC-IAWG meetings, and rules for reviewing projects.

A MITC-IAWG was held on December 20, 2022, to review projects and modeling assumptions; individuals attended by video conferencing (TEAMS). The meeting was a joint meeting between the two conformity areas: the Berrien County 2015 Ozone Nonattainment Area and the Cass County 1997 Ozone Orphan Maintenance Area (OMA). The NATS MPO extends into Cass County, which is a 1997 ozone orphan maintenance area. A summary of the MITC-IAWG meeting and relevant interagency consultation correspondence related to this conformity is in Appendix A. A copy of this conformity analysis was sent to each MITC-IAWG member for review and comment.

4.0 Public Participation

The Public Participation Plan, adopted by the MPO Policy Committee, establishes the procedures by which the MPOs reach affected public agencies and the public. The same procedures were followed for this document, ensuring the public has an opportunity to review and comment before the SWMPC, representing the two MPOs, makes a determination.

A formal public comment period for the draft Air Quality Conformity Analysis held from January 3 to 17, 2023, for the TwinCATS and NATS MPOs. Public comments received and responses to the comments are in Appendix B.

5.0 Projects Evaluated for the Conformity Analysis

The Michigan Transportation Conformity Interagency Workgroup (MITC-IAWG) had reviewed all projects for this analysis as part of the analysis for the 2023 to 2026 TIPs and amendments to date. There were no new projects for the 2050 TwinCATS LRTP. Thus, there were no new projects to be reviewed. All projects in the TwinCATS 2023 to 2026 TIP, NATS 2023 to 2026 TIP and STIP projects in Berrien County were evaluated for inclusion in the analysis. Projects classified as non-exempt must be analyzed.

6.0 Transportation Modeling

6.1 Travel Demand Forecasting Models

Nonattainment areas are established independent of MPO boundaries. The Berrien County nonattainment and maintenance area is covered by three travel demand forecasting models: the TwinCATS travel demand model, the South Bend/NATS regional travel demand model covering the urban portions, and the statewide model covering the rural area of the county. Each of these models was developed in the TransCAD modeling software, using the latest demographic and employment data available to generate estimates of travel, vehicle miles of travel (VMT), vehicles hours of travel (VHT), and speeds. Detailed documentation on each of these models is contained in separate documents available upon request.

6.1.2 TwinCATS Model

The TwinCATS model covers the greater Benton Harbor, St. Joseph, and Berrien Springs area. Developed by the Michigan Department of Transportation (MDOT), this standard four-step model has a base year of 2015 and a horizon year of 2050. Each of the four steps - trip generation, trip distribution, mode choice, and traffic assignment - are checked for reasonableness against national standards. Final model validation verifies that the assigned volumes replicate actual traffic counts. The decennial 2010 census and 2015 American Community Survey (ACS) data were the sources of population and household base data. Employment data was obtained from a private business database and verified with local knowledge. Economic, Regional Economic Models Inc. (REMI), and demographic forecast data were used to estimate future growth to 2045. The University of

Michigan and MDOT jointly develop county-specific forecast data for the REMI model. Horizon year 2050 was created by projecting socioeconomic data.

6.1.3 Niles/South Bend Regional Model

This model is a regional model developed by a consultant and covers the NATS MPO and the Michiana Area Council of Governments (MACOG) MPO areas. The model reflects the interconnected travel patterns experienced in the Niles, Michigan, and South Bend, Indiana, region. The model is a hybrid, blending a traditional four-step model with an activity-based model, with a base year of 2015 and horizon year of 2045. Census data was used to develop base population and household data, employment data is developed from a private business database verified with local knowledge, and REMI was used to develop future year socioeconomic data to 2045. Horizon year 2050 was created by projecting VMT and VHT.

6.1.4 Statewide Model

The statewide model developed by MDOT (completed in 2019) covers all counties in the state and was used for the non-urban parts of Berrien County. The model is an advanced trip-based model with short- and long-distance passenger trip generation, mode choice, trip distribution, and traffic assignment by four time-of-day periods, as well as freight models for multi- and single-unit trucks and other light commercial vehicles. The model has a base year of 2015 and forecasts traffic in five-year increments through 2045. Required interim analysis years are interpolated. The base year trip table is calibrated to match a passive origin and destination dataset for a typical fall weekday. Trip assignment uses an equilibrium method and base year volumes were validated against traffic counts using MDOT and FHWA standards. Future data is based on REMI and demographic forecasts to 2045. Horizon year 2050 was created by projecting VMT and VHT.

6.1.5 Coding Travel Demand Model Links for NFC by Urban and Rural

For emission modeling, the National Functional Classification (NFC) system is used to determine the function of roads; however, after 2010, NFCs do not distinguish roads by urban and rural. The emission model, Motor Vehicle Emission Simulator (MOVES), requires roads to be classified as urban or rural. MOVES also requires roads to be grouped into one of four road types: rural restricted, rural unrestricted, urban restricted, and urban unrestricted. To determine a road's urban or rural status, roads within the adjusted census urban boundary were considered urban and those outside as rural. NFCs designated as interstate and other freeways are considered restricted while all others are considered unrestricted. The Michigan Geographic Framework (GIS digital base map) was used to combine NFC with adjusted census urban boundary to generate MOVES road types for the network.

6.1.6 Highway Performance Monitoring System (HPMS)

The EPA and FHWA endorse HPMS as the source of VMT estimates. The travel demand modeling VMT is aggregated by NFC road types for the county, then normalized to HPMS data for the base year/validation year of the travel demand model. Normalization factors were applied to all analysis years.

6.2 Analysis Years

Analysis years were determined by the MITC-IAWG. Projects requiring modeling are grouped into an analysis year based on the projects open-to-traffic date. Emissions are generated for each analysis year.

Analysis Year	Reason
2023	2015 ozone standard attainment year
2025	Interim year (thus, analysis years not more than 10 years apart)
2035	Interim year (thus, analysis years not more than 10 years apart)
2045	Last year of the long-range transportation plan for NATS
2050	Last year of long-range transportation plans for TwinCATS

7.0 Latest Planning Assumptions

7.1 Demographic Data

The most current and future assumptions developed or approved by the MPO were used in the development of the travel demand models. Table 2 shows base and future year 2045 population and employment by county from the travel demand models. Future year REMI data was not available for 2050 at the time of this analysis; only the TwinCATS model projected socioeconomic data to year 2050.

Table 2: Base and Future Year Population and Employment by County

County	Population		Employment	
	2015	2045	2015	2045
Berrien County	154,845	158,681	80,113	81,989

7.2 Vehicle Miles of Travel

VMT is one measure of travel. Current and future levels of travel and growth rates are provided in Table 3.

Table 3: Vehicle Miles of Travel and Growth Rate by County

	Analysis year					
Berrien County	Base Year 2015	2023	2025	2035	2045	2050
VMT	5,362,141	5,508,248	5,521,750	5,639,161	5,749,027	5,796,859
Growth Rate	1.00	1.03	1.03	1.05	1.07	1.08

7.3 Vehicle Hours of Travel

VHT is an indicator of congestion. Current and future levels are provided in Table 4.

Table 4: Vehicle Hours of Travel by County

	Analysis year					
Berrien County	Base Year 2015	2023	2025	2035	2045	2050
VHT	119,758	121,817	122,188	123,939	126,418	127,467

7.4 Transportation Control Measures

There are no transportation control measures (TCMs) identified in the applicable state implementation plan. Thus, no measures are included at this time.

8.0 Emission Modeling

8.1 MOVES Specifications

The EPA’s MOVES version MOVES3.0.4 was used to generate emissions. Ozone is formed in the presence of heat and sunlight, so the highest ozone concentrations are monitored during the summer. This conformity analysis involves generating summer (July) weekday emissions to simulate the meteorology of a high-ozone summer day.

8.2 Road Type Distribution

HPMS data is used to create MOVES road-type distribution fractions. County-level HPMS passenger data is used for motorcycle and passenger vehicles, and commercial HPMS is used for trucks and buses. HPMS VMT is aggregated to MOVES road types, then converted to a fraction, generating a road-type distribution.

8.3 Average Speed

A speed distribution is created using a method developed by EPA for taking a single average speed and creating a distribution. An average speed is generated for each of the four-time periods (a.m., midday, p.m., and off-peak) in the travel demand forecasting models for each of the four road types in MOVES, generating 16 average speeds. The same distribution was used for each vehicle type. The Niles/South Bend travel demand model was not used to generate speeds.

8.4 Average Weekday VMT to Annual VMT

Monthly VMT adjustment factors were obtained from MDOT's data collection area. The EPA's AADVMT Converter-Tool MOVES2014 was used to convert annual average daily VMT to annual VMT, monthly VMT fractions, and daily VMT fractions. Hourly fractions use MOVES default data. For motorcycles, the monthly fractions use MOVES defaults since local data is limited. Future analysis years utilize the same fractions.

8.5 Vehicle Population

The source of the vehicle population is the Michigan Secretary of State (SOS) vehicle registration database of 2015. The database was supplemented with school bus data from the Michigan Department of Education and MDOT public transit bus data. The EPA's default distributions were used to determine intercity bus, refuse truck, single-unit truck, and combination truck categories. The SOS data must be converted to MOVES source (vehicle) types. Table 5 shows how vehicle body style combined with plate type and company code are used to obtain MOVES vehicle types.

Future year vehicle population is based on growth in VMT from base year to analysis year. The growth rate is applied to all MOVES vehicle types. Table 3 shows the VMT for each analysis year and growth rate.

8.6 Vehicle Age Distribution

MOVES requires vehicle age as one of the local data inputs. The Michigan SOS vehicle registration database of 2015 was the source of vehicle ages. Vehicles are assigned to an age group, from 0 to 30-plus, based on model year indicated in the SOS database, with 0 being the newest vehicles (2015 or newer) and each year is its own group until vehicles are 30 years and older, which are aggregated into the 30-plus group. The SOS database is sorted by MOVES vehicle types and age. For intercity buses, refuse trucks, single-unit trucks, and combination trucks, the EPA's default age distribution are used to calculate splits in population because of limited local numbers. Base year age distribution fractions were used for all future analysis years.

8.7 Meteorology Data

Local meteorology data was imported into MOVES. Data from the Midwestern Regional Climate Center (MRCC) using the cli-MATE tool was used. For ozone, a typical summer day is being estimated. Local temperature and humidity data for year 2015, measured at the airport within the nonattainment area, was generated averaging the three summer months June, July, and August.

8.8 Other Local Data

The MOVES model allows input for other types of local data, if available. This conformity demonstration used default data for hoteling (truck parking) and starts. The default fuel data is correct for Michigan and was used.

9.0 Conclusion

Conformity has a two-step endorsement process. The MPOs must make a formal conformity determination through a resolution that the findings of this conformity analysis conform to the SIP; thus, emissions are at or below the budgets found in the SIP. Then FHWA, jointly with the FTA, after consultation with the EPA, issues a letter of concurrence with the determination.

The conformity analysis described here and conducted by MDOT, with support of TwinCATS and NATS, concludes that the TwinCATS 2023-2026 TIP and 2050 LRTP, NATS 2023-2026 TIP and 2045 LRTP, along with the projects in the 2023-2026 STIP, contained in Berrien County meet all applicable requirements for conformity for the 2015 and 1997 ozone standards; thus, it is recommended that FHWA support this conformity determination finding.

Table 5: MOVES Source Types from SOS Body Style, Plate Type, and Company Code

MOVES Source Type	SOS Body Style, Plate Type, and Company Code
11 – Motorcycles	Motorcycles
21 – Passenger Cars	Two-Door Four-Door Convertible Roadster Low-Speed
31 – Passenger Trucks	Station Wagon Pickup Van Hearse with Plate Type, Personal Ambulance with Plate Type, Personal Panel Van with Plate Type, Personal
32 – Light Commercial Trucks	Pickup with Plate Type, Commercial or Company Van with Plate Type, Commercial or Company Hearse with Plate Type, Commercial or Company Ambulance with Plate Type, Commercial or Company Panel Van with Plate Type, Commercial or Company Utility Truck Wrecker
40 – Buses (MOVES: 41*, 42, 43)	Bus; Supplemented with Other Data Sources
50 – Single-Unit Trucks* (MOVES: 51, 52, 53)	Dump Truck Mixer Truck Stake Truck
54 – Motorhomes	Motorhome
60 – Combination Trucks* (MOVES: 61, 62)	Tractor Trailer Tanker

* The EPA default age distribution is applied to calculate individual MOVES Source Type categories.

Appendix A: Meeting Summary of the Interagency Workgroups

Meeting Summary
Michigan Transportation Conformity Interagency Workgroup (MITC-IAWG)
For the
**Berrien County 2015 Ozone Nonattainment Area and
Cass County 1997 Ozone Orphan Maintenance Area**

December 20, 2022
2:30 – 3 pm TEAMS Meeting

<u>Name</u>	<u>Agency</u>
In attendance:	
Andy Pickard	Federal Highway Administration (FHWA)
Michael Leslie	US Environmental Protection Agency (EPA)
Breanna Bukowski	Michigan Department of Environment, Great Lakes, and Energy (EGLE)
Donna Wittl	Michigan Department of Transportation (MDOT) – regional conformity
Brandon Kovnat & Kim Gallagher	Southwest Michigan Planning Commission (SWMPC) representing TwinCATS and NATS MPOs
Jim Sturdevant	MDOT – program manager
Katie Beck	MDOT – travel demand modeler
Josh Grab	MDOT – region planner
Lane Masoud	MDOT – project level conformity

Note: *Changes to the modeling years and removal of the NATS 2050 LRTP were required because it was realized that the new NATS 2050 LRTP could not be included in this analysis because the plan would not be completed by the time the conformity determination letter from FHWA would be needed for the TwinCATS LRTP. Edits are indicated by italics and strikethroughs.*

Introductions were held. The MITC-IAWG was held to discuss new 2050 LRTPs for both Twin Cities Area Transportation Study (TwinCATS) and Niles-Buchanan-Cass Area Transportation Study (NATS). *However, Only the new TwinCATS 2050 LRTP will be included in the analysis and the NATS 2045 LRTP will be included.* Both TwinCATS and NATS are part of the Berrien County 2015 ozone nonattainment area. NATS is also part of the Cass County 1997 ozone orphan maintenance area. Projects for both MPOs have been reviewed by the MITC-IAWG either when the new 2023-2026 TIP was developed or subsequent TIP amendments. There were no new projects to review for both 2050 LRTPs.

Berrien County will require emission modeling with MOVES3. MOVES3.0.4 will be used unless MOVES3.1 is successfully installed.

Analysis years will be:

2015 base year of travel demand models

2023 attainment year of 2015 ozone NAAQS- moderate (must attain standard by Aug 3, 2024)

2025 interim analysis year

2035 interim analysis year

2045 *last year of NATS LRTP* ~~interim analysis year~~

2050 last year of *TwinCATS LRTPs*: projected data from travel models

The local inputs will be the same as used for the TIP analysis except the meteorology and speed data. Local meteorology data will be incorporated. The 2015 temperature and humidity data from the Midwestern Regional Climate Center (MRCC) using their cli-MATE tool will be used. Temperature and humidity will be derived by averaging the three summer months June, July, and August as measured at the airport within the nonattainment area.

A question was asked why is temperature important? Temperature affects the creation of VOCs (volatile organic compounds). Also, it was mentioned that conformity analysis must use the same local meteorology data as is used in the state implementation plan (SIP). Previous conformity analysis used the default data provided in MOVES but the latest emission modeling for the ozone SIP uses this method.

The method to derive speeds was also changed. Previous analysis used an average speed per MOVES road type. That method has been replaced with using an average speed being generated for each of the four-time periods (a.m., midday, p.m., and off-peak) in the travel demand models for each road type in MOVES, generating 16 average speeds. The same distribution is used for each vehicle type. NATS/South Bend model will not be used to generate speeds because of the time it would take to post process the data. The TwinCATS and Statewide models will be used. It was mentioned that MDOT is working on a better method to generate a speed distribution. The new method is better than what was being done but needs to be improved.

The group was asked if there were any concerns or if anyone disagreed with the new methods. No concerns or disagreements were voiced.

Cass County being a 1997 ozone orphan maintenance area will require a conformity report that is based on the projects in the TIP and TIP amendments, and LRTP being fiscally constrained. No emission modeling is required. *This report will not be developed until the 2050 NATS LRTP is completed.*

The public comment period for the Berrien County Conformity Analysis ~~both documents~~ will be Jan 3 through 17. The group discussed when the SWMPC Board would be meeting to make a formal resolution supporting the findings. Because a special meeting will be held the exact date was not known; the MPO would determine the date and follow-up. Later in the day of Dec 20 the MPO emailed MDOT that the date would be Jan 18, 2023. The date is part of the document and allows the public to know when action will be taken.

In closing it was mentioned that the determination letter for the new *TwinCATS* LRTPs from FHWA would need to be dated by February 13, 2023.

Appendix B: Public Comments and Responses

No comments were received.

Appendix C: Projects Evaluated for Conformity Analysis

All projects were evaluated as part of the 2023 to 2026 TIP analysis or by subsequent amendments. The projects for TwinCATS and NATS and rural STIP within Berrien County are being evaluated in this conformity report. There were no new projects for the 2050 TwinCATS LRTP. All projects had been reviewed previously; thus, no projects are attached.