

Georgia's Nonattainment Area Designation Recommendations for the 2015 Ozone NAAQS - Technical Analysis Document -

This document contains Georgia Environmental Protection Division's (EPD) technical analysis for designation recommendations for areas in Georgia for the 2015 ozone National Ambient Air Quality Standards (NAAQS). This analysis was conducted in accordance with U.S. EPA's February 25, 2016 memorandum "Area Designations for the 2015 Ozone National Ambient Air Quality Standards". This memo recommends evaluating five factors:

1. Air quality data
2. Emissions and emissions-related data
3. Meteorological data
4. Geography/topography
5. Jurisdictional boundaries

Each of the 159 counties in Georgia has been evaluated and recommended as unclassifiable/attainment or nonattainment based on the available information and data.

Air Quality Data and Potential Nonattainment Areas in Georgia

Federal Reference Method (FRM) measurements of ozone concentrations in Georgia, during the most recent three consecutive years (2013-2015), were analyzed and used to identify sites currently violating the 2015 ozone NAAQS of 0.070 ppm. These ozone measurements have been quality-assured and certified and are stored in EPA's Air Quality System (AQS) database. Design values (DV) were calculated for each monitor by averaging the fourth-highest daily maximum 8-hour average ozone concentrations for three consecutive years. If the 2013-2015 DV for a monitor is greater than 0.070 ppm, the monitor is violating the NAAQS.

According to the U.S. EPA's February 25, 2016 memorandum "Area Designations for the 2015 Ozone National Ambient Air Quality Standards":

"...Section 107(d) explicitly requires that the EPA designate as nonattainment not only the area that is violating the pertinent standard, but also those nearby areas that contribute to the violation in the violating area. After identifying each monitor that indicates a violation of the 2015 ozone NAAQS in an area, the EPA will determine which nearby areas contribute to the violation(s)."

“...for analyzing whether nearby areas contribute to a violating area. The EPA intends to consider information relevant to designations associated with the counties in the Combined Statistical Area (CSA) or, where appropriate, the Core Based Statistical Area (CBSA) in which the violating monitor(s) are located. The CSAs and CBSAs are delineated by the Office of Management and Budget (OMB) as part of their Metropolitan and Micropolitan Statistical Area program.”

Of the 21 ozone monitors in Georgia, there are currently three (3) monitors in the Atlanta-Sandy Springs-Marietta, GA CBSA that are violating the 2015 ozone NAAQS (Table 1). Also, the 2013-2015 DVs in neighboring states were checked and no violating monitors were identified (Figure 1).

Table 1. 2013-2015 design values (DV) at each ozone monitor in Georgia by CBSA. Counties in red are violating the 2015 ozone NAAQS based on 2013-2015 DVs.

| CBSA Name | County | AQS Site ID | Local Site Name | 2013-2015 DVs (ppm) |
|------------------------------------|-----------------|--------------------|--|----------------------------|
| Americas, GA | Sumter | 132611001 | Leslie-Union High School | 0.058 |
| Athens-Clarke County, GA | Clarke | 130590002 | Fire Station # 7 | 0.061 |
| Atlanta-Sandy Springs-Marietta, GA | Fulton | 131210055 | Confederate Avenue | 0.073 |
| | Rockdale | 132470001 | Monastery | 0.072 |
| | Henry | 131510002 | McDonough-County Extension Office | 0.071 |
| | Gwinnett | 131350002 | Gwinnett Tech | 0.069 |
| | DeKalb | 130890002 | South DeKalb | 0.067 |
| | Douglas | 130970004 | W. Strickland Street | 0.066 |
| | Pike | 132319991 | Georgia Station | 0.066 |
| | Cobb | 130670003 | Kennesaw-National Guard | 0.065 |
| | Dawson | 130850001 | Dawsonville, Georgia Forestry Commission | 0.064 |
| | Paulding | 132230003 | Yorkville, King Farm | 0.062 |
| Coweta | 130770002 | Newnan | 0.062 | |
| Augusta-Richmond County, GA-SC | Richmond | 132450091 | Bungalow Road | 0.061 |
| | Columbia | 130730001 | Evans-Riverside Park | 0.060 |
| Brunswick, GA | Glynn | 131270006 | Risley Middle School | 0.056 |
| Columbus, GA-AL | Muscogee | 132150008 | Columbus- Airport | 0.061 |
| Dalton, GA | Murray | 132130003 | Fort Mountain | 0.064 |
| Macon, GA | Bibb | 130210012 | Macon SE | 0.063 |
| Savannah, GA | Chatham | 130510021 | Savannah-E. President Street | 0.058 |
| Summerville, GA | Chattooga | 130550001 | Summerville-DNR Fish Hatchery | 0.060 |

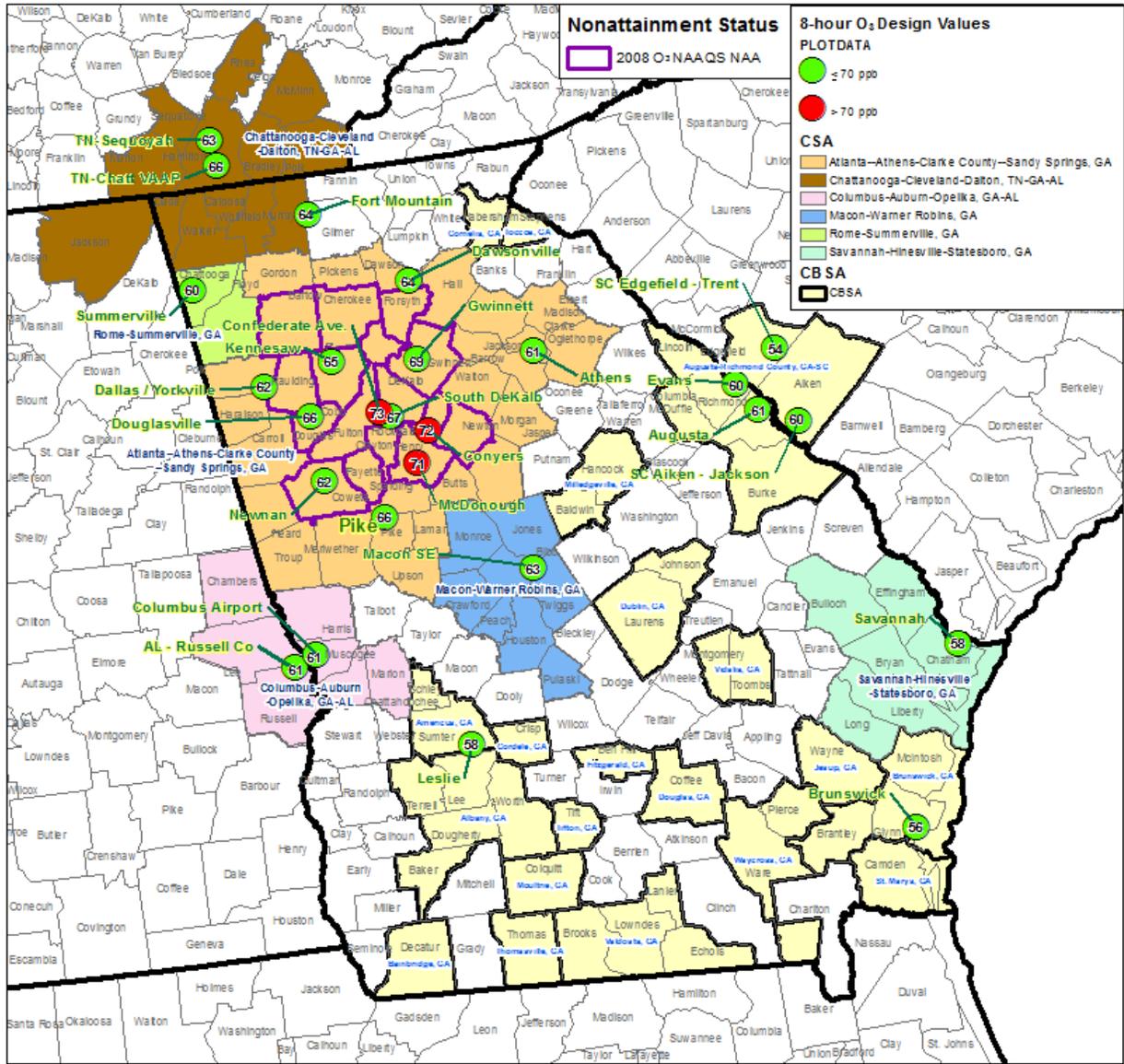


Figure 1. CSA and CBSA boundaries (CBSAs in CSAs are not shown) and 2013-2015 DVs at ozone monitors in and around Georgia. Nonattainment area boundaries for the 2008 ozone NAAQS are outlined in purple.

There are 39 counties (Table 2) in the Atlanta--Athens-Clarke County--Sandy Springs, GA CSA (Atlanta CSA). The Atlanta CSA includes the following CBSAs: Athens-Clarke County, Atlanta-Sandy Springs-Marietta, Calhoun, Cedartown, Gainesville, Jefferson, LaGrange, and Thomaston. All 39 counties in the Atlanta CSA were evaluated as potential nonattainment areas. The remaining 120 counties in Georgia have no violating monitors in their CBSAs. Therefore, no additional analysis will be performed for these counties and they will be recommended as unclassifiable/attainment.

Table 2. List of CBSAs and counties in the Atlanta CSA. Counties with violating monitors based on 2013-2015 DVs are marked in red.

| CBSA Name | County Name and Federal Information Processing Standard (FIPS) code |
|-----------------------------------|--|
| Athens-Clarke County, GA | Clarke (13059), Madison (13195), Oconee (13219), Oglethorpe (13221) |
| Atlanta-Sandy Springs-Roswell, GA | Barrow (13013), Bartow (13015), Butts (13035), Carroll (13045), Cherokee (13057), Clayton (13063), Cobb (13067), Coweta (13077), Dawson (13085), DeKalb (13089), Douglas (13097), Fayette (13113), Forsyth (13117), Fulton (13121) , Gwinnett (13135), Haralson (13143), Heard (13149), Henry (13151) , Jasper (13159), Lamar (13171), Meriwether (13199), Morgan (13211), Newton (13217), Paulding (13223), Pickens (13227), Pike (13231), Rockdale (13247) , Spalding (13255), Walton (13297) |
| Calhoun, GA | Gordon (13129) |
| Cedartown, GA | Polk (13233) |
| Gainesville, GA | Hall (13139) |
| Jefferson, GA | Jackson (13157) |
| LaGrange, GA | Troup (13285) |
| Thomaston, GA | Upson (13293) |

Five-Factor Analysis in the Atlanta CSA

The nonattainment area boundaries were evaluated using five factors as described in the U.S. EPA’s February 25, 2016 memorandum “Area Designations for the 2015 Ozone National Ambient Air Quality Standards”:

1. Air quality data
2. Emissions and emissions-related data
3. Meteorological data
4. Geography/topography
5. Jurisdictional boundaries

Factor 1: Air Quality Data

The 2013-2015 DVs at ozone monitors in Fulton, Henry, and Rockdale counties violate the 2015 ozone NAAQS. The preliminary 2016 ozone data indicate that monitors in Gwinnett and DeKalb will also violate the 2015 ozone NAAQS (Table 3). Therefore, these 5 counties with violating monitors will be recommended as nonattainment. The other 34 counties in the Atlanta CSA do not have a violating monitor. These counties were evaluated to determine whether or not they contribute to violations at the ozone monitors in Fulton, Henry, Rockdale, Gwinnett, and DeKalb.

Table 3. 2013-2015 and preliminary 2014-2016 ozone design values in the Atlanta CSA.

| County | AQS Site ID | Local Site Name | DV 2013-2015 | DV 2014-2016* |
|----------|-------------|--|--------------|---------------|
| Fulton | 131210055 | Confederate Avenue | 0.073 | 0.075 |
| Rockdale | 132470001 | Monastery | 0.072 | 0.074 |
| Henry | 131510002 | McDonough-County Extension Office | 0.071 | 0.074 |
| Gwinnett | 131350002 | Gwinnett Tech | 0.069 | 0.072 |
| DeKalb | 130890002 | South DeKalb | 0.067 | 0.071 |
| Douglas | 130970004 | W. Strickland Street | 0.066 | 0.068 |
| Pike | 132319991 | Georgia Station | 0.066 | 0.068 |
| Cobb | 130670003 | Kennesaw-National Guard | 0.065 | 0.066 |
| Dawson | 130850001 | Dawsonville, Georgia Forestry Commission | 0.064 | 0.065 |
| Coweta | 130770002 | Newnan | 0.062 | 0.066 |
| Paulding | 132230003 | Yorkville, King Farm | 0.062 | 0.062 |
| Clarke | 130590002 | Fire Station # 7 | 0.061 | 0.064 |

*The 2014-2016 preliminary design values are based on uncertified ozone data through August 21, 2016.

Factor 2: Emissions and Emissions-Related Data

EPD evaluated emissions of ozone precursors and other emissions-related data that provide information on areas contributing to the violating monitors.

NO_x and VOC Emissions Data

EPD analyzed county-level emissions data for nitrogen oxides (NO_x) and volatile organic compounds (VOCs) from the 2011 National Emissions Inventory (NEI)¹. Most of the 2014 NEI data is still draft, but the 2014 point source emissions are very reliable since they matched the emissions that EPD submitted to EPA's Emissions Inventory System (EIS) for the 2014 NEI. Therefore, EPD replaced 2011 point source emissions data with 2014 point source emissions data. This is the best available data to represent recent NO_x (Table 4) and VOC (Table 6) emission levels in the Atlanta CSA. In addition to the county-level emissions (tons per year, tpy), emission densities (tons per year per square mile, tpy/mile²) were also calculated since all counties are not the same size geographically. Significant emissions levels in a nearby county may indicate the potential for that area to contribute to observed ozone violations. Percent of NO_x (Table 5) and VOC (Table 7) emissions by source categories (including fire, nonpoint, nonroad, onroad, and point) are summarized by each county in the Atlanta CSA. Fire emissions include prescribed fires and wildfires. Nonpoint (area source) emissions include small-scale industrial, commercial, and residential sources that generate emissions. Nonroad vehicles do not typically operate on roads or highways and include agricultural equipment; construction and mining equipment; lawn and garden equipment; aircraft and airport equipment; locomotives; and commercial marine vessels. Onroad mobile emission sources consist of automobiles, trucks, motorcycles, and other motor vehicles traveling on public roadways. Point sources include Electric Generating Units (EGUs) and non-EGUs.

¹ Obtained from <https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data>.

NOx emissions from 6 counties (Fulton, Gwinnett, DeKalb, Cobb, Bartow, and Clayton) are each higher than 10,000 tpy. Also, each of these counties has more than double (>100%) the CSA average NOx emissions, has a NOx emission density of more than 26 tpy/mi², and are more than 75% higher than the Atlanta CSA average NOx emission density. None of the other 33 counties in the Atlanta CSA meet any of these criteria. In total, NOx emissions from Fulton, Gwinnett, DeKalb, Cobb, Bartow, and Clayton account for 51.5% of all NOx emissions in the Atlanta CSA. The majority of the NOx emissions in Fulton (70.6%), Gwinnett (68.3%), DeKalb (76.8%), and Cobb (61.6%) come from on-road mobile sources. The NOx emissions in Bartow mostly come from on-road mobile (33.9%) and point (55.6%), some of which is attributed to Georgia Power's Plant Bowen. The NOx emissions in Clayton mostly come from on-road mobile (45.0%) and non-road mobile (55.6%), some of which is attributed to airport emissions from the Hartsfield-Jackson Atlanta International Airport.

Modeling studies have demonstrated that emission reductions of anthropogenic VOCs have a much smaller impact on daily 8-hour ozone concentrations in the Southeastern U.S. compared to NOx emissions². In addition, GA EPD has demonstrated that the Atlanta area is strongly NOx limited as presented in the Atlanta 8-hour Ozone Attainment Demonstration submitted to EPA on October 21, 2009. For this reason, the VOC emission factor will account for a lower total percent of emissions than in our NOx analysis. VOC emissions from 4 counties (Fulton, Gwinnett, Cobb, and DeKalb) are each higher than 20,000 tpy. Also, each of these counties is more than 75% higher than the CSA average VOC emissions. Cobb, DeKalb, and Clayton have a VOC emission density of more than 65 tpy/mi², and are more than 65% higher than the Atlanta CSA average VOC emission density. None of the other 34 counties in the Atlanta CSA meet any of these criteria. In total, VOC emissions from Fulton, Gwinnett, DeKalb, Cobb, and Clayton account for 23.4% of all VOC emissions in the Atlanta CSA. The majority of the VOC emissions in Fulton (65.4%), Gwinnett (60.9%), Cobb (64.0%), DeKalb (62.2%), and Clayton (61.6%) come from nonpoint (area) sources.

² Odman M.T., Hu Y., Russell A.G., Hanedar A., Boylan J.W., and Brewer P.F., 2009, Quantifying the sources of ozone, fine particulate matter, and regional haze in the Southeastern United States, *Journal of Environmental Management*, 90, 3155–3168.

Table 4. NO_x Emissions by county in the Atlanta CSA. Red values meet EPD thresholds.

| County | NO _x (tpy) | NO _x % CSA Total | NO _x % CSA Average | NO _x Density (tpy/sq mi) | NO _x Density % of CSA Average |
|-----------------|--------------------------|--------------------------------|----------------------------------|--|---|
| Fulton | 23,218 | 13.0% | 408.1% | 43.48 | 194.9% |
| Gwinnett | 16,576 | 9.3% | 262.8% | 37.93 | 157.2% |
| DeKalb | 14,617 | 8.2% | 219.9% | 53.94 | 265.8% |
| Cobb | 13,716 | 7.7% | 200.2% | 39.76 | 169.6% |
| Bartow | 13,059 | 7.3% | 185.8% | 27.79 | 88.4% |
| Clayton | 10,675 | 6.0% | 133.6% | 74.13 | 402.7% |
| Henry | 6,786 | 3.8% | 48.5% | 20.75 | 40.7% |
| Hall | 5,347 | 3.0% | 17.0% | 12.46 | -15.5% |
| Coweta | 4,998 | 2.8% | 9.4% | 11.21 | -24.0% |
| Carroll | 4,464 | 2.5% | -2.3% | 8.86 | -39.9% |
| Cherokee | 4,375 | 2.5% | -4.3% | 10.08 | -31.6% |
| Jackson | 4,012 | 2.3% | -12.2% | 11.70 | -20.7% |
| Troup | 3,884 | 2.2% | -15.0% | 8.71 | -40.9% |
| Forsyth | 3,690 | 2.1% | -19.3% | 14.94 | 1.3% |
| Gordon | 3,469 | 1.9% | -24.1% | 9.69 | -34.3% |
| Douglas | 3,046 | 1.7% | -33.3% | 15.15 | 2.8% |
| Heard | 3,031 | 1.7% | -33.7% | 10.07 | -31.7% |
| Clarke | 3,027 | 1.7% | -33.8% | 25.02 | 69.7% |
| Newton | 3,017 | 1.7% | -34.0% | 10.81 | -26.7% |
| Paulding | 2,688 | 1.5% | -41.2% | 8.56 | -42.0% |
| Madison | 2,540 | 1.4% | -44.4% | 8.88 | -39.8% |
| Walton | 2,424 | 1.4% | -47.0% | 7.35 | -50.2% |
| Morgan | 2,364 | 1.3% | -48.3% | 6.66 | -54.8% |
| Fayette | 2,240 | 1.3% | -51.0% | 11.26 | -23.7% |
| Barrow | 2,229 | 1.3% | -51.2% | 13.68 | -7.2% |
| Rockdale | 2,117 | 1.2% | -53.7% | 16.04 | 8.8% |
| Butts | 1,900 | 1.1% | -58.4% | 10.10 | -31.5% |
| Meriwethe | 1,869 | 1.0% | -59.1% | 3.70 | -74.9% |
| Haralson | 1,743 | 1.0% | -61.9% | 6.16 | -58.2% |
| Spalding | 1,714 | 1.0% | -62.5% | 8.57 | -41.9% |
| Polk | 1,562 | 0.9% | -65.8% | 5.01 | -66.1% |
| Upson | 1,399 | 0.8% | -69.4% | 4.27 | -71.1% |
| Oconee | 1,370 | 0.8% | -70.0% | 7.37 | -50.0% |
| Lamar | 1,141 | 0.6% | -75.0% | 6.13 | -58.4% |
| Pickens | 1,089 | 0.6% | -76.2% | 4.67 | -68.3% |
| Dawson | 760 | 0.4% | -83.4% | 3.55 | -75.9% |
| Jasper | 730 | 0.4% | -84.0% | 1.96 | -86.7% |
| Pike | 674 | 0.4% | -85.2% | 3.08 | -79.1% |
| Oglethorpe | 644 | 0.4% | -85.9% | 1.46 | -90.1% |
| Average | 4,569 | | | 14.75 | |
| Total | 178,201 | 100.0% | | | |

Table 5. Percent of NO_x emissions by county and source categories in the Atlanta CSA.

| County | Fires | Nonpoint | Nonroad | Onroad | Point |
|----------------------------|--------------|-----------------|----------------|---------------|--------------|
| Fulton | 0.0% | 10.5% | 17.0% | 70.6% | 1.9% |
| Gwinnett | 0.0% | 8.0% | 23.7% | 68.3% | 0.0% |
| DeKalb | 0.0% | 8.9% | 13.4% | 76.8% | 0.9% |
| Cobb | 0.0% | 13.8% | 18.9% | 61.6% | 5.7% |
| Bartow | 0.1% | 6.5% | 3.9% | 33.9% | 55.6% |
| Clayton | 0.0% | 4.1% | 49.8% | 45.0% | 1.0% |
| Henry | 0.1% | 9.2% | 13.1% | 53.6% | 24.0% |
| Hall | 0.0% | 9.7% | 16.6% | 70.5% | 3.2% |
| Coweta | 1.2% | 11.3% | 9.8% | 52.3% | 25.5% |
| Carroll | 0.4% | 9.8% | 11.1% | 77.9% | 0.8% |
| Cherokee | 0.1% | 7.4% | 23.0% | 67.2% | 2.3% |
| Jackson | 0.1% | 6.2% | 9.6% | 77.0% | 7.2% |
| Troup | 1.3% | 16.1% | 8.2% | 73.0% | 1.4% |
| Forsyth | 0.0% | 6.1% | 27.0% | 65.4% | 1.4% |
| Gordon | 0.1% | 23.1% | 7.7% | 68.8% | 0.2% |
| Douglas | 0.1% | 10.0% | 12.4% | 77.5% | 0.0% |
| Heard | 0.9% | 4.2% | 2.1% | 10.1% | 82.6% |
| Clarke | 0.0% | 9.8% | 16.6% | 66.1% | 7.5% |
| Newton | 0.6% | 8.5% | 15.0% | 74.9% | 1.0% |
| Paulding | 0.2% | 18.3% | 15.3% | 66.2% | 0.0% |
| Madison | 0.5% | 11.7% | 2.1% | 28.1% | 57.5% |
| Walton | 0.5% | 10.3% | 16.6% | 67.7% | 4.8% |
| Morgan | 1.9% | 11.7% | 6.6% | 75.1% | 4.8% |
| Fayette | 0.0% | 14.5% | 21.6% | 63.5% | 0.3% |
| Barrow | 0.1% | 12.9% | 10.4% | 74.9% | 1.8% |
| Rockdale | 0.1% | 9.5% | 15.6% | 72.2% | 2.6% |
| Butts | 0.8% | 20.6% | 4.9% | 73.7% | 0.0% |
| Meriwether | 6.3% | 33.4% | 4.4% | 44.4% | 11.4% |
| Haralson | 0.8% | 18.9% | 3.6% | 76.7% | 0.0% |
| Spalding | 0.9% | 12.0% | 10.4% | 76.7% | 0.0% |
| Polk | 1.0% | 28.7% | 7.6% | 58.2% | 4.5% |
| Upson | 5.4% | 13.6% | 4.9% | 42.4% | 33.6% |
| Oconee | 0.5% | 11.3% | 15.1% | 73.1% | 0.0% |
| Lamar | 1.1% | 12.5% | 5.4% | 59.3% | 21.7% |
| Pickens | 1.0% | 10.4% | 13.9% | 74.3% | 0.4% |
| Dawson | 1.3% | 10.1% | 16.8% | 71.8% | 0.0% |
| Jasper | 13.6% | 25.8% | 8.9% | 47.7% | 4.0% |
| Pike | 5.9% | 20.7% | 9.4% | 64.0% | 0.0% |
| Oglethorpe | 9.0% | 26.1% | 10.8% | 54.2% | 0.0% |
| All counties in CSA | 0.4% | 10.6% | 16.2% | 62.7% | 10.1% |

Table 6. Anthropogenic VOC emissions by county in the Atlanta CSA. Red values meet EPD thresholds.

| County | VOC (tpy) | VOC % CSA Total | VOC % CSA Average | VOC Density (tpy/sq mi) | VOC Density % CSA Average |
|-----------------|----------------|-----------------|-------------------|-------------------------|---------------------------|
| Fulton | 30,934 | 6.3% | 147.3% | 57.93 | 43.5% |
| Gwinnett | 26,794 | 5.5% | 114.2% | 61.31 | 51.9% |
| Cobb | 23,603 | 4.8% | 88.7% | 68.41 | 69.5% |
| DeKalb | 21,988 | 4.5% | 75.8% | 81.14 | 101.0% |
| Hall | 16,310 | 3.3% | 30.4% | 38.02 | -5.8% |
| Meriwether | 16,142 | 3.3% | 29.0% | 31.97 | -20.8% |
| Troup | 16,013 | 3.3% | 28.0% | 35.9 | -11.1% |
| Bartow | 15,601 | 3.2% | 24.7% | 33.19 | -17.8% |
| Cherokee | 15,509 | 3.2% | 24.0% | 35.73 | -11.5% |
| Carroll | 15,403 | 3.2% | 23.1% | 30.56 | -24.3% |
| Coweta | 14,826 | 3.0% | 18.5% | 33.24 | -17.7% |
| Oglethorpe | 13,694 | 2.8% | 9.5% | 30.98 | -23.3% |
| Jasper | 13,128 | 2.7% | 4.9% | 35.2 | -12.8% |
| Upson | 12,712 | 2.6% | 1.6% | 38.76 | -4.0% |
| Paulding | 11,592 | 2.4% | -7.3% | 36.92 | -8.6% |
| Morgan | 11,579 | 2.4% | -7.4% | 32.62 | -19.2% |
| Henry | 11,494 | 2.4% | -8.1% | 35.15 | -12.9% |
| Gordon | 11,265 | 2.3% | -10.0% | 31.47 | -22.1% |
| Newton | 11,071 | 2.3% | -11.5% | 39.68 | -1.7% |
| Polk | 11,022 | 2.3% | -11.9% | 35.33 | -12.5% |
| Clayton | 10,996 | 2.3% | -12.1% | 76.36 | 89.1% |
| Heard | 10,796 | 2.2% | -13.7% | 35.87 | -11.2% |
| Walton | 10,651 | 2.2% | -14.9% | 32.27 | -20.1% |
| Forsyth | 10,553 | 2.2% | -15.6% | 42.72 | 5.8% |
| Haralson | 10,351 | 2.1% | -17.3% | 36.58 | -9.4% |
| Jackson | 10,230 | 2.1% | -18.2% | 29.82 | -26.1% |
| Douglas | 9,660 | 2.0% | -22.8% | 48.06 | 19.0% |
| Madison | 8,938 | 1.8% | -28.5% | 31.25 | -22.6% |
| Pickens | 8,649 | 1.8% | -30.9% | 37.12 | -8.1% |
| Fayette | 8,554 | 1.8% | -31.6% | 42.99 | 6.5% |
| Butts | 8,162 | 1.7% | -34.8% | 43.41 | 7.5% |
| Pike | 8,059 | 1.7% | -35.6% | 36.8 | -8.9% |
| Clarke | 7,829 | 1.6% | -37.4% | 64.7 | 60.3% |
| Spalding | 7,728 | 1.6% | -38.2% | 38.64 | -4.3% |
| Lamar | 7,588 | 1.6% | -39.3% | 40.8 | 1.0% |
| Dawson | 7,555 | 1.5% | -39.6% | 35.31 | -12.6% |
| Barrow | 7,132 | 1.5% | -43.0% | 43.75 | 8.4% |
| Rockdale | 7,010 | 1.4% | -44.0% | 53.1 | 31.5% |
| Oconee | 6,774 | 1.4% | -45.9% | 36.42 | -9.8% |
| Average | 12,510 | | | 40.37 | |
| Total | 487,894 | 100.0% | | | |

Table 7. Percent of anthropogenic VOC emissions by county and source categories in the Atlanta CSA.

| County | Fires | Nonpoint | Nonroad | Onroad | Point |
|----------------------------|--------------|-----------------|----------------|---------------|--------------|
| Fulton | 0.0% | 65.4% | 9.6% | 24.2% | 0.8% |
| Gwinnett | 0.0% | 60.9% | 14.3% | 24.6% | 0.3% |
| Cobb | 0.0% | 64.0% | 12.6% | 21.4% | 2.1% |
| DeKalb | 0.0% | 62.2% | 6.2% | 25.8% | 5.8% |
| Hall | 0.0% | 73.7% | 9.9% | 13.8% | 2.6% |
| Meriwether | 1.5% | 94.6% | 1.3% | 2.2% | 0.4% |
| Troup | 0.7% | 84.6% | 4.7% | 6.6% | 3.5% |
| Bartow | 0.1% | 81.3% | 4.7% | 11.6% | 2.2% |
| Cherokee | 0.1% | 84.0% | 5.4% | 10.3% | 0.2% |
| Carroll | 0.2% | 84.1% | 2.8% | 11.1% | 1.8% |
| Coweta | 0.8% | 88.5% | 2.4% | 7.6% | 0.6% |
| Oglethorpe | 0.9% | 97.0% | 0.6% | 1.5% | 0.0% |
| Jasper | 1.5% | 95.3% | 0.7% | 1.6% | 0.9% |
| Upson | 1.2% | 92.8% | 0.6% | 3.0% | 2.4% |
| Paulding | 0.1% | 88.8% | 2.4% | 8.7% | 0.0% |
| Morgan | 0.8% | 90.5% | 2.2% | 4.2% | 2.3% |
| Henry | 0.1% | 75.9% | 5.0% | 15.2% | 3.8% |
| Gordon | 0.1% | 86.4% | 4.1% | 8.9% | 0.5% |
| Newton | 0.3% | 80.4% | 3.5% | 12.1% | 3.6% |
| Polk | 0.3% | 91.6% | 0.9% | 5.1% | 2.1% |
| Clayton | 0.1% | 61.6% | 14.4% | 22.0% | 1.9% |
| Heard | 0.5% | 94.2% | 0.9% | 1.6% | 2.9% |
| Walton | 0.2% | 85.3% | 2.7% | 10.8% | 0.9% |
| Forsyth | 0.0% | 73.8% | 12.4% | 11.9% | 1.9% |
| Haralson | 0.3% | 90.5% | 0.6% | 5.0% | 3.7% |
| Jackson | 0.1% | 85.4% | 1.8% | 10.7% | 2.0% |
| Douglas | 0.1% | 85.5% | 2.5% | 11.9% | 0.0% |
| Madison | 0.3% | 91.3% | 2.3% | 4.7% | 1.5% |
| Pickens | 0.2% | 91.7% | 2.7% | 5.3% | 0.0% |
| Fayette | 0.0% | 82.0% | 6.0% | 11.1% | 0.8% |
| Butts | 0.4% | 92.6% | 1.2% | 5.8% | 0.0% |
| Pike | 0.9% | 93.2% | 2.6% | 3.3% | 0.0% |
| Clarke | 0.0% | 80.0% | 3.4% | 16.3% | 0.3% |
| Spalding | 0.4% | 86.3% | 1.7% | 10.8% | 0.8% |
| Lamar | 0.3% | 92.0% | 0.7% | 4.0% | 3.1% |
| Dawson | 0.3% | 94.0% | 1.5% | 4.2% | 0.0% |
| Barrow | 0.1% | 82.9% | 2.4% | 13.8% | 0.8% |
| Rockdale | 0.1% | 83.1% | 3.7% | 10.6% | 2.5% |
| Oconee | 0.2% | 89.5% | 2.0% | 8.3% | 0.0% |
| All counties in CSA | 0.3% | 81.3% | 5.0% | 11.7% | 1.6% |

Population Density and VMT Data

EPD evaluated the population and vehicle use characteristics and trends in the Atlanta CSA. This information is a good indicator for nonpoint, on-road mobile, and non-road mobile source emissions. Areas of dense population and traffic usually are associated with higher nonpoint and mobile emissions, and may contribute to counties with violating ozone monitors. Rapid growth of population and VMT in a county indicates increasing integration with the core urban area.

2010 population data was obtained from the designation data provided by EPA³. 2013 population data was obtained from the Georgia statistics center⁴. Table 8 summarizes 2010 and 2013 population data, as well as population density and population trends. 2010 and 2013 population in five counties (Fulton, Gwinnett, Cobb, DeKalb, and Clayton) are each higher than 250,000 people. Fulton, Gwinnett, Cobb, DeKalb, and Clayton have a population density of more than 1,500 person/mi², and are more than triple (>200%) the CSA average population. The 2013-2010 increase in population is over 20,000 people in Fulton, Gwinnett, Cobb, and DeKalb which is more than 225% higher compared to the Atlanta CSA average. None of the other 34 counties in the Atlanta CSA meet any of these criteria. In total, population from Fulton, Gwinnett, DeKalb, Cobb, and Clayton account for 57.4% of all people in the Atlanta CSA.

2011 vehicle miles traveled (VMT) data was obtained from the designation data provided by EPA². 2014 VMT data was developed by EPD as part of the 2014 NEI. Table 9 summarizes 2011 and 2014 VMT data. VMT from 6 counties (Fulton, Gwinnett, Cobb, DeKalb, Clayton, and Henry) are each higher than 2.2x10⁹ miles for 2011 and higher than 2.4x10⁹ miles for 2014. VMT from Fulton, Gwinnett, Cobb, DeKalb, Clayton, and Henry are each 30% higher compared to the Atlanta CSA average. None of the other 33 counties in the Atlanta CSA meet any of these criteria. In total, VMT from Fulton, Gwinnett, DeKalb, Cobb, Clayton, and Henry account for 60.8% of all VMT in the Atlanta CSA.

³ Download from <https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data#F2>.

⁴ <http://georgiastats.uga.edu>

Table 8. Population and growth in the Atlanta CSA. Red values meet EPD thresholds.

| County | 2010 Population | 2013 Population | % CSA Total | 2013 Density | % CSA Average | 2013-2010 Change | % CSA Change Average |
|-----------------|--------------------|--------------------|----------------|-----------------|------------------|---------------------|-------------------------|
| Fulton | 920,581 | 984,293 | 15.97% | 1,843 | 261.5% | 63,712 | 886.4% |
| Gwinnett | 805,321 | 859,304 | 13.94% | 1,966 | 285.6% | 53,983 | 735.8% |
| Cobb | 688,078 | 717,190 | 11.64% | 2,079 | 307.7% | 29,112 | 350.7% |
| DeKalb | 691,893 | 713,340 | 11.58% | 2,632 | 416.2% | 21,447 | 232.1% |
| Clayton | 259,424 | 264,220 | 4.29% | 1,835 | 259.8% | 4,796 | -25.7% |
| Cherokee | 214,346 | 225,106 | 3.65% | 519 | 1.7% | 10,760 | 66.6% |
| Henry | 203,922 | 211,128 | 3.43% | 646 | 26.6% | 7,206 | 11.6% |
| Forsyth | 175,511 | 195,405 | 3.17% | 791 | 55.1% | 19,894 | 208.0% |
| Hall | 179,684 | 187,745 | 3.05% | 438 | -14.2% | 8,061 | 24.8% |
| Paulding | 142,324 | 146,950 | 2.38% | 468 | -8.2% | 4,626 | -28.4% |
| Douglas | 132,403 | 136,379 | 2.21% | 679 | 33.1% | 3,976 | -38.4% |
| Coweta | 127,317 | 133,180 | 2.16% | 299 | -41.4% | 5,863 | -9.2% |
| Clarke | 116,714 | 121,265 | 1.97% | 1,002 | 96.5% | 4,551 | -29.5% |
| Carroll | 110,527 | 112,355 | 1.82% | 223 | -56.3% | 1,828 | -71.7% |
| Fayette | 106,567 | 108,365 | 1.76% | 545 | 6.8% | 1,798 | -72.2% |
| Newton | 99,958 | 102,446 | 1.66% | 367 | -28.0% | 2,488 | -61.5% |
| Bartow | 100,157 | 101,273 | 1.64% | 215 | -57.7% | 1,116 | -82.7% |
| Rockdale | 85,215 | 86,919 | 1.41% | 658 | 29.1% | 1,704 | -73.6% |
| Walton | 83,768 | 85,754 | 1.39% | 260 | -49.0% | 1,986 | -69.3% |
| Barrow | 69,367 | 71,453 | 1.16% | 438 | -14.0% | 2,086 | -67.7% |
| Troup | 67,044 | 69,053 | 1.12% | 155 | -69.6% | 2,009 | -68.9% |
| Spalding | 64,073 | 63,829 | 1.04% | 319 | -37.4% | -244 | -103.8% |
| Jackson | 60,485 | 61,044 | 0.99% | 178 | -65.1% | 559 | -91.3% |
| Gordon | 55,186 | 55,757 | 0.90% | 156 | -69.5% | 571 | -91.2% |
| Polk | 41,475 | 41,183 | 0.67% | 132 | -74.1% | -292 | -104.5% |
| Oconee | 32,808 | 34,035 | 0.55% | 183 | -64.1% | 1,227 | -81.0% |
| Pickens | 29,431 | 29,584 | 0.48% | 127 | -75.1% | 153 | -97.6% |
| Haralson | 28,780 | 28,495 | 0.46% | 101 | -80.3% | -285 | -104.4% |
| Madison | 28,120 | 28,057 | 0.46% | 98 | -80.8% | -63 | -101.0% |
| Upson | 27,153 | 26,566 | 0.43% | 81 | -84.1% | -587 | -109.1% |
| Butts | 23,655 | 23,361 | 0.38% | 124 | -75.6% | -294 | -104.6% |
| Dawson | 22,330 | 22,686 | 0.37% | 106 | -79.2% | 356 | -94.5% |
| Meriwet | 21,992 | 21,232 | 0.34% | 42 | -91.8% | -760 | -111.8% |
| Lamar | 18,317 | 17,959 | 0.29% | 97 | -81.1% | -358 | -105.5% |
| Pike | 17,869 | 17,796 | 0.29% | 81 | -84.1% | -73 | -101.1% |
| Morgan | 17,868 | 17,781 | 0.29% | 50 | -90.2% | -87 | -101.3% |
| Oglethor | 14,899 | 14,548 | 0.24% | 33 | -93.5% | -351 | -105.4% |
| Jasper | 13,900 | 13,601 | 0.22% | 36 | -92.8% | -299 | -104.6% |
| Heard | 11,834 | 11,558 | 0.19% | 38 | -92.5% | -276 | -104.3% |
| Average | 151,546 | 158,005 | | 509 | | 6,459 | |
| Total | 5,910,296 | 6,162,195 | 100% | | | | |

Table 9. VMT data in the Atlanta CSA. Red values meet EPD thresholds.

| County | 2011 VMT (10 ⁶) | 2014 VMT (10 ⁶) | % Total CSA | % CSA Average |
|-----------------|-----------------------------|-----------------------------|---------------|----------------|
| Fulton | 12,222 | 13,389 | 18.79% | 632.67% |
| Gwinnett | 7,422 | 8,655 | 12.14% | 373.61% |
| Cobb | 6,617 | 8,029 | 11.27% | 339.35% |
| DeKalb | 7,644 | 7,956 | 11.16% | 335.37% |
| Clayton | 2,881 | 2,834 | 3.98% | 55.06% |
| Henry | 2,215 | 2,441 | 3.42% | 33.56% |
| Forsyth | 1,690 | 2,124 | 2.98% | 16.23% |
| Cherokee | 1,872 | 2,119 | 2.97% | 15.96% |
| Hall | 1,762 | 2,067 | 2.90% | 13.14% |
| Bartow | 1,651 | 1,908 | 2.68% | 4.42% |
| Douglas | 1,588 | 1,758 | 2.47% | -3.82% |
| Coweta | 1,460 | 1,699 | 2.38% | -7.02% |
| Carroll | 1,249 | 1,602 | 2.25% | -12.31% |
| Paulding | 940 | 1,179 | 1.65% | -35.48% |
| Newton | 870 | 1,108 | 1.56% | -39.35% |
| Rockdale | 985 | 1,089 | 1.53% | -40.40% |
| Fayette | 888 | 1,040 | 1.46% | -43.09% |
| Clarke | 952 | 1,038 | 1.46% | -43.22% |
| Jackson | 930 | 1,026 | 1.44% | -43.87% |
| Troup | 969 | 976 | 1.37% | -46.59% |
| Walton | 698 | 906 | 1.27% | -50.42% |
| Barrow | 704 | 858 | 1.20% | -53.04% |
| Gordon | 798 | 773 | 1.08% | -57.69% |
| Spalding | 550 | 677 | 0.95% | -62.93% |
| Oconee | 478 | 477 | 0.67% | -73.90% |
| Morgan | 465 | 457 | 0.64% | -75.01% |
| Polk | 377 | 366 | 0.51% | -80.00% |
| Haralson | 343 | 338 | 0.47% | -81.50% |
| Butts | 333 | 334 | 0.47% | -81.70% |
| Pickens | 315 | 315 | 0.44% | -82.79% |
| Meriwether | 297 | 278 | 0.39% | -84.76% |
| Madison | 287 | 265 | 0.37% | -85.48% |
| Dawson | 220 | 232 | 0.32% | -87.33% |
| Lamar | 248 | 226 | 0.32% | -87.65% |
| Upson | 249 | 219 | 0.31% | -88.02% |
| Pike | 168 | 158 | 0.22% | -91.33% |
| Oglethorpe | 140 | 125 | 0.18% | -93.16% |
| Jasper | 136 | 121 | 0.17% | -93.38% |
| Heard | 124 | 107 | 0.15% | -94.13% |
| Average | 1,634 | 1,827 | | |
| Total | 63,736 | 71,268 | 100.00% | |

Factor 3: Meteorological Data

Meteorological impacts on violating monitors were evaluated using the Hybrid Single Particle Lagrangian Integrated Trajectory Model (HYSPLIT) modeling results provided by EPA⁵.

24-hour back-trajectories were created for all exceedance days (> 70 ppb) at each violating ozone monitor from 2013-2014 (Figures 2 - 6). Back-trajectories were developed for three different heights: 1000 meters (green), 500 meters (blue), and 100-meters (red). For the South DeKalb monitor (13-089-0002), the majority of the back-trajectories pass over DeKalb, Fulton, and Cobb counties. For the Confederate Avenue monitor (13-121-0055), the majority of the back-trajectories pass over DeKalb, Fulton, Cobb, and Bartow counties. For the Gwinnett Tech monitor (13-135-0002), the majority of the back-trajectories pass over Gwinnett, DeKalb, and Fulton counties. For the McDonough monitor (13-151-0002), the majority of the back-trajectories pass over Henry, DeKalb, Fulton, Cobb, Clayton, and Bartow counties. For the Conyers monitor (13-247-0001), the majority of the back-trajectories pass over Rockdale, DeKalb, Fulton, and Cobb counties.

Factor 4: Geography/Topography

This factor did not play a significant role in this evaluation of the Atlanta CSA since it does not have any geographical or topographical barriers significantly limiting air pollution transport within its air shed.

Factor 5: Jurisdictional Boundaries

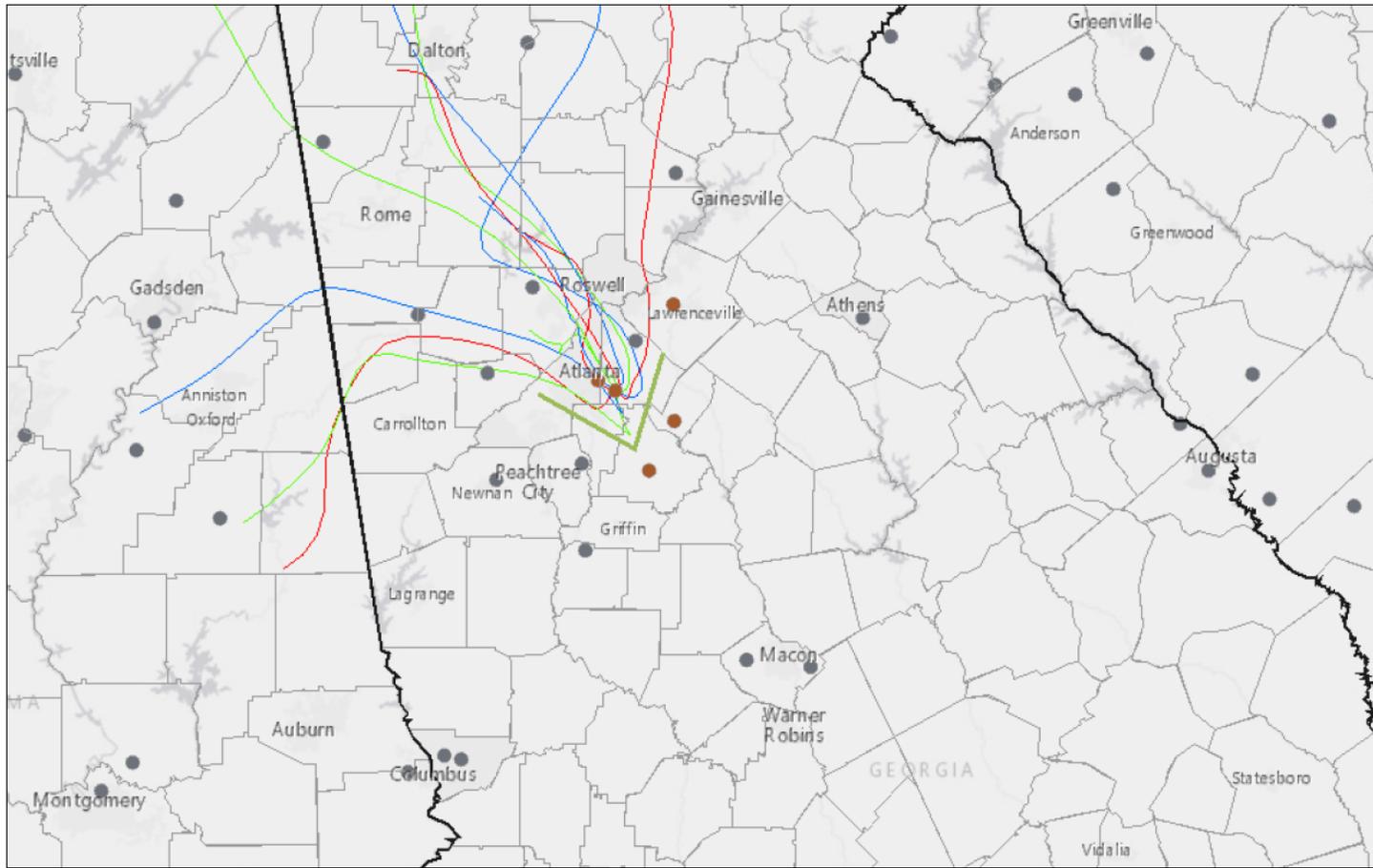
All counties discussed in this technical analysis are within Georgia and fall within the jurisdiction of GA EPD. The Atlanta-Sandy Springs-Gainesville CBSA has previously established nonattainment boundaries associated with both the 1-hour and the 8-hour ozone NAAQS (Table 10).

Table 10. Nonattainment counties associated with the 1-hour, 1997 8-hour, and the 2008 8-hour ozone standards.

| Atlanta nonattainment boundary for the 1-hour ozone standard | Atlanta nonattainment boundary for the 1997 8-hour ozone standard | Atlanta nonattainment boundary for the 2008 8-hour ozone standard |
|--|---|--|
| Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Paulding, and Rockdale. | Barrow, Bartow, Carroll, Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Hall, Henry, Newton, Paulding, Rockdale, Spalding, and Walton. | Bartow, Cherokee, Clayton, Cobb, Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Newton, Paulding, and Rockdale. |

⁵ Download from <https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data#F2>.

EPA Ozone Designations Mapping Tool - 130890002 HYSPLIT



June 9, 2016

| | | | |
|-------------------|---------------------------|--|--|
| State Boundaries | Site Design Values | Atlanta_Sandy_Springs_Marietta_GA_130890002 | — 1,000 |
| County Boundaries | ● ≤ 0.070 ppm | — 100 | |
| | ● > 0.070 ppm | — 500 | |

1:2,311,162
 0 20 40 80 mi
 0 30 60 120 km

U.S. EPA Office of Air and Radiation (OAR) - Office of Air Quality Planning and Standards (OAQPS), National Oceanographic and Atmospheric Administration

U.S. Environmental Protection Agency

Figure 2. HYSPLIT modeling results for ozone exceedance days in 2013-2014 at the South DeKalb monitor (13-089-0002) in DeKalb County.

EPA Ozone Designations Mapping Tool - 131210055 HYSPLIT

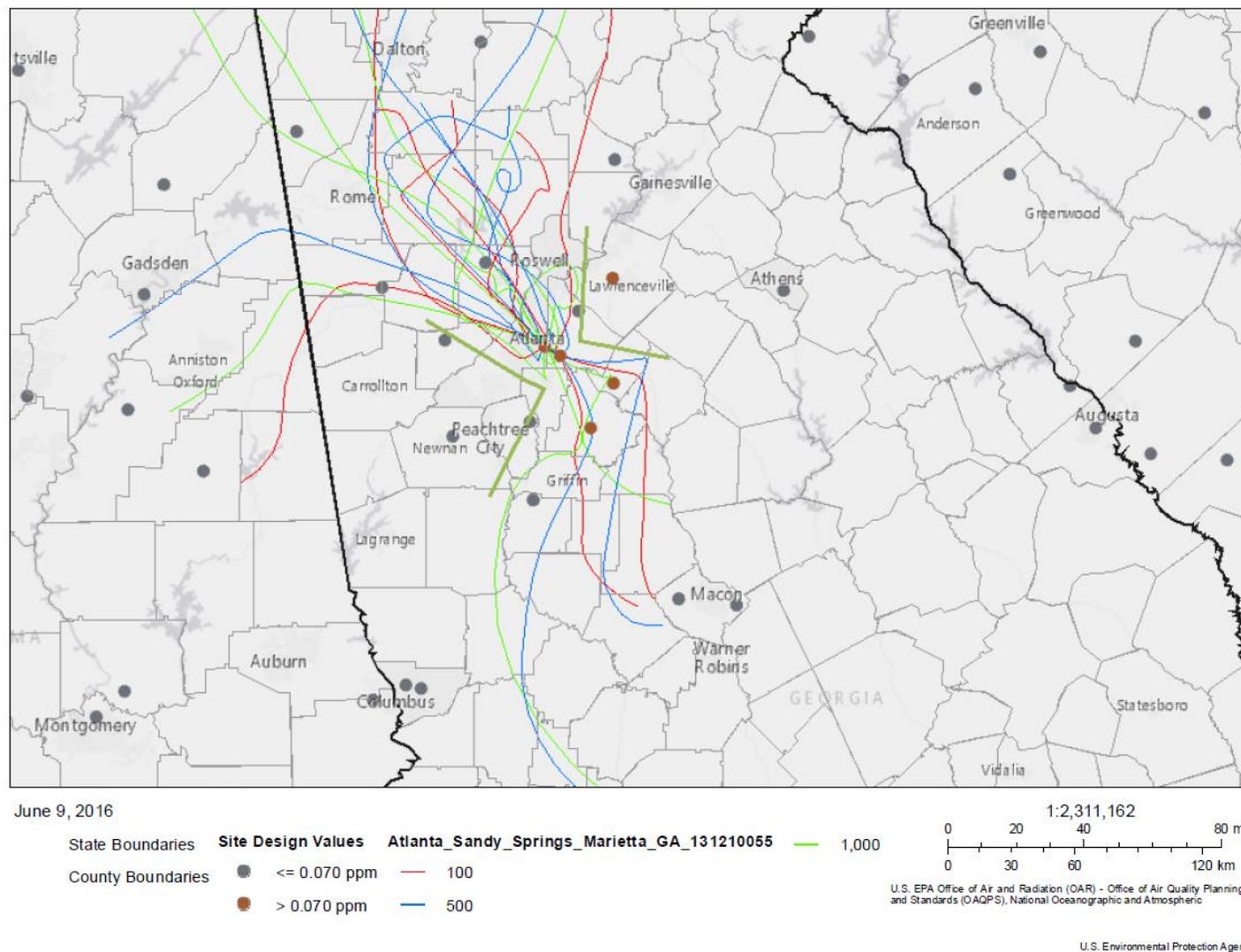
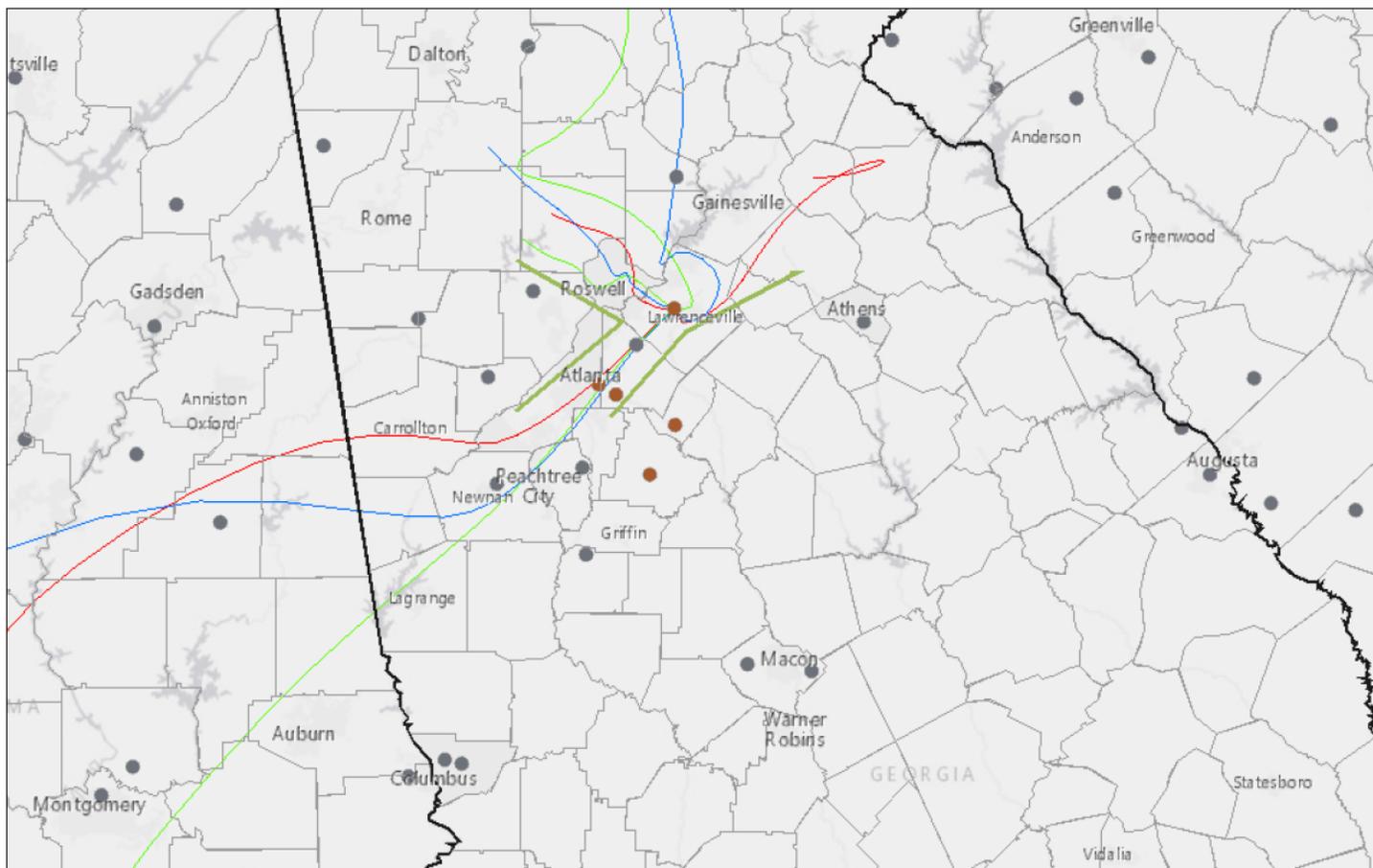


Figure 3. HYSPLIT modeling results for ozone exceedance days in 2013-2014 at the Confederate Avenue monitor (13-121-0055) in Fulton County.

EPA Ozone Designations Mapping Tool - 131350002 HYSPLIT



June 9, 2016

| | | | |
|-------------------|---------------------------|--|--|
| State Boundaries | Site Design Values | Atlanta_Sandy_Springs_Marietta_GA_131350002 | — 1,000 |
| County Boundaries | ● ≤ 0.070 ppm | — 100 | |
| | ● > 0.070 ppm | — 500 | |

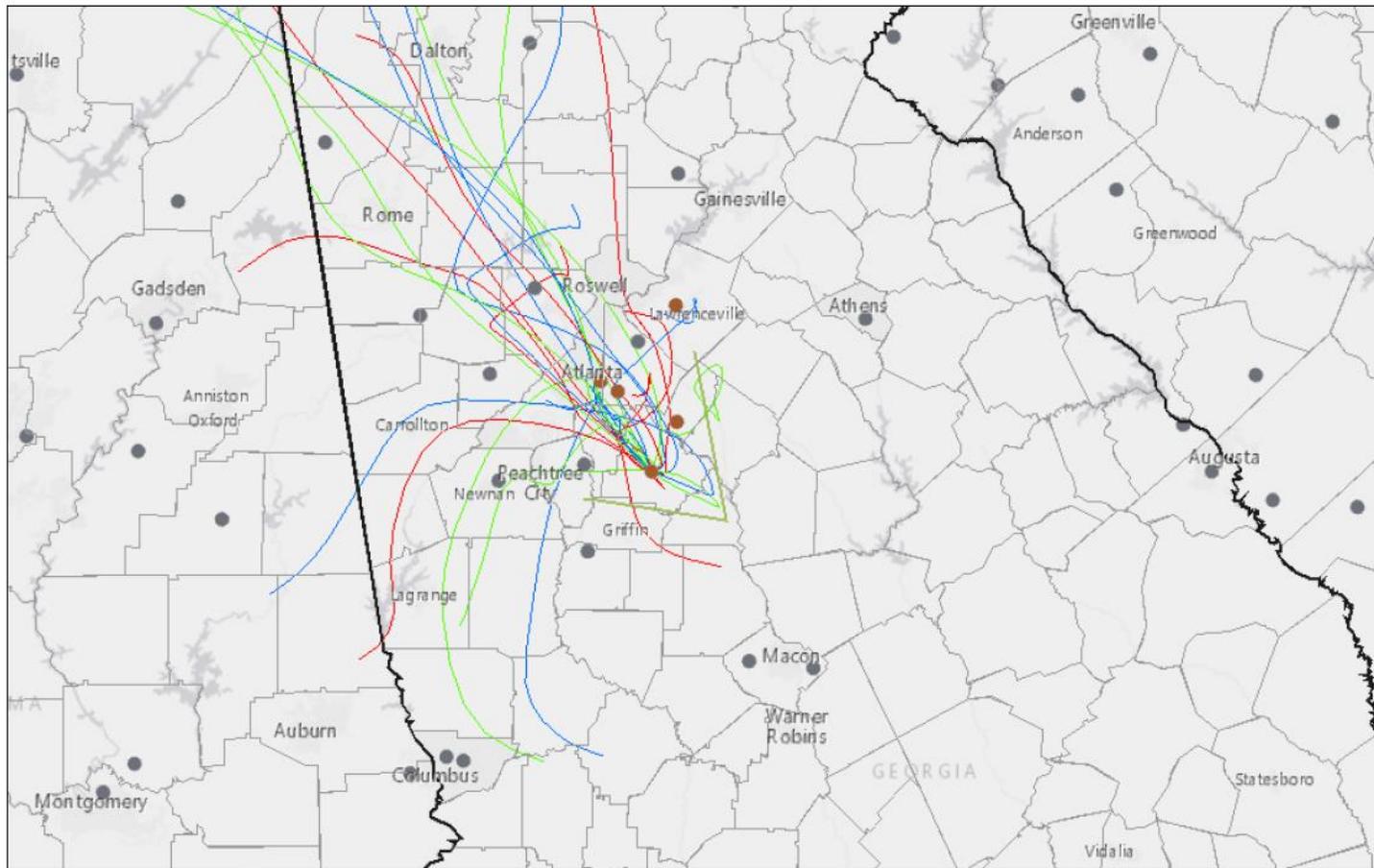
1:2,311,162
 0 20 40 80 mi
 0 30 60 120 km

U.S. EPA Office of Air and Radiation (OAR) - Office of Air Quality Planning and Standards (OAQPS), National Oceanographic and Atmospheric Administration

U.S. Environmental Protection Agency

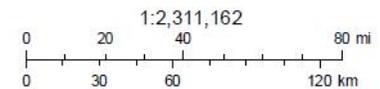
Figure 4. HYSPLIT modeling results for ozone exceedance days in 2013-2014 at the Gwinnett Tech monitor (13-135-0002) in Gwinnett County.

EPA Ozone Designations Mapping Tool - 131510002 HYSPLIT



June 9, 2016

| | | | |
|-------------------|---------------------------|--|--|
| State Boundaries | Site Design Values | Atlanta_Sandy_Springs_Marietta_GA_131510002 | — 1,000 |
| County Boundaries | ● ≤ 0.070 ppm | — 100 | |
| | ● > 0.070 ppm | — 500 | |

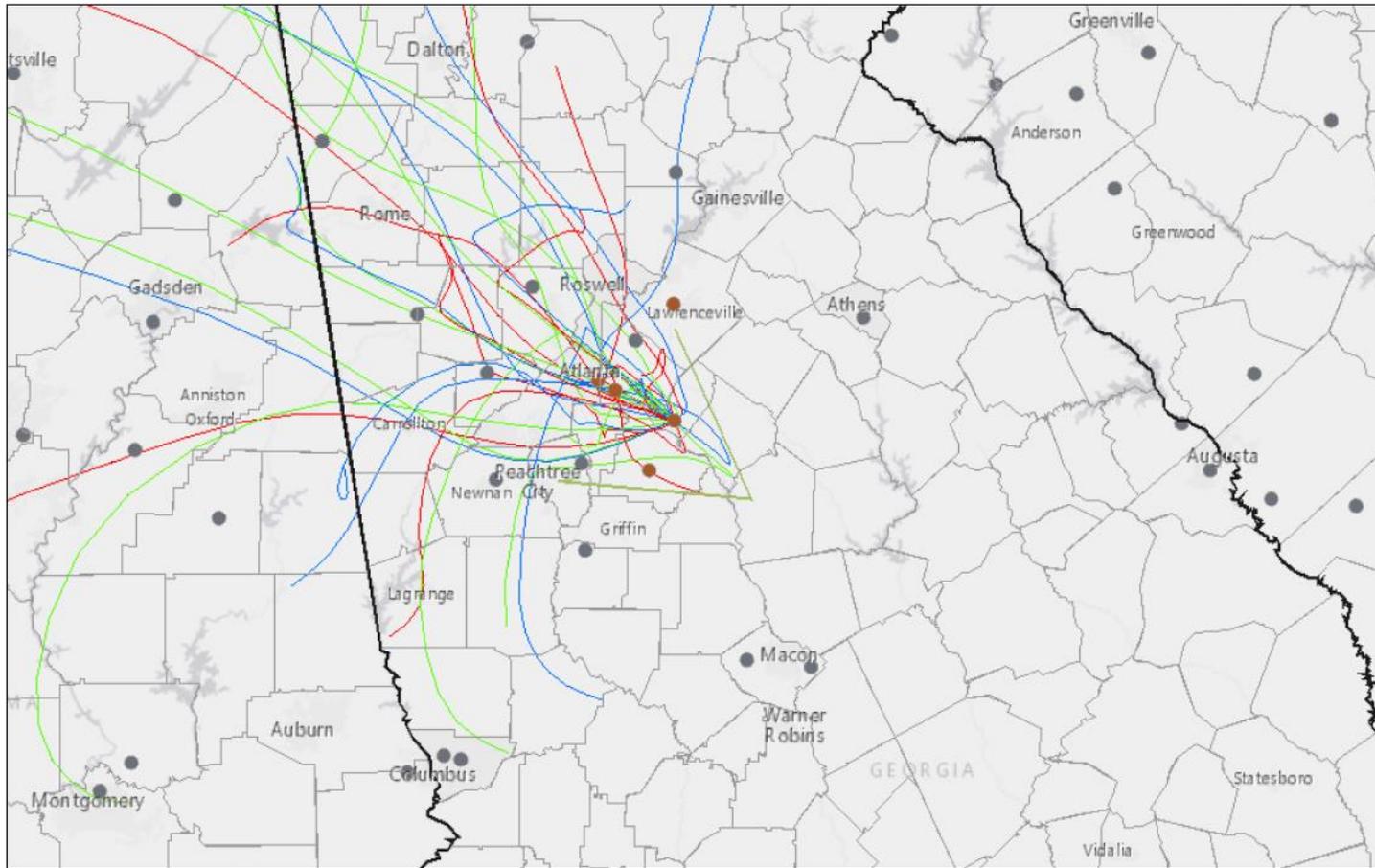


U.S. EPA Office of Air and Radiation (OAR) - Office of Air Quality Planning and Standards (OAQPS), National Oceanographic and Atmospheric Administration

U.S. Environmental Protection Agency

Figure 5. HYSPLIT modeling results for ozone exceedance days in 2013-2014 at the McDonough monitor (13-151-0002) in Henry County.

EPA Ozone Designations Mapping Tool - 132470001 HYSPLIT



June 9, 2016

| | | | |
|-------------------|---------------------------|--|---------|
| State Boundaries | Site Design Values | Atlanta_Sandy_Springs_Marietta_GA_132470001 | — 1,000 |
| County Boundaries | ● ≤ 0.070 ppm | — 100 | |
| | ● > 0.070 ppm | — 500 | |

1:2,311,162
 0 20 40 80 mi
 0 30 60 120 km

U.S. EPA Office of Air and Radiation (OAR) - Office of Air Quality Planning and Standards (OAQPS), National Oceanographic and Atmospheric Administration

U.S. Environmental Protection Agency

Figure 6. HYSPLIT modeling results for ozone exceedance days in 2013-2014 at the Conyers monitor (13-247-0001) in Rockdale County

Source Apportionment with CAMx-APCA

EPA's designation guidance memo states that source apportionment modeling can be used as part of the initial area designation process. EPD applied the Comprehensive Air Quality Model with eXtensions (CAMx) model⁶ (version 6.2) with its Anthropogenic Precursor Culpability Assessment (APCA) tool to determine the contribution of each of the 39 counties in the Atlanta CSA to the five violating ozone monitors. EPD used a similar approach with CAMx-APCA as EPA used for the proposed Cross-State Air Pollution Rule modeling⁷ (hereafter, Transport Rule Modeling).

EPD conducted the CAMx-APCA run for the ozone season from April 1 to October 31 using 2017 projected emissions and 2011 meteorology on a 12-km grid centered on the Atlanta CSA and covering most of Georgia and parts of neighboring states (Figure 7). The year 2017 was chosen since EPA's designations will be finalized by October 1, 2017 and high-quality modeling data used for EPA's Transport Rule Modeling was readily available. EPD also conducted 2011 modeling to evaluate model performance. EPD conducted Sparse Matrix Object Kernel Emission (SMOKE) modeling for 2017 emissions to tag anthropogenic emissions from each of the 39 counties in the Atlanta CSA as an individual source region; anthropogenic emissions from all other counties in the modeling domain were tagged as the "other" region, and emissions from biogenic sources, wildfires, and prescribed burning were tagged as the "biogenic" source group. The 2017 emissions used for the Transport Rule Modeling were updated to include more accurate 2017 EGU emission projections based on information that EPD sent to EPA as part of Georgia's comments on the Transport Rule NODA. Additional details on the SMOKE, CAMx, and CAMx-APCA modeling can be found in the attached modeling technical support document.

This modeling combines the first four factors discussed of the five-factor analysis into a single contribution value for each county (Table 11). A contribution threshold of 1.0 ppb was used to determine which counties significantly contribute to the violating monitors. The 1.0 ppb threshold was chosen because it is EPA's recently proposed significant impact level for single source PSD modeling⁸. The following counties had more than a 1.0 ppb impact on a violating ozone monitor: Fulton, Gwinnett, DeKalb, Cobb, Bartow, Clayton, and Henry.

⁶ Environ, CAMx Overview, <http://www.camx.com/about/default.aspx>

⁷ EPA, Proposed Cross-State Air Pollution Update Rule, <https://www.epa.gov/airmarkets/proposed-cross-state-air-pollution-update-rule>

⁸ EPA, 2016. Draft Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program.

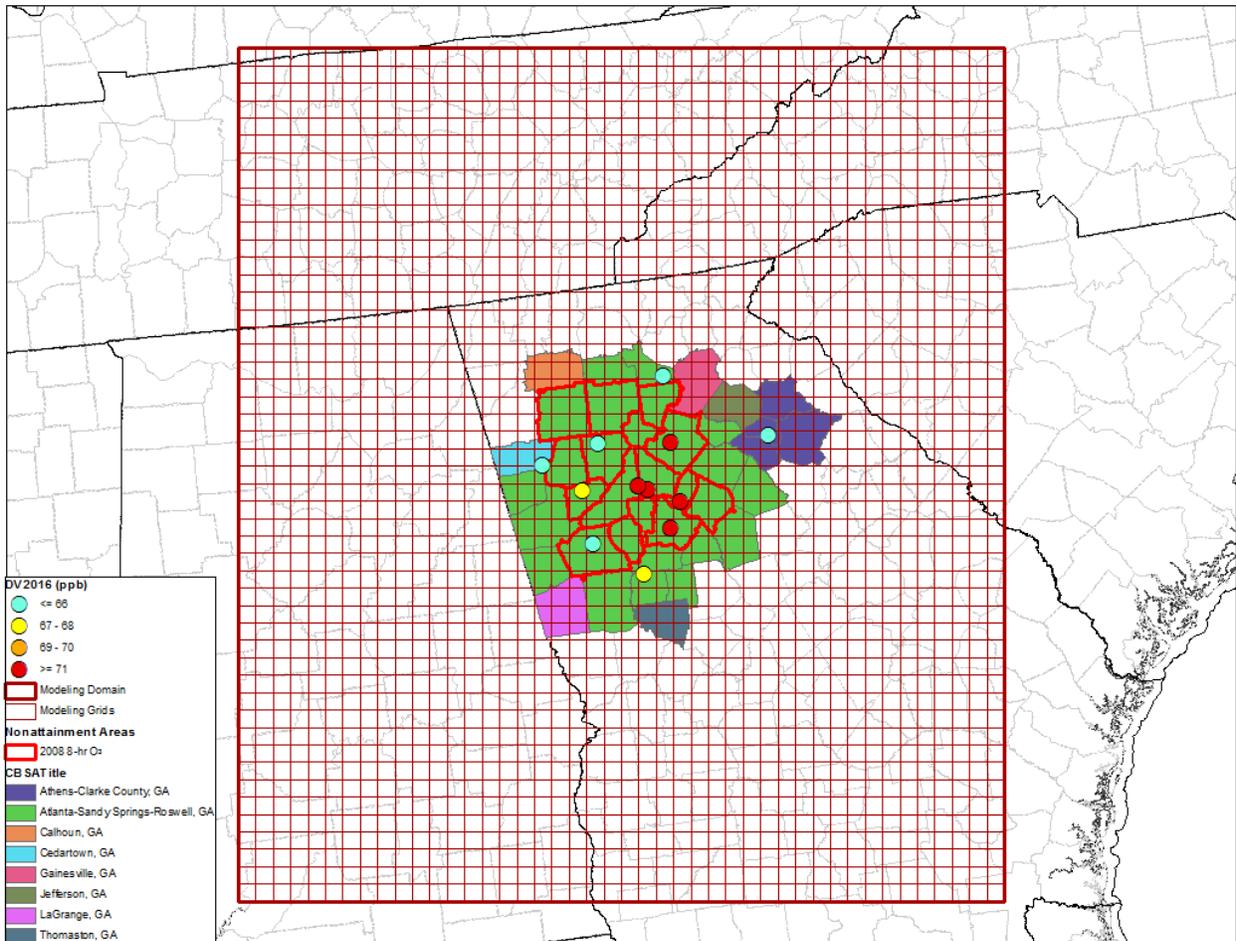


Figure 7. GA EPD's modeling domain for the source contribution assessment. Also shown are the preliminary 2014-2016 design values, nonattainment counties for the 2008 ozone NAAQS, and the Atlanta CSA broken down by CBSAs.

Table 11. Contributions of 39 counties in the Atlanta CSA to violating ozone monitors. Red values indicate more than 1.0 ppb contribution to a violating ozone monitor.

| Monitor | Confederate Ave. (13-121-0055) | Conyers (13-247-0001) | McDonough (13-151-0002) | Gwinnett Tech (13-135-0002) | South DeKalb (13-089-0002) |
|-----------------|-----------------------------------|--------------------------|----------------------------|--------------------------------|-------------------------------|
| Barrow | 0.12 | 0.06 | 0.10 | 0.23 | 0.10 |
| Bartow | 1.17 | 0.77 | 0.97 | 1.45 | 0.96 |
| Butts | 0.04 | 0.07 | 0.14 | 0.02 | 0.04 |
| Carroll | 0.24 | 0.33 | 0.15 | 0.09 | 0.26 |
| Cherokee | 0.40 | 0.30 | 0.36 | 0.64 | 0.33 |
| Clarke | 0.08 | 0.03 | 0.10 | 0.09 | 0.08 |
| Clayton | 3.54 | 4.22 | 3.85 | 0.68 | 3.26 |
| Cobb | 2.69 | 1.50 | 1.72 | 2.49 | 2.05 |
| Coweta | 0.24 | 0.38 | 0.29 | 0.14 | 0.23 |
| Dawson | 0.03 | 0.03 | 0.03 | 0.04 | 0.03 |
| DeKalb | 3.04 | 3.07 | 3.17 | 2.33 | 5.56 |
| Douglas | 0.68 | 0.41 | 0.33 | 0.16 | 0.55 |
| Fayette | 0.21 | 0.31 | 0.40 | 0.07 | 0.18 |
| Forsyth | 0.29 | 0.26 | 0.24 | 0.78 | 0.24 |
| Fulton | 8.74 | 4.12 | 4.07 | 3.92 | 5.98 |
| Gordon | 0.15 | 0.11 | 0.14 | 0.07 | 0.13 |
| Gwinnett | 1.71 | 1.93 | 1.60 | 8.25 | 1.58 |
| Hall | 0.26 | 0.18 | 0.16 | 0.61 | 0.19 |
| Haralson | 0.07 | 0.10 | 0.03 | 0.04 | 0.09 |
| Heard | 0.14 | 0.26 | 0.16 | 0.09 | 0.15 |
| Henry | 0.55 | 2.65 | 4.08 | 0.26 | 0.88 |
| Jackson | 0.16 | 0.07 | 0.12 | 0.29 | 0.13 |
| Jasper | 0.01 | 0.01 | 0.03 | 0.01 | 0.01 |
| Lamar | 0.01 | 0.02 | 0.03 | 0.01 | 0.01 |
| Madison | 0.07 | 0.03 | 0.07 | 0.11 | 0.07 |
| Meriwether | 0.02 | 0.03 | 0.03 | 0.02 | 0.03 |
| Morgan | 0.06 | 0.02 | 0.08 | 0.03 | 0.06 |
| Newton | 0.17 | 0.29 | 0.34 | 0.06 | 0.21 |
| Oconee | 0.04 | 0.01 | 0.05 | 0.04 | 0.04 |
| Oglethorpe | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 |
| Paulding | 0.35 | 0.20 | 0.22 | 0.20 | 0.29 |
| Pickens | 0.05 | 0.05 | 0.05 | 0.03 | 0.05 |
| Pike | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 |
| Polk | 0.09 | 0.06 | 0.05 | 0.07 | 0.08 |
| Rockdale | 0.23 | 0.95 | 0.41 | 0.09 | 0.31 |
| Spalding | 0.04 | 0.10 | 0.15 | 0.03 | 0.05 |
| Troup | 0.03 | 0.04 | 0.04 | 0.03 | 0.04 |
| Upson | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| Walton | 0.16 | 0.09 | 0.20 | 0.14 | 0.17 |

Summary and Recommendations

EPD performed a detailed analysis that considered EPA's five factors. In addition, EPD performed source contribution modeling with CAMx-APCA. A summary of the factors that were evaluated for the Atlanta CSA are contained in Table 12. Based on this analysis, EPD recommends that the following eight (8) counties be designated as **nonattainment** for the 2015 ozone NAAQS (Figure 8):

- **Fulton** (based on Factors 1, 2, 3, 5, and CAMx-APCA);
- **Gwinnett** (based on Factors 1, 2, 3, 5, and CAMx-APCA);
- **DeKalb** (based on Factors 1, 2, 3, 5, and CAMx-APCA);
- **Cobb** (based on Factors 2, 3, 5, and CAMx-APCA);
- **Bartow** (based on Factors 2, 3, 5, and CAMx-APCA);
- **Clayton** (based on Factors 2, 3, 5, and CAMx-APCA);
- **Henry** (based on Factors 1, 2, 3, 5, and CAMx-APCA); and
- **Rockdale** (based on Factors 1, 3, and 5).

The remaining 151 counties in Georgia are recommended as **unclassifiable/attainment**.

Table 12. Summary of the Atlanta CSA counties exceeding EPD thresholds for various factors.

| County | Air Quality Data (Factor 1) | NOx Emissions (Factor 2) | VOCs Emissions (Factor 2) | Population (Factor 2) | VMT (Factor 2) | HYSPLIT (Factor 3) | CAMx-APCA Source Contribution |
|-----------------|-----------------------------|--------------------------|---------------------------|-----------------------|----------------|--------------------|-------------------------------|
| Barrow | | | | | | | |
| Bartow | | X | | | | X | X |
| Butts | | | | | | | |
| Carroll | | | | | | | |
| Cherokee | | | | | | | |
| Clarke | | | | | | | |
| Clayton | | X | X | X | X | X | X |
| Cobb | | X | X | X | X | X | X |
| Coweta | | | | | | | |
| Dawson | | | | | | | |
| DeKalb | X | X | X | X | X | X | X |
| Douglas | | | | | | | |
| Fayette | | | | | | | |
| Forsyth | | | | | | | |
| Fulton | X | X | X | X | X | X | X |
| Gordon | | | | | | | |
| Gwinnett | X | X | X | X | X | X | X |
| Hall | | | | | | | |
| Haralson | | | | | | | |
| Heard | | | | | | | |
| Henry | X | | | | X | X | X |
| Jackson | | | | | | | |
| Jasper | | | | | | | |
| Lamar | | | | | | | |
| Madison | | | | | | | |
| Meriweth | | | | | | | |
| Morgan | | | | | | | |
| Newton | | | | | | | |
| Oconee | | | | | | | |
| Oglethorp | | | | | | | |
| Paulding | | | | | | | |
| Pickens | | | | | | | |
| Pike | | | | | | | |
| Polk | | | | | | | |
| Rockdale | X | | | | | X | |
| Spalding | | | | | | | |
| Troup | | | | | | | |
| Upson | | | | | | | |
| Walton | | | | | | | |



Figure 8. Map of eight counties (orange shading) in the Atlanta CSA recommended by EPD as nonattainment for the 2015 ozone NAAQS.