
Indiana
Area Designations for the
2008 Ozone National Ambient Air Quality Standards

SUMMARY

EPA has revised the levels of the 8-hour ozone primary (health-based) and secondary (environment/welfare-based) National Ambient Air Quality Standards (NAAQS or standards). The primary 8-hour ozone standard has been revised from 0.08 parts per million (ppm) to 0.075 ppm (the 2008 ozone NAAQS). EPA has also revised the secondary ozone standard to be consistent with the primary ozone standard in all respects.

The table below identifies the areas and associated county in Indiana that EPA intends to designate as nonattainment for the 2008 ozone NAAQS.[1] In accordance with section 107(d) of the CAA, EPA must designate an area (county or part of a county) as "nonattainment" if it is violating the 2008 ozone NAAQS or if it is contributing to a violation of the 2008 ozone NAAQS in a nearby area. The technical analysis supporting the boundary for the individual nonattainment area is provided below.

Table 1. Intended Ozone Nonattainment Areas in Indiana

Area	Indiana Recommended Nonattainment Counties	EPA's Intended Nonattainment Counties
Nonattainment Area †		
Cincinnati-Middletown-Wilmington, OH-KY-IN	None	Lawrenceburg Township, Dearborn County

† Nonattainment for both primary and secondary 2008 8-hour ozone standards.

Cincinnati-Middletown, OH-KY-IN is a multi-state nonattainment area. Table 2 below identifies the counties in other states that EPA intends to designate as part of the nonattainment area.

EPA intends to designate the remaining counties in Indiana that are not listed in the table above as "unclassifiable/attainment" for the 2008 ozone NAAQS.

The analysis below provides the basis for the intended nonattainment area boundaries. It relies on our analysis of whether and which monitors are recording violations of the 2008 ozone NAAQS, based on certified air quality monitoring data from 2008-2010 and on an evaluation of whether nearby areas are contributing to such violations. EPA has evaluated contributions from nearby areas based on a weight-of-evidence analysis considering the factors identified below and

[1] All other counties in Indiana would be designated as "unclassifiable/attainment" for the 2008 ozone NAAQS.

other relevant analyses. EPA issued guidance on December 4, 2008 that identified these factors as ones EPA would consider in determining nonattainment area boundaries, and recommended that states consider these factors in making their designation recommendations to EPA.[2]

1. Air quality data (including the ozone design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor in the area);

2. Emissions and emissions-related data (including location of sources, population, amount of emissions and emission controls, and growth patterns);

3. Meteorology (weather/transport patterns);

4. Geography and topography (mountain ranges and other basin boundaries affecting ozone levels and ozone precursor transport); and,

5. Jurisdictional boundaries (e.g. counties, air districts, existing ozone nonattainment areas, Indian country, Metropolitan Planning Organization (MPOs) and their covered area).

Ground-level ozone is generally not emitted directly into the air, but is created by chemical reactions involving Nitrogen Oxides (NOx) and Volatile Organic Compounds (VOC) in the presence of sunlight.[3] Because NOx and VOC emissions from a broad range of sources over a wide area typically contribute to violations of the ozone standards, EPA believes it is important to consider whether there are contributing emissions from a broad geographic area. Accordingly, EPA chose to examine the 5 factors with respect to the larger of the Combined Statistical Area (CSA) or Core Based Statistical Area (CBSA) associated with the violating monitor(s).[4] All data and information used by EPA in this evaluation are the latest available to EPA and/or provided to EPA by states or tribes.

In EPA's designations guidance for the 2008 ozone NAAQS, EPA recommended examining CSA/CBSAs because certain factors used to establish CSAs and CBSAs are similar to the factors EPA is using in this technical analysis to determine if a nearby area is contributing to a violation of the 2008 ozone NAAQS. Congress required a similar approach in 1990 for areas classified as serious and above for the 1-hour ozone standard and EPA used the same approach in the designation process for the 1997 ozone NAAQS. Where a violating monitor is not located in a CSA or CBSA, EPA's September 4, 2008 guidance recommends using the boundary of the county containing the violating monitor as the starting point for considering the nonattainment area's boundary.

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[2] The December 4, 2008 guidance memorandum, "Area Designations for the 2008 Revised Ozone National Ambient Air Quality Standards," refers to 9 factors. In this technical support document, we have grouped the emissions-related factors together under the heading of "Emissions-Related Data," which results in 5 categories of factors.

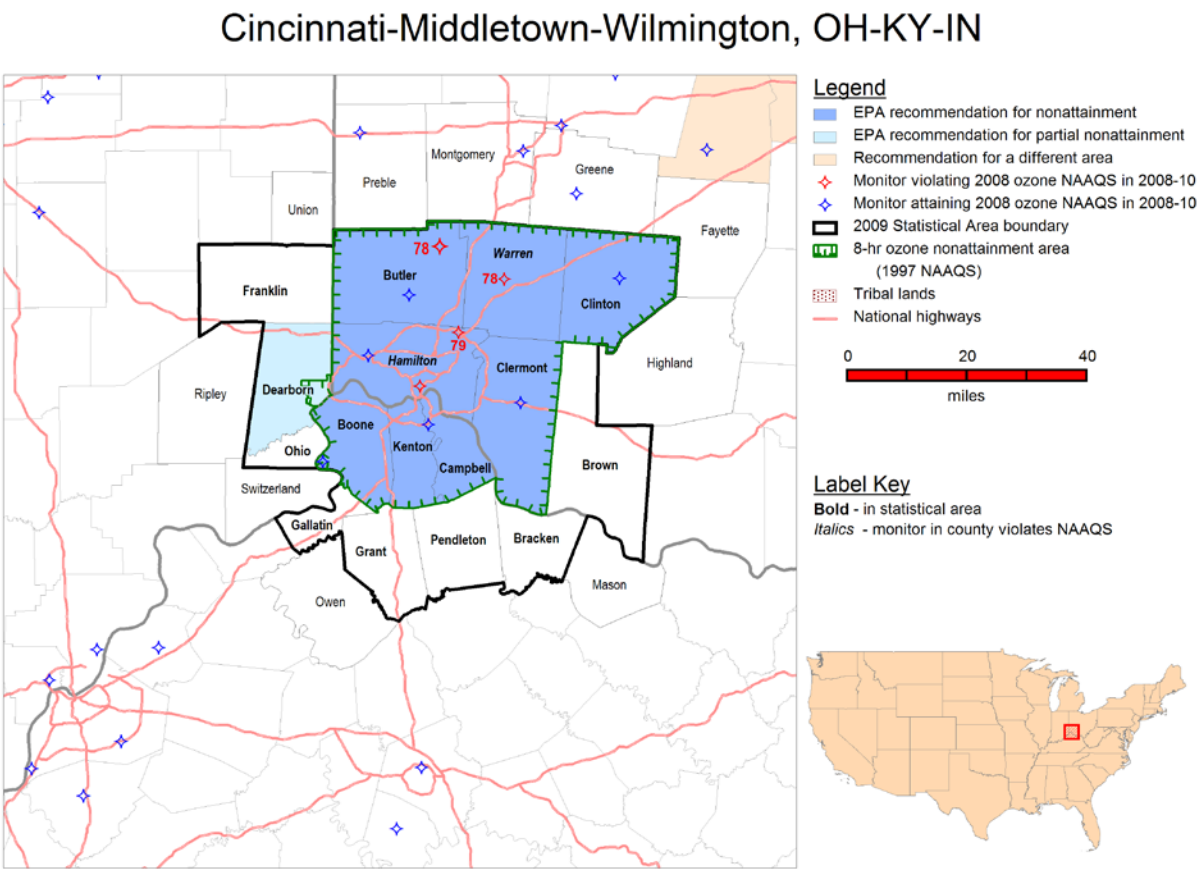
[3] Peak ozone concentrations generally occur downwind of source areas on relatively sunny days with high temperatures and relatively low wind speeds.

[4] Lists of CBSAs and CSAs and their geographic components are provided at www.census.gov/population/www/metroareas/metrodef.html. The lists are periodically updated by the Office of Management and Budget. EPA used the most recent update, based on 2008 population estimates, issued on December 1, 2009 (OMB Bulletin No. 10-02).

Technical Analysis for Cincinnati-Middletown-Wilmington, OH-KY-IN

Figure 1 is a map of the Cincinnati-Middletown-Wilmington, OH-KY-IN intended nonattainment area. The map provides other relevant information, including the locations and ozone design values (violating monitors only) of air quality monitors, county and other jurisdictional boundaries, existing maintenance boundary for the 1997 ozone NAAQS, Cincinnati-Middletown-Wilmington, OH-KY-IN CSA boundary, and major transportation arteries.

Figure 1. Cincinnati-Middletown-Wilmington, OH-KY-IN Area



For purposes of the 1997 ozone NAAQS, as noted in Figure 1, portions of this area were designated nonattainment and subsequently redesignated to attainment (maintenance). The boundary for the nonattainment area for the 1997 ozone NAAQS included the entire counties of Butler, Clermont, Clinton, Hamilton, and Warren in Ohio and Boone, Campbell, and Kenton in Kentucky and part of Dearborn County (Lawrenceburg Township) in Indiana.

In March 2009, Ohio recommended that Butler, Clermont, Clinton, Hamilton, and Warren Counties be designated as “nonattainment” for the 2008 ozone NAAQS based on air quality data

from 2006-2008. In March 2009, Kentucky recommended that Boone, Campbell, and Kenton Counties be designated as nonattainment for the 2008 ozone NAAQS based on air quality data from 2006-2008. Additionally, Indiana, in March 2009, recommended that each county in the Indiana portion of the Cincinnati-Middletown-Wilmington, OH-KY-IN CSA be designated as "attainment" for the 2008 ozone NAAQS. In October 2011, Kentucky submitted an update to their 2009 recommendation, and revised their recommendation to "attainment" designations for each county in the State.[5]

The ozone data reflected in Figure 1 and summarized below are from FEM monitors sited and operated in accordance with 40 CFR part 58.

After considering these recommendations and based on EPA's technical analysis described below, EPA intends to designate the counties in Ohio and Kentucky and the partial county in Indiana identified in Table 2 below as "nonattainment" for the 2008 ozone NAAQS as part of the Cincinnati-Middletown-Wilmington, OH-KY-IN nonattainment area.

Table 2. EPA's Intended Nonattainment Counties for the Cincinnati-Middletown-Wilmington, OH-KY-IN Ozone Nonattainment Area

Cincinnati-Middletown-Wilmington, OH-KY-IN	State-Recommended Nonattainment Counties	EPA Intended Nonattainment Counties
Indiana	None	Dearborn-Partial
Kentucky	None	Boone Campbell Kenton
Ohio	Butler Clermont Clinton Hamilton Warren	Butler Clermont Clinton Hamilton Warren

Factor Assessment

Factor 1: Air Quality Data

For this factor, we considered 8-hour ozone design values (in ppm) for air quality monitors in counties in the Cincinnati-Middleton-Wilmington, OH-KY-IN CSA based on data for the 2008-2010 period, which are the most recent years with fully-certified air quality data. A monitor's design value is the metric or statistic that indicates whether that monitor attains a specified air

[5] Letters from Leonard K, Peters, Kentucky Energy and Environmental Cabinet Secretary to A. Stanley Meiburg and Gwendolyn Keyes Fleming regarding the initial and updated nonattainment boundary recommendations for the 2008 8-hour ozone standard for Kentucky(October 13, 2011 and March 12, 2009, respectively); Letter from Chris Korleski, Director, State of Ohio Environmental Protection Agency, to Lynn Buhl, Regional Administrator, U.S. Environmental Protection Agency, Region 5, regarding initial nonattainment boundary recommendations for Ohio for the 2008 ozone NAAQS (March 9, 2009); Letter from Thomas W. Easterly, Commissioner, Indiana Department of Environmental Management, to Bharat Mathur, Deputy Regional Administrator, U.S. Environmental Protection Agency, Region 5, regarding the initial nonattainment boundary recommendations for the 2008 ozone NAAQS for Indiana.

quality standard. The 2008 ozone NAAQS are met at a monitor when the annual fourth-highest daily maximum 8-hour ozone concentrations, averaged over 3 years is 0.075 ppm or less. A design values is valid only if minimum data completeness requirements are met. See 40 CFR part 50 Appendix P. Where several monitors are located in a county (or a designated nonattainment area or maintenance area), the design value for the county or area is determined by the monitor with the highest individual design value.

Note: Monitors that are eligible for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are sited in accordance with 40 CFR Part 58, Appendix D (Section 4.1) and operating with a Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor that meets the requirements of 40 CFR Part 58, Appendix A. All data from a Special Purpose Monitor (SPM) using an FRM or FEM which has operated for more than 24 months is eligible for comparison to the NAAQS unless the monitoring agency demonstrates that the data came from a particular period during which the requirements of Appendix A (quality assurance requirements) or Appendix E (probe and monitoring path siting criteria) were not met.

The 2008-2010 ozone design values for monitors and counties in the Cincinnati-Middletown-Wilmington, OH-KY-IN CSA are shown in Table 3.

Table 3. Ozone Air Quality Data for the Cincinnati-Middletown-Wilmington, OH-KY-IN CSA

State/County	Site Number	2008-2010 8-hour Ozone Design Values (ppm)
Ohio:		
Butler	390170018	**0.078†**
Butler	390170004	0.073
Clermont	390250022	0.071
Clinton	390271002	0.074
Hamilton	390610040	**0.076†**
Hamilton	390610010	0.073
Hamilton	390610006	**0.079†**
Warren	391650007	**0.078†**
Kentucky:		
Boone	210150003	0.065
Campbell	210373002	0.072

† Monitored violation of the 2008 ozone NAAQS.

Butler, Hamilton, and Warren Counties in Ohio show violations of the 2008 ozone NAAQS. Therefore, these counties are included in the intended ozone nonattainment area. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area. Each county without a violating monitor that is located near a county with a violating monitor has been evaluated based on the weight-of-evidence of the five factors and other relevant information to determine whether it contributes to the nearby violation.

Please note that the state of Ohio, in its March 9, 2009 area designation recommendations and accompanying technical support documentation, based its recommendations on 2006-2008 ozone data. Since these data no longer cover the most recent 3-year period with quality-assured, state-certified data and have been supplanted by the more current 2008-2010 ozone data, we are not reviewing the older ozone data covered by the state of Ohio.

Factor 2: Emissions and Emissions-Related Data

EPA evaluated emissions for ozone precursors (VOC and NOx) and other emissions-related data that provide information on area contributions to ozone standard violations.

Emissions Data

EPA evaluated county-level emission data for NOx and VOC derived from the 2008 National Emissions Inventory (NEI), version 1.5. These are the most recently available NEI emissions data. (See http://www.epa.gov/ttn/chief/net/2008inventory.html) Significant emission levels in a nearby area indicate the potential for the area to contribute to the observed ozone standard violation.

Table 4 shows the 2008 emissions of VOC and NOx (tons per year (tpy)) for all counties in the Cincinnati-Middletown-Wilmington, OH-KY-IN CSA. This table also indicates which of the counties were recommended to be nonattainment for the 2008 ozone NAAQS by their respective states.

Table 4. Total 2008 VOC and NOx Emissions (tons/year) in the Cincinnati-Middletown-Wilmington, OH-KY-IN CSA

State/County	State Recommended Nonattainment?	VOC Emissions (tpy)	NOx Emissions (tpy)
Indiana:			
Dearborn	No	3,572	11,637
Franklin	No	1,097	862
Ohio	No	210	259
Kentucky:			
Boone	No	4,332	8,848
Bracken	No	361	760
Campbell	No	2,260	2,697
Gallatin	No	671	1,634
Grant	No	1,148	1,623
Kenton	No	3,901	4,095
Pendleton	No	608	1,394
Ohio:			
Brown	No	1,720	1,430
Butler	Yes	10,813	12,600
Clermont	Yes	5,809	28,461
Clinton	Yes	2,618	2,941
Hamilton	Yes	26,816	38,664
Warren	Yes	5,618	6,027
CSA Total		71,554	123,933

Emissions Observations by State

Ohio:

From the Ohio emissions data in Table 4, it can be seen that comparatively high 2008 VOC and NOx emissions in the vicinity of the violating counties originate in the following counties: Butler, Clermont, Hamilton, and Warren. Emissions from these counties in 2008 account for 68.6 percent of the VOC emissions and 69.2 percent of the NOx emissions for the entire Cincinnati-Middletown-Wilmington, OH-KY-IN CSA.

The VOC and NOx emissions from Brown and Clinton Counties, Ohio are significantly smaller than those originating in the higher emitting counties elsewhere in the Cincinnati-Middletown-Wilmington, OH-KY-IN CSA. This supports the exclusion of Brown County from the recommended ozone nonattainment area for the 2008 8-hour ozone NAAQS, but not the exclusion of Clinton County based on consideration of jurisdictional boundaries (see the discussion of Factor 5 below).

Indiana:

From the Indiana emissions data in Table 4, it can be seen that comparatively high 2008 VOC and NOx emissions in the vicinity of the violating counties originate from Dearborn County. Emissions from this county in 2008 account for 5.0 percent of the VOC emissions and 9.4 percent of the NOx emissions for the entire Cincinnati-Middletown-Wilmington, OH-KY-IN CSA. The majority of these emissions come from the American Electric Power (AEP) - Tanner's Creek Generating Station located in the Lawrenceburg Township, adjacent to the recommended nonattainment area.

The VOC and NOx emissions from Franklin and Ohio Counties in Indiana are comparatively smaller than those originating in the higher emitting counties elsewhere in the Cincinnati-Middletown-Wilmington, OH-KY-IN CSA. This supports the exclusion of these counties from the recommended ozone nonattainment area for the 2008 8-hour ozone NAAQS.

Kentucky:

Based on the 2008 NEI, 62 percent of Boone County's NOx emissions are from point sources, and 21 percent of Boone County's NOx emissions from mobile sources. Less than 5 percent of Campbell County's NOx emissions are from point sources, and 57 percent of Campbell County's NOX emissions are from mobile sources. Kenton County also has less than 5 percent of its NOx emission from point sources, but 63 percent of Kenton County's NOX emissions are from mobile sources. Boone County has 29 percent of its VOC emission coming from area sources and 23 percent of its VOC emissions from mobile sources. Campbell County has 35 percent of its VOC emissions coming from area sources and 43 percent of VOC emissions from mobile sources. Kenton County has 38 percent of its VOC emission coming from area sources and 41 percent of its VOC emissions from mobile sources.

The VOC and NOx emissions from Bracken, Gallatin, Grant, and Pendleton Counties, Kentucky are considerably less than those originating in the higher emitting counties elsewhere in the Cincinnati-Middletown-Wilmington, OH-KY-IN CSA. This would support the exclusion of these counties from the recommended ozone nonattainment area for the 2008 8-hour ozone NAAQS.

Population, Population Density, and Degree of Urbanization

EPA evaluated the population and vehicle use characteristics and population trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include ozone-creating emissions from on-road and off-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NOx and VOC emissions that may contribute to violating ozone monitors. Rapid population or Vehicle Miles Traveled (VMT) growth in a county on the urban perimeter signifies increasing integration with the urban core area, and indicates that it may be appropriate to include this county in the ozone nonattainment area, particularly if this county already has moderate or higher VOC and/or NOx emissions. Table 5 shows the 2010 population, population density, and population growth information for each county in the Cincinnati-Middletown-Wilmington, OH-KY-IN CSA.

Table 5. Population and Population Growth in the Cincinnati-Middletown-Wilmington, OH-KY-IN CSA

State/County	State Recommended Nonattainment	2010 Population	2010 Population Density (1,000 per square mile)	Change in Population (2000-2010)	Population Percent Change (2000-2010)
Indiana:					
Dearborn	No	50,047	0.16	3,702	+8
Franklin	No	23,087	0.06	866	+4
Ohio	No	6,128	0.07	492	+9
Kentucky:					
Boone	No	118,811	0.46	31,811	+37
Bracken	No	8,488	0.04	211	+3
Campbell	No	90,336	0.57	1,680	+2
Gallatin	No	8,589	0.08	705	+9
Grant	No	24,662	0.09	2,115	+9
Kenton	No	159,720	0.97	8,032	+5
Pendleton	No	14,877	0.05	389	+3
Ohio:					
Brown	No	44,846	0.09	2,263	+5
Butler	Yes	368,130	0.78	34,447	+10
Clermont	Yes	197,363	0.43	18,733	+10
Clinton	Yes	42,040	0.10	1,378	+3
Hamilton	Yes	802,374	1.94	-41,916	-5
Warren	Yes	212,693	0.52	52,006	+32
Area-wide		2,172,191	0.45	116,914	+6

Sources: U.S. Census Bureau population estimates for 2010 as of August 4, 2011. (http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_10_PL_GCTPL2.STO5&prodType=table)

Population Observations by State

Ohio:

For Ohio, the population data show that Butler, Clermont, Hamilton, and Warren Counties have comparatively large populations and population densities and are densely populated. This implies that the population-related VOC and NOx emissions in these counties are relatively high. In addition, the population change percentages in Butler, Clermont, and Warren Counties between 2000 and 2010 exceed the population change percentage for the entire Cincinnati-Middletown-Wilmington, OH-KY-IN area, implying that the population-related emission contributions from these counties are increasing compared to those from other counties in the Cincinnati-Middletown-Wilmington, OH-KY-IN area.

Indiana:

The populations of the Indiana counties in the Cincinnati-Middletown-Wilmington, OH-KY-IN CSA are smaller than those of the Ohio counties and larger Kentucky counties in this CSA, but Dearborn County has a moderate population implying moderate population-related VOC and NOx emissions. In addition, the population change percentage change from 2000 to 2010 in Dearborn County is greater than the population change percentage for the entire Cincinnati-Middletown-Wilmington, OH-KY-IN CSA, implying that the population-related emission contribution from this county may be increasing relative to those from other counties in the Cincinnati-Middletown-Wilmington, OH-KY-IN area. Ohio County, Indiana also has a greater population change percentage as well, but the lower population in this county causes this change to be less significant.

Kentucky:

For Kentucky, Boone, Campbell, and Kenton Counties have relatively high populations and population densities when compared to the rest of the CSA. Bracken, Gallatin, Grant and Pendleton Counties are smaller when compared to the counties included in the non-attainment recommendation. Boone County at 37 percent growth and Warren County at 32 percent growth had the highest percentage of population growth for any of the counties in the Cincinnati-Middletown-Wilmington CSA. Other counties in this CSA did not have as large of a population percentage change, with their growth rates ranging from a 2 to 10 percent increase. Hamilton County population decreased by 5 percent from 2000-2010.

Traffic and Commuting Patterns

EPA evaluated the total VMT for each county in the Cincinnati-Middletown-Wilmington, OH-KY-IN CSA. In combination with the population/population density data and the location of main transportation arteries (see above area map), this information helps identify the probable

location of non-point source emissions. A county with high VMT is generally an integral part of an urban area and indicates the presence of relatively high motor vehicle emissions that may significantly contribute to ozone formation and transport that contributes to nonattainment in the urban area. Rapid population or VMT growth in a county on the urban perimeter signifies increasing integration with the core urban area, and suggests that this county should be included in the ozone nonattainment area, particularly if the VOC and/or NOx emissions in this county are a significant portion of the total emissions in the nonattainment area.

Table 6 shows the traffic levels, total 2008 VMT, in each county in the Cincinnati-Middletown-Wilmington, OH-KY-IN CSA.

Table 6. Traffic Levels in the Cincinnati-Middletown-Wilmington, OH-KY-IN CSA

State/County	State Recommended Nonattainment	2008 VMT* (million miles)
Indiana:		
Dearborn	No	904
Franklin	No	316
Ohio	No	63
Kentucky:		
Boone	No	1,095
Bracken	No	89
Campbell	No	1,005
Gallatin	No	278
Grant	No	432
Kenton	No	1,669
Pendleton	No	182
Ohio:		
Brown	No	413
Butler	Yes	2,469
Clermont	Yes	1,464
Clinton	Yes	655
Hamilton	Yes	7,391
Warren	Yes	1,640
Area-wide		20,063

* MOBILE model VMT are those input into the NEI version 1.5 use to compute the mobile source portion of the NEI emissions summarized above in Table 4.

VMT Observations by State

Ohio:

For Ohio, the VMT data show that VMT levels in Butler, Clermont, Hamilton, and Warren Counties are comparatively higher than those in Brown and Clinton Counties and, accumulatively, are a significant portion of the total VMT for the Cincinnati-Middletown-Wilmington, OH-KY-IN CSA.

Indiana:

For Indiana, the data show that VMT level in Dearborn County is a comparatively high portion of the total VMT for the Cincinnati-Middletown-Wilmington, OH-KY-IN CSA.

Kentucky:

The VMT data show that VMT levels in Boone, Campbell, and Kenton Counties are larger than those in Bracken, Gallatin, Grant, and Pendleton Counties and, accumulatively, are a large portion of the total VMT for the Cincinnati-Middletown-Wilmington, OH-KY-IN CSA.

Additional Emissions-Related Data Discussed in Indiana's March 11, 2009 Designation Recommendation Submittal

Indiana provided additional information about the controls for the American Electric Power (AEP) - Tanner's Creek Generating Station. Due to a consent decree, three of the four electric generating units have applied non-catalytic reduction systems. The plant as a whole is also controlled by low NO_x burner technology. This shows that there are some controls in place for the facility. Indiana provided emissions date from point sources for 2005 by county. Of the three counties in Indiana considered in this area, Dearborn County contributed 100% of the point source emissions for NO_x and VOC. Indiana also provided additional information about commuter data that should 13.9% of the Dearborn County workforce was from outside counties (3,178 workers in 2006) and 39.8% of the Dearborn County labor force works outside of the county, mostly in Ohio (8,895 workers in 2006) and Kentucky (2,111 workers in 2006).

Factor 3: Meteorology (Weather/Transport Patterns)

EPA evaluated available meteorological data to help determine how meteorological conditions, particularly transport conditions, affect the fate and transport of ozone and ozone precursors contributing to ozone formation in the Cincinnati-Middletown-Wilmington, OH-KY-IN CSA. The wind direction percentages show that there is no "preferred" wind direction during the summertime. Transport winds can and do blow from all directions into the counties with the recorded violations of the 2008 ozone NAAQS. There is, however, an indication that winds from south-southwest and west-southwest (collectively, the southwest quadrant) may be more prevalent than winds from other wind directions during the summertime in all three ozone standard violation counties.

Factor 4: Geography/Topography (Mountain Ranges or Other Air Basin Boundaries)

The geography/topography analysis evaluates the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area.

The Cincinnati-Middletown-Wilmington, OH-KY-IN CSA does not have any geographical or topographical barriers significantly limiting air pollution transport within its air shed. Therefore, this factor did not play a significant role in this evaluation.

Factor 5: Jurisdictional Boundaries

Once we identified the general area that we anticipated we would recommend as nonattainment for the 2008 ozone NAAQS, we then considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary and to help identify the area appropriate for carrying out the air quality planning and enforcement functions for an ozone nonattainment area. Examples of jurisdictional boundaries include existing/prior nonattainment boundaries for ozone or other urban-scale pollutants, county boundaries, air district boundaries, township boundaries, areas covered by metropolitan planning organizations, state lines, and Reservation boundaries. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, other clearly defined and permanent landmarks or geographic coordinates may be considered.

The Cincinnati-Middletown-Wilmington, OH-KY-IN area has previously established nonattainment boundaries associated with the both the 1-hour ozone and 1997 8-hour ozone NAAQS. The Cincinnati nonattainment boundary for the 1-hour ozone NAAQS included Boone, Campbell and Kenton Counties in their entireties in Kentucky; Butler, Clermont, Hamilton and Warren Counties in their entireties in Ohio. Whereas the Cincinnati nonattainment boundary for the 1997 8-hour ozone NAAQS included Boone, Campbell and Kenton Counties in their entireties in Kentucky, Butler, Clermont, Clinton, Hamilton and Warren Counties in their entireties in Ohio, and a portion of Dearborn County (Lawrenceburg Township) in Indiana. Kentucky and Indiana have recommended a different nonattainment boundary for the 2008 ozone NAAQS for their portion of this area. Ohio recommended the same boundary as the 1997 ozone NAAQS nonattainment boundary for their portion of this area. With the exception of those counties (and partial county) that comprise the 1997 8-hour ozone boundary for this area, we believe that the remainder of the counties in the CSA do not contribute to the violations at the monitors in this area and, therefore, are not necessary for consideration as part of the nonattainment area.

Conclusion

Ohio:

Based on the assessment of factors described above, EPA has preliminarily concluded that the following Ohio counties should be included in the Cincinnati-Middletown-Wilmington, OH-KY-IN ozone nonattainment area because they are either violating the 2008 ozone NAAQS or contributing to a violation of the 2008 ozone NAAQS within this preliminary nonattainment area: Butler; Clermont; Clinton; Hamilton; and, Warren.

Table 8a summarizes which factors, discussed above, support the inclusion of each Ohio county in the intended nonattainment area for the 2008 ozone NAAQS. Note that Table 8a covers all Ohio counties in the Cincinnati-Middletown-Wilmington, OH-KY-IN CSA, but that not all of these counties are included in the preliminary nonattainment area for the 2008 ozone NAAQS.

Table 8a. Factors Supporting Inclusion of Ohio Counties in the Cincinnati-Middletown-Wilmington, OH-KY-IN Ozone Nonattainment Area for the 2008 Ozone NAAQS

County	Violates Ozone Standard	High Emissions Population and Traffic Levels	Meteorology Favors Emissions Impact on Violating Monitor	Geography Favors High Ozone or Emissions Impact on Violating Monitor	Jurisdictional Basis for Inclusion In Nonattainment Area
Butler	X	X	X	NA	X
Clermont		X	X	NA	X
Clinton			X	NA	X
Hamilton	X	X	X	NA	X
Warren	X	X	X	NA	X

The results in the above table show that Butler, Hamilton, and Warren Counties, at minimum, should be included in the ozone nonattainment area based on air quality data. In addition, these counties also have comparatively high VOC and NOx emissions, populations (high population-related emissions), and traffic levels (traffic-related emissions), which favor their inclusion in the ozone nonattainment area.

Clermont County has comparatively high VOC and NOx emissions and relatively high populations and traffic levels, which, based on meteorological considerations, can also contribute to the monitored ozone standard violations in EPA's intended ozone nonattainment area. Therefore, Clermont County should also be included in the preliminary ozone nonattainment area.

Clinton County has no monitored ozone standard violations and generally lacks the higher VOC and NOx emissions and high population and traffic levels of the other Ohio counties discussed above. Therefore, these factors do not favor the inclusion of Clinton County in the intended ozone nonattainment area. However, it is noted that Clinton County has historically been included in the Cincinnati ozone nonattainment area for the 1997 ozone NAAQS. In addition, the State of Ohio, in its March 9, 2009 ozone designation submittal, has recommended that Clinton County should be included in the ozone nonattainment area for the 2008 ozone NAAQS. Based on the jurisdictional factor and the State's recommendation, we are including Clinton County in the intended, preliminary Cincinnati-Middletown-Wilmington, OH-KY-IN ozone nonattainment area for the 2008 ozone NAAQS.

Finally, it is noted Brown County lacks ozone standard violations, and the comparatively high emissions, populations, and traffic levels of other Ohio counties in the Cincinnati-Middletown-Wilmington, OH-KY-IN CSA. In addition, this county was not included in the nonattainment area for the 1997 ozone NAAQS and Ohio has not recommended the inclusion of this county in the ozone nonattainment area for the 2008 ozone NAAQS. Based on all of these factors and facts, we are not including Brown County in the intended Cincinnati-Middletown-Wilmington, OH-KY-IN ozone nonattainment area for the 2008 ozone NAAQS.

Indiana:

Based on the assessment of factors described above, EPA has preliminarily concluded that the following Indiana county should be included in the Cincinnati-Middletown-Wilmington, OH-KY-IN ozone nonattainment area because they are either violating the 2008 ozone NAAQS or contributing to a violation of the 2008 ozone NAAQS within this preliminary nonattainment area: Lawrence Township in Dearborn County.

Table 8b summarizes which factors, discussed above, support the inclusion of each Indiana county in the intended nonattainment area for the 2008 ozone NAAQS. Note that Table 8b covers all Indiana counties in the Cincinnati-Middletown-Wilmington, OH-KY-IN CSA, but that not all of these counties are included in the preliminary nonattainment area for the 2008 ozone NAAQS.

Table 8b. Factors Supporting Inclusion of Indiana Counties in the Cincinnati-Middletown-Wilmington, OH-KY-IN Ozone Nonattainment Area for the 2008 Ozone NAAQS

County	Monitored Violation for Ozone Standard	High Emissions Population and Traffic Levels	Meteorology Favors Emissions Impact on Violating Monitor	Geography Favors High Ozone or Emissions Impact on Violating Monitor	Jurisdictional Basis for Inclusion In Nonattainment Area
Dearborn - Partial		X	X	NA	X

EPA has preliminarily concluded that Franklin and Ohio Counties are not expected to contribute to the ozone standard violations in the recommended Cincinnati-Middletown-Wilmington, OH-KY-IN ozone nonattainment area. The areas are mostly rural with no point source emissions and minimal amounts of nonpoint source and mobile emissions. Franklin and Ohio Counties were not included in the Cincinnati ozone nonattainment area for the 1997 ozone NAAQS. EPA has preliminarily concluded that Franklin and Ohio Counties are to be excluded from the proposed nonattainment area.

Lawrenceburg Township in Dearborn County contains the American Electric Power (AEP) – Tanner's Creek Generating Station and has high NOx and VOC emissions. Dearborn County also has the potential to have moderate mobile source and population related VOC and NOx emissions. The inclusion of Lawrenceburg Township in the Cincinnati-Middletown-Wilmington, OH-KY-IN ozone nonattainment area would be consistent with the ozone nonattainment area for the 1997 ozone NAAQS. Lawrenceburg Township contains the only major stationary source in the Indiana portion of Cincinnati-Middletown-Wilmington, OH-KY-IN CSA and accounts for the majority of the VOC and NOx emissions in the Indiana portion of this area. The remainder of Dearborn County is fairly rural and is similar to Franklin and Ohio Counties. The inclusion of the Lawrenceburg Township portion of Dearborn County, Indiana in the intended Cincinnati-Middletown-Wilmington, OH-KY-IN nonattainment area for the 2008 ozone NAAQS is sufficient to account for the contribution of this county.

Kentucky:

Table 8c summarizes which factors discussed above support the inclusion of Kentucky counties in the intended nonattainment area for the 2008 ozone NAAQS. Note that Table 8c covers all Kentucky counties in the Cincinnati-Middletown-Wilmington, OH-KY-IN CSA, but that not all of these counties are included in the preliminary nonattainment area for the 2008 ozone NAAQS.

Table 8c. Factors Supporting Inclusion of Kentucky Counties in the Cincinnati-Middletown-Wilmington, OH-KY-IN Ozone Nonattainment Area for the 2008 Ozone NAAQS

County	Monitored Violation for Ozone Standard	High Emissions Population and Traffic Levels	Meteorology Favors Emissions Impact on Violating Monitor	Geography Favors High Ozone or Emissions Impact on Violating Monitor	Jurisdictional Basis for Inclusion In Nonattainment Area
Boone		X	X	NA	X
Campbell		X	X	NA	X
Kenton		X	X	NA	X

For Kentucky, based on the assessment of factors described above, EPA has preliminarily concluded that the following counties, Boone, Campbell and Kenton, should be included as part of the Cincinnati-Middletown-Wilmington nonattainment area because they are contributing to a violation in a nearby area. Source category emissions data indicate that mobile sources and area sources are not the primary contributors of NOx to ozone formation in the Cincinnati-Middletown -Wilmington area. The analysis reveals that mobile emissions make up approximately 28 percent of the total NOx in the Cincinnati-Middletown-Wilmington area, and area sources make up approximately 12 percent of the total NOx emissions in the Cincinnati-Middletown -Wilmington area. The total of mobile sources and area sources make up approximately 40 percent of the total NOx emissions in the Cincinnati area. However, VOC emissions in Cincinnati-Middletown-Wilmington area are high for area and mobile sources. The analysis reveals that mobile emissions make up approximately 37 percent of the total VOC in the Cincinnati-Middletown-Wilmington area, and area sources make up approximately 38 percent of the total VOC emissions in the Cincinnati area. The total of mobile sources and area sources make up approximately 75 percent of the total VOC emissions in the Cincinnati-Middletown-Wilmington area. Point sources in the area make up approximately 50 percent of the total NOx emissions and approximatley10 percent of the total VOC emissions in the Cincinnati-Middletown-Wilmington Area.

Boone, Campbell, and Kenton counties' NOx and VOC precursor emissions, high VMT along with population growth suggest that these counties should be considered for inclusion in the Cincinnati-Middletown-Wilmington, OH-KY-IN ozone nonattainment area.