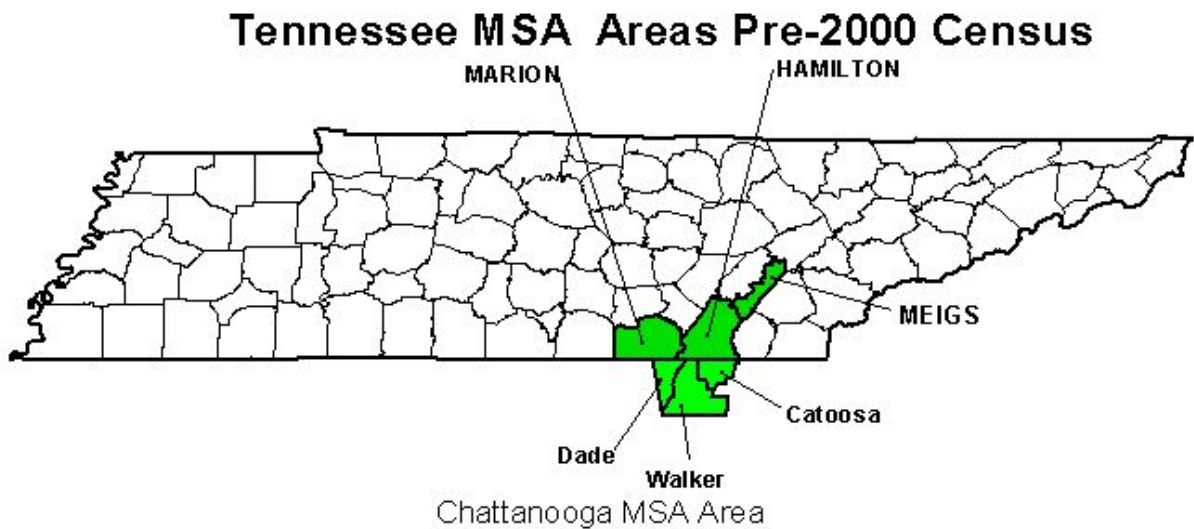


# Chattanooga TN-GA MSA and Meigs County, TN

## Local Air Quality Improvement Plan



The Chattanooga TN-GA Metropolitan Statistical Area encompasses five counties in two states. It includes Hamilton and Marion counties in Tennessee as well as Catoosa, Dade, and Walker counties in Georgia. For purposes of comparison, Meigs County, TN will also be included in this discussion. In 2000, this MSA was listed as the 89th largest MSA within the United States.

# Hamilton County, Tennessee

## Geography/Topography

Hamilton County has a land area of 542.44 square miles and is located on the western fringe of the Valley and Ridge physiographic province of the East Grand Division of the State along the Interstate 24 corridor near the Georgia Stateline.

## Meteorological Information

Wind data from Chattanooga, TN for the period of record from 1988 through 1992 was determined to be representative for Hamilton County. The predominate wind direction and speed is from the south at 7 to 10 knots (see Figure 1 A). The mean high temperature for July is 89.8 F, while the mean low is 69.4 F. The mean July precipitation is 4.7 inches. The period of record for this data is from 1971 through 2000.

## Planning Authority

The authority for air quality planning for Hamilton County resides with the Chattanooga Hamilton County Air Pollution Control Bureau. Transportation planning for Hamilton County is performed by the Chattanooga Urban Area Metropolitan Planning Organization.

## Air Monitoring

For the 2001-2003 monitoring period, the ozone monitor (470650028-1) located at the Volunteer Army Ammunition Plant shows an 8-hour design value of .088 parts per million (ppm), and the ozone monitor (470651011-1) located on Ridgetrail Road, in Chattanooga shows an 8-hour design value of .087 ppm. Both monitors would be classified as nonattainment (see Table 1 A).

## Population

Based on projections to 2002 from the 2000 census data, there are 309,321 persons living in Hamilton County (see Table 1 C). This indicates a population density of 570.2 persons per square mile. The population of Hamilton County is approximately 9.7% rural with the remaining 90.3% living in incorporated areas. The largest cities in Hamilton County are Chattanooga and East Ridge (see Table 1 C).

Hamilton County's population from 1990 through 2000 increased by approximately 7.8% (285,571 to 307,896). The population is expected to decrease by .7% between 2000 and 2010 (see Table 1 B).

Based on the 2002 population data for the entire Chattanooga TN-GA MSA and Meigs County, Hamilton County represents approximately 64% of the total Chattanooga TN-GA MSA and Meigs County population (see Table 1 C).

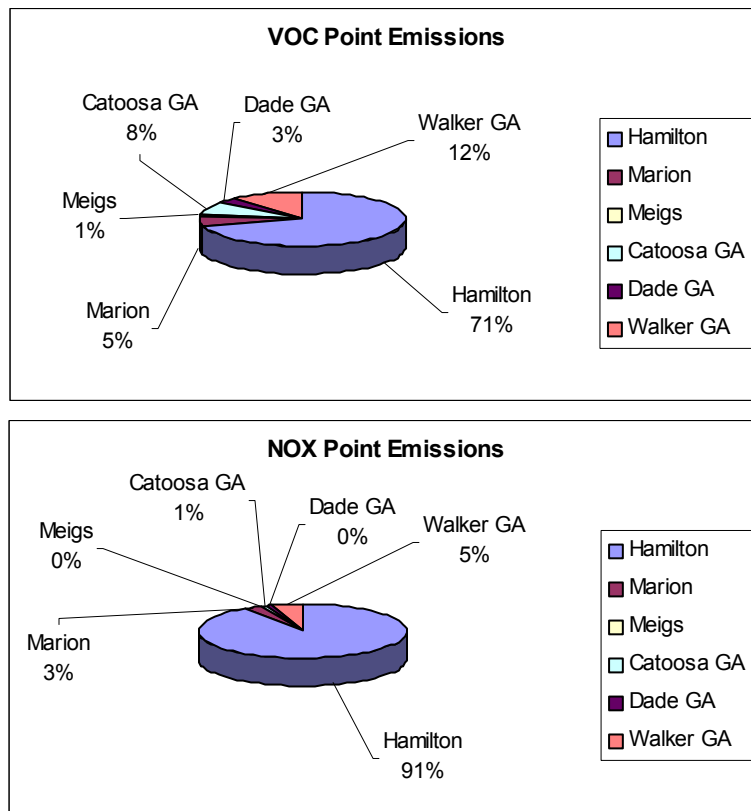
## Air Emissions

All air emission estimates were derived from EPA's 1999 National Emission Inventory (NEI) database.

Point source NOX emissions from Hamilton County were estimated at 18.42 ton/day in 1999 which represents approximately 91% of the 20.36 ton/day of overall NOX point source emissions from the Chattanooga TN-GA MSA and Meigs County (see Table 1 D).

Point source VOC emissions from Hamilton County were estimated at 44.52 ton/day in 1999 which represents approximately 71% of the 62.65 ton/day of overall VOC point source emissions from the Chattanooga TN-GA MSA and Meigs County (see Table 1 D).

### 1999 NEI Point Source Emissions (ton/day)



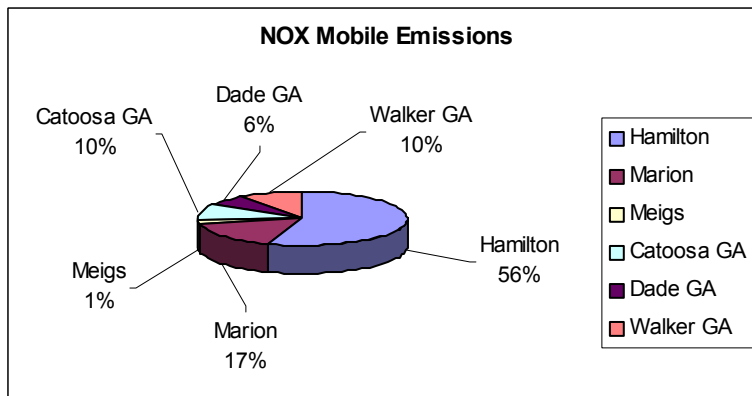
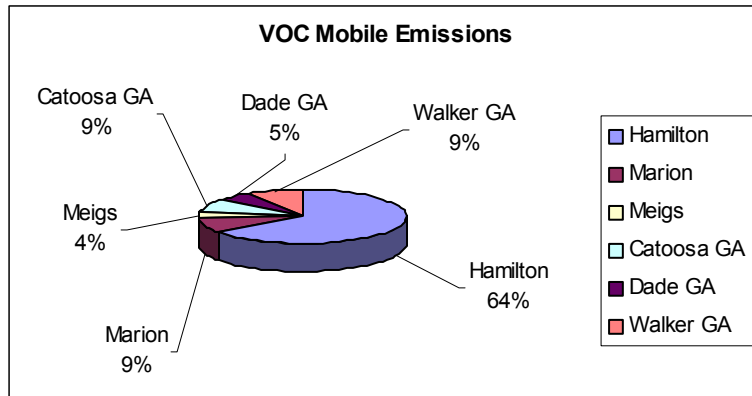
For NOX and VOC control, point sources located within Hamilton County are subject to Prevention of Significant Deterioration (PSD) requirements, Control Technology Guideline Reasonable Available Control Technology (CTG RACT) requirements, Maximum Achievable Control Technology (MACT) requirements

for Hazardous Air Pollutants (HAP), and New Source Performance Standards (NSPS).

Mobile source NOX emissions from Hamilton County were estimated at 55.36 ton/day in 1999 which represents approximately 56% of the 100.31 ton/day of overall NOX mobile source emissions from the Chattanooga TN-GA MSA and Meigs County (see Table 1 D).

Mobile source VOC emissions from Hamilton County were estimated at 29.69 ton/day in 1999 which represents approximately 64% of the 45.94 ton/day of overall VOC mobile source emissions from the Chattanooga TN-GA MSA and Meigs County (see Table 1 D).

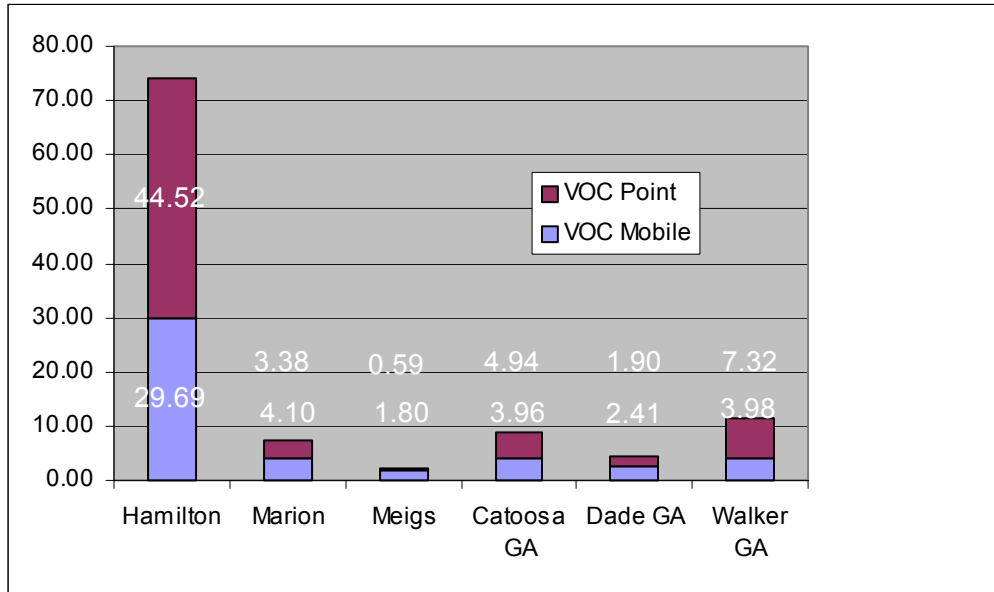
### 1999 NEI Mobile Source Emissions (ton/day)



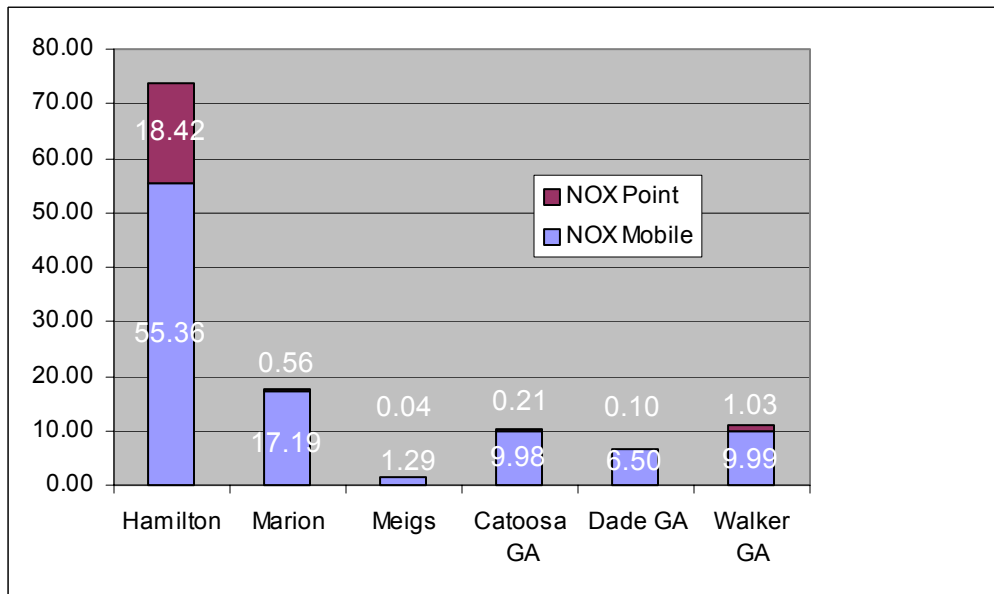
Commuting traffic from surrounding counties into Hamilton County is minimal. Commuting traffic from Hamilton County into surrounding counties is not significant.

<b>Commuting Classifications</b>	
Not Significant	0-10%
Minimal	11-30%
High	31-50%
Significant	51% or more

### 1999 NEI VOC Contribution (ton/day)



### 1999 NEI NOX Contribution (ton/day)



## Summary

Local air pollution emission reductions for Hamilton County are listed in the Quantification of Control Measures Table. The local measures listed are to be implemented by the local government of Hamilton County. All local measures are to be implemented by ozone season of 2007, at the latest. The most desirable implementation is the soonest time possible (ideally ozone season of 2005). Local jurisdictions understand that measures are to be implemented on a schedule that concurs with the schedule in the attainment demonstration modeling.

For a Weight of Evidence Analysis, review the summary Attainment Demonstration for the Chattanooga Area and see the complete Weight of Evidence discussion presented in Chapter 8 of the Modeling Analysis Technical Support Documentation (TSD) for details.

Some voluntary measures were not included in the modeling demonstration. These measures will, it is expected, create even further reductions in the ozone level of the EAC. Effectiveness of these measures may not necessarily be quantifiable, however, given the concern for air quality in the region, any reduction is viewed as positive.

Please review the detailed attainment demonstration contained in the Modeling Analysis Technical Support Documentation, which includes specific information on the EAC's control measures and subsequent ozone design value. County level endorsement of their local control measures can be found in Attachment 1.



Emission Reductions for the AS-4 EAC Attainment Strategy  
Quantification of Control Measures

Control Measure by Source Category	Hamilton, TN		
	NOx TPD	VOC TPD	CO TPD
<b>Area Sources</b>			
Open Burning Ban -yard waste2B.	0.140	0.506	9.600
Open Burning Ban - Land clearing2C.	0.440	1.102	6.320
Stage I Controls at Gas Stations.	0.000	2.468	0.000
<b>Nonroad Mobile</b>			
Construction Equipment (10% New).	0.053	0.007	0.024
<b>Onroad Mobile</b>			
Cetane to Diesel (-3% NOx)(10% effective)	0.110	0.000	0.000
Anti-idling Legis. (1% veh idle 5 min/day)	0.004	0.004	0.027
Transit (increase bus ridership 10%)	0.003	0.004	0.043
Ozone Action Day (Reduce VMT 1%)	0.124	0.161	1.796

Please see Table 7-4d on page 7-22 of the Modeling Analysis Technical Support Document for additional details and further discussion.

# Marion County, Tennessee

## Geography/Topography

Marion County has a land area of 498 square miles and is located on the western fringe of the Valley and Ridge physiographic province of the East Grand Division of the State along the Interstate 24 corridor near the Georgia Stateline.

## Meteorological Information

Wind data from Chattanooga, TN for the period of record from 1988 through 1992 was determined to be representative for Marion County. The predominate wind direction and speed is from the south at 7 to 10 knots (see Figure 1 A). The mean high temperature for July is 89.8 F, while the mean low is 69.4 F. The mean July precipitation is 4.7 inches. The period of record for this data is from 1971 through 2000.

## Planning Authority

The authority for air quality planning for Marion County resides with the Tennessee Department of Environment and Conservation. Transportation planning for Marion County is performed by the Tennessee Department of Transportation.

## Air Monitoring

Marion County does not have an ozone monitor.

## Population

Based on projections to 2002 from the 2000 census data, there are 27,654 persons living in Marion County (see Table 1 C). This indicates a population density of 55.5 persons per square mile. The population of Marion County is approximately 79.3% rural with the remaining 20.7% living in incorporated areas. The largest city in Marion County is South Pittsburg (see Table 1 C).

Marion County's population from 1990 through 2000 increased by approximately 11.7% (24,873 to 27,776). The population is expected to increase by 7.8% between 2000 and 2010 (see Table 1 B).

Based on the 2002 population data for the entire Chattanooga TN-GA MSA and Meigs County, Marion County represents approximately 6% of the total Chattanooga TN-GA MSA and Meigs County population (see Table 1 C).

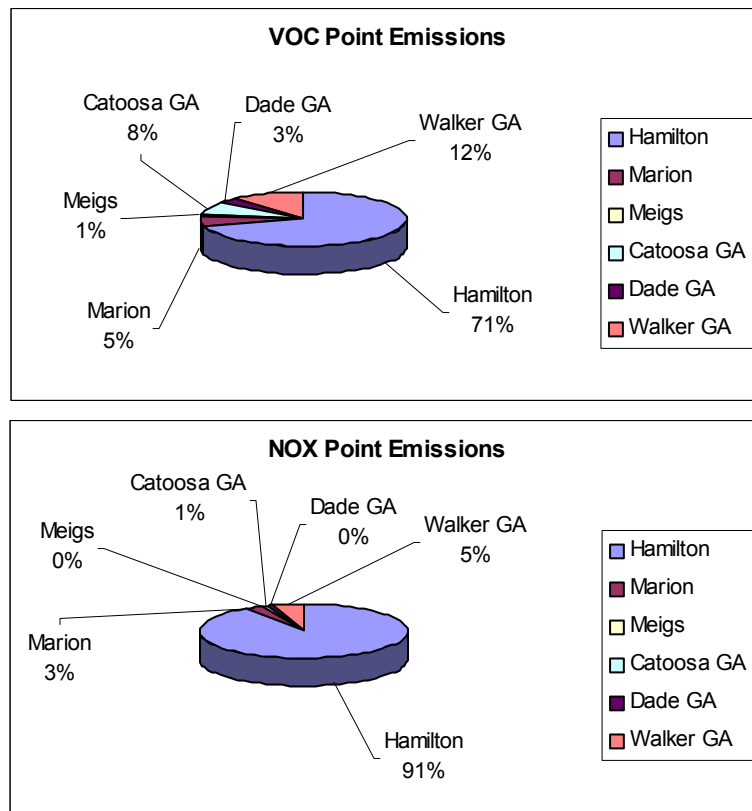
## Air Emissions

All air emission estimates were derived from EPA's 1999 National Emission Inventory (NEI) database.

Point source NOX emissions from Marion County were estimated at 0.56 ton/day in 1999 which represents approximately 3% of the 20.36 ton/day of overall NOX point source emissions from the Chattanooga TN-GA MSA and Meigs County (see Table 1 D).

Point source VOC emissions from Marion County were estimated at 3.38 ton/day in 1999 which represents approximately 5% of the 62.65 ton/day of overall VOC point source emissions from the Chattanooga TN-GA MSA and Meigs County (see Table 1 D).

### 1999 NEI Point Source Emissions (ton/day)



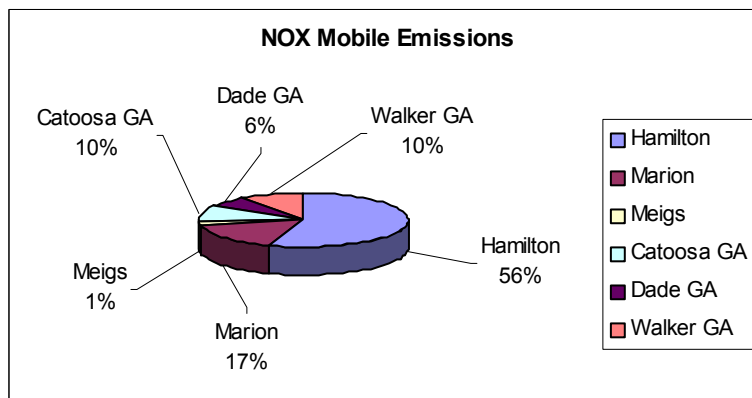
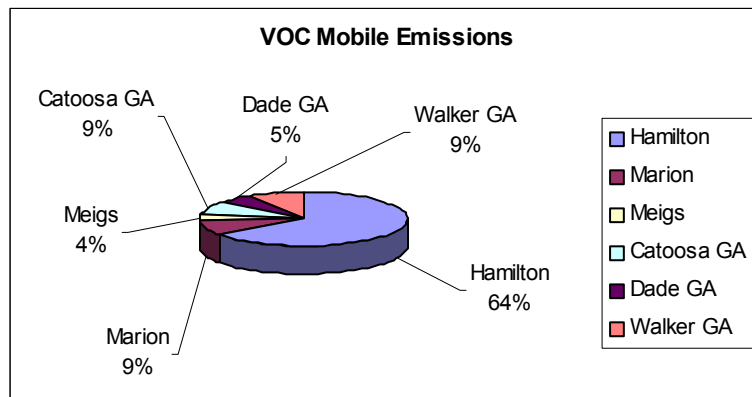
For NOX and VOC control, point sources located within Marion County are subject to Prevention of Significant Deterioration (PSD) requirements, Control Technology Guideline Reasonable Available Control Technology (CTG RACT) requirements, Maximum Achievable Control Technology (MACT) requirements

for Hazardous Air Pollutants (HAP), and New Source Performance Standards (NSPS).

Mobile source NOX emissions from Marion County were estimated at 17.19 ton/day in 1999 which represents approximately 17% of the 100.31 ton/day of overall NOX mobile source emissions from the Chattanooga TN-GA MSA and Meigs County (see Table 1 D).

Mobile source VOC emissions from Marion County were estimated at 4.10 ton/day in 1999 which represents approximately 9% of the 45.94 ton/day of overall VOC mobile source emissions from the Chattanooga TN-GA MSA and Meigs County (see Table 1 D).

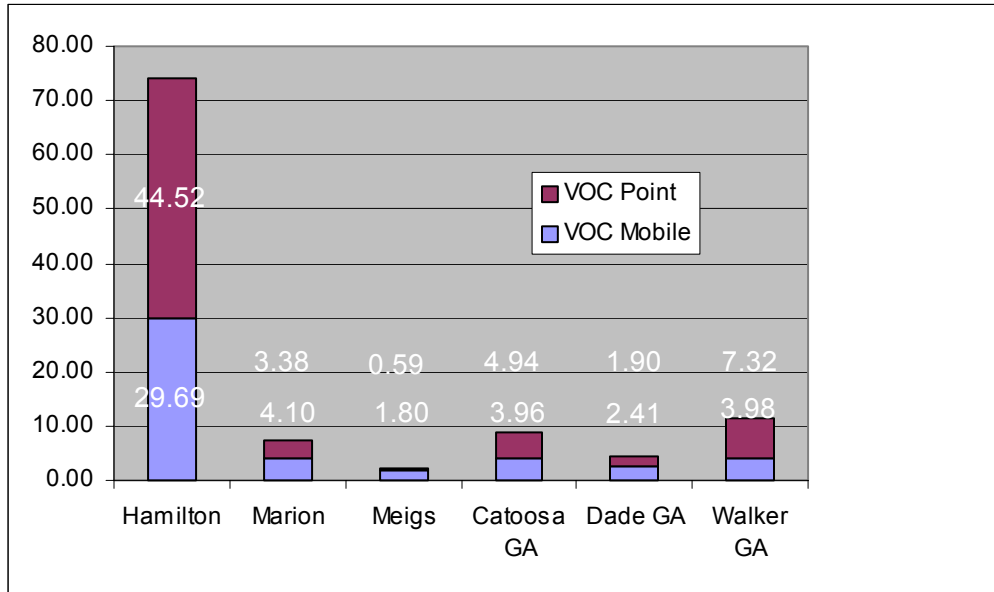
### 1999 NEI Mobile Source Emissions (ton/day)



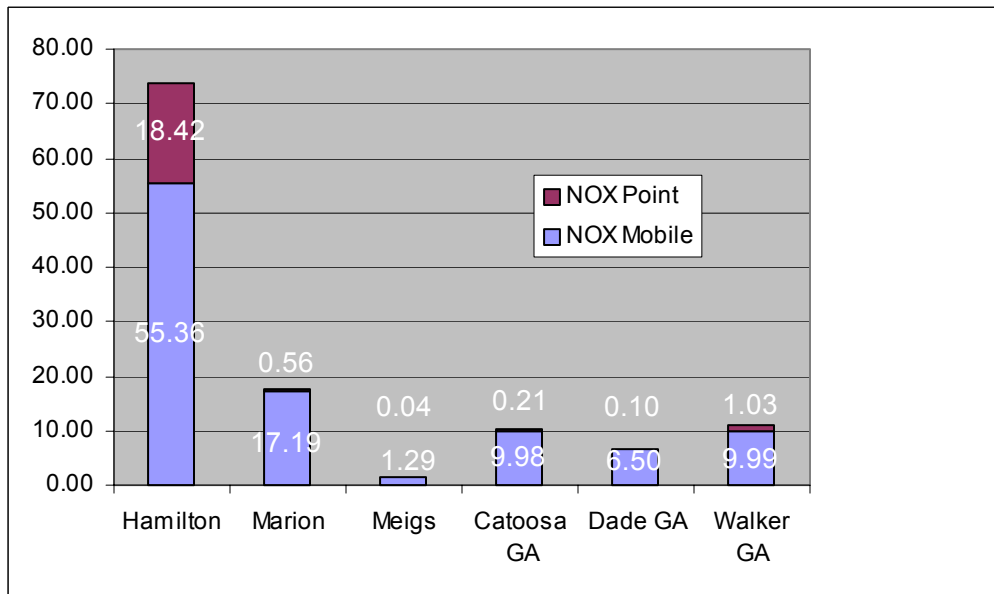
Commuting traffic from surrounding counties into Marion County is minimal.  
Commuting traffic from Marion County into surrounding counties is significant.

<b>Commuting Classifications</b>	
Not Significant	0-10%
Minimal	11-30%
High	31-50%
Significant	51% or more

### 1999 NEI VOC Contribution (ton/day)



### 1999 NEI NOX Contribution (ton/day)



## Summary

Local air pollution emission reductions for Marion County are listed in the Quantification of Control Measures Table. The local measures listed are to be implemented by the local government of Marion County. All local measures are to be implemented by ozone season of 2007, at the latest. The most desirable implementation is the soonest time possible (ideally ozone season of 2005). Local jurisdictions understand that measures are to be implemented on a schedule that concurs with the schedule in the attainment demonstration modeling.

For a Weight of Evidence Analysis, review the summary Attainment Demonstration for the Chattanooga Area and see the complete Weight of Evidence discussion presented in Chapter 8 of the Modeling Analysis Technical Support Documentation (TSD) for details.

Some voluntary measures were not included in the modeling demonstration. These measures will, it is expected, create even further reductions in the ozone level of the EAC. Effectiveness of these measures may not necessarily be quantifiable, however, given the concern for air quality in the region, any reduction is viewed as positive.

Please review the detailed attainment demonstration contained in the Modeling Analysis Technical Support Documentation, which includes specific information on the EAC's control measures and subsequent ozone design value. County level endorsement of their local control measures can be found in Attachment 1.

Emission Reductions for the AS-4 EAC Attainment Strategy  
Quantification of Control Measures

Control Measure by Source Category	Marion, TN		
	NOx TPD	VOC TPD	CO TPD
<b>Area Sources</b>			
Open Burning Ban -yard waste2B.	0.000	0.000	0.000
Open Burning Ban - Land clearing2C.	0.000	0.000	0.000
Stage I Controls at Gas Stations.	0.000	0.485	0.000
<b>Nonroad Mobile</b>			
Construction Equipment (10% New).	0.008	0.001	0.004
<b>Onroad Mobile</b>			
Cetane to Diesel (-3% NOx)(10% effective)	0.039	0.000	0.000
Anti-idling Legis. (1% veh idle 5 min/day)	0.000	0.000	0.002
Transit (increase bus ridership 10%)	0.000	0.000	0.000
Ozone Action Day (Reduce VMT 1%)	0.024	0.032	0.353

Please see Table 7-4d on page 7-22 of the Modeling Analysis Technical Support Document for additional details and further discussion.



# Meigs County, Tennessee

## Geography/Topography

Meigs County has a land area of 195 square miles and is on the western fringe of the Valley and Ridge physiographic province of the East Grand Division of the State.

## Meteorological Information

Wind data from Chattanooga, TN for the period of record from 1988 through 1992 was determined to be representative for Meigs County. The predominate wind direction and speed is from the south at 7 to 10 knots (see Figure 1 A). The mean high temperature for July is 89.8 F, while the mean low is 69.4 F. The mean July precipitation is 4.7 inches. The period of record for this data is from 1971 through 2000.

## Planning Authority

The authority for air quality planning for Meigs County resides with the Tennessee Department of Environment and Conservation. Transportation planning for Meigs County is performed by the Tennessee Department of Transportation.

## Air Monitoring

For the 2001-2003 monitoring period, the ozone monitor 471210104 - 1 located in Meigs County shows an 8-hour design value of 0.088 parts per million (ppm) which would be classified as nonattainment (see Table 1 A).

## Population

Based on projections to 2002 from the 2000 census data, there are 11,310 persons living in Meigs County (see Table 1 C). This indicates a population density of 58 persons per square mile. The population of Meigs County is 100% rural. The largest cities in Meigs County are Decatur (see Table 1 C).

Meigs County's population from 1990 through 2000 increased by approximately 37% (8,092 to 11,086). The population is expected to increase by 4% between 2000 and 2010 (see Table 1 B).

Based on the 2002 population data for the entire Chattanooga MSA and Meigs County, Meigs County represents approximately 2% of the total Chattanooga MSA population (see Table 1 C).

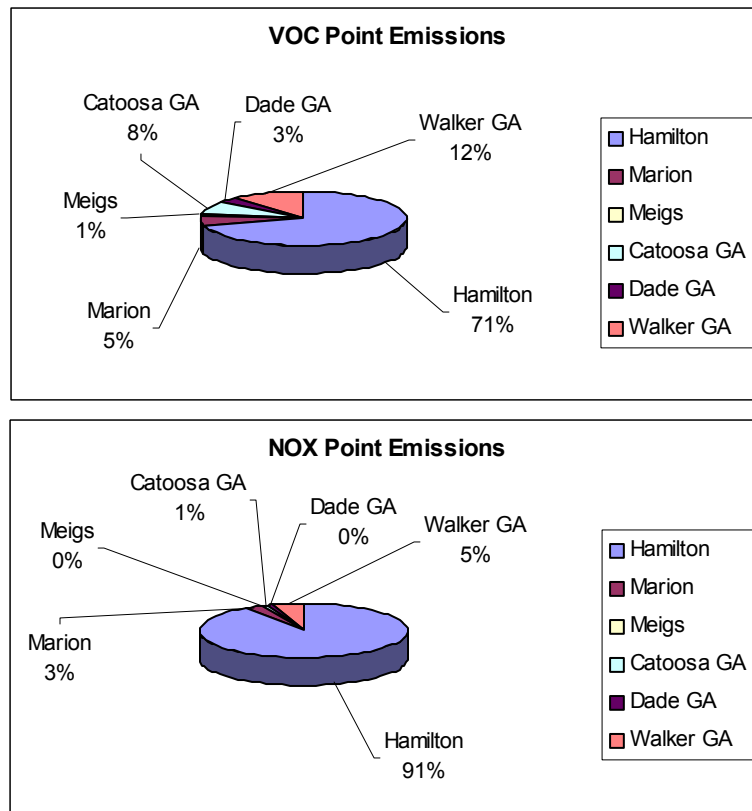
## Air Emissions

All air emission estimates were derived from EPA's 1999 National Emission Inventory (NEI) database.

Point source NOX emissions from Meigs County were estimated at 0.04 ton/day in 1999 which represents less than one percent of the 20.36 ton/day of overall NOX point source emissions from the Chattanooga MSA (see Table 1 D).

Point source VOC emissions from Meigs County were estimated at 0.59 ton/day in 1999 which represents approximately 1% of the 62.65 ton/day of overall VOC point source emissions from the Chattanooga MSA (see Table 1 D).

### 1999 NEI Point Source Emissions (ton/day)

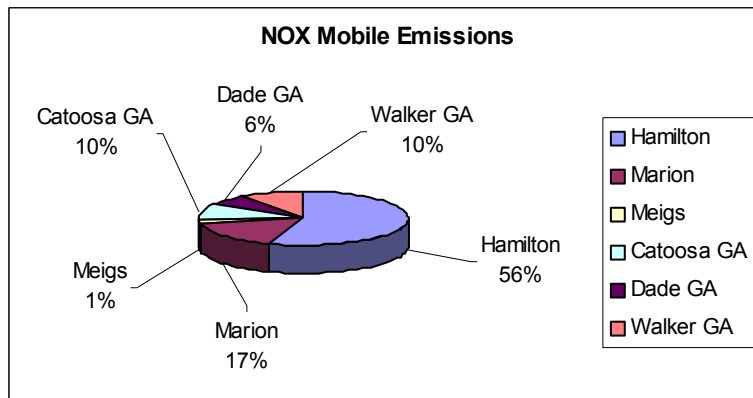
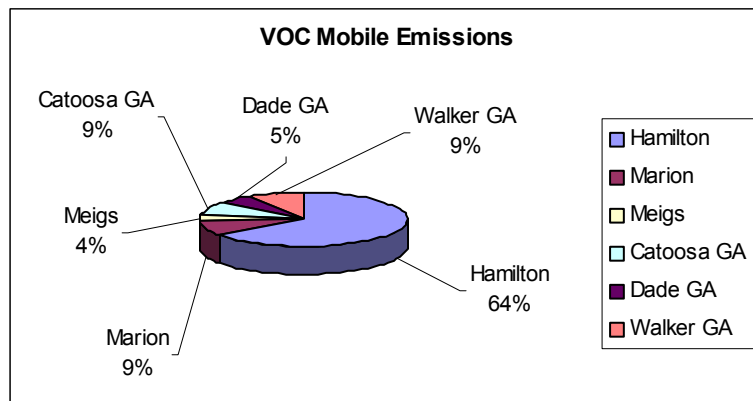


For NOX and VOC control, point sources located within Meigs County are subject to Prevention of Significant Deterioration (PSD) requirements, Control Technology Guideline Reasonable Available Control Technology (CTG RACT) requirements, Maximum Achievable Control Technology (MACT) requirements for Hazardous Air Pollutants (HAP), and New Source Performance Standards (NSPS).

Mobile source NOX emissions from Meigs County were estimated at 1.29 ton/day in 1999 which represents approximately 1% of the 100.31 ton/day of overall NOX mobile source emissions from the Chattanooga MSA (see Table 1 D).

Mobile source VOC emissions from Meigs County were estimated at 1.80 ton/day in 1999 which represents approximately 4% of the 45.94 ton/day of overall VOC mobile source emissions from the Chattanooga MSA (see Table 1 D).

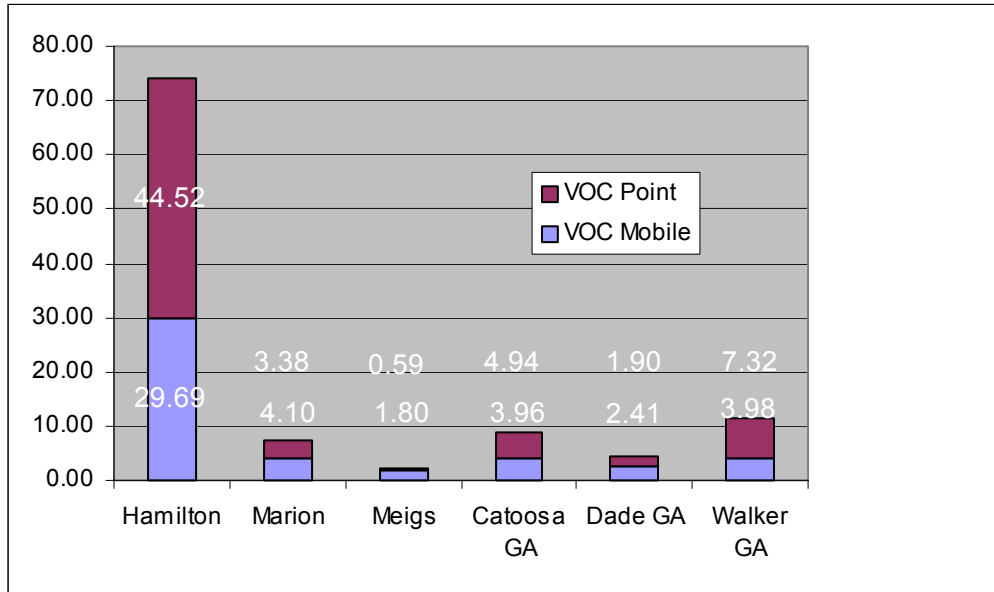
### 1999 NEI Mobile Source Emissions (ton/day)



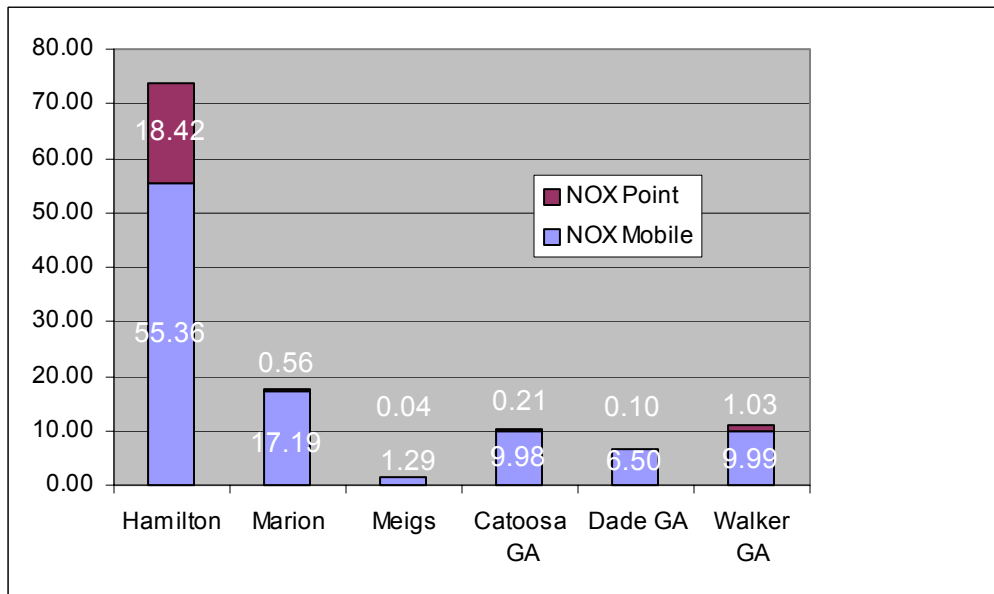
Commuting traffic from surrounding counties into Meigs County is minimal.  
Commuting traffic from Meigs County into surrounding counties is significant.

<b>Commuting Classifications</b>	
Not Significant	0-10%
Minimal	11-30%
High	31-50%
Significant	51% or more

### 1999 NEI VOC Contribution (ton/day)



### 1999 NEI NOX Contribution (ton/day)



## Summary

Local air pollution emission reductions for Meigs County are listed in the Quantification of Control Measures Table. The local measures listed are to be implemented by the local government of Meigs County. All local measures are to be implemented by ozone season of 2007, at the latest. The most desirable implementation is the soonest time possible (ideally ozone season of 2005). Local jurisdictions understand that measures are to be implemented on a schedule that concurs with the schedule in the attainment demonstration modeling.

For a Weight of Evidence Analysis, review the summary Attainment Demonstration for the Chattanooga Area and see the complete Weight of Evidence discussion presented in Chapter 8 of the Modeling Analysis Technical Support Documentation (TSD) for details.

Some voluntary measures were not included in the modeling demonstration. These measures will, it is expected, create even further reductions in the ozone level of the EAC. Effectiveness of these measures may not necessarily be quantifiable, however, given the concern for air quality in the region, any reduction is viewed as positive.

Please review the detailed attainment demonstration contained in the Modeling Analysis Technical Support Documentation, which includes specific information on the EAC's control measures and subsequent ozone design value. County level endorsement of their local control measures can be found in Attachment 1.

Emission Reductions for the AS-4 EAC Attainment Strategy  
Quantification of Control Measures

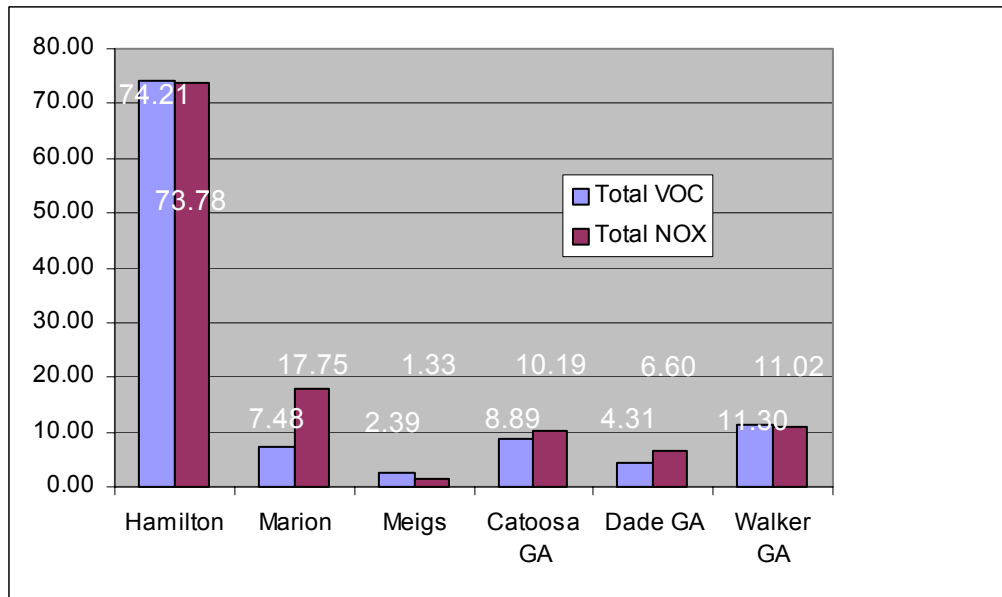
Control Measure by Source Category	NOx TPD	Meigs, TN VOC TPD	CO TPD
<b>Area Sources</b>			
Open Burning Ban -yard waste2B.	0.000	0.000	0.000
Open Burning Ban - Land clearing2C.	0.000	0.000	0.000
Stage I Controls at Gas Stations.	0.000	0.058	0.000
<b>Nonroad Mobile</b>			
Construction Equipment (10% New).	0.001	0.001	0.005
<b>Onroad Mobile</b>			
Cetane to Diesel (-3% NOx)(10% effective)	0.000	0.000	0.000
Anti-idling Legis. (1% veh idle 5 min/day)	0.000	0.000	0.001
Transit (increase bus ridership 10%)	0.000	0.000	0.000
Ozone Action Day (Reduce VMT 1%)	0.003	0.004	0.042

Please see Table 7-4d on page 7-22 of the Modeling Analysis Technical Support Document for additional details and further discussion.





**Figure 1 B**  
**Chattanooga TN-GA MSA and Meigs County**  
**1999 NEI VOC and NOX Emissions**  
*(ton/day)*



**Table 1 A**  
**Chattanooga TN-GA MSA and Meigs County**  
**Ozone Design Values**  
*(ppm)*

County	Site Name	MONITOR ID	1999 2001 Design Value PPM	2000 2002 Design Value PPM	2001 2003 Design Value PPM
Hamilton	Volunteer Army Ammunition Plant	470650028 - 1	0.092	0.092	0.088
Hamilton	Ridgetrail Rd.	470651011 - 1	0.092	0.093	0.087
Meigs	8401 Highway 60	471210104 - 1		0.093	0.088

**Table 1 B**  
**Chattanooga TN-GA MSA and Meigs County**  
**Population Growth Data**

County	Population 1990	Population 2000	PERCENT CHANGE 1990 - 2000	Population 2002	Area in Square Miles	2002 Pop. Density (Sq. Mile)	Projection 2010	% Growth 2000 - 2010
<b>Tennessee</b>								
Hamilton	285,571	307,896	7.8	309,321	542.44	570.2	305,767	-0.7
Marion	24,873	27,776	11.7	27,654	498.36	55.5	29,930	7.8
<b>Not in the MSA</b>								
Meigs	8,092	11,086	37.0	11,310	194.86	58.0	11,549	4.2
<b>Georgia</b>								
Catoosa	42,464	53,282	25.5				65,877	23.6
Dade	13,147	15,154	15.3				17,740	17.1
Walker	58,340	61,053	4.7				65,195	6.8
<b>TOTALS</b>	<b>432,487</b>	<b>407,811</b>		<b>348,285</b>			<b>496,058</b>	

**Table 1 C**  
**Chattanooga TN-GA MSA and Meigs County**  
**2002 Population Estimates**

<b>Tennessee Counties</b>		<b>Population</b>
Hamilton		<b>309,321</b>
*Chattanooga	(155,554)	
*East Ridge	( 20,640)	
Marion		<b>27,654</b>
*South Pittsburg	( 3,295)	
Meigs		<b>11,310</b>
*Decatur	( 1,395)	
<b>TN TOTALS</b>		<b>348,285</b>

<b>Georgia Counties</b>		<b>Population</b>
**Catoosa		<b>55,197</b>
**Dade		<b>15,508</b>
**Walker		<b>61,884</b>
<b>GA TOTALS</b>		<b>132,589</b>

<b>TN &amp; GA TOTALS</b>	<b>480,874</b>
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\* Based on 2000 Census Data

\*\* Based on 2001 Census Data

**Table 1 D**  
**Chattanooga TN-GA MSA and Meigs County**  
**1999 NEI VOC and NOX Emissions**  
*(ton/day)*

<b>County</b>	<b>Mobile</b>	<b>VOC</b>		<b>Mobile</b>	<b>NOX</b>	
		<b>Point</b>	<b>Total</b>		<b>Point</b>	<b>Total</b>
Hamilton	29.69	44.52	74.21	55.36	18.42	73.78
Marion	4.10	3.38	7.48	17.19	0.56	17.75
Meigs	1.80	0.59	2.39	1.29	0.04	1.33
Catoosa GA	3.96	4.94	8.89	9.98	0.21	10.19
Dade GA	2.41	1.90	4.31	6.50	0.10	6.60
Walker GA	3.98	7.32	11.30	9.99	1.03	11.02
<b>TOTAL</b>	<b>45.94</b>	<b>62.65</b>	<b>108.58</b>	<b>100.31</b>	<b>20.36</b>	<b>120.67</b>

## Summary Attainment Demonstration for the Chattanooga Area

The attainment and screening tests and additional corroborative analyses indicate that the Chattanooga EAC area will be in attainment of the 8-hour ozone standard by 2007. Good modeling results and good representation of typical 8-hour ozone conducive meteorological conditions by the simulation periods provide a sound basis for the application of the model-based tests. Variations in the selection of days or the radius of influence assumptions employed in the application of the attainment test do not alter the outcome of the modeled attainment test, but do suggest an even greater response for higher ozone days than when all days are considered. There is one location within a subdomain encompassing the Chattanooga EAC area for which high ozone concentrations (greater than any near a monitor) are consistently simulated. When the attainment test is applied for this location using the maximum design value for any site in the subregion, it is passed. The values of the simulated ozone exposure metrics indicate a significant reduction in 8-hour ozone for the 2007 AS-4 control measures simulation - approximately 60 to 75 percent for each of the exposure metrics. The amount of excess ozone is reduced by a somewhat greater percentage than the incidence (number of hours) of high ozone.

Estimates of modeling system noise also suggest that, relative to the 2007 baseline simulation, the simulated ozone reductions associated with the AS-4 control measures are meaningful within the context of the simulation—that is, the measures are expected to result in meaningful further ozone reductions by 2007, compared to the baseline values. In addition, the oxidant tagging results (as presented in Section 7 of this document) indicate that 8-hour ozone concentrations in the Chattanooga area are influenced by emissions from the Atlanta area as well as other areas outside of the ATMOS fine grid. Thus, any regional ozone reductions that are not accounted for in the ATMOS modeling inventory (such as that from EACs being developed for Augusta, Macon, and other areas in northern Georgia) will contribute positively to lower ozone in the Chattanooga region.

All three of the monitoring sites in the Chattanooga area have future-year estimated design values for 8-hour ozone that are less than or equal to 85 ppb if the 2000-2002 design value is used and less than or equal to 81 ppb if the 2001-2003 design value is used. Analysis of the effects of meteorology on the design value provides an estimate of a meteorologically adjusted design value for both 2000-2002 and 2001-2003 that is equal to 86 ppb. Use of a meteorologically adjusted DV of 86 ppb is consistent with the outcome of the attainment test based on the use of the 2001-2003 DV and gives an EDV of 79 ppb. Meteorologically adjusted trends indicate a value of 83 ppb, assuming that the emissions changes between 2003 and 2007 will be, on average, the same as that for 1996-2003.

Regional- and national-scale modeling by the Georgia Department of Natural Resources, Environmental Protection Division (GEPD) and the U.S. EPA, gives even lower future-year EDVs for the Chattanooga area. The GEPD EDV for 2007 for Chattanooga is 81 ppb, while that for the Clear Skies Initiative is 79 ppb. These other studies use coarser

grid resolution, but may be more specific in incorporating regional (e.g., for Atlanta) and national measures. Therefore, these results further support a finding of attainment.

Finally, it is important to note that the future-year emissions estimates for Chattanooga do not fully reflect the reduced number of permitted non-major industrial sources (approximately 12 percent) and the loss in manufacturing jobs (approximately 13 percent) that has occurred in the Chattanooga area during the past several years (1999-2002). Overall, these factors would tend to lower the future-year emissions and further support a finding of attainment.

Please see the complete Weight Of Evidence discussion presented in Chapter 8 of the Modeling Analysis Technical Support Document (TSD) for details.

**Attachment 1**