
# Early Action Compact Program for Ground-Level Ozone: A Study

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## INTRODUCTION

The United States Environmental Protection Agency (EPA) initiated the Early Action Compact (EAC) Program in 2002 to make available an option of early implementation action that provided for cleaner air sooner than might have occurred by otherwise following the timelines in the Clean Air Act (CAA). In exchange for early implementation action for the 8-hour ozone standard, EPA deferred the effective dates of designation for those areas that would have been designated nonattainment for the 0.08 parts per million 8-hour ozone National Ambient Air Quality Standard (NAAQS). (The deferral of the effective date had the effect of also deferring the application of specific CAA requirements in these EAC areas, including the New Source Review (NSR) and Conformity Programs.)
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The program concluded in the spring of 2008. At that time, the EPA designated as 'attainment' those EAC areas that had attained the ozone NAAQS and affirmed a nonattainment designation for the one area that had not attained the NAAQS for ozone.

Following the conclusion of the EAC program, EPA's Office of Policy Analysis and Review and EPA's Office of Air Quality Planning and Standards undertook this study of the EAC program in order to learn what worked well and what did not with this community-based program, including whether EAC Program areas attained the ozone NAAQS early. EPA's intent was then to share that knowledge with leaders of programs that EPA and the states create to improve air quality in communities.

## BACKGROUND ON THE EAC PROGRAM

In July 1997, EPA promulgated a revised ozone standard, i.e., the 1997 8-hour standard. EPA designated areas for the 8-hour ozone standard in April 2004. After the standard was promulgated but before areas were designated for it, some state, local and tribal air pollution control agencies expressed a need for added flexibility in implementing the 8-hour ozone NAAQS. One concept was to provide incentives for taking early action to reduce ground-level ozone in exchange for avoiding the stigma of a CAA nonattainment designation and its accompanying requirements (e.g., the NSR and Conformity Programs). This incentive concept became the basis for the development of the EAC program.

Certain environmental groups supported the concept of early action to improve air quality sooner, but had serious concerns about the approach, including, in their view, a weakening of enforcement of the CAA's nonattainment area requirements. Ultimately, EPA worked with these parties to address their concerns by incorporating program elements to help ensure accountability and results.

In 2002, the Texas Commission on Environmental Quality submitted an EAC protocol to EPA. EPA endorsed the protocol and subsequently issued guidance for compact areas. Twenty-nine areas from 12 states submitted signed compact agreements by December 2002. Table ES-1 lists all of the participating areas, only one of which did not complete the program due to an air quality violation (Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado). Fourteen of the areas participated as nonattainment-deferred. This meant that their effective date of designation as nonattainment would have been June 15, 2004; however, EPA deferred this date because of their participation in the EAC Program. The remaining fifteen areas met the ozone NAAQS and were designated attainment, but were close to violating the standard and were looking to voluntarily adopt programs to avoid becoming nonattainment in the future.

**Table ES-1: Twenty-Nine Participating EAC Program Areas**

| Nonattainment Deferred Areas (14) | Attainment Areas (15) |
|---|---|
| Berkeley and Jefferson Counties, West Virginia* | Austin, Texas* |
| Chattanooga, Tennessee-Georgia* | Berkeley-Charleston-Dorchester, South Carolina* |
| Columbia, South Carolina (Central Midlands Area)* | Catawba, South Carolina |
| Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado* | Longview/Northeast, Texas |
| Fayetteville, North Carolina (Cumberland County)* | Low Country, South Carolina |
| Frederick County, Virginia* | Lower Savannah-Augusta, South Carolina-Georgia* |
| Greensboro-Winston Salem-High Point, North Carolina (Triad Area)* | Mountain Area of Western North Carolina (Asheville)* |
| Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area)* | Oklahoma City, Oklahoma* |
| Hickory-Morganton-Lenoir, North Carolina (Unifour Area)* | Pee Dee, South Carolina |
| Johnson City-Kingsport-Bristol, Tennessee* | San Juan County, NM |
| Nashville, Tennessee* | Santee Lynches, South Carolina |
| Roanoke, Virginia* | Shreveport/Bossier City, LA |
| San Antonio, Texas* | Tulsa, Oklahoma* |
| Washington County, Maryland (Hagerstown)* | Upper Savannah Abbeville-Greenwood, South Carolina |
| | Waccamaw, South Carolina |

Source: http://www.epa.gov/ttn/naaqs/ozone/eac/index.htm#EAC_Main.
*Indicates the 20 areas included in this study.

## INFORMATION COMPILATION APPROACH

This study examined both environmental and program design aspects of the EAC program. The environmental aspects of the program included:

- Changes in air quality;
- Estimated emissions reductions from control measures;
- Estimates made in State Implementation Plan (SIP) air quality modeling; and
- Growth-related issues.

The design aspects of the study of the program included:

- Efficiency of the EAC Program;
- Longer term impact of the program;
- Extent of outreach and stakeholder interaction; and
- Other aspects of the program.

The study examined all 14 "nonattainment deferred" and six of the 15 "attainment" EAC Program areas (see Table ES-1). The six attainment areas were selected based on geographic diversity and the availability of relevant data. As part of the study, EPA gathered information on air quality and control measure emissions reductions, among other data. Discussions were also held with state agencies from all 12 states that participated in the program, as well as local agencies in six of the 14 nonattainment-deferred areas and in three of the 15 attainment areas that also participated in the program. EPA also

consulted with representatives from two non-EAC Program areas and the states in which they are located to provide additional perspectives.

The qualitative information and observations developed from discussions with state and local agencies reflect the views of the individuals consulted. So, in that sense, the information gained was somewhat subjective and should be interpreted in that light. But, to some degree, the information obtained was consistent enough such that it could be generalized to other EAC areas. The program design areas in particular were addressed in a qualitative manner because they did not lend themselves easily, if at all, to quantitative measurement. Ideally, for example, it would have been beneficial to be able to develop a questionnaire to answer some of the study's questions. Because that was not feasible in the time available for the study, EPA held informal discussions, which, though not ideal, yielded useful information. State and local agencies provided insights, positive and negative, on the EAC Program.

## LIMITATIONS OF THIS STUDY

This report is not a formal program evaluation and has several limitations. Specifically, the study did not:

- Compare emission reductions of EAC areas versus non-EAC areas in terms of both quantities and implementation timeframes;
- Study air quality for EAC areas past 2007; and
- Rigorously compare EAC areas with non-EAC areas with respect to certain key areas, such as:
    - Program design-related concerns (e.g., program efficiency)
    - Control measure implementation.

## KEY OBSERVATIONS RESULTING FROM THE STUDY

Because of the study's limitations, it is difficult to draw hard findings and conclusions. However, the study was able to make a number of observations about emission reductions, changes in air quality, and issues related to program design and process.

Overall, a number of states in the Northeast had serious concerns about the approach. The EAC program was generally popular with participating state and local officials. These officials indicated the EAC Program model provided the right combination of incentives, flexibility, and structure and was used to foster a collaborative environment that:

1) Encouraged local stakeholders to take ownership of the ozone air quality issue and to develop and adopt local measures;
2) Increased awareness of ozone air quality issues with key stakeholders and, to a degree, with the public; and
3) Helped establish working relationships between state environmental agencies and local government that may prove beneficial for future implementation of air quality standards.

### Emission Reductions

For the vast majority of the areas included in this study, the EAC Program appeared to successfully encourage the development and adoption of quantifiable, local emission reduction control measures by the December 2005 deadline. Ninety-six percent of the total 388 measures implemented for the 20 areas included in the study were implemented by the EAC December 2005 deadline, according to EAC progress reports and SIPs. Estimated emission reductions from local measures collectively constituted an estimated nine percent or more of quantified nitrogen oxides ($NO_x$)and volatile organic compounds

(VOC) emissions reductions in seven of 18 EAC Program areas included in this study for which complete emissions reductions data were available (the remaining reductions were achieved from national and state measures). The local measures were "directionally correct" and should assist the areas in maintaining the ozone NAAQS.

According to many state and local officials, the program also resulted in quantifiable emission co-reductions of other pollutants, including particulate matter and/or air toxics.

**Air Quality**

The study analyzed the air quality improvements experienced by EAC Program areas in the eastern U.S. by comparing them to improvements achieved in nearby nonattainment areas that did not participate in the EAC program. (This could not be analyzed in the Colorado, Oklahoma and Texas EAC areas, because there were not ozone nonattainment areas located near enough to provide a comparison.) The analysis found that the changes in air quality in eastern EAC Program areas were consistent with those observed in non-EAC areas. Additionally, consistent with the expectation that most progress towards ozone attainment in the East would come generally from national measures such as vehicle standards and power plant controls, it appears that, based on air quality data, local EAC measures adopted and implemented in EAC Program areas in the East did not produce an early, demonstrable incremental improvement in air quality. Relative to non-EAC Program areas, the information compiled appears to indicate that, for EAC areas in the East, progress toward meeting the air quality standards on time was not adversely affected by two factors: (1) the absence of some or all of the nonattainment area requirements that traditional nonattainment areas face, or (2) population and vehicle miles traveled growth that most of the areas experienced during EAC Program implementation. Relative to non-EAC Program areas, these two factors also did not appear to adversely affect the ability of EAC areas in the East to attain the NAAQS by December 2007 (or earlier for many EAC areas).

The fact that local measures did not produce an early, demonstrable incremental improvement in air quality can be explained in part by the fact that quantified $NO_x$ and VOC emissions reduction estimates from *local* EAC measures represented a small part of emissions overall: (1) in EAC Program areas; (2) in states in which they are located, and (3) as compared to reductions achieved in each state through the $NO_x$ SIP call. The best way to measure the impact on air quality of the EAC local measures – and whether they contributed to the areas attaining early – would be to conduct incremental air quality modeling of the emissions reductions from those measures. Short of that, the reductions are so small relative to the emission reductions from federal and state measures that their impact is indiscernible.

All but one of the EAC areas did attain the ozone NAAQS by December 31, 2007; in fact, 15 of the 20 EAC areas attained the 8-hour ozone NAAQS by December 31, 2004 – prior to the required 2005 implementation date for the EAC control measures.

This study looked at ozone air quality through 2007. And while almost all the EAC areas met the ozone NAAQS before 2007, it remains to be seen what will happen to ozone air quality levels in these areas as they grow in the next 5 to 10 years. Ozone air quality in many of the areas will continue to be influenced by, among other things, state and national programs to reduce $NO_x$ and VOCs. Some state and local officials believe that local measures should benefit air quality in the future. EAC Program areas were required to develop plans to demonstrate how they would address emissions growth and maintain meeting the ozone NAAQS for five years (to 2012). They did so, and almost all the states in the southeastern U.S (EPA Region 4) with EAC Program areas submitted maintenance plans for 10 years.

The study also looked at whether the air quality modeling provided insight into what degree the "local" EAC measures contributed to additional improvements in air quality, beyond the improvements provided by the state and national measures. The only reliable way to quantify the air quality improvements from the EAC local measures is to model the local measures independently of the state and national measures. But the modeling performed for the EAC SIPs did not provide such an analysis. For this study the information available only allows for a review of whether the actual air quality improvement achieved is consistent with the level of improvement predicted by the model. After making this comparison, this study observes that the estimates in the modeled demonstration are consistent with the air quality achieved. Therefore, the modeling provided reasonable information.

It was beyond the scope of this study to analyze the improvements in short-term or long-term air quality that would have otherwise occurred in the affected EAC areas if they had followed the traditional requirements under the CAA associated with a nonattainment designation. For example, several of the nonattainment-deferred areas experienced new stationary source activity that may have been subject to permitting requirements under the CAA nonattainment NSR program had the same activities been undertaken while these areas had a designation of nonattainment. The proposed emissions increases for some of those sources were controlled under the CAA's Prevention of Significant Deterioration Program. As noted above, this study did not quantify emission changes in EAC versus non-EAC areas and is, therefore, unable to provide information on the impact on emissions of the absence in EAC areas of some or all of the nonattainment area requirements that traditional nonattainment areas face, including those of the Nonattainment NSR Program.

State and local agencies consulted did believe the EAC approach to be well suited for nonattainment-deferred areas that were new to the ozone air quality issue and had ozone air quality levels relatively close to the standard. Those areas did not face the same degree of ozone air quality challenge faced by some of the nation's largest areas and so, in that regard, their air quality problems were more manageable. EAC Program participants in these areas took ownership of their air quality problem in a way that was not likely, in the opinion of the state and local agencies consulted, to have occurred to the same degree under the traditional approach, absent a concerted EAC-type effort or unless the community was already active on environmental issues.

**Program Design and Process**

Some EAC Program areas did not experience the "collaborative environment" the EAC Program model fostered in other EAC Program areas. Based on the study discussions, several possible reasons emerged to help explain this:

- Insufficient technical support for EAC Program areas from EPA and the states;
- Insufficient state or local agency leadership to help start and/or shepherd the EAC Program process;
- Lack of public interest due to insufficient information about local air quality issues; and
- Ozone air quality problem believed to be solvable due to state and national measures alone so there was not much action perceived to be needed locally.

The state and local agencies implementing the EAC Program reported that, in order to succeed, the EAC program needed (1) the threat of reinstatement of the nonattainment designation as the consequence of failure to meet EAC Program requirements and (2) for the EAC Program to be part of the larger SIP

program. The majority of state and local agencies consulted believed that states and local areas needed motivation to participate in the program for it to succeed.

The EAC Program required as much EPA staff resources or less than the staff resources EPA estimated would have been needed to implement the regular program for the same areas. The question of whether the EAC Program saved estimated human resources varied by EPA region. The study lacked data to assess the resource impact of the EAC program on the participating state and local agencies.

Details on specific quantitative and qualitative observations on environmental impacts and program design-related issues can be found in Section 3.0 of this report.

**HOW THIS REPORT IS ORGANIZED**

This report contains four sections. Section 1.0 provides background on the EAC Program, including some of its history and why some states supported and other states and environmental groups opposed the program. Section 2.0 describes the quantitative and qualitative information compilation approach used to conduct the study of the program. Section 3.0 presents a summary of the study information, as well as observations based on that information. The appendices include numerous data tables, lists of state and local agencies consulted, and a complete summary of discussions with state and local agency officials.

# SECTION 1.0 BACKGROUND ON THE EARLY ACTION COMPACT PROGRAM

This section provides background on the Early Action Compacts (EAC) Program, including: (1) a brief history; (2) why some states supported the program and other states and environmental groups opposed it; and (3) why the United States Environmental Protection Agency's (EPA's) Office of Policy Analysis and Review (OPAR) and Office of Air Quality Planning and Standards (OAQPS) decided to undertake this study.

## 1.1 Origin of the EAC Program

The Clean Air Act (CAA) establishes a process for air quality management through the National Ambient Air Quality Standards (NAAQS). Area designations are required after promulgation of a new or revised NAAQS. In 1979, EPA promulgated the 0.12 parts per million (ppm), 1-hour ozone standard. On July 18, 1997, EPA promulgated a revised ozone standard of 0.08 ppm, measured over an 8-hour period (i.e., the 1997 8-hour standard.)[1] The 8-hour standard is more protective of public health and, thus, more stringent than the 1-hour standard. In 2008, the Agency further tightened the 8-hour ozone standard. (In this document, when references are made to the 8-hour standard it applies to the 0.08 ppm standard promulgated in 1997.) The 1997 NAAQS rule was challenged by numerous litigants and, in May 1999, the U.S. Court of Appeals for the District of Columbia Circuit (D.C. Circuit) issued a decision remanding, but not vacating, the 8-hour ozone standard. The EPA sought review of two aspects of that decision in the U.S. Supreme Court. In February 2001, the Supreme Court upheld EPA's authority to set the NAAQS and remanded the case back to the D.C. Circuit for disposition of issues the Court did not address in its initial decision. Whitman v. American Trucking Association, 121 S.Ct. 903, 911-914, 916-919 (2001)(Whitman). The Supreme Court also remanded the 8-hour implementation strategy to EPA. In March 2002, the D.C. Circuit rejected all remaining challenges to the 8-hour ozone standard. American Trucking Assoc. v. EPA, 283 F.3d355 (D.C. Cir. 2002).

The process for designations following promulgation of a NAAQS is contained in section 107(d)(1) of the CAA. For the 8-hour NAAQS, the Transportation Equity Act for the 21st Century (TEA-21) extended by one year the time for EPA to designate areas under the 8-hour NAAQS.[2] Thus, EPA was required to designate areas for the 8-hour NAAQS by July 2000. However, House Resolution 3645 (EPA's appropriation bill in 2000) restricted EPA's authority to spend money to designate areas until June 2001, or the date of the Supreme Court ruling on the standard, whichever came first. As noted earlier, the Supreme Court decision was issued in February 2001. In 2003, several environmental groups filed suit in district court claiming EPA had not met its statutory obligation to designate areas for the 8-hour NAAQS. The EPA entered into a consent decree that required EPA to issue the designations by April 15, 2004.[3]

During this period, in the early 2000s, some state, local and tribal air pollution control agencies expressed an interest in added flexibility in implementing the 8-hour ozone NAAQS, including incentives for taking action sooner than the CAA required for reducing ground level ozone. Some of these agencies were particularly interested in early planning and implementation to avoid the nonattainment designation and

[1] "National Ambient Air Quality Standards for Ozone," 62 Federal Register 38856, http://www.epa.gov/ttn/naaqs/standards/ozone/data/19970718_o3naaqs.pdf, July 18, 1997.
[2] CAA section 107(d)(1); TEA-21 section 6103(a).
[3] "Air Quality Designations and Classifications for the 8-Hour Ozone National Ambient Air Quality Standards; Early Action Compact Areas with Deferred Effective Dates," 69 Federal Register 23858-23951, http://www.epa.gov/ttn/naaqs/ozone/eac/fr_69(84)_23858.pdf, April 30, 2004.

the various CAA requirements associated with being designated nonattainment (e.g., Conformity and Nonattainment New Source Review (NSR) Programs) that they were going to face in 2004 with EPA area designations. The concept for an EAC program required local areas to make decisions to achieve reductions in volatile organic compounds (VOCs) and nitrogen oxides ($NO_x$) emissions sooner than otherwise mandated by the CAA. It was assumed that early planning and early implementation of control measures that improved air quality would provide early protection of public health. Environmental groups supported efforts to improve air quality sooner, but had serious concerns about the EAC Program. Some states, supported efforts that afforded flexibility in achieving their clean air goals but did not support the EAC Program per se. They believed that EPA could not relieve areas of nonattainment area requirements under title I, part D of the CAA when such areas were in violation of the standard at the time EPA designated areas. (These concerns are discussed in greater depth in Section 1.6 below.)

In March 2002, the Texas Commission on Environmental Quality (TCEQ) encouraged EPA to consider incentives for early planning towards achieving the 8-hour ozone NAAQS. The TCEQ submitted to EPA the "Protocol for Early Action Compacts Designed to Achieve and Maintain the 8-hour Ozone Standard (the Protocol)."[4] The Protocol was designed to achieve $NO_x$ and VOC emissions reductions for the 8-hour ozone NAAQS sooner than would otherwise be required under the CAA. The TCEQ recommended that the Protocol be formalized by ''early action compact'' agreements to be developed primarily by local, state and EPA officials. The principles of the compacts, as described in the Protocol, were as follows:

- Early planning, implementation, and emissions reductions leading to expeditious attainment and maintenance of the 8-hour ozone standard;
- Local control of the measures employed, with broad-based public input;
- State support to ensure technical integrity of the early action plan;
- Formal incorporation of the early action plan into the State Implementation Plan (SIP);
- Designation of all areas as attainment or nonattainment in April 2004, but, for compact areas, deferral of the effective date of the nonattainment designation and/or designation requirements so long as all compact terms and milestones continue to be met; and
- Safeguards to return areas to traditional SIP attainment requirements should compact areas fail to meet program terms (e.g., if the area fails to attain in 2007), with appropriate credit[5] given for reduction measures already implemented.

In a letter dated June 19, 2002, from Gregg Cooke, Administrator, Region 6, to Robert Huston, Chairman, TCEQ, EPA endorsed the principles outlined in the Protocol.[6] The Protocol was subsequently revised on December 11, 2002, based on comments from EPA. The Protocol specified certain components that compacts had to address, including the development of local air quality plans and the following elements:

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[4] http://www.epa.gov/ttn/naaqs/ozone/eac/20020619_eac_protocol.pdf

[5] In the EAC context "credit" is discussed in a guidance Q and A that EPA issued under the heading of "SIP credit": "Question: If an area implements controls under an MOA or Compact, will those reductions be able to be counted as control measures under a subsequent attainment SIP, if one is required?
Response: The 8-hour "Compact" is the Memorandum of Agreement. Reductions from any control measures implemented under the 8-hour Early Action Compact and approved into the SIP can be credited towards a subsequent attainment SIP, if one is required (see memorandum from John S. Seitz, Director, Office of Air Quality Planning and Standards, to Gregg Cooke, Regional Administrator, Region VI, dated January 29, 2001, "Near-Term Discretionary Emission Reductions for Ozone NAAQS–Clarification.")," http://www.epa.gov/oar/eac/faq.html.

[6] http://www.epa.gov/ttn/naaqs/ozone/eac/20020619_eac_protocol.pdf

- Completion of emissions inventories and modeling (based on most recent Agency guidance) to support selection of local control measures;
- Adoption of control strategies that demonstrate attainment and that are submitted as a revision to the SIP;
- Completion of a maintenance component to address emissions growth at least five years beyond December 31, 2007, ensuring that the area will remain in attainment of the 8-hour ozone standard during that period;
- Public involvement in all stages of planning and implementation, including public education programs and a process that ensures stakeholder involvement and public participation in planning local strategies and reviewing air quality plans; and
- Semiannual reports detailing progress toward completion of compact milestones.

**1.2 What EPA Required of Compact Areas**

Based on the Protocol, EPA issued Agency guidance[7] that established parameters for entering into a compact. To be eligible as an EAC area, areas had to be designated attainment for the 1-hour ozone standard[8] and be in attainment with that standard when entering into the compact. Air quality in qualifying EAC Program areas could approach or violate the 8-hour ozone standard[9] at the time of the agreement, but the area would need to demonstrate that it would attain that standard by December 31, 2007.

EPA's EAC guidance memorandum specified that compacts had to be completed, submitted to EPA and signed by local, state and EPA officials by December 31, 2002. Each EPA Regional Administrator (or designee) was a signatory on the compact agreement. Although these compacts alone did not constitute EPA-approved SIP revisions, EPA's signature indicated the Agency's support and willingness to honor the commitments established in these agreements, provided the areas met all components of the Protocol and acted consistently with Agency guidance and schedules. No additional areas were allowed to enter into compacts after December 31, 2002.

The EPA guidance described several features of the EAC Program:

- Laid out the process by which compact areas would select control strategies based on SIP quality modeling that showed attainment of the 8-hour ozone standard no later than December 31, 2007;
- No later than December 31, 2004 states and tribes were to submit to EPA a SIP or Tribal Implementation Plan consisting of the local EAC plan, including all adopted control measures, and a demonstration that the area will attain the 8-hour ozone standard by December 31, 2007;

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[7] (1) Memorandum from Jeffrey R. Holmstead, Assistant Administrator, Office of Air and Radiation, "Schedule for 8-Hour Ozone Designations and its Effect on Early Action Compacts," http://www.epa.gov/ttn/naaqs/ozone/eac/designation_eac_20021114.pdf, November 14, 2002 and (2) Memorandum from Lydia N. Wegman, Director, Air Quality Strategies and Standards Division, Office of Air Quality Planning and Standards, ''Early Action Compacts (EACs): The June 16, 2003 Submission and Other Clarifications,'' http://www.epa.gov/ttn/naaqs/ozone/eac/6-16-2003_eac_milestone_memo.pdf, April 4, 2003.

[8] The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 parts per million is equal to or less than 1 (see 40 CFR part 50.9 and Appendix H).

[9] The 1997 8-hour ozone standard is met when the 3-year average of the annual fourth-highest daily maximum 8-hour average ozone concentration is less than or equal to 0.08 ppm 1 (see 40 CFR part 50.9 and Appendix I).

- Indicated that all compact areas were to submit a local plan by March 31, 2004 that included measures that were specific, quantifiable, permanent, and that, if approved into the SIP by EPA, would be federally enforceable
    - The March 31, 2004 submission had to include specific implementation dates for the local controls, as well as detailed documentation supporting the selection of measures
    - Deadline for plan submission was approximately 30 months earlier than would have otherwise been required by the CAA;
- Local controls were to be implemented by the 2005 ozone season (or no later than December 31, 2005). This deadline was at least 16 1⁄2 months earlier than would have otherwise been required by the CAA; and
- Reports were to be submitted every six months to describe progress toward completion of milestones.
    - In June 2006, compact areas were to submit a report to EPA that described the implementation of control measures, as well as an assessment of reductions in emissions and resultant improvement in air quality.

EPA EAC guidance[10] with respect to the attainment demonstrations due by December 2004 indicated that state and local agencies should do the following:

- Follow the most recent OAQPS modeling guidance ("Draft Guidance on the Use of Models and Other Analyses in Attainment Demonstrations for the 8-hour Ozone NAAQS," May 1999, EPA-454/R-99-004);
- Model most current emissions inventory, preferably 2002 (however, if 2002 was not available, use of a 1999 or later inventory for EAC modeling was acceptable);
- Base 2007 projections on 1999 emissions inventory or later;
- Use MOBILE6 in both the current and future inventories;
- Select episodes representative of the area's ozone problem; and
- Use appropriate assumptions and emissions analysis techniques in quantifying emissions reductions.

Table 1-1 describes the milestones and submissions that compact areas were to complete to continue eligibility for a deferred effective date of the nonattainment designation for the 8-hour ozone standard, which is further described in Section 1.4 below. (The EAC milestones and requirements were issued as a regulation on April 30, 2004.[11])

[10] (1) Memorandum from Lydia N. Wegman, Director, Air Quality Strategies and Standards Division, Office of Air Quality Planning and Standards, ''Early Action Compacts (EACs): The June 16, 2003 Submission and Other Clarifications,'' http://www.epa.gov/ttn/naaqs/ozone/eac/6-16-2003_eac_milestone_memo.pdf, April 4, 2003; (2) "Draft Guidance on the Use of Models and Other Analyses in Attainment Demonstrations for the 8-Hour Ozone NAAQS," U.S. Environmental Protection Agency, EPA-454/R-99-004, May 1999; and (3) "Frequently Asked Questions on Implementing the DRAFT 8-Hour Ozone Modeling Guidance to Support Attainment Demonstrations for Early Action Compact (EAC)," U.S. Environmental Protection Agency, http://www.epa.gov/scram001/guidance/guide/eac-ozone.pdf.

[11] "8-Hour Ozone National Ambient Air Quality Standards; Final Rules," 69 Federal Register 23858-23951, 23875-76, http://www.epa.gov/ttn/naaqs/ozone/eac/fr_69(84)_23858.pdf, April 30, 2004; and 40 Code of Federal Regulations 81.300(e).

**Table 1-1: EAC Milestones**

| Compact Milestone | Submittal Date |
|---|---|
| Submit Compact for EPA signature. | December 31, 2002 |
| Submit preliminary list and description of potential local control measures under consideration. | June 16, 2003 |
| Submit complete local plan to state (includes specific, quantified and permanent control measures to be adopted). | March 31, 2004 |
| State submits adopted local measures to EPA as a SIP revision that, when approved, will be federally enforceable. | December 31, 2004 |
| Implement SIP control measures. | 2005 ozone season (or no later than December 31, 2005) |
| State reports on implementation of measures and assessment of air quality improvement and reductions in $NO_x$ and VOC emissions to date. | June 30, 2006 |
| Area attains 8-hour ozone NAAQS. | December 31, 2007 |

Source: "Air Quality Designations and Classifications for the 8-Hour Ozone National Ambient Air Quality Standards; Early Action Compact Areas with Deferred Effective Dates," 69 Federal Register 23858-23951, 23865, http://www.epa.gov/ttn/naaqs/ozone/eac/fr_69(84)_23858.pdf, April 30, 2004.

### 1.3 Areas that Participated in the EAC Program

Many areas were interested in participating in the EAC Program. Some areas that showed initial interest decided not to pursue participation in the program or were ineligible for different reasons such as the applicant could not meet the deadline (December 2002) for submitting a signed compact agreement or their application did not meet all of the criteria described in EPA guidance. Thirty-one areas from 12 states submitted signed compact agreements by December 2002 and 29 of those areas ultimately participated fully in the program (two areas withdrew from the program prior to submitting an EAC SIP). Table 1-2 lists all of the participating areas at the end of the program. Fourteen of those areas were "nonattainment-deferred" which meant that EPA would have designated them nonattainment with an effective date of June 15, 2004 had they not participated in the EAC Program. Fifteen of the areas that participated were designated "attainment" with an effective date of June 15, 2004. The nonattainment-deferred areas were in the mid-Atlantic and southeastern regions, except for San Antonio, Texas. Nine of the 15 attainment areas were in the southeast, eight of which were in South Carolina. The remaining six areas were spread across Texas, Oklahoma, New Mexico and Louisiana.

**Table 1-2: Twenty-Nine Participating EAC Program Areas**

| Nonattainment Deferred Areas (14) | Attainment Areas (15) |
|---|---|
| Berkeley and Jefferson Counties, West Virginia | Austin, Texas |
| Chattanooga, Tennessee-Georgia | Berkeley-Charleston-Dorchester, South Carolina |
| Columbia, South Carolina (Central Midlands Area) | Catawba, South Carolina |
| Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado | Longview/Northeast, Texas |
| Fayetteville, North Carolina (Cumberland County) | Low Country, South Carolina |
| Frederick County, Virginia | Lower Savannah-Augusta, South Carolina-Georgia |
| Greensboro-Winston Salem-High Point, North Carolina (Triad Area) | Mountain Area of Western North Carolina (Asheville) |
| Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area) | Oklahoma City, Oklahoma |
| Hickory-Morganton-Lenoir, North Carolina (Unifour Area) | Pee Dee, South Carolina |
| Johnson City-Kingsport-Bristol, Tennessee | San Juan County, NM |
| Nashville, Tennessee | Santee Lynches, South Carolina |
| Roanoke, Virginia | Shreveport/Bossier City, LA |
| San Antonio, Texas | Tulsa, Oklahoma |
| Washington County, Maryland (Hagerstown) | Upper Savannah Abbeville-Greenwood, South Carolina |
| | Waccamaw, South Carolina |

Source: http://www.epa.gov/ttn/naaqs/ozone/eac/index.htm#EAC_Main.

## 1.4 Action EPA Undertook To Defer the Effective Date of Nonattainment Designation for the EAC Areas

At the time EPA designated areas for the 8-hour ozone standard in April 2004,[12] EPA took final action deferring the effective date until September 30, 2005 of the nonattainment designation for the 14 participating compact areas that were monitoring a violation of the 8-hour ozone standard. The EPA took action because all terms of the agreement continued to be met up to that point, including timely completion of all compact milestones and reports. Subsequently, through notice-and-comment rulemaking, EPA further deferred the effective date, based upon a determination that the areas continued to meet all compact milestones the time of the action. Table 1-3 provides the deferred effective date adopted in each of the Federal Register actions for the 14 areas.

Table 1-3 also includes the effective dates that were specific to the Denver, Colorado EAC Program area. On November 29, 2006, EPA extended the deferred effective date for Denver from December 31, 2006 to July 1, 2007. In that final rulemaking, EPA noted that it would further extend the deferred effective date to as late as April 15, 2008, which was the then-applicable effective date for the other 13 areas, once Denver addressed certain issues with its EAC. The action extending the deferral to July 2007 was challenged by Rocky Mountain Clean Air Action (RMCAA), which had also challenged the August 16, 2007 deferral as it applied to the Denver EAC Program Area. EPA issued a short further deferral to preserve the status quo as settlement discussion with RMCAA continued, extending the deferral date from July 1, 2007 to September 14, 2007. At the conclusion of settlement discussions, EPA extended the deferral of the effective date to November 20, 2007. Because EPA determined that the Denver area violated the 0.08 ppm, 8-hour ozone NAAQS based on air quality data from 2005 through the first three

[12] "8-Hour Ozone National Ambient Air Quality Standards; Final Rules," 69 Federal Register 23858-23951, http://www.epa.gov/ttn/naaqs/ozone/eac/fr_69(84)_23858.pdf, April 30, 2004; and in subsequent Federal Register notices provided on http://www.epa.gov/ttn/naaqs/ozone/eac/index.htm#RMNotices.

quarters of 2007, the nonattainment designation for the Denver EAC was not further extended and it took effect on November 20, 2007. After concluding that the remaining 13 EAC Program areas had attained the 8-hour ozone NAAQS based on air quality data from 2005-2007, on March 27, 2008 the EPA Administrator signed a final action designating those 13 EAC Program areas as attainment, effective April 15, 2008.[13]

**Table 1-3: EPA Actions Deferring Effective Date of Nonattainment Designation**

| Deferral | Final Rule Date (EPA Administrator Signature) | Deferred Effective Date |
|---|---|---|
| 1st | April 15, 2004 | September 30, 2005 |
| 2nd | August 16, 2005 | December 31, 2006 |
| 3rd | November 22, 2006 | April 15, 2008<br>July 1, 2007 (Denver, Colorado) |
| 4th | June 22, 2007 | September 14, 2007 (Denver, Colorado) |
| 5th | September 14, 2007 | November 20, 2007 (Denver, Colorado) |

Source: http://www.epa.gov/ttn/naaqs/ozone/eac/index.htm#EAC_Main.

## 1.5 How EPA Addressed Compact Areas Attaining the 8-Hour Ozone Standard in April 2004

Compact areas not violating the 8-hour ozone standard based on the most recent air quality data available (generally data from 2001–2003) were designated unclassifiable/attainment in the April 2004 designation action and the unclassifiable/attainment designation became effective on June 15, 2004. EPA encouraged unclassifiable/attainment areas that had joined the EAC Program to continue to develop clean air plans and to remain committed to the compact program to ensure air quality remained clean. Seventeen such areas decided to participate in the program; however, two areas (Haywood County, Tennessee and Putnam County, Tennessee) later withdrew from the program. If an area designated unclassifiable/attainment in April 2004 participating in the EAC Program subsequently violated the 8-hour ozone standard during the term of the compact, EPA had the discretion (under section 107(d)(3) of the CAA) to redesignate the area to nonattainment, as it does with any unclassifiable/attainment areas following designations.

## 1.6 Concerns About and Legal Challenges to the EAC Program

A number of environmental groups and states had significant concerns with the EAC program. This section describes concerns expressed by outside parties in formal comments on EPA Federal Register actions, EPA's response to them and the chronology of events concerning legal challenges to the EAC program.

Many commenters on EPA's initial designations notice expressed support for the compact process, the goal of clean air sooner, the incentives and flexibility the program provides for encouraging early reductions of ozone-forming pollution, and the deferred effective date of nonattainment designation.[14]

[13] "Final 8-Hour Ozone National Ambient Air Quality Standards Designations for the Early Action Compact Areas," 64 Federal Register 17897, http://www.epa.gov/ttn/naaqs/ozone/eac/fr20080327_eac.pdf, April 2, 2008.

[14] "Deferral of Effective Date of Nonattainment Designations for 8-Hour Ozone National Ambient Air Quality Standards for Early Action Compact Areas," 68 Federal Register 70108-70119, http://www.epa.gov/ttn/naaqs/ozone/eac/fr_68(241)_70108.pdf, December 16, 2003. See "Response to Public Comments—Early Action Compacts for Implementing the 8-hour Ozone National Ambient Air Quality Standards for Early Action Compact Areas," Docket No. OAR-2003-0090-0278, April 15, 2004.

However, a number of commenters opposed the EAC program. Several of these commenters expressed concern about the legality of the program and primarily about the deferral of the effective date of the nonattainment designation for these areas. Although all of these commenters were supportive of the goal of addressing proactively the public health concerns associated with ozone pollution, the commenters stated that the EAC program was not authorized by the CAA. All of these commenters indicated that EPA lacked authority under the CAA to defer the effective date of a nonattainment designation. In addition, these commenters stated that EPA lacked the authority to enter into EACs and lacked authority to allow areas to be relieved of obligations under title I, part D of the CAA while these areas were violating the 8-hour ozone standard or were designated nonattainment for that standard.

In response, EPA continued to believe that the compact program, as designed, will give local areas the flexibility to develop their own approach to meeting the 8-hour ozone standard, provided the participating communities are serious in their commitment to control emissions from local sources earlier than the CAA would otherwise require. By involving diverse stakeholders, including representatives from industry, local and state governments, and local environmental and citizens' groups, a number of communities were discussing for the first time the need for regional cooperation in solving air quality problems that affect the health and welfare of its citizens. EPA stated that people living in these areas that realize reductions in pollution levels sooner will enjoy the health benefits of cleaner air sooner than might otherwise occur. In the April 2004 rule EPA codified the specific requirements in part 81 of the CFR to clarify what is required of compact areas to be eligible for deferral of the effective date of their nonattainment designation and what actions EPA intends to take in response to areas that meet the milestones and areas

In addition, in response to environmental groups' concerns, the EPA entered into discussions with those environmental groups. The EPA sought to address their concerns by incorporating several safeguards into the program to ensure the accountability of EPA and participating state and local agencies. The safeguards included: bi-annual progress reports; periodic milestones; and, requiring state and local agencies to identify measures that would produce meaningful emissions reductions.

Several parties filed a lawsuit claiming EPA had not designated areas within the timeframe required by the CAA. In a March 13, 2003 consent decree between EPA and the parties who filed the challenge, the EPA agreed to sign a notice by April 15, 2004 promulgating the 8-hr ozone designations and to publish that action by April 30, 2004. In addition, the environmental groups and EPA agreed to meet periodically to discuss ways to encourage areas that approach or monitor minimal exceedances of the 8-hr standard to develop and implement early action plans offering a more expeditious time line for achieving emission reductions.

Upon promulgation of the 8-hour area designations, several environmental groups and some of the Northeastern states filed suit challenging EPA's deferral of the effective date of designation for the EAC areas. American Lung Assoc., et al., v. EPA (D.C. Cir. No. 04-1275). These same parties challenged each of the subsequent actions further deferring the effective date of designation and those subsequent cases were consolidated with the first. In addition to these actions by national environmental groups and Northeastern states noted above, RMCAA sued EPA specifically on the deferral for Denver, Colorado from November 29, 2006 to July 1, 2007. RMCAA v. EPA (D.C. Cir. 07-1012). As noted above, on November 29, 2006, EPA deferred designations for 13 EAC areas until April 15, 2008. EPA deferred the designation for Denver only until July 1, 2007, as it had not yet completed all of the necessary rulemaking. Subsequently, the measures were adopted. EPA settled the suit with RMCAA in 2007, by

which time Denver had measured a violation that ultimately resulted in the nonattainment designation taking effect on November 20, 2007. RMCAA had several comments[15] on EPA's proposed deferral of Denver's nonattainment designation, including:

- 2006 ozone levels have risen to unhealthy levels;
- Denver EAC has fallen short of achieving reductions in ozone precursors;
- Nowhere does the CAA allow deferrals of nonattainment designations; and
- If Denver violates the 8-hour ozone NAAQS in 2007, there is nothing that triggers an automatic nonattainment designation.

**1.7 Federal Emissions Control Programs that Have Helped Improve Air Quality in EAC Areas**

Amid the concerns and challenges discussed in the prior section, the EAC Program moved forward and was implemented with all but one of the 29 participating areas attaining the 1997 ozone NAAQS by the December 2007 deadline. The EAC areas were aided in reducing their ozone levels to a significant degree, as is true for many other ozone areas in the country, by implementation of several Federal programs to reduce emissions of $NO_x$, and to some degree VOCs. These programs include:

- $NO_x$ SIP Call[16]
  - Compliance dates 2004-2007, depending on the state
  - Set $NO_x$ budgets for electrical generation units, large industrial boilers, cement kilns and turbines in 20 Eastern states and Washington, D.C.
  - $NO_x$ reductions of 880,000 tons per ozone season by 2007;
- Tier 2 Vehicle and Gasoline Sulfur Program[17]
  - Compliance dates 2004 for gasoline sulfur content and 2004–2009 for phase-in of new vehicle standards by model year
  - Covered gasoline sold nationwide and cars, light-duty trucks, and certain size sport utility vehicles sold outside California
  - Reduces $NO_x$ and VOC emissions; and
- New Source Performance Standard and Emission Guidelines for Waste Combustion[18]
  - Compliance date 2005
  - Covered certain incinerators and municipal waste combustors nationwide
  - Reduced $NO_x$ emissions by 16,283 tons per year in 2006.

These and other Federal programs helped to reduce ozone in the EAC Program areas – both locally-formed and transported ozone. Figure 1-1 provides a visual display of the benefit to ozone air quality for

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[15] "Final Extension of the Deferred Effective Date for 8-Hour Ozone National Ambient Air Quality Standards for the Denver Early Action Compact: Proposed Rule," http://www.epa.gov/ttn/naaqs/ozone/eac/fr_20070301_72(40)_9285_eac_4extend_deferred_date.pdf , March 1, 2007; Docket No. EPA–HQ–OAR–2003–0090, comment submitted by Jeremy Nichols, Director, Rocky Mountain Clean Air Action, April 2, 2007.

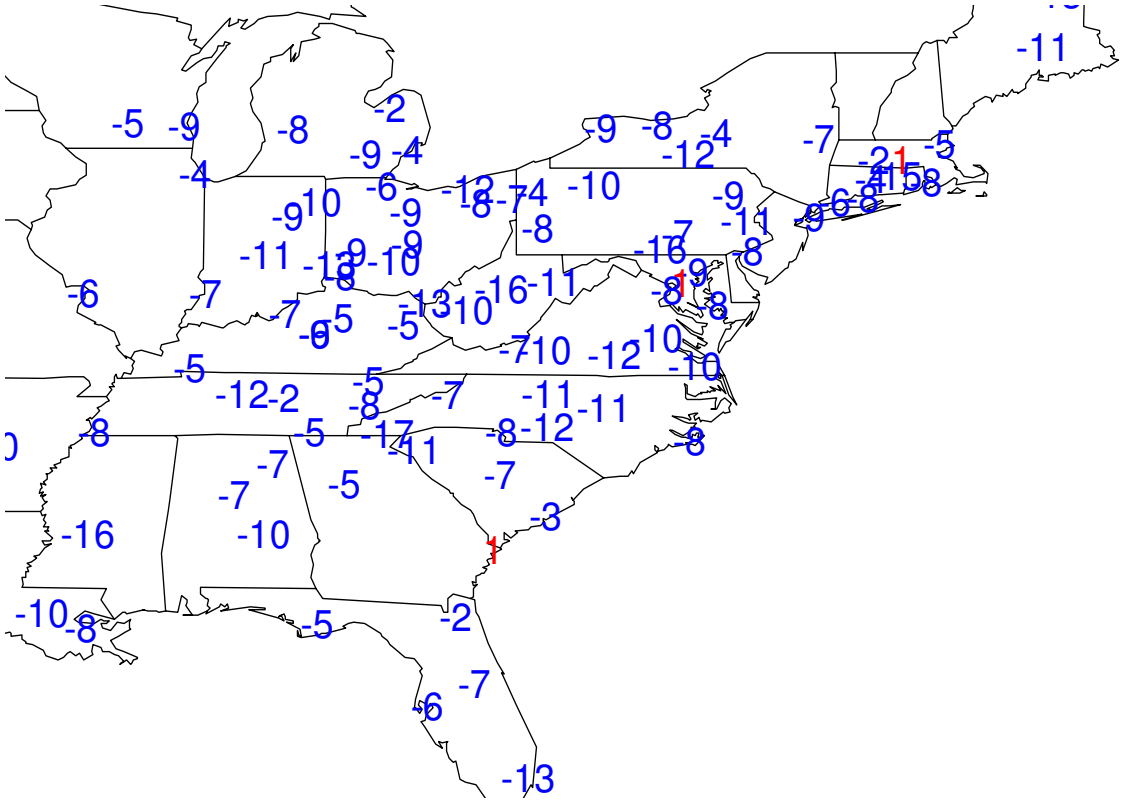
[16] "Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transport of Ozone," 63 Federal Register 57356, http://www.epa.gov/ttn/naaqs/ozone/rto/sip/index.html, October 27, 1998.

[17] "Control of Air Pollution From New Motor Vehicles: Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements," 65 Federal Register 6698-6870, http://www.epa.gov/tier2/finalrule.htm, February 10, 2000.

[18] "Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Other Solid Waste Incineration Units; Final Rule," 70 Federal Register 74870-74924, http://www.epa.gov/ttn/oarpg/t3/fr_notices/30600oswi_fr_note.pdf, December 16, 2005.

areas in the Eastern U.S. due, in part, to these control programs, particularly the $NO_x$ SIP Call. The figure shows the change in seasonal 8-hour ozone averages adjusted for weather[19] from 2000-2002 to 2005-2007. The map shows the wide range of change across the East. The range spans a one percent deterioration in the seasonal 8-hour ozone average to a 17 percent improvement in the seasonal 8-hour ozone average. The impacts of $NO_x$ reductions in the East have been assessed in three $NO_x$ Budget Trading Reports that have been issued from 2003 to 2006.[20] See also Figure 3-1, which compares ozone reductions in EAC and non-EAC areas.

**Figure 1-1: Percentage Change in Seasonal 8-Hour Qzone Average Air Quality from 2000-2002 to 2005-2007, Adjusted for Weather**




Source: Analysis by the Air Quality Assessment Group, OAQPS, using the method described in Camalier, L., Cox, W., Dolwick, P., 2007. The effects of meteorology on ozone in urban areas and their use in assessing ozone trends. Atmospheric Environment 41, 7127-7137.

[19] The methodology used to adjust for weather is explained in section 3.1.1.
[20] http://www.epa.gov/airmarkets/progress/progress-reports.html.

# SECTION 2.0 INFORMATION COMPILATION APPROACH

This section describes the study's information compilation approach, both quantitative and qualitative. It is important to note that the information compilation approach has several limitations because this report is not a formal program evaluation. Specifically, the study did not:

- Compare emission reductions of EAC areas versus non-EAC areas in terms of both quantities and implementation timeframes;
- Study air quality for EAC areas past 2007; and
- Rigorously compare EAC areas with non-EAC areas with respect to certain key areas, such as:
    - Program design-related concerns (e.g., program efficiency)
    - Control measure implementation.

## 2.1 Decision to Conduct EAC Study

Following the conclusion of the EAC program, EPA's OPAR and EPA's OAQPS undertook this study of the EAC program in order to learn what worked well and what did not with this community-based program, including whether EAC Program areas attained the ozone NAAQS early. EPA's intent was to then share that knowledge with leaders of programs that EPA and the states create to improve air quality in communities.

## 2.2 Scope of the Study

EPA staff, consulting with EPA management, determined that the quantitative component of the study should address all 14 of the "nonattainment deferred" and six of the 15 "attainment" EAC areas. The six attainment EAC Program areas were selected based on geographic diversity and availability of meteorological data. The attainment EAC Program areas were located in the Southeast and Southwest – EPA Regions 4 and 6 – so areas were selected from these two parts of the country for which meteorological data were available. (The availability of meteorological data was important for the air quality information compilation because it was needed in order to be able to remove the effects of weather when examining changes in seasonal 8-hour ozone air quality. Section 2.3.1 below provides a description of how the meteorological adjustments were made.) Qualitatively, the study addressed all 29 areas primarily by consulting state and local agencies from all 12 states that participated in the program, as well as six of the 14 nonattainment-deferred areas and three of the 15 attainment areas that also participated in the program. Information and observations from these discussions have been generalized and extrapolated to all EAC Program areas. To provide a qualitative comparison for these areas, two non-EAC Program areas and the states in which they are located were also consulted.

Table 2-1 provides a list of the 20 areas that were included in the study, along with their 2001-2003 8-hour ozone design values (DVs), 2001 population and vehicle miles traveled (VMT) and a breakout of $NO_x$ and VOC emissions. (Appendix D also provides a brief profile of the 20 areas. More detailed information on population and VMT for the states in which these 20 areas are located can be found in Appendix B, Tables B-27 to B-30.)

Of the 14 nonattainment-deferred areas, some are rural with lower populations, such as Frederick County, Virginia, while others are medium sized – Chattanooga, Tennessee – and yet others are larger – Denver, Colorado and San Antonio, Texas. Eight-hour ozone DVs for 2001-2003 for the 14 areas were relatively close to the level of the 1997 standard with only one area above 0.090 ppm: Greensboro, North Carolina at 0.093 ppm. The mix of $NO_x$ and VOC emissions varies from area to area.

Of the six attainment areas, one is rural with lower populations – Mountain Area of Western North Carolina (Asheville) – while three others are medium sized – Lower Savannah-Augusta, South Carolina-Georgia – and yet two others are larger – Austin, Texas and Oklahoma City, Oklahoma. Eight-hour ozone DVs for 2001-2003 for the six areas were at or below the level of the 1997 standard with two areas at 0.072 ppm or less. The balance among $NO_x$ emissions sources and among VOC emission source types varies from area to area.

## 2.3 Refining the Study Scope

As the study scope was determined, EPA staff, consulting with EPA management, refined it by identifying the key areas the study would address. The following two subsections capture the essential issues that the study included.

### 2.3.1 Environmental Aspects of Study

**Changes in Air Quality**

The study analyzed changes in air quality in EAC Program areas (improvements or deteriorations), both not controlling and controlling for meteorology. One of the purposes of the study was to determine whether those changes were more, less, or the same as neighboring areas. The study also sought to determine what accounted for the changes.

**Estimated Emissions Reductions from Control Measures**

This study looked at to what degree "local" EAC measures contributed to any improvements in air quality in EAC Program areas. In addition, the following issues were investigated:

- What control measures (and how many of the total) had emissions reductions associated with them (and which did not) and how large were they;
- Which measures provided the greatest or least for overall emission reductions and the modeled attainment demonstration;
- Were all control measures actually implemented as required of the states;
- Were there environmental benefits as a direct result of the EAC activities for pollutants other than ozone; and
- Did areas implement temporary control measures that were later discontinued.

**Table 2-1: Population, 8-Hour DVs and Emissions Information for the 20 Areas Included in this Study for Which Quantitative Information was Compiled**

| EAC Program Area | 2002 Population* | 2002 VMT* | 2001-2003 DV (ppm) | 2002 Emissions | | |
|---|---|---|---|---|---|---|
| | | | | $NO_x$ | VOC | Source Type |
| **Nonattainment Deferred Areas** | | | | | | |
| Berkeley and Jefferson Counties, West Virginia | 126,357 | 1,279 | 0.086 | 30% | 3% | Point |
| | | | | 7% | 52% | Area |
| | | | | 37% | 33% | Highway Vehicles |
| | | | | 27% | 12% | Off Highway Vehicles |
| Chattanooga, Tennessee-Georgia | 466,775 | 4,976 | 0.088 | 9% | 6% | Point |
| | | | | 6% | 44% | Area |
| | | | | 63% | 37% | Highway Vehicles |
| | | | | 22% | 13% | Off Highway Vehicles |
| Columbia, South Carolina (Central Midlands Area) | 611,932 | 7,208 | 0.089 | 35% | 9% | Point |
| | | | | 6% | 50% | Area |
| | | | | 46% | 27% | Highway Vehicles |
| | | | | 13% | 13% | Off Highway Vehicles |
| Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado | 2,970,672 | 24,081 | 0.087 | 28% | 37% | Point |
| | | | | 5% | 26% | Area |
| | | | | 49% | 26% | Highway Vehicles |
| | | | | 18% | 12% | Off Highway Vehicles |
| Fayetteville, North Carolina (Cumberland County) | 304,094 | 2,780 | 0.087 | 7% | 9% | Point |
| | | | | 5% | 40% | Area |
| | | | | 73% | 42% | Highway Vehicles |
| | | | | 15% | 9% | Off Highway Vehicles |
| Frederick County, Virginia | 87,282 | 1,136 | 0.085 | 4% | 16% | Point |
| | | | | 17% | 40% | Area |
| | | | | 63% | 23% | Highway Vehicles |
| | | | | 16% | 21% | Off Highway Vehicles |
| Greensboro-Winston Salem-High Point, North Carolina (Triad Area) | 1,471,869 | 16,351 | 0.093 | 47% | 14% | Point |
| | | | | 3% | 50% | Area |
| | | | | 40% | 27% | Highway Vehicles |
| | | | | 10% | 9% | Off Highway Vehicles |

**Table 2-1: Population, 8-Hour DVs and Emissions Information for the 20 Areas Included in this Study for Which Quantitative Information was Compiled**

| EAC Program Area | 2002 Population* | 2002 VMT* | 2001-2003 DV (ppm) | 2002 Emissions | | |
|---|---|---|---|---|---|---|
| | | | | $NO_x$ | VOC | Source Type |
| Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area) | 1,053,490 | 10,887 | 0.087 | 13% | 8% | Point |
| | | | | 10% | 58% | Area |
| | | | | 59% | 23% | Highway Vehicles |
| | | | | 18% | 11% | Off Highway Vehicles |
| Hickory-Morganton-Lenoir, North Carolina (Unifour Area) | 348,968 | 3,003 | 0.088 | 60% | 37% | Point |
| | | | | 3% | 31% | Area |
| | | | | 27% | 23% | Highway Vehicles |
| | | | | 9% | 9% | Off Highway Vehicles |
| Johnson City-Kingsport-Bristol, Tennessee | 408,857 | 3,887 | 0.086 | 67% | 33% | Point |
| | | | | 3% | 36% | Area |
| | | | | 23% | 24% | Highway Vehicles |
| | | | | 8% | 7% | Off Highway Vehicles |
| Nashville, Tennessee | 1,269,605 | 15,876 | 0.086 | 21% | 13% | Point |
| | | | | 4% | 36% | Area |
| | | | | 58% | 35% | Highway Vehicles |
| | | | | 18% | 16% | Off Highway Vehicles |
| Roanoke, Virginia | 235,494 | 2,487 | 0.085 | 14% | 6% | Point |
| | | | | 14% | 53% | Area |
| | | | | 58% | 34% | Highway Vehicles |
| | | | | 14% | 7% | Off Highway Vehicles |
| San Antonio, Texas | 1,654,839 | 14,967 | 0.089 | 28% | 2% | Point |
| | | | | 8% | 50% | Area |
| | | | | 49% | 34% | Highway Vehicles |
| | | | | 15% | 14% | Off Highway Vehicles |
| Washington County, Maryland (Hagerstown) | 134,700 | 1,886 | 0.086 | 30% | 5% | Point |
| | | | | 7% | 51% | Area |
| | | | | 48% | 33% | Highway Vehicles |
| | | | | 15% | 12% | Off Highway Vehicles |

**Table 2-1: Population, 8-Hour DVs and Emissions Information for the 20 Areas Included in this Study for Which Quantitative Information was Compiled**

| EAC Program Area | 2002 Population* | 2002 VMT* | 2001-2003 DV (ppm) | 2002 Emissions | | |
|---|---|---|---|---|---|---|
| | | | | $NO_x$ | VOC | Source Type |
| **Attainment EAC Program Areas** | | | | | | |
| Austin, Texas | 1,347,464 | 13,088 | 0.084 | 14% | 2% | Point |
| | | | | 7% | 48% | Area |
| | | | | 57% | 34% | Highway Vehicles |
| | | | | 22% | 17% | Off Highway Vehicles |
| Berkeley-Charleston-Dorchester, South Carolina | 562,579 | 5,649 | 0.072 | 48% | 10% | Point |
| | | | | 3% | 46% | Area |
| | | | | 20% | 23% | Highway Vehicles |
| | | | | 29% | 21% | Off Highway Vehicles |
| Mountain Area of Western North Carolina (Asheville) | 285,431 | 3,115 | 0.083 | 44% | 12% | Point |
| | | | | 3% | 38% | Area |
| | | | | 43% | 35% | Highway Vehicles |
| | | | | 9% | 15% | Off Highway Vehicles |
| Oklahoma City, Oklahoma | 1,107,167 | 13,793 | 0.080 | 13% | 4% | Point |
| | | | | 12% | 45% | Area |
| | | | | 59% | 39% | Highway Vehicles |
| | | | | 15% | 11% | Off Highway Vehicles |
| Lower Savannah-Augusta, South Carolina-Georgia | 594,875 | 6,790 | 0.067 | 46% | 11% | Point |
| | | | | 6% | 55% | Area |
| | | | | 37% | 26% | Highway Vehicles |
| | | | | 11% | 9% | Off Highway Vehicles |
| Tulsa, Oklahoma | 819,321 | 10,639 | 0.083 | 43% | 4% | Point |
| | | | | 10% | 52% | Area |
| | | | | 35% | 30% | Highway Vehicles |
| | | | | 12% | 13% | Off Highway Vehicles |

Source: U.S. Census, 2002 National Emissions Inventory, and Air Quality System
*For four areas the population and VMT estimates are for whole counties even though only a partial county was part of the EAC Program: Mountain Area of Western North Carolina (Asheville); Columbia, South Carolina (Central Midlands Area); Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado; and Hickory-Morganton-Lenoir, North Carolina (Unifour Area).

**Air Quality Modeling for EAC SIPs**
The study addressed three issues with respect to the air quality modeling work states performed as part of their EAC SIPs:

- Whether the modeling could provide any insight into what degree "local" EAC measures contributed to any improvements in air quality in EAC Program areas;
- Did the air quality modeling predict attainment with or without the local EAC measures; and
- Were the air quality improvements projected in the state's EAC modeling achieved or did the observed air quality improvements exceed the air quality improvements projected in the state's EAC modeling.

**Growth-Related Aspects of the Study**
There was interest in studying the impact on EAC Program areas of not requiring the Nonattainment NSR and Conformity Programs in EAC areas, both of which address growth in emissions. However, because of the complexity of the programs, it was decided such an analysis was beyond the scope of this effort and that it would require a separate study. So, instead, the study focused on a limited scope:

- Determining whether the extent of new source activity that occurred in the 14 nonattainment-deferred EAC Program areas that may have been subject to the Nonattainment NSR Program had the areas been designated nonattainment;
- Determining which of the 14 nonattainment-deferred EAC Program areas were subject to the Conformity Program for other reasons even though they were participating in the EAC Program for ozone; and
- Displaying changes in estimated population and VMT during EAC Program implementation.

### 2.3.2 Program Design Aspects of the Study

**Efficiency of EAC Program**
The study addressed the issue of whether the EAC model is just as efficient at producing clean air as the traditional nonattainment designation approach. This issue was approached by: (1) studying the resource aspect of this question for EPA regions and headquarters, and for state and local agencies; and, (2) asking whether all states and areas met their process-related goals and requirements. This study also addresses whether the compact agreements gave local areas flexibility to develop their own approach to meeting the 8-hour ozone standard. Additionally, the study asks whether the program would have succeeded without the threat of nonattainment designation for those areas with deferred nonattainment designations.

**Longer Term Impact**
The study addressed whether EAC activities: (1) will result in longer-term emission reductions or continued reductions in ozone and air quality improvement activities and policies into the future; and, (2) provide for or create a local "infrastructure" for further or continued action in the future through, for example, the creation of an organizational entity in the local area.

**Outreach and Stakeholder Interaction**
The study addressed whether the compacts were successful at engaging and involving stakeholders at the local level. In addition, the study addressed whether there were any intangible information from

stakeholder engagement. It was also important to gain an understanding of how successful the outreach programs were in EAC Program areas.

**Other Aspects of the Program**
The study also addressed how the requirements for the EAC Program areas compare to the requirements the areas would have faced as traditional nonattainment areas.

## 2.4 Information Compilation

Table 2-2 provides a breakout of the EAC Program aspects and areas included in the study and whether it was quantitative or qualitative. To understand the table, it is important to note that the study's quantitative information focused on 20 areas (of the 29 total EAC areas), while the qualitative information addressed all 29 areas. The qualitative study was conducted through discussions with all 12 states in the program and nine of the 29 EAC Program areas. The information from those discussions was generalized to all 29 areas.

The following two subsections provide an overview of how the study was conducted for the 14 nonattainment-deferred EAC Program areas and the six attainment EAC Program areas that were included.

### 2.4.1 Quantitative Information Compilation

For environmental aspects of the study, the quantitative information addressed:

- Changes in air quality;
- Estimated emissions reductions from control measures;
- Air quality modeling for EAC SIPs; and
- Growth-related aspects of the study.

For design aspects of the study, the information compiled addressed the efficiency of the EAC Program.

**Changes in Air Quality**
The air quality information gathered came from EPA's Air Quality System submitted by the states to EPA. The study looked at changes in air quality from 2001-2003 to 2005-2007 on three bases: 8-hour ozone DV; Air Quality Index (AQI) days above 100; and seasonal averages of daily maximum 8-hour ozone (not controlling and controlling for meteorology) (see Appendix B, Tables B-1 to B-4). Seasonal averages for meteorology were "controlled" or adjusted. The study performed meteorological adjustments for the 15 EAC Program areas that are located in the East (except for a few cases where data were not available), and, for comparative purposes, for 18 non-EAC metropolitan areas that are generally in the same region as these EAC Program areas. The non-EAC Program areas are a mix of attainment and nonattainment areas. In the Southwest, air quality comparisons were difficult to make because of a

**Table 2-2: EAC Program Aspects and Areas Included in the Study, Breakout of Information Compiled, and Whether it was Quantitative or Qualitative**

| Program Aspect | Quantitative Information Compiled | Qualitative Information Compiled | Areas |
|---|---|---|---|
| **EAC Program Environmental Aspects of Study** | | | |
| Changes in air quality | Yes | No | • Quantitative information: all 20 areas (except for cases where meteorological data were not available) |
| Estimated emissions reductions from control measures | Yes | Yes | • Quantitative information: all 20 areas<br>• Qualitative information: all 29 areas (able to generalize information to all areas by consulting all 12 states in the program and nine of the 29 EAC Program areas) |
| Air quality modeling for EAC SIPs | Yes | No | • Quantitative information: all 20 areas |
| Growth-related aspects of the study | Yes | Yes | • Quantitative information: all 20 areas<br>• Qualitative information: 14 of the 20 areas |
| **EAC Program Design Aspects of the Study** | | | |
| Efficiency of EAC Program | Yes | Yes | • Qualitative information: all 29 areas (for estimation of EPA resources for EAC Program versus traditional approach)<br>• Qualitative information: all 29 areas (able to generalize information to all areas by consulting all 12 states in the program and nine of the 29 EAC Program areas) |
| Longer term impact | No | Yes | • Qualitative information: all 29 areas (able to generalize information to all areas by consulting all 12 states in the program and nine of the 29 EAC Program areas) |
| Outreach and stakeholder interaction | No | Yes | • Qualitative information: all 29 areas (able to generalize information to all areas by consulting all 12 states in the program and nine of the 29 EAC Program areas) |
| Other aspects of the program | No | Yes | • Qualitative information: all 29 areas (able to generalize information to all areas by consulting all 12 states in the program and nine of the 29 EAC Program areas) |

lack of monitoring sites with meteorologically controlled air quality data that were close enough to the EAC Program areas. Therefore, the study was not able provide a review of how those air quality gains in that region compare to other non-EAC ozone areas in the same region. The study did not compare two individual cities because it is very difficult to determine if they are comparable. Comparing the range of reductions between two groups is more reasonable, as the study did for areas in the East.

Meteorological adjustments of the data pertain to how weather differences from day-to-day and across years can cause substantial differences in monitored ozone concentrations, even when emissions are not changing. This can obscure the changes in ozone that are rightly attributable to emissions reductions achieved by control strategies like those included in the EAC and standard ozone SIPs. Therefore, it is useful to adjust monitored ozone concentrations for meteorological effects. The methodology uses a generalized linear model is used to describe the relationship between daily ozone and several meteorological parameters. The model also accounts for the variation in seasonal ozone across different years by correcting for meteorological fluctuations between those years. The most important meteorological parameters considered in this model are daily maximum 1-hour temperature and midday (10 a.m. to 4 p.m.) relative humidity. This model is estimated or fitted for individual metropolitan areas of interest, where the necessary ozone and meteorological data sets were both available. Once the parameters (i.e., coefficients) have been estimated using daily data, the model produces an estimate of what the seasonal average daily 8-hour maximum would have been in a given year if that year had had typical weather conditions combined with its actual emissions. This methodology and the subsequent ozone estimates are provided by EPA's OAQPS, Air Quality Assessment Division.[21]

**Estimated Emissions Reductions from Control Measures**
The emission reductions information compilation had two features:

First, information was gathered from the EAC SIPs in several areas to compile a complete list of measures, including any prospective emission reduction estimates provided by the states in their SIPs for local, state and national (Federal) measures (see Tables B-6 to B-26). For this part of the study, local measures were defined as measures adopted locally by a local body or authority, as well as measures adopted by the state that applied specifically to that area. (State measures were measures adopted by states that apply in more than one area in a state and national (Federal) measures were measures adopted by EPA that apply nationally or in a sub-region of the country.) In addition, where possible, the quantified emission reduction from each EAC SIP measure was compared as a percentage to the total reductions for all such measures in the same SIP, as well as to the total 2002 $NO_x$ and VOC emissions in the EAC Program areas from the 2002 National Emissions Inventory. This was done in an attempt to convey the relative air quality importance of the various measures.

There are at least two important limitations to what can be discerned from the estimates in Tables B-6 to B-26:

1) Estimating emissions reductions is inherently uncertain.

[21] The method used is described in: "The effects of meteorology on ozone in urban areas and their use in assessing ozone trends," Atmospheric Environment 41, 7127-7137, Camalier, L., Cox, W., Dolwick, P., 2007. See additional resources on meteorological adjustment of ozone air quality on: http://www.epa.gov/air/airtrends/weather.html.

- For the local measures, the limitations include the inherent uncertainty of estimating emissions reductions from non-traditional sources and strategies on which the EAC Program areas relied for local measures.

2) The percentages must be studied carefully when comparing the reductions for each measure (or groups of measures) to total reductions for all the measures. In some of the EAC SIPs, the denominator for the percentages (total quantified emissions reductions from listed EAC SIP measures) may not be a completely consistent benchmark because it may not reflect every state and national measure that contributed to air quality improvement.
    - For the Federal measures, the study calculated a rough estimate of the emissions reductions from Federal measures. This is reflected in Tables B-6 to B-26 (or "other" Federal measure emission reductions in the case of the two areas where some Federal measures were quantified).
        - The study employed an approach for developing the estimates that is described in Appendix C.
    - The approach was to calculate the total emissions reductions assumed in the modeled attainment demonstration and to subtract from that the quantified state and local measures in the attainment demonstration (as well as some national measures that were quantified in two areas).
    - Providing the *estimates* of Federal measure emission reductions helps to address the concern with respect to the percentages by making the denominators more reflective of all the measures that benefited the areas.
    - Having as accurate a denominator as possible is important to avoid overstating or understating the percentage contributions of local, state and national measures.
    - In an extreme case, a hypothetical SIP that explicitly listed only one small local measure would calculate that measure's percentage as 100 percent of total quantified emissions, possibly giving the impression that the measure was important to air quality progress in the area when it may not have been.
    - Another example of the misimpression that can be taken from these percentages is the hypothetical case of a SIP that contains 100 local measures each with equal and large emissions reductions; those measures would each only score 1 percent.

Second, the study also put the magnitude of the emission reductions in the EAC Program areas' SIPs into perspective by comparing the total quantified $NO_x$ and VOC emission reductions estimates in the EAC SIPs to:

- Total 2002 $NO_x$ and VOC emissions in the EAC Program areas;
- Total 2002 $NO_x$ and VOC emissions in the state in which the area is located; and
- Total $NO_x$ reductions from the $NO_x$ SIP call within the state in which the area is located (for states that were part of that program).

The 2002 $NO_x$ and VOC emissions estimates for the EAC Program areas and for the state in which the area is located come from the 2002 National Emissions Inventory. The quantified $NO_x$ and VOC emissions estimates in the EAC SIPs used for comparative purposes are for local measures, state/national measures, and the two combined.

**Air Quality Modeling for EAC SIPs**
To answer the questions posed with respect to air quality modeling, the study addressed the modeling information from EAC SIPs and then compared the information to observed air quality values.

**Growth-Related Aspects of the Study**
The study also reviewed information concerning estimates of population and VMT change from 2001 to 2006. The population estimates came from the U.S. Census. The VMT numbers come from the National Emission Inventory's VMT estimates, which are derived from the Highway Performance Monitoring System (HPMS). It is important to note that they are subject to significant uncertainty that can cause over or underestimates. HPMS was designed to collect statewide data to populate a national database that would be used to: (1) assess the performance and condition of the nationwide transportation system; and, (2) help guide national investment priorities. The sampling techniques were designed for these purposes. They may not be appropriate for estimating small changes in VMT in smaller geographic areas such as the areas included in this study. While the margin of error at the statewide and national level is acceptable for the purposes that HPMS was designed for, it is unclear whether the margin of error at the nonattainment areas scale would render the study inconclusive.[22]

**Other Aspects of the EAC Program**
For design aspects of the study, the quantitative information addressed the efficiency of the EAC Program by estimating the resources expended by EPA headquarters and regional offices for the EAC Program. This was compared to the level of estimated resources that would have been necessary had the EAC Program areas not participated in the EAC Program but instead pursued a traditional approach after being designated nonattainment or attainment (estimates do not include state and local agency resources). The resource estimates encompassed Full Time Equivalent (FTE) and the number of Federal Register actions and pages (including costs). Federal Register costs were calculated using the current rates due to the difficulty of determining historical Federal Register costs and of determining what costs apply to which Federal Register actions. Table B-31 provides the methodology used to develop them. The resource estimates for the traditional approach assume that: (1) the 14 nonattainment-deferred areas would have been Subpart 1 areas; and (2) the resource estimates vary depending on the size of the area. Because the regional resource estimates varied for the traditional approach, a range of numbers is presented.

### 2.4.2 Qualitative Information Compilation
For environmental aspects of the study, the qualitative information compiled addressed qualitative aspects of (1) control measure emissions reductions and (2) growth-related aspects of the study (i.e., new source activity, and Conformity Program applicability in the 14 nonattainment-deferred EAC Program areas during the implementation of the EAC Program).

For design aspects of the study, the compilation of qualitative information addressed:

- Efficiency of EAC Program;
- Longer term impact;
- Outreach and stakeholder interaction; and
- Other aspects of the program.

[22] For more information about HPMS, visit: http://www.fhwa.dot.gov/policy/ohpi/hpms/abouthpms.htm.

These four program design areas were addressed in a qualitative manner because they did not lend themselves easily, if at all, to quantitative measurement. Ideally, for example, it would have been beneficial to measure the impact of the EAC Program on state and local resources by developing a questionnaire that measured the impact on state and local agency FTE and budgetary outlays. However, that was not feasible in the time given for the study, so an alternative informal discussion method was employed, which, nonetheless, yielded useful information.

Information for the qualitative part of the study came from four sources:

- The progress reports and SIPs submitted by the states and local agencies;
- EPA and state permitting databases containing information on new source activity;
- The four EPA regional offices that implemented the program; and
- Discussions with staff and managers at the state and local agencies that implemented the program.

The discussions were held with all of the air planning agencies for the 12 states involved in the EAC Program and with local agencies for six of the 14 areas involved in the nonattainment-deferred EAC Program. Appendix A provides a list of the individuals consulted. In addition, two non-EAC ozone 8-hour nonattainment areas – Rocky Mount, North Carolina and Knoxville, Tennessee – and the air agencies for the states in which they are located were consulted to provide a comparison to the responses received with respect to the EAC Program areas. Appendix E provides a complete summary of the discussions that can reasonably be generalized to other EAC areas. The discussions reflect people's views so, in that sense, the information gained is the view of the respective local or state agency. Because the state and local agency names are included in Appendix E, the individual discussion notes were shared with the individuals consulted as a courtesy and to provide an opportunity for any corrections. The discussions provided useful insights, both positive and negative, on the EAC Program.

# SECTION 3.0 INFORMATION COMPILED AND OBSERVATIONS

In this section the information compiled as part of the study is described and observations stemming from the information are provided.

## 3.1 Information Compiled

### 3.1.1 Quantitative Information

The study produced quantitative information for both the environmental and program design aspects of the study.

**Environmental Aspects of the Study**

The study produced information in four areas:

- Changes in air quality;
- Estimated emissions reductions from control measures;
- Air quality modeling for EAC SIPs; and
- Growth-related aspects of the study.

**Changes in Air Quality**

Ten of the 14 nonattainment-deferred areas attained the 8-hour ozone NAAQS by December 31, 2004, prior to the required 2005 implementation date for the EAC control measures. All of the 14 nonattainment-deferred areas, except Denver, Colorado, attained the 8-hour ozone NAAQS by December 31, 2007. Five of the areas had 2005-2007 8-hour DVs at or below 0.079 ppm, while 11 were at or below 0.083 ppm. All of the areas showed an improvement in ozone air quality from 2001-2003 to 2005-2007 and five areas showed a 10 percent or greater improvement in their DVs. All of the areas reduced the number of AQI days above 100 from 2001-2003 to 2005-2007, while 10 showed a greater than 60 percent improvement on an AQI day basis. Thirteen of the 14 nonattainment-deferred areas showed an improvement in air quality from 2001-2003 to 2005-2007 on an 8-hour, meteorologically controlled seasonal average basis (Denver was excluded due to a lack of meteorological data). Eight of the 14 areas showed a 10 percent or greater improvement on that basis. (For a summary, see Table 3-1 and, for more details, see Tables B-1 to B-3 in Appendix B.)

Five of the six attainment areas attained the 8-hour ozone NAAQS by December 31, 2004, prior to the required 2005 implementation date for the EAC control measures. All six attainment areas included in the study attained the 8-hour NAAQS as of December 31, 2007 and all had 2005-2007 8-hour DVs at or below 0.080 ppm. Three attainment areas showed an improvement in ozone air quality from 2001-2003 to 2005-2007 on an 8-hour DV basis. One of the six attainment areas showed deterioration in air quality from 2001-2003 to 2005-2007 on the same basis, while two of the six showed no change. When areas were studied on an AQI day basis, four of the six areas showed an improvement from 2001-2003 to 2005-2007. Two of these areas showed a greater than 80 percent improvement. One area showed an increase, while another showed no change. Four of the six attainment areas show an improvement in air quality from 2001-2003 to 2005-2007 on an 8-hour, meteorologically controlled seasonal 8-hour average basis. One area showed an increase, while another showed no change. (For a summary, see Table 3-1 and, for more details, see Tables B-1 to B-3 in Appendix B.)

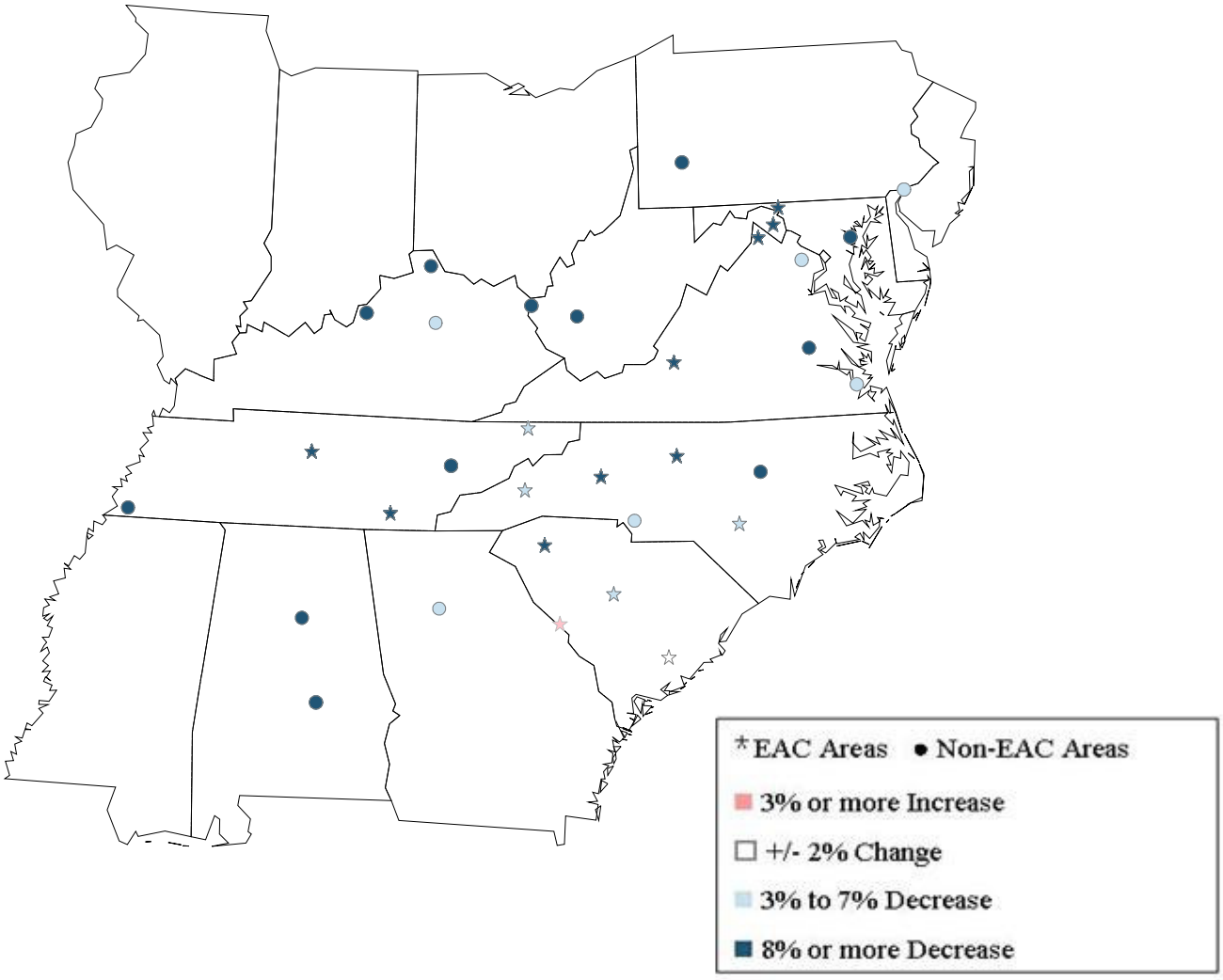
For the 12 nonattainment-deferred areas in the East, the improvement in ozone air quality on a meteorologically controlled seasonal 8-hour average basis from 2001-2003 to 2005-2007 ranges from 4 percent to 12 percent, with an average 9 percent improvement. For the three attainment areas in the East, the change in ozone air quality on a meteorologically-controlled, seasonal 8-hour average basis from 2001-2003 to 2005-2007 ranges from a 6 percent improvement to a 3 percent deterioration, with an average 1 percent improvement. The air quality deteriorated in Lower Savannah-Augusta, South Carolina-Georgia. Savannah is located on the perimeter of the $NO_x$ SIP call region (due to its location on the border between Georgia and South Carolina, a state that was part of the $NO_x$ SIP Call). It is also not located in the normal downwind area in the East that would benefit from $NO_x$ reductions in the Midwest and Southeast. Overall, the average improvement in air quality was 8 percent for the 15 nonattainment-deferred and attainment areas in the East.

For comparative purposes, the range of improvement in ozone air quality on a meteorologically controlled seasonal 8-hour average basis for 18 non-EAC, 8-hour ozone nonattainment areas in the East from 2001-2003 to 2005-2007 was from 5 percent to 14 percent. Overall, for the 18 non-EAC Program areas in the East the average improvement in air quality was 8 percent.

Figure 3-1 is a map that shows the 15 EAC Program areas in the East that were included in the study and the 18 non-EAC, 8-hour ozone nonattainment areas in the East that were used for comparison. The map indicates the percentage reduction in ozone from 2001-2003 to 2005-2007. Figure 3-2 is a box-plot of the same areas that illustrates the means, medians and the 90th and 100th percentiles of the percentage reductions. (As indicated in Figure 3-2, the dots represent the means of the areas represented, the line inside the box represents the median, the ends of box represent the 10th percentiles and the ends of the "whiskers" represent the 90th percentiles. The length of the "whiskers" represents the spread of the data.) The means and the medians are close, while the 90th and 100th percentiles are farther apart, particularly at the deterioration end of the range. However, the percentiles are within the 2 percent margin of error. The meteorological adjustment analyst considers this difference to be within the range of uncertainty (or close to it), with the exception of the 100 percentile where the EAC air quality change is greater at the deterioration end of the range. Table B-4 in Appendix B contains the air quality data and percentage changes from 2001-2003 to 2005-2007 for the 15 and 18 areas.

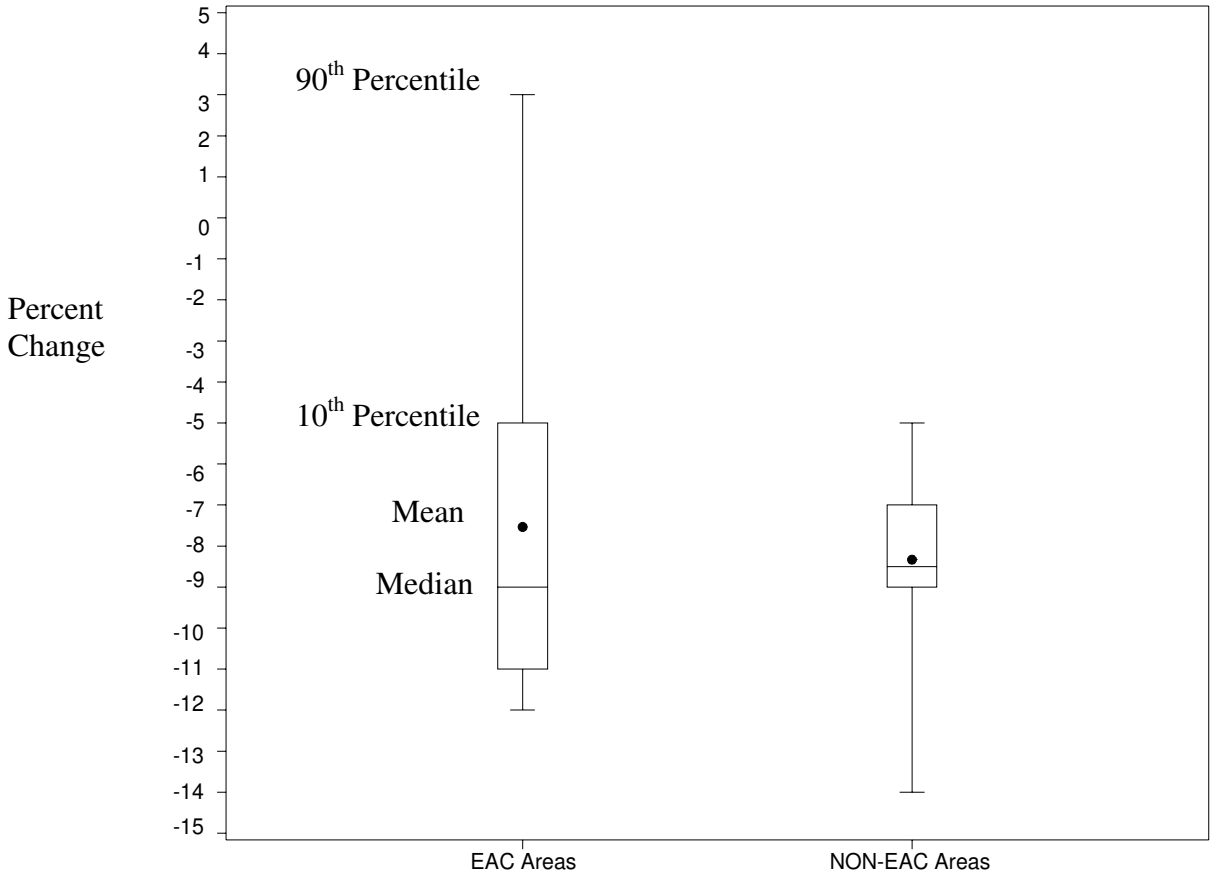
In addition to these figures and tables, Figure 3-3 shows the difference in ozone air quality (seasonal average adjusted for weather) over time from 2001 to 2007 for the 15 EAC Program areas in the East that were included in the study and the 18 non-EAC, 8-hour ozone nonattainment areas in the East that were used for comparison. While the graph shows consistently better air quality in the EAC areas versus the non-EAC areas, the difference is within the margin of error and, thus, not significant. In addition, the degree to which the two trend lines track so closely indicates the degree to which air quality levels recorded at monitors across the East are uniformly influenced by regional air pollution emissions reductions from programs such as the $NO_x$ SIP call.

**Figure 3-1: Map Showing Percentage Changes in Average Summertime Daily Maximum 8-hour Ozone Concentrations in EAC and Non-EAC Program Areas in the East Between 2001-2003 and 2005-2007, After Adjusting for Weather**



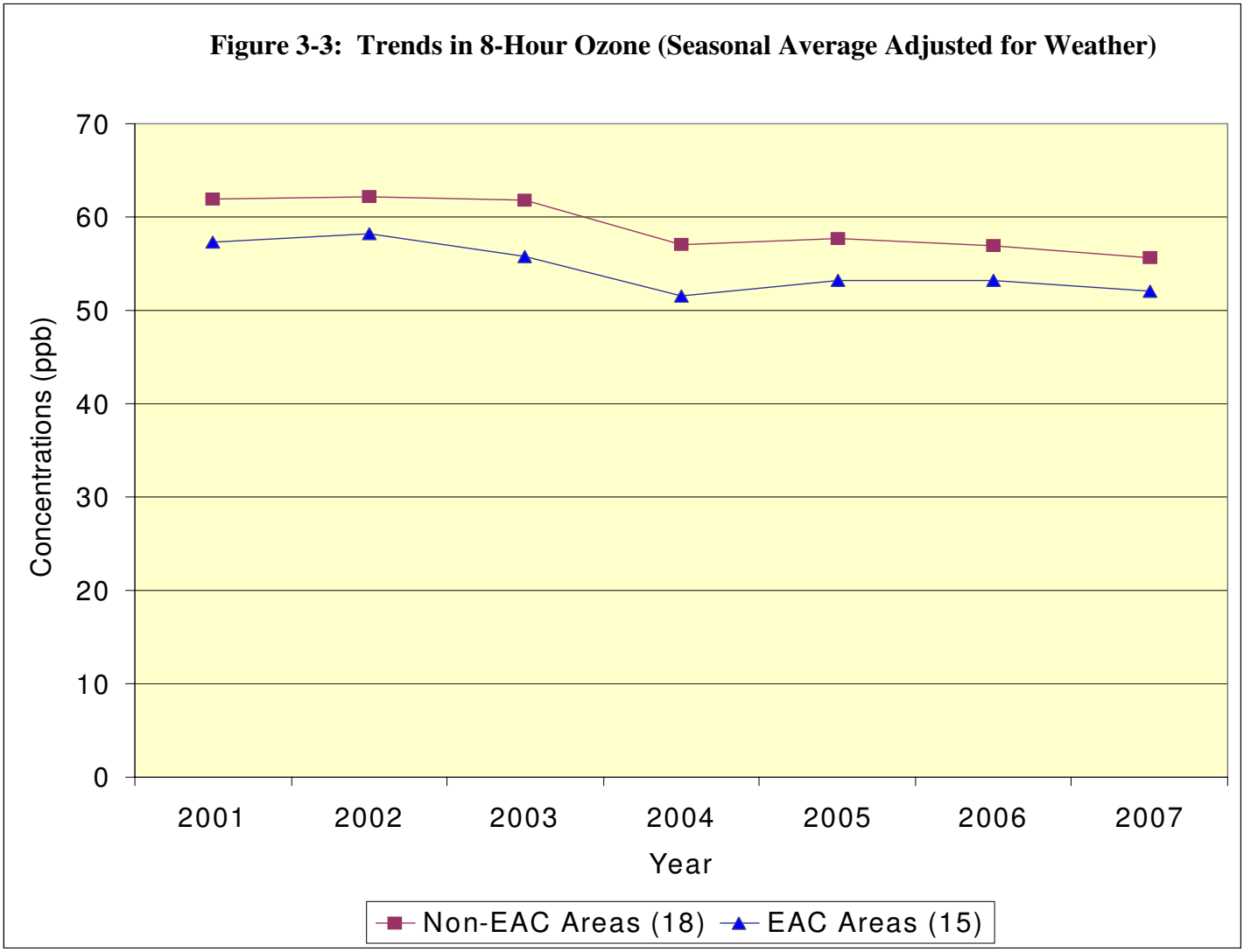

Source: Analysis by the Air Quality Assessment Group, OAQPS, using the method described in Camalier, L., Cox, W., Dolwick, P., 2007. The effects of meteorology on ozone in urban areas and their use in assessing ozone trends. Atmospheric Environment 41, 7127-7137.

**Figure 3-2: Box Plot Showing Percentage Changes in Average Summertime Daily Maximum 8-hour Ozone Concentrations in EAC and Non-EAC Program Areas in the East Between 2001-2003 and 2005-2007, After Adjusting for Weather**




Source: Analysis by the Air Quality Assessment Group, OAQPS, using the method described in Camalier, L., Cox, W., Dolwick, P., 2007. The effects of meteorology on ozone in urban areas and their use in assessing ozone trends. Atmospheric Environment 41, 7127-7137.

**Figure 3-3: Trends in 8-Hour Ozone (Seasonal Average Adjusted for Weather)**




Source: Analysis by the Air Quality Assessment Group, OAQPS, using the method described in Camalier, L., Cox, W., Dolwick, P., 2007. The effects of meteorology on ozone in urban areas and their use in assessing ozone trends. Atmospheric Environment 41, 7127-7137.

## Table 3-1: Summary of Air Quality Study Information

| | Percent Improvement In 8-Hour DV (2001-2003 to 2005-2007) | Percent Improvement In AQI Days (2001-2003 to 2005-2007) | Change In Number of Average AQI Days (2001-2003 to 2005-2007) | Percent Improvement In Seasonal Ozone Average, Meteorologically Controlled (2001-2003 to 2005-2007) |
|---|---|---|---|---|
| **Nonattainment-Deferred EAC Program Areas** | | | | |
| Berkeley and Jefferson Counties, West Virginia | -13% | -77% | -3.3 | -12% |
| Chattanooga, Tennessee-Georgia | -5% | -72% | -9.3 | -9% |
| Columbia, South Carolina (Central Midlands Area) | -8% | -48% | -3.7 | -6% |
| Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado | -2% | -47% | -5.0 | NA |
| Fayetteville, North Carolina (Cumberland County) | -6% | -62% | -5.3 | -4% |
| Frederick County, Virginia | -14% | -93% | -4.7 | -12% |
| Greensboro-Winston Salem-High Point, North Carolina (Triad Area) | -11% | -76% | -14.7 | -10% |
| Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area) | -5% | -77% | -11.0 | -10% |
| Hickory-Morganton-Lenoir, North Carolina (Unifour Area) | -11% | -100% | -5.0 | -11% |
| Johnson City-Kingsport-Bristol, Tennessee | -3% | -45% | -3.3 | -5% |
| Nashville, Tennessee | -2% | -24% | -2.7 | -11% |
| Roanoke, Virginia | -11% | -91% | -3.3 | -8% |
| San Antonio, Texas | -8% | -64% | -5.3 | -13% |
| Washington County, Maryland (Hagerstown) | -8% | -84% | -7.0 | -10% |

**Table 3-1: Summary of Air Quality Study Information**

| | Percent Improvement In 8-Hour DV (2001-2003 to 2005-2007) | Percent Improvement In AQI Days (2001-2003 to 2005-2007) | Change In Number of Average AQI Days (2001-2003 to 2005-2007) | Percent Improvement In Seasonal Ozone Average, Meteorologically Controlled (2001-2003 to 2005-2007) |
|---|---|---|---|---|
| **Attainment EAC Program Areas** | | | | |
| Austin, Texas | -5% | -11% | -0.3 | 0% |
| Berkeley-Charleston-Dorchester, South Carolina | 3% | 0% | 0.0 | -1% |
| Mountain Area of Western North Carolina (Asheville) | -5% | -81% | -4.3 | -6% |
| Oklahoma City, Oklahoma | 0% | 143% | 3.3 | -6% |
| Lower Savannah-Augusta, South Carolina-Georgia | 0% | -100% | -0.3 | 3% |
| Tulsa, Oklahoma | -4% | -22% | -1.3 | -6% |

Source: AQS and meteorological analysis by the Air Quality Assessment Group, OAQPS, using the method described in Camalier, L., Cox, W., Dolwick, P., 2007. The effects of meteorology on ozone in urban areas and their use in assessing ozone trends. Atmospheric Environment 41, 7127-7137.

**Estimated Emissions Reductions from Control Measures**

This section provides information for EAC areas on the estimated emission reductions from state and local EAC measures and overall from Federal measures. Federal measures include programs such as EPA rules for motor vehicle standards (i.e., Tier 2 and non-road diesel engines). State measures include programs such as inspection and maintenance (I/M), lower Reid vapor pressure, and Reasonably Available Control Technology (RACT) controls for VOCs. It is important to keep in mind that many EAC local measures were implemented that could not be easily quantified, if at all. They were implemented with the goal of effecting lifestyle and other changes that could, in turn, help reduce emissions contributing to ozone levels. Examples of these measures are:

- Bike racks and trails at work sites (Chattanooga, Tennessee-Georgia);
- Encouragement of carpooling (Columbia, South Carolina (Midlands Area));
- Energy efficient buildings (Fayetteville, NC);
- Timing of refueling vehicles (Roanoke, Virginia); and
- Truck stop anti-idling program (San Antonio, Texas).

This subsection discusses five areas relating to control measures:

- Measures Implemented in Nonattainment-Deferred EAC Program Areas;
- Measures Implemented in Attainment EAC Program Areas;
- Control Measure Emissions Reductions in Perspective;
- Control Measure Implementation; and
- Non-Ozone Air Quality Benefits.

***Measures Implemented in Nonattainment-Deferred EAC Program Areas***

The 14 nonattainment-deferred areas implemented a range of state and local measures, spanning from as few as four in Denver, Colorado[23] to as many as 35 in Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area). In the 14 areas, the number of *local* measures that were implemented ranged from zero in Denver, Colorado to as many as 35 in the Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area). Across all 14 nonattainment-deferred EAC Program areas, 258 state and local measures were implemented. (See Table 3-2 and Appendix B, Tables B-5 to B-25.)

All 14 of the nonattainment-deferred areas implemented state and local measures that had estimated emissions reductions associated with them. Of the local measures, the percentage that had quantified emissions reductions associated with them ranged from zero percent in Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado that had no local measures to 100 percent in Berkeley and Jefferson Counties, West Virginia. Five of the 14 areas had one percent or less of quantified $NO_x$ and VOC emissions from local measures. Four of the 14 nonattainment-deferred areas had 10 percent or greater of their quantified $NO_x$ and VOC emissions from local measures. Six areas had 10 percent or greater of their quantified $NO_x$ and VOC emissions from state measures. All 14 areas had 35 percent or more of their quantified $NO_x$ and VOC emissions from Federal measures, while twelve areas had 50 percent or more and 8 areas had 80 percent or more. The 14 nonattainment-deferred areas relied largely on state and national measures for their modeled attainment demonstrations.

[23] These were State of Colorado, federally-enforceable measures adopted as rule revisions, resulting in permanent emissions reductions of 58,765 tons per year of VOC and 6,935 tons per year of $NO_x$ (see Appendix B, Table B-8).

Table 3-3 contains a list of the eight local EAC measures in the four of the 14 nonattainment-deferred area SIPs that individually contributed 5 percent or greater of their quantified $NO_x$ and VOC emissions reductions to their respective SIPs.

***Measures Implemented in Attainment EAC Program Areas***

The six attainment areas included in the study implemented a range of state and local measures, spanning from as few as one in Tulsa, Oklahoma to as many as 44 in Lower Savannah-Augusta, South Carolina-Georgia. In four of the six areas, the number of *local* measures that were implemented ranged from zero in Mountain Area of Western North Carolina (Asheville) to 42 in Lower Savannah-Augusta, South Carolina-Georgia. Across all six attainment EAC Program areas, 130 state and local measures were implemented. (See Table 3-2 and Appendix B, Tables B-5 to B-25.)

Four of the six attainment areas included in the study implemented measures that had emission reductions associated with them. Of the local measures, the percentage that had quantified emissions reductions associated with them ranged from zero percent for Berkeley-Charleston-Dorchester, South Carolina and Mountain Area of Western North Carolina (Asheville) to 100 percent for Tulsa, Oklahoma. One of five of the six attainment areas included in the study had 21 percent of its quantified $NO_x$ and VOC emission reductions from local measures, while the remainder had two percent or less. These five had 4 percent or less of their quantified $NO_x$ and VOC emission reductions from state measures. Of four of the six attainment areas included in the study, one had 78 percent of its quantified $NO_x$ and VOC emission reductions from national measures, while the remainder had 96 percent or more. The six attainment areas included in the study relied largely on estimated $NO_x$ and VOC emissions reductions from state and national measures for their modeled attainment demonstrations.

Table 3-4 contains a list of the three local EAC measures in two of the six attainment EAC area SIPs that individually contributed five percent or greater of their quantified $NO_x$ and VOC emissions reductions to their respective SIPs.

## Table 3-2: Summary of Control Measure Emission Reduction Study Information

| Geographic Area | Number of Measures Implemented | | Emission Reductions | | | | |
|---|---|---|---|---|---|---|---|
| | Local | State | Percentage of Local Measures Quantified | Percentage of Estimated Quantified $NO_x$ and VOC Emissions From: | | | Of the Quantified $NO_x$ and VOC Emissions, Percentage From State or National Measures that Were Modeled |
| | | | | Local Measures | State Measures | National (Federal) Measures | |
| **Nonattainment-Deferred EAC Program Areas** | | | | | | | |
| Berkeley and Jefferson Counties, West Virginia | 7 | 0 | 100% | 65% | 0% | 35% | 35% |
| Chattanooga, Tennessee-Georgia | 14 | 6 | 57% | 9% | 18% | 73%* | 91% |
| Columbia, South Carolina (Central Midlands Area) | 27 | 2 | 37% | 13% | 0% | 87% | 87% |
| Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado | 0 | 4 | 0% | 0% | 54% | 46%* | 100% |
| Fayetteville, North Carolina (Cumberland County) | 24 | 2 | 17% | 4% | 8% | 88% | 96% |
| Frederick County, Virginia | 7 | 3 | 57% | 10% | 7% | 83% | 89% |
| Greensboro-Winston Salem-High Point, North Carolina (Triad Area) | 27 | 2 | 41% | 1% | 2% | 97% | 99% |
| Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area) | 35 | 0 | 20% | 24% | 0% | 77% | 77% |
| Hickory-Morganton-Lenoir, North Carolina (Unifour Area) | 12 | 3 | 33% | 0% | 5% | 95% | 99% |
| Johnson City-Kingsport-Bristol, Tennessee | 2 | 5 | 50% | 1% | 10% | 89% | 99% |
| Nashville, Tennessee | 11 | 4 | 100% | 4% | 3% | 93%* | 96% |
| Roanoke, Virginia | 24 | 5 | 46% | 3% | 16% | 81% | 98% |
| San Antonio, Texas | 10 | 3 | 70% | 9% | 38% | 52% | 91% |
| Washington County, Maryland (Hagerstown) | 12 | 7 | 83% | 1% | 32% | 66% | 82% |

**Table 3-2: Summary of Control Measure Emission Reduction Study Information**

| Geographic Area | Number of Measures Implemented | | Emission Reductions | | | | |
|---|---|---|---|---|---|---|---|
| | Local | State | Percentage of Local Measures Quantified | Percentage of Estimated Quantified $NO_x$ and VOC Emissions From: | | | Of the Quantified $NO_x$ and VOC Emissions, Percentage From State or National Measures that Were Modeled |
| | | | | Local Measures | State Measures | National (Federal) Measures | |
| **Attainment EAC Program Areas** | | | | | | | |
| Austin, Texas | 39 | 2 | 21% | 21% | 1% | 78% | 79% |
| Berkeley-Charleston-Dorchester, South Carolina | 39 | 0 | 0% | 0% | 0% | Insufficient data | 100% |
| Mountain Area of Western North Carolina (Asheville) | 0 | 2 | 0% | 0% | 4% | 96% | 100% |
| Oklahoma City, Oklahoma | 3 | 0 | 66% | 0% | 0% | 100% | 100% |
| Lower Savannah-Augusta, South Carolina-Georgia | 42 | 2 | 2% | Insufficient data | | | |
| Tulsa, Oklahoma | 1 | 0 | 100% | 4% | 0% | 96% | 96% |

*The estimates of the percentage contributions of national (Federal) measures are higher than they should be because they reflect emissions reductions for one state measure for each area that the study was unable to subtract out due to insufficient information. See Appendix C for more details.

**Table 3-3: Four Nonattainment-Deferred EAC Program Areas with Five Percent or Greater of Quantified $NO_x$ and VOC Emissions Reductions from Eight Individual Local Measures**

| Nonattainment-Deferred EAC Program Area | Local Measure | Percent of Quantified $NO_x$ and VOC Emissions Reductions |
|---|---|---|
| Berkeley and Jefferson Counties, West Virginia | Ozone action day program | 17% |
| | Public awareness program | 26% |
| | Bicycle/pedestrian measures | 5% |
| | Voluntary -ground freight industry | 14% |
| Columbia, South Carolina (Central Midlands Area) | Reduce NOx emissions from South Carolina Electric and Gas - 2 coal fired boilers | 11% |
| Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area) | Develop stakeholder group - regulatory development | 14% |
| | Transco (gas pipeline company) - early implementation of Phase 2 emission reductions | 5% |
| San Antonio, Texas | Reduced Stage I vapor recovery exemption level from 125k gal/mo to 25k gal/mo | 6% |

**Table 3-4: Two Attainment EAC Program Areas with Five Percent or Greater of Quantified $NO_x$ and VOC Emissions Reductions from Three Individual Local Measures**

| Nonattainment-Deferred EAC Program Area | Local Measure | Percent of Quantified $NO_x$ and VOC Emissions Reductions |
|---|---|---|
| Austin, Texas | I/M Onboard Diagnostics & Low Income Repair Program | 6% |
| | Degreasing controls | 5% |
| Lower Savannah-Augusta, South Carolina-Georgia | Open burning ban -ozone season (Georgia) | Insufficient data* |

*Using the data the study had available, this percentage is 48 percent. However, due to insufficient data for this area, the study could not include a complete quantification of the emission reductions benefitting the area in this report. Therefore, the 48 percent overstates the measure's contribution and would be lower if we had more complete information on emission reductions.

***Control Measure Emissions Reductions in Perspective***

For the 20 EAC Program areas included in the study, the study compared quantified $NO_x$ emissions reduction estimates for local measures to (1) 2002 $NO_x$ emissions in the area, (2) 2002 $NO_x$ emissions in the state in which the area is located, and (3) the emission reduction achieved in that state through the $NO_x$ SIP call. For 17 of the 20 areas the ratio of the emissions for all three of these comparisons represented five percent or less (See Table B-26, Appendix B). The three areas for which one or more of the ratios is above five percent are:

- Berkeley and Jefferson Counties, West Virginia;
- Columbia, South Carolina (Central Midlands Area); and
- Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area).

For 15 of the 20 areas the $NO_x$ emissions reductions for local measures represent 2.5 percent or less than the respective point of comparison. The two areas with one or more comparisons between 2.5 and 5 percent are:

- Austin, Texas and
- Frederick County, Virginia.

The study also compared quantified VOC emissions reduction estimates for local measures to 2002 VOC emissions in the area and in the state in which the area is located. For 18 of the 20 areas the ratio of the emissions for the two comparisons represented five percent or less. The two areas for which one or both of the ratios is above five percent are:

- Austin, Texas and
- Berkeley and Jefferson Counties, West Virginia.

For 15 of the 20 areas, the VOC emission reductions for local measures represented two and a half percent or less. The three areas with one or more comparisons between 2.5 and 5 percent are:

- Chattanooga, Tennessee-Georgia;
- Frederick County, Virginia; and
- San Antonio, Texas.

***Control Measure Implementation***

According to the EAC progress reports and SIPs, all measures committed to by the states in the 20 areas included in the study but 14 were implemented by December 2005.[24] The 14 measures not implemented by December 2005 are listed in Table 3-5 and are also included in Appendix B, Tables B-5 to B-25. The 14 measures represent 4 percent of the total 388 state and local measures implemented for the 20 areas included in the study with seven in nonattainment-deferred areas and seven in attainment areas. As Table 3-5 indicates, seven of the 14 measures were implemented after 2005. Only one of the measures was modeled in an area attainment demonstration.

[24] For purposes of EAC measures, implementation meant that areas committed, at a minimum, to begin implementing measures no later than December 2005. Considering the variety of programs and technologies adopted into the SIPs, EPA recognized that certain measures required phased implementation on a specific schedule and that all of those activities were not expected to occur by December 2005.

## Table 3-5: EAC Program Area Measures Not Implemented by December 2005

| EAC Program Area | Control Measure | State or National Measure? | Implementation Date | Emissions Reductions Quantified | Measure Modeled? |
|---|---|---|---|---|---|
| **Nonattainment-Deferred EAC Program Areas** | | | | | |
| Chattanooga, TN-Georgia | Accelerated replacement of on-road vehicles | No | 2006* | No | No |
| Denver, Colorado | Reduce flash VOC emissions from condensate collection at various natural gas facilities | Yes | December 31, 2007 | Yes | Yes |
| Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area) | Encourage community schools | No | Insufficient information to determine date | No | No |
| | Improve landscape at county facilities | No | Insufficient information to determine date | No | No |
| | School bus retrofits | No | 2006 | Yes | No |
| Roanoke, Virginia | Ethanol alternative fuel vehicles | No | 2007 | No | No |
| | Biodiesel ready trucks | No | 2007 | No | No |
| **Attainment EAC Program Areas** | | | | | |
| Austin, Texas | Power Plant Reductions--enforceable commitments by area power plants | No | December 31, 2006 | No | No |
| Berkeley-Charleston-Dorchester, South Carolina | Educational programs | No | Insufficient information to determine date | No | No |
| | Schools-add sidewalks, increase bus usage; restrict vehicle idle times | No | Insufficient information to determine date | No | No |
| | Educate public - festivals, lecturer, brochure | No | Insufficient information to determine date | No | No |
| Lower Savannah-Augusta, South Carolina-Georgia | Seek information on alternative fuels | No | Insufficient information to determine date | No | No |
| | Replace vehicles with latest emission reduction vehicles | No | Insufficient information to determine date | No | No |
| | Install Intelligent Transportation Systems equipment along major routes | No | Post 2007** | No | No |

*While this measure was implemented in 2006, as approved by the SIP, procedures were in place in 2005 to accelerate replacement of non-road vehicles. Actual replacement occurred in 2006.
**A master plan for this area was completed in May 2002 that contained plans to install Intelligent Transportation Systems equipment along major routes. When EPA approved the SIP in 2004, the equipment installations were not expected until post 2007.

***Non-Ozone Air Quality Benefits***

The study lacked data regarding non-ozone air quality benefits so these benefits were not quantified. However, according to 12 of the individuals consulted EAC Program activities directly generated environmental benefits in addition to ozone reduction. Seven of the individuals consulted stated that the EAC Program has reduced $PM_{2.5}$ (generally referring to particles less than or equal to 2.5 micrometers) through such programs as alternative fuels, open burning bans, freight partnership, diesel and school bus retrofits, and idling reduction. The EAC Program has also led to efforts to reduce $PM_{2.5}$ that are underway in three additional areas. In addition, EAC Program activities are also responsible for generating reductions in air toxics, $NO_x$, and VOCs.

**Air Quality Modeling for EAC SIPs**

The study reviewed the SIP modeling demonstrations to determine whether the air quality modeling predicted attainment with or without the local EAC measures. The attainment demonstrations did rely largely on state and national measures for their attainment demonstrations and not local measures.

The study addressed whether the modeling could provide any insight into what degree "local" EAC measures contributed to any improvements in air quality in EAC Program areas. Because the states for the most part did not include local measures in their modeling, the study determined that the only reliable way to quantify the air quality impacts of EAC local measures would be to model the incremental contribution of those measures. The study did not possess the resources to perform that modeling and, thus, could not reliably answer that question.

For the question of how the air quality improvements projected in the state's EAC modeling compare to the observed air quality improvements, actual 2007 air quality data (on an 8-hour DV basis) was compared to predicted 2007 air quality data, based on air quality modeling in the EAC SIPs. Eighty-five percent of the EAC Program areas that were included in the study predicted better or the same air quality for 2007 as was observed, as shown in Table 3-6. In projecting from their base years to 2007, the state-submitted EAC modeling projections had an average error of about 0.003 ppm. Where the model projections deviated from what was observed, the eventual air quality tended to be cleaner than what was predicted; that is, the modeling projections tended to be conservative (average projection bias was 0.0014 ppm). Where the model projections overestimated the amount of air quality improvement, the areas still came into attainment in 2005-2007, although in some cases only by very small amounts (e.g., Nashville predicted 0.082 ppm, actual was 0.084 ppm). Overall, the level of ozone improvement anticipated was achieved.

**Table 3-6: Comparison of Projected Air Quality Improvements Projected by EAC SIP Modeling to Monitored Air Quality Measured as 8-hour Ozone Concentrations, From 2001-2003 to 2005-2007, 14 Nonattainment-Deferred EAC Program Areas and Six Attainment EAC Program Areas**

| EAC Program Area | 2007 SIP Predicted DV (ppm) | Observed 2005-2007 DV (ppm) | Observed Air Quality Cleaner Than Predicted?* |
|---|---|---|---|
| **Nonattainment-Deferred EAC Program Areas** | | | |
| Berkeley and Jefferson Counties, West Virginia | 0.082 | 0.075 | Yes |
| Chattanooga, Tennessee-Georgia | 0.084 | 0.084 | Same |
| Columbia, South Carolina (Central Midlands Area) | 0.080 | 0.082 | Same |
| Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado | 0.085 | 0.085 | Same |
| Fayetteville, North Carolina (Cumberland County) | 0.078 | 0.082 | No |
| Frederick County, Virginia | 0.082 | 0.073 | Yes |
| Greensboro-Winston Salem-High Point, North Carolina (Triad Area) | 0.084 | 0.083 | Same |
| Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area) | 0.084 | 0.083 | Same |
| Hickory-Morganton-Lenoir, North Carolina (Unifour Area) | 0.075 | 0.078 | No |
| Johnson City-Kingsport-Bristol, Tennessee | 0.084 | 0.083 | Same |
| Nashville, Tennessee | 0.082 | 0.084 | Same |
| Roanoke, Virginia | 0.080 | 0.076 | Yes |
| San Antonio, Texas | 0.084 | 0.082 | Same |
| Washington County, Maryland (Hagerstown) | 0.081 | 0.079 | Same |
| **Attainment EAC Program Areas** | | | |
| Austin, Texas | 0.083 | 0.080 | Yes |
| Berkeley-Charleston-Dorchester, South Carolina | 0.071 | 0.074 | No |
| Mountain Area of Western North Carolina (Asheville) | 0.077 | 0.079 | Same |
| Oklahoma City, Oklahoma | 0.080 | 0.080 | Same |
| Lower Savannah-Augusta, South Carolina-Georgia | 0.077 | 0.067 | Yes |
| Tulsa, Oklahoma | 0.084 | 0.080 | Yes |

Source: AQS and EAC SIPs

*Assume "same" if observed and predicted values are within 0.002 ppm or "yes" or "no" if difference is greater than 0.002 ppm.

**Growth-Related Aspects of the Study**

All but one of the 14 nonattainment-deferred areas – Fayetteville, North Carolina (Cumberland County) – had population growth from 2002 to 2006 during EAC Program implementation. Two of the nonattainment-deferred areas experienced a greater than 10 percent increase. Seven of the 14 areas experienced estimated growth for the period equal to or greater than the rest of the state in which the area is located, the region in which it is located, and the U.S. as a whole. All of the six attainment areas experienced population growth from 2002 to 2006. Four of the attainment areas experienced a five percent or greater increase. Two of the areas experienced estimated population growth for the period equal to or greater than the rest of the state in which the area is located, the region in which it is located, and the U.S. as a whole.

All but two of the 14 nonattainment-deferred areas – Berkeley and Jefferson Counties, West Virginia and Frederick County, Virginia – were estimated to have experienced VMT growth from 2002 to 2006 during EAC Program implementation. Three of the areas experienced a greater than 10 percent increase. Three of the 14 areas experienced estimated growth for the period equal to or greater than the rest of the state in which the area is located, the region in which it is located and the U.S. as a whole. All of the six attainment areas experienced VMT growth from 2002 to 2006. Three experienced a nine percent or greater increase. Three of the areas experienced estimated VMT growth for the period equal to or greater than the rest of the state in which the area is located, the region in which it is located and the U.S. as a whole. (See Figure 3-3 and Appendix B, Tables B-27 to B-30.)

The percentage changes in Figure 3-3 for the South and the West consist of the following states:

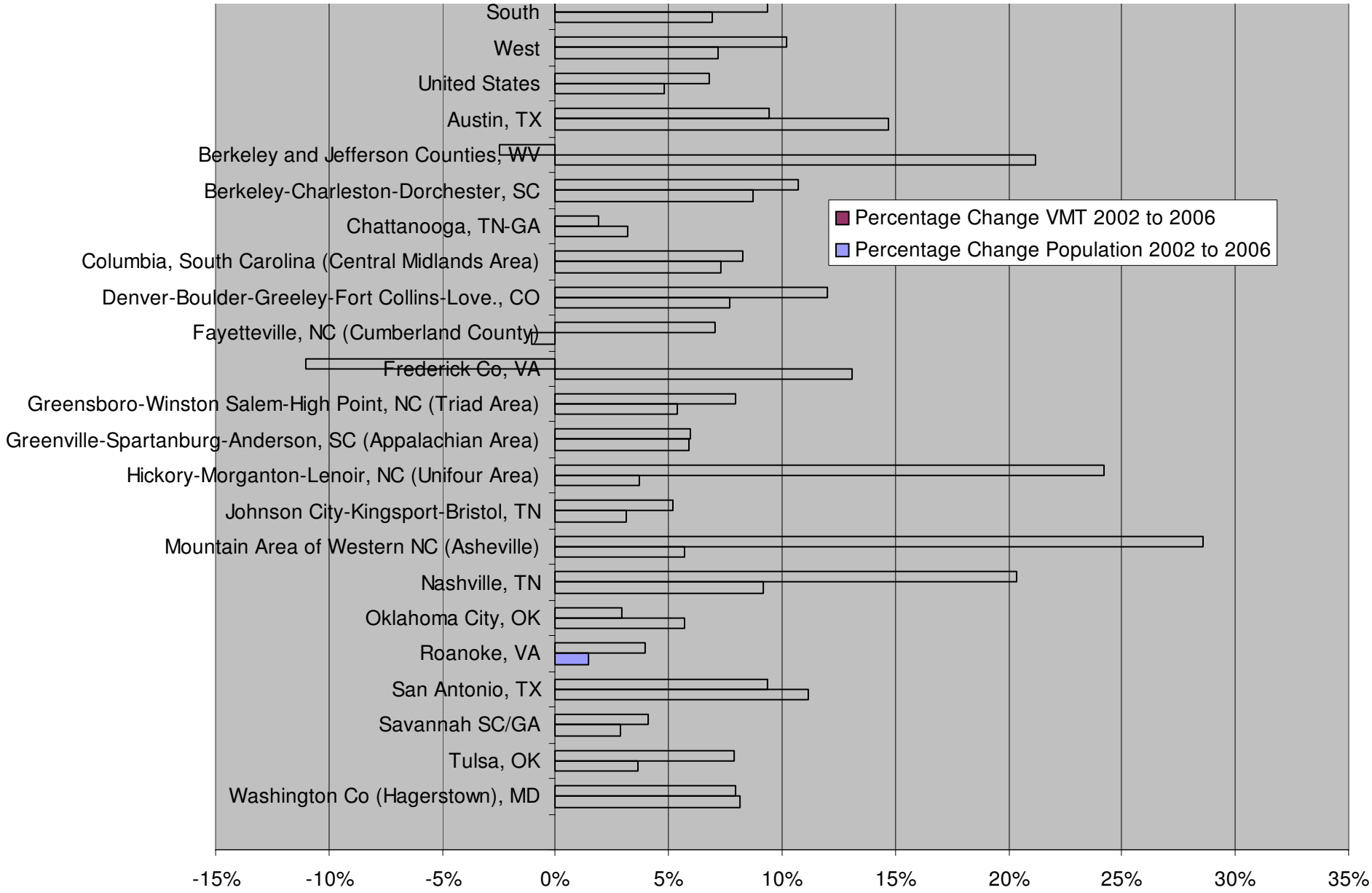
**Western States**

- Alaska;
- Arizona;
- California;
- Colorado;
- Idaho;
- Montana;
- Nevada;
- New Mexico;
- Oregon;
- Utah;
- Washington; and
- Wyoming.

**Southern States**

- Alabama;
- Arkansas;
- Delaware;
- District of Columbia;
- Florida;
- Georgia;
- Kentucky;
- Texas;
- Virginia;
- West Virginia;
- Louisiana;
- Maryland;
- Mississippi;
- North Carolina;
- Oklahoma;
- South Carolina; and
- Tennessee.

**Figure 3-4: Percentage Change in Population and VMT from 2002 to 2006 for 20 EAC Program Areas, the U.S. and the South and West**



**Program Design Aspects of the Study**
The study produced quantitative information in one area regarding program design: other aspects of the EAC Program related to EPA resources. The methodology and information from the study of the EPA resource estimates for the EAC Program versus the traditional approach are summarized in Table 3-7 (and described in detail in Table B-31). These are estimates made after completion of the EAC program, as resources expended on the program were not specifically tracked during its implementation.

Table 3-7 indicates that the study estimate for FTE to implement the EAC Program is 23.8. Table 3-7 also indicates that the study estimate for FTE to implement the traditional approach for the EAC areas is 24.6 to 57.3. The FTE estimates for implementation of a hypothetical traditional approach vary because of the differences across the regions in the FTE estimates for implementation of such an approach. Based on these estimates, since 23.8 and 24.6 are roughly comparable and 57.3 is well above those two numbers, the study information indicate that the EAC Program is as resource intensive (or less, depending on the EPA region) as a hypothetical traditional program for FTE.

Table 3-7 indicates that the study estimate for Federal Register actions to implement the EAC Program is 55. Table 3-7 also indicates that the study estimate for Federal Register actions to implement the traditional approach for the EAC areas is 28 to 46. The reason for the variability in the Federal Register actions for implementation of a hypothetical traditional approach is because of the variability across the regions in the estimates of the implementation of such an approach. According to these estimates, because 55 exceeds 46, the EAC Program is more resource intensive for Federal Register actions than the hypothetical traditional program. This is due partly to the fact that the EAC Program necessitated that EPA headquarters issue a number of Federal Register notices.

The estimates in Table 3-7 also indicate that the EAC Program is less resource intensive for Federal Register cost than the traditional program. This is due to the fact that the EAC Program's Federal Register actions were shorter than those of the traditional approach, despite being more numerous.

**Table 3-7: EPA Resource Estimates for the EAC Program versus the Traditional Approach**

| Resource | Traditional Approach | EAC Program |
|---|---|---|
| FTE | 24.6 to 57.3 | 23.8 |
| Number of EPA Federal Register Actions (pages) | 28 actions (715 pages) to 46 actions (1,085 pages) | 55 actions (561 pages) |
| Federal Register Cost* | $349,635 to $530,565 | $274,329 |

Source: EPA headquarters and regional office Staff estimates made retrospectively after the EAC Program ended, not during the EAC Program.
*Assumes current Federal Register of $489/page.

### 3.1.2 Qualitative Information
The study produced qualitative information for both the environmental and program design aspects of the study.

**Qualitative Information for Environmental Aspects of the Study**
The study produced information in one area: growth-related aspects of the study. Specifically, the discussion of study information in this area covers NSR Program activity and Conformity Program applicability.

**NSR Program Activity**
There are fundamental limitations to the ability to do a full quantitative analysis of the environmental benefits, or loss of opportunity for benefits, from Nonattainment NSR Program requirements due to implementing an EAC versus a traditional program. An analysis of this type would rely upon the ability to estimate the effects that the Nonattainment NSR Program would be expected to have on emissions over time, and compare that to the effects that occur absent the Nonattainment NSR Program. Although the study had available some limited information about some permit actions in some EAC areas, it cannot quantify, with a reasonable level of specificity, the differences in emissions for a given pollutant or pollutants, if any, that result from Nonattainment NSR Program requirements not being in place for EAC areas since it is not known:

- Whether a given project that went forward in the EAC area would have gone forward in the nonattainment area;
- If the Nonattainment NSR Program would create incentives for sources to relocate outside the nonattainment area, or to redesign or resize projects to avoid the Nonattainment NSR Program; and
- What the outcome of a nonattainment permitting process would have been (i.e., would the control technology determination have been different under Lowest Achievable Emission Rate (LAER) than under Best Available Control Technology (BACT), and from where would the offsets have come).

Because of these and other difficulties, it is very difficult to model the likely changes in emissions or air quality that could have occurred as a result of Nonattainment NSR Program requirements being in place. Therefore, the study considered qualitative observations more appropriate when looking at EAC programs and the potential emissions that may have been averted if Nonattainment NSR Program requirements had been in place in these areas. Nonetheless, specific permit information can provide a useful supplement to these conclusions when data is available. For that reason, the study provides the information below. However, the study is not able to make a quantitative estimate based on this information. While the Nonattainment NSR Program requirements have more stringent requirements in many cases, EPA cannot assume a direct comparison between hypothetical Nonattainment NSR Program and what actually occurred (i.e., between hypothetical LAER and actual BACT, or hypothetical major NSR Program and actual minor NSR Program) for these individual sources is valid.

The study identified two categories of NSR Program permitting activity in the 14 nonattainment deferred areas:

- Projects where the Prevention of Significant Deterioration (PSD) Program applied (projected emissions greater than either 250 tons per year or a PSD emissions significance rate) and the Nonattainment NSR Program may have applied because the projected emissions exceeded 100 tons per year (Category 1); and

- Projects that were not subject to the PSD Program (projected emissions less than 250 tons per year) but the Nonattainment NSR Program may have applied because either the projected emissions exceeded 100 tons per year or met another Nonattainment NSR Program emissions applicability test (Category 2).

The study addressed permitting activity from June 15, 2004 until April 15, 2008 by consulting with EPA regional and, where appropriate, state permitting staff. In five of the 14 areas the study found that there was no new source activity that triggered the PSD program requirements or that would have triggered the CAA's Nonattainment NSR Program requirements had the areas been designated nonattainment. The areas are:

- Berkeley and Jefferson Counties, West Virginia;
- Denver-Boulder-Greeley-Fort Collins-Love, Colorado;
- Frederick County, Virginia;
- Nashville, Tennessee; and
- Roanoke, Virginia.

Four of the 14 areas had eight new source permitting actions under Category One (plus one application submitted) in which the applicant was subject to the PSD Program but may have been subject to the Nonattainment NSR Program instead had the areas been designated nonattainment. The areas (and the associated activity) are:

- Columbia, South Carolina (Central Midlands Area)
    - Lexington County
        - Permit issued in 2007 – Michelin Corporation - major PSD Program source for VOC – increased VOC emissions by 110.9 tons per year, exceeding the PSD Program significance rates for VOCs of 40 tons per year;
- Greensboro-Winston Salem-High Point, North Carolina (Triad Area);
    - Forsyth County
        - Permit issued in 2005 – R.J. Reynolds - major PSD Program source for VOC – increased VOC emissions by 3,495 tons per year, exceeding the PSD Program significance rates for $NO_x$ of 40 tons per year;
- Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area)
    - Anderson County
        - Permit issued in 2005 – Santee Cooper - major PSD Program source for $NO_x$ – increased $NO_x$ emissions by 217.2 tons per year, exceeding the PSD Program significance rates for $NO_x$ of 40 tons per year
        - Permit issued in 2006 – Duke Energy Corporation - major PSD Program source for $NO_x$ – increased $NO_x$ emissions by 84.1 tons per year, exceeding the PSD Program significance rates for $NO_x$ of 40 tons per year
    - Greenville County
        - Permit issued in 2007 – Michelin Corporation - major PSD Program source for VOC – increased VOC emissions by 260 tons per year, exceeding the PSD Program significance rates for VOCs of 40 tons per year; and

- San Antonio, Texas
    - Bexar County
        - 2004 permit issued - Toyota Motor Manufacturing of Texas - major PSD Program source of VOC – increased VOC emissions by 75.6 tons per year, exceeding PSD Program significant rates for VOC of 40 tons per year
        - 2005 permit issued - City Public Service Spruce Power Unit No. 2- new major PSD Program source – increased $NO_x$ emissions by 1,752 tons per year, exceeding PSD Program major source threshold for $NO_x$ of 250 tons per year
    - Comal County
        - 2006 application submitted - Chemical Lime No. 1 – proposed $NO_x$ increase of 711 tons per year - permit not issued to date
        - 2007 permit issued - TXI Operations, Hunter Plant - new major PSD Program source – increased $NO_x$ emissions by 1,224 tons per year, exceeding PSD Program major source threshold for $NO_x$ of 250 tons per year.

Two of the 14 areas had three new source permitting actions under Category Two in which the applicant was not subject to the PSD Program but may have been subject to the Nonattainment NSR Program had the areas been designated nonattainment. The areas are:

- Chattanooga, Tennessee-Georgia
    - Hamilton County
        - 2005 permit issued - Caraustar Mill Group, Inc. (d/b/a Chattanooga Paperboard) - major Nonattainment NSR Program source of $NO_x$ – increased $NO_2$ by 145.69 tons per year, which would have exceeded Nonattainment NSR Program major source threshold for $NO_x$ of 100 tons per year
        - 2005 permit issued - Aerisyn LLC - major Nonattainment NSR Program source of VOC – increased VOC emissions by 120 tons per year, which would have exceeded Nonattainment NSR Program major source threshold for $NO_x$ of 100 tons per year; and
- Johnson City-Kingsport-Bristol, Tennessee
    - Sullivan County
        - 2005 permit issued - Aurora Hardwoods, Inc. - major Nonattainment NSR Program source of VOC – increased VOC emissions by 249.9 tons per year, exceeding Nonattainment NSR Program major source threshold for VOCs of 100 tons per year.

For six of the 14 areas the study lacked sufficient information to determine whether there was any activity under Category Two:

- Columbia, South Carolina (Central Midlands Area);
- Fayetteville, North Carolina (Cumberland County);
- Greensboro-Winston Salem-High Point, North Carolina (Triad Area);
- Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area);
- Hickory-Morganton-Lenoir, North Carolina (Unifour Area); and
- San Antonio, Texas.

For Washington County, Maryland (Hagerstown), no activity in Categories 1 and 2 were identified as they would have not been subject to the Nonattainment NSR Program because Maryland is in the Ozone Transport Commission and would have had to meet NSR Program requirements regardless of participation in the EAC Program because it is treated as a moderate nonattainment area for NSR Program purposes.

**Conformity Program Applicability**

Although they were participating in the EAC Program, six of the 14 nonattainment-deferred EAC Program areas were subject to the CAA Conformity Program requirement during the EAC Program (from June 14 2004 to April 15, 2008) for pollutants other than the 8-hour ozone NAAQS. Those pollutants were: the 1-hour ozone NAAQS, the $PM_{10}$ NAAQS, the $PM_{2.5}$ NAAQS and the carbon monoxide NAAQS. Table 3-8 provides information on each area's Conformity Program status.

Federal actions in these areas may also have been subject to the environmental review process under the National Environmental Policy Act (NEPA), which has some overlap with the Conformity Program for certain analyses. The NEPA requires Federal agencies to integrate environmental values into their decision making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions.[25]

**Table 3-8: Conformity Program Status of Nonattainment-Deferred EAC Program Areas during Implementation of EAC Program**

| Nonattainment-Deferred EAC Program Areas | Was the Conformity Program in Effect for At Least Part of EAC Program Implementation? | What NAAQS Pollutant(s)? |
|---|---|---|
| Berkeley and Jefferson Counties, West Virginia | No | • Not applicable |
| Chattanooga, Tennessee-Georgia | Yes | • $PM_{2.5}$ NAAQS because area designated nonattainment for $PM_{2.5}$ (effective April 5, 2005) |
| Columbia, South Carolina (Central Midlands Area) | No | • Not applicable |
| Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado | Yes | • 1-hour ozone NAAQS (approved maintenance plan in place with budgets for $NO_x$ and VOCs)<br>• $PM_{10}$ NAAQS (approved maintenance plan in place with budgets for $PM_{10}$ and $NO_x$)<br>• Carbon Monoxide NAAQS (approved maintenance plan in place with budget for Colorado) |
| Fayetteville, North Carolina (Cumberland County) | No | • Not applicable |
| Frederick County, Virginia | No | • Not applicable |
| Greensboro-Winston Salem-High Point, North Carolina (Triad Area) | Yes | • 1-hour ozone NAAQS (to be revoked after April 15, 2009)<br>• $PM_{2.5}$ NAAQS because area designated nonattainment for $PM_{2.5}$ (effective April 5, 2005) |
| Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area) | No | • Not applicable |

[25] http://www.epa.gov/compliance/nepa/index.html

| Nonattainment-Deferred EAC Program Areas | Was the Conformity Program in Effect for At Least Part of EAC Program Implementation? | What NAAQS Pollutant(s)? |
|---|---|---|
| Hickory-Morganton-Lenoir, North Carolina (Unifour Area) | Yes | • $PM_{2.5}$ NAAQS because area designated nonattainment for $PM_{2.5}$ (effective April 5, 2005) |
| Johnson City-Kingsport-Bristol, Tennessee | No | • Not applicable |
| Nashville, Tennessee | Yes | • 1-hour ozone NAAQS (will be revoked after April 15, 2009) |
| Roanoke, Virginia | No | • Not applicable |
| San Antonio, Texas | No | • Not applicable |
| Washington County, Maryland (Hagerstown) | Yes | • $PM_{2.5}$ NAAQS because area designated nonattainment for $PM_{2.5}$ (effective April 5, 2005) |

Source: EPA regional office Conformity Program staff.

**Qualitative Information for Program Design Aspects of the Study**
The study produced information in four areas:

- Efficiency of EAC Program;
- Longer term impact;
- Outreach and stakeholder interaction; and
- Other aspects of the program.

**Efficiency of EAC Program**
Ten of the state and local agency officials consulted believe the EAC Program model is a more efficient way to deliver clean air than the traditional nonattainment designation approach. The EAC Program is considered by the individuals consulted to be more efficient because it is thought to generate cleaner air quicker than the traditional approach. EAC Program areas are perceived to have an incentive to address air quality issues earlier than they would otherwise. Individuals consulted believe that is why participants preferred to take a proactive approach rather than a retroactive response to air quality problems in their areas.

In addition, the individuals consulted believe the traditional nonattainment approach can create resentment between states and localities. States bear criticism for administering the mandatory measures required under nonattainment designation. The individuals consulted observed that local stakeholders preferred to have some control over the types of measures that would be applied in their areas. Also, localities are not believed to make an effort to improve air quality if they think that the area will be designated nonattainment anyway.

Most importantly, the individuals consulted expressed the view that the EAC Program establishes better working relationships between states and local stakeholders than occur in the traditional approach. As a result, stakeholders appeared to focus better on developing and implementing control measures. They also developed ownership of the air quality issues in their community. These factors contributed to the perceived efficiency of the program.

The majority of the individuals consulted would like EPA to establish an EAC-type program for the 2008 ozone standard. The reasons for wanting to participate in another EAC Program, include:

- Strong incentives to come into attainment;
- Ability to build on lessons learned during the first EAC experience;
- Positive collaboration with educated stakeholders; and
- Need to obtain emissions reductions from local measures.

Five of the individuals consulted believed that the efficiency of the EAC Program model depends on the circumstances of individual programs. First, they regard the EAC Program to be a more efficient method for improving air quality for areas that are relatively close to the standard. In these situations, a few local measures, coupled with state, regional, and national programs, are all that is needed to bring the area into attainment. But, the EAC Program is not considered to be the right approach for areas further from the standard that need more measures to reach attainment. Second, the individuals consulted stated that the efficiency of the EAC Program model must be studied on an area-by area basis. They found that the extent of local involvement in a program has a major influence on the efficiency of an EAC Program. Local measures may be more efficient in concept but will not work if stakeholders are not engaged in the process.

One local agency could not determine whether the EAC Program is more efficient because it had never participated in the traditional approach. However, it believed the EAC Program did speed up the pace of emissions reductions in the area. Local stakeholders attempted to clean up the air as quickly as possible.

One individual consulted stated that the EAC Program is not more or less efficient than the traditional approach. Even so, the agency believed the EAC Program did produce benefits. The EAC Program's collaborative approach did make the program effective. The public also became aware that it could play a role in improving air quality.

One state agency noted that the EAC Program produced positive and negative impacts. The EAC generated the following positive impacts: additional funding for ozone modeling; better outreach on ozone action days; and, greater public air quality awareness. On the negative side, the agency became frustrated with the procrastination of local areas in submitting required data for the state to complete EAC progress reports to EPA.

A state agency implementing the traditional approach did not believe it was a more efficient approach in a nonattainment area. The traditional approach did not generate support for environmental measures. Conversely, the agency believed the EAC approach would have helped to change attitudes and generate local support in the area. The CAA is considered to be punitive because the agency had to obtain unnecessary VOC reductions under the traditional approach.

A local agency participating in the traditional approach in this state could not compare the two approaches because it is not familiar with the EAC process. But, it noted that the redesignation process takes a very long time under the traditional approach. The agency believed that shortening this time period would greatly benefit local areas.

Rather than follow the traditional approach, five areas in another state decided to pursue voluntary EAC-type activities. The state agency administering this program believed the traditional model is a less efficient method of improving air quality. This is due to the restrictive nature of the traditional

program. The agency believed that the EAC Program provided areas with the opportunity to utilize control measures that work best for local conditions without imposing the regulatory burden. The collaborative dialogue among participants provided for a more efficient method of reaching attainment status. In addition, the agency believed that the selection criteria made the EAC a more efficient approach than the traditional model because only areas that are likely to succeed are accepted into the program.

***EAC Program Resources versus Traditional Approach***

Six of the individuals consulted believed that local areas spent more resources in the EAC Program than they would have in the traditional program. This is because local stakeholders would not have been as involved in the traditional method. The individuals consulted noted that industry would likely have been the only stakeholder involved in the traditional process.

Four of the individuals consulted stated that the EAC Program did cost more time and resources initially. However, they believed that the benefits from the EAC Program outweighed the costs by:

- Saving resources in the long run;
- Developing control measures that accommodate economic growth;
- Developing good will among stakeholders;
- Providing local control over program activities; and
- Avoiding nonattainment status.

One of these individuals consulted did comment, however, that comparing resource expenditures is not an appropriate method to study the EAC Program. The benefits of participating in the EAC were considered to have outweighed the costs.

Five of the individuals consulted found it difficult to compare resource allocations under the two different approaches. One state agency reportedly saved money and staff time while planning the EAC Program but still had to allocate resources to SIP development. Another state agency believed that the EAC Program approach required fewer resources at the state level than would be needed to conduct rulemaking for a traditional SIP. However, it noted that the EAC Program required more resources at the local level to engage stakeholders.

An agency in a different state noted that its EAC effort required more work and resource allocation up front. However, it believed that the traditional approach would have required more state resources over time. This is because local areas were more willing to contribute resources in the EAC approach because they had greater responsibility for the program. In comparison, nonattainment areas had to rely more heavily on the state for resources. So, the agency found it difficult to say whether one approach was more costly overall than the other.

An agency in another state reported that staff responsibilities were redirected from technical SIP work to working with local EAC Program areas. No additional state resources were committed to the EAC program. In one respect, though, the agency believed that the EAC Program reduced the resource burden. In its experience, more people became involved in "bureaucratic exercises" in the traditional nonattainment process. Because the EAC Program did not contain comparable requirements, the agency found that EAC participants were able to focus resources on implementing "air quality improvement efforts". The agency considered this a more efficient use of limited resources.

Instead of hiring any additional staff for the EAC Program, one County agency also added air quality duties to the workload of existing staff. It also found that the EAC Program approach did make more resources available than would have been available through the traditional approach. Local stakeholders stepped up, took ownership of the program, and tried to implement control measures.

Three of the individuals consulted stated that the EAC Program did not save money or resources over the traditional approach. One state agency noted that it had to allocate more staff time for the EAC Program approach. An agency in another state said that additional resources were needed to complete the EAC requirement for ongoing progress reports. It considered the reporting requirement burdensome and very similar to the SIP approach.

Two of the individuals consulted stated that EPA needed to provide additional technical assistance and education for participants to fulfill EAC Program requirements. Three of the individuals consulted reported that they did not have the funding and/or technical expertise needed to complete modeling requirements or implement local measures. One state agency pointed out that it could not have performed the ozone modeling needed for the EAC areas without funding from their State Department of Transportation. EPA Section 105 funding enabled the state to develop a modeling capability but it did not provide the capacity to refine the system for the EAC Program Areas. The agency believed that funding limitations, particularly for technical assistance, may have prevented interested parties from participating in the EAC Program.

One local agency participating in the traditional approach found the process to be time consuming but a great learning experience as well. Although it found that more staff time is required in the traditional approach, the resource burden was not overtaxing. The state agency administrating the traditional approach noted that this approach required fewer state resources initially to deal with a local nonattainment area. In contrast, it found that the EAC process required a lot of resources up front but has long-term benefits.

The local agency participating in a voluntary program rather than the traditional approach stated that the voluntary measures cost the same as the traditional approach. The resource cost was sizeable but unavoidable. In general, however, it considered that more local resources would be required for a locally-driven, EAC-type approach than in the traditional approach. The state agency administering this voluntary program believed that the resource allocation was burdensome but required by law. Since modeling would have been required under the traditional approach, the modeling aspect of the voluntary program was not considered to be more or less burdensome than the traditional model. Although the voluntary EAC approach cost a little bit more upfront, however, the agency thought it produced a greater yield of benefits.

***EAC Program Flexibility***

Fifteen of the individuals consulted believed the EAC Program gave local areas the flexibility to develop their own approach. According to one state agency, the EAC Program's flexibility created an intergovernmental dynamic that would not likely have occurred under the traditional approach. This dynamic is credited with bringing a more willing and receptive response from the local area to the program. A County agency stated that local flexibility was a strong selling point for bringing a skeptical community showing resistance to an unknown program. Another state agency believed that

the opportunity for flexibility in local decision making was critical for obtaining support for the program.

The EAC Program areas in two states would have come into attainment through national measures alone. By participating in the EAC Program, however, the states believed they had the flexibility to develop control measures that were appropriate for their own areas. For example, an area may have been interested in pursuing an anti-idling program originally to save fuel. Because the anti-idling program would also provide air quality benefits, it may have made it easier politically for the area to implement the program in the context of the EAC Program. In addition, the flexibility of the EAC Program was considered to have provided an opportunity for local programs to include controversial measures such as lowering the speed limits for truckers.

One local agency commented that the EAC Program's flexibility allowed localities to focus on specific industries of interest. As a result, it did not have to spend resources on all sources in the area. A local agency in another EAC Program area noted that the flexibility provided an opportunity to develop measures that would be best for each individual source or sources. It believed that the local control measures adopted in EAC Program areas could not have been mandated by states.

Three of the individuals consulted believe it is possible that the EAC Program may have provided flexibility to local areas. Although more flexibility may have been available, one state agency maintained that its EAC Program areas did not take advantage of the added flexibility. A local agency stated that there was not much it could do at the local level. It believed that whatever emissions reductions it generated would be a drop in the bucket compared to those coming from all the federal and state programs.

The local agency and state agency that followed the traditional approach agreed that it does not give local areas flexibility to develop their own approach. However, the local agency stated that it is difficult for local areas to develop alternative approaches to complex issues when state government already has a good approach.

A local agency participating in a voluntary program rather than the traditional approach believed that the traditional approach does not provide flexibility to local areas. The state agency that administered this approach noted that the CAA does not provide local flexibility in the traditional approach.

***Threat of Nonattainment Designation as Incentive***

Sixteen of the individuals consulted stated that the EAC Program would not have succeeded without the threat of nonattainment designation or without the program being part of the larger SIP effort. They believed that states and local areas needed motivation to participate in the program. Moreover, EAC Program participants indicated that they entered the program to avoid the NSR and Conformity Program requirements of nonattainment designation. They were also concerned about the impact of a nonattainment designation on economic development. In addition, the individuals consulted thought it would be difficult to get local stakeholders to participate in the program without the threat of nonattainment.

Four of the individuals consulted were not certain whether the EAC Program would have succeeded without the threat of nonattainment. They believed that some areas might have participated under the right circumstances.

One state agency commented that one of its EAC Program Areas would have participated without the threat of nonattainment because it is a very environmentally-motivated area. The local agency agreed that it would have participated in the EAC without the threat of nonattainment.

***EAC Program Process-Related Goals and Requirements***

Based on information contained in the bi-annual progress reports from the 14 nonattainment-deferred and six attainment areas, all of the areas studied met their progress-related requirements. However, one attainment area was late with some of their bi-annual progress reports.

Six of the individuals consulted stated that EPA should streamline the EAC biannual reporting process. They believe that less frequent reporting would have the same or greater value than a biannual exercise. In addition, EPA is encouraged to develop a simplified reporting process such as: a more quantitative approach; a standard checklist; or a standard electronic form. However, six other individuals consulted felt that the reporting requirements were not more burdensome than the traditional approach.

**Longer Term Impact**

***EAC Provision for Longer Term Emission Reductions or Continued Action In The Future***

Based on information contained in the progress reports from the 14 nonattainment-deferred and six attainment areas, these areas have entities that will continue the EAC Program activities beyond April 2008.[26]

Nineteen of the individuals consulted stated that the EAC Program activities did provide for longer term emission reductions or create a local "infrastructure" for further or continued action in the future. Several of the individuals consulted noted that the EAC control measures would remain in place for the foreseeable future. There are several reasons for this. They include the following:

- EAC control measures may have been adopted without expiration dates or are intended to be permanent;
- Control measures that are included in SIPs will remain in effect as long as necessary;
- Local areas may value the benefits of air quality measures put in place during the EAC Program; and
- Due to the anti-backsliding provision, it may be necessary to retain EAC Program control measures to comply with the SIP.

The EAC is credited with creating an infrastructure for continued action in the future. One state agency reported that air quality is among the elements in the smart growth principles adopted by planning districts during the EAC Program. These measures have and will continue to remain in place after the EAC Program. The agency believed it was important that the program was being implemented by government entities that will remain in place long term.

An agency in another state noted that an EAC Program task force created during the EAC Program's development and implementation formed a successor group after the program ended. About 80 members attend the regularly scheduled meetings. The new task force has already developed a

[26] To clarify, the EAC control measures are part of the SIP and are, therefore, Federally enforceable and are to continue to be implemented in the future regardless of whether an entity has been designated to continue EAC Program activities.

document of control measures for planning agencies in the state. The agency stated that this document prepared the groundwork for the next ozone standard.

Local areas in another state have indicated they are committed to keeping air quality programs going. Financial support and the new standard will help keep those commitments alive. One local area, for example, wants to expand air quality measures beyond ozone to address $PM_{2.5}$ and greenhouse gases (GHG). Another community has inquired about funding for woodstove changeout programs. A different area has developed a website, conducted significant outreach, and committed to funding an air quality coordinator.

An agency in another state believed that the EAC Program did provide a learning experience. It also is credited with facilitating inter-state collaboration on air quality issues, particularly $PM_{2.5}$ emissions. However, the local EAC Program activities did not provide much capacity for continued action in the future.

One local agency participating in the traditional approach believed that this approach created a close working relationship between local stakeholders and the state. The relationship has proven to be beneficial. In addition, local stakeholders learned from the experience. The state agency administering this program believed that the EAC approach provided these benefits to a greater extent. It believed the traditional approach is more short sighted and does not get local long-term emissions reductions.

According to a local agency participating in a voluntary program rather than the traditional approach, the public received a great deal of information about air quality. This generated an awareness of air quality issues. The EAC-type activities are credited with generating advocacy for increased bus routes, especially to outlying areas. The state agency administering this voluntary EAC program noted that the traditional approach locks in control measures and contingency measures for an extended period of time. The traditional approach also provides for continued and more concrete control measures. Under the voluntary approach, however, the agency notes that it created a Clean Air Coalition of regional stakeholders that continues to function.

***EAC Activities and Continued Reductions in Ozone***

Sixteen of the individuals consulted believed that EAC Program activities resulted in continued reductions in ozone and air quality improvement activities/policies that were not foreseen initially as the EAC Program was implemented. Two of the individuals consulted could not determine at this time whether unforeseen reductions would continue. Two other individuals consulted reported that EAC Program activities did not lead to continuing unforeseen air quality benefits.

Four states maintained that the EAC Programs led to the development of policies and projects that yielded continuing benefits that would not have occurred otherwise. These included:

- A school bus anti-idling program;
- Increased use of biodiesel;
- Alternative modes of transportation;
- Carpooling;
- Expanded bus routes;
- Policies requiring sidewalks and green-spaces;
- Local capacity building;

- Cement kiln voluntary reductions;
- Airport reductions;
- Lawn mower trade-in programs;
- Retrofits for compressor engines; and
- A green building program.

In another state, the EAC Program established an atmosphere that helped create alliances to push the oil and gas industry for emissions reductions. As a result, the EAC Program is credited with generating large emissions reductions than would not have occurred without the program. The state agency continues to ask for additional reductions from the oil and gas industry. It plans to ask for more reductions from the industry in the future as well.

Three local areas reported that the EAC Program provided ongoing unforeseen air quality benefits such as: a regional ride share website for twenty-two participating counties; an ozone watch/warning system; greater use of greenways, bikeways and similar measures; closer and more trusting inter-governmental relationships; and greater public awareness of air quality issues.

A local agency participating in the traditional approach stated that the traditional approach increased public awareness of air quality issues. It believed that the growing awareness may lead to vehicle emissions reductions if the public changes personal behavior patterns by driving less or filling up at appropriate times. The state agency administering this traditional program did not think that there would be any additional unforeseen reductions.

A local agency participating in a voluntary program rather than the traditional approach did not think there would be additional unforeseen reductions. Most of the voluntary activities have already concluded. The agency reported that one criticism of the voluntary approach is that it keeps initial momentum going but falters once the initial catalyst has been removed. According to the state agency administering the voluntary EAC program, desulfurization will result in mercury reductions that were not foreseen. This will help improve mercury-impaired waters.

## Outreach and Stakeholder Interaction

### *EAC Air Quality Task Forces*

Based on information contained in the bi-annual progress reports, the 20 areas included in the study did have air quality task forces except for three of the attainment areas: Mountain Area of Western North Carolina (Asheville); Oklahoma City, Oklahoma; and Tulsa, Oklahoma. The Mountain Area had a group but it included only government representation. For the areas that had task forces, all had diverse representation from at least three sectors except for Chattanooga, Tennessee-Georgia and Nashville, Tennessee. Chattanooga addressed their task force needs through the public transportation planning organization, which did not have representation from least three sectors.

### *Ozone Awareness Outreach*

Based on information contained in the bi-annual progress reports from the 14 nonattainment-deferred and six attainment areas, the 20 areas included in the study did conduct ozone awareness and all but one – Chattanooga, Tennessee-Georgia – had a coordinator.

***Stakeholder Engagement***

Seventeen of the individuals consulted stated that the EAC Program did engage local stakeholders in the program. The diverse range of local stakeholders included local governments, elected officials, the media, councils of governments, industry, local businesses, utilities, chambers of commerce, environmentalists, and other organizations. One state agency noted that it had to reach out to stakeholder groups, which are not customarily involved in air quality issues. Another state agency maintained that public engagement in the process was the largest benefit of the EAC Program. A local agency stated that the program generated a greater level of engagement from a wider range of local stakeholders than found in other issues. Another local agency summarized the importance of engaging local stakeholders in the process. It stated that, in general, suggestions from local stakeholders are better received than ideas from government. The EAC is credited with improving the working relationships between states and local stakeholders. It is believed that the improved relationships and the flexibility given to local areas provided opportunities to consider measures that would not have been discussed outside of the EAC Program.

The individuals consulted believed that the EAC Program produced the following additional benefits.

1. Prior to the EAC Program, local stakeholders were considered to have a limited awareness of air quality issues. Because of the EAC Program, however, elected officials, citizens, and other local stakeholders became more aware of air quality issues. The increased level of public awareness may not have occurred under the traditional approach. One state agency noted that local stakeholders are now discussing air quality issues amongst themselves. It also credited the EAC Program for creating clean air advocates at the local level.

   The EAC also is credited with increasing the involvement of local stakeholders in air quality issues. Stakeholders had to take part in the initial stages of the program to meet the EAC schedule. Besides getting involved more quickly, stakeholders also participated in air quality issues to a greater extent than they would have under the traditional approach.

   A local agency noted that citizens now discuss aspects of air quality that they would not have known about prior to the EAC Program. At stakeholder meetings, for example, citizens are aware of particulates, the new standards, and other air quality issues. In addition, the public is aware that personal actions, such as exchanging gas cans and lawn mowers, can improve air quality.

2. The EAC Program process is credited with strengthening the relationship between states and local stakeholders. One state agency maintained that its relationship and communication with local stakeholders was not nearly as strong prior to the EAC Program. Another state agency acknowledged that it had an outreach program to local areas prior to the EAC Program. However, the EAC Program enhanced its outreach effort. The EAC generated broad stakeholder representation in each of the participating areas. As a result, the agency believed the state's outreach efforts are better now.

   One state agency believed that its enhanced relationship with stakeholders has already provided important benefits. The state legislature must approve all proposed regulations. Before receiving legislative approval, however, the state has to demonstrate stakeholder support for a regulation. The agency was able to tighten the open burning ban and $NO_x$ reduction regulations.

But, the agency stated that it would have not have been able to obtain the stakeholder support needed to get the regulations passed without the improved relationships from the EAC Program.

3. The EAC Program is credited with creating an infrastructure for stakeholder involvement in future air quality issues. Seven of the individuals consulted noted that stakeholder groups remain involved in air quality issues. Three of the stakeholder groups are working with states on implementation of the $PM_{2.5}$ standard. One local agency stated that its entire metropolitan area has been working proactively on $PM_{2.5}$ issues for the past year. Many of the same people who were involved in the EAC are now working on $PM_{2.5}$. The relationships established during the EAC Program are credited with making collaboration on $PM_{2.5}$ much easier.

One County agency stated that it could not have afforded to pay for the technical expertise provided by stakeholders participating in the EAC Program. Technical experts from industry and the state continue to help the County with EPA guidance, other air quality issues, and community events.

One state agency maintained that the infrastructure developed through the EAC Program will help it meet the new ozone standard quicker. It plans to do more of the same activities developed during the EAC Program to meet the new standard. Moreover, the state is very interested in developing the EAC Program concept. It is exploring whether states and localities can build upon previous programs to continue the EAC.

Two of the individuals consulted found it difficult to determine whether the EAC Program increased stakeholder involvement. According to one individual consulted, local stakeholders participated extensively in the EAC Program. However, air quality issues were already important to stakeholders before the areas became involved in the EAC Program. The other individual consulted did not track stakeholder involvement.

Due to the rural nature of the region, one EAC Program area did not have much stakeholder participation. The local agency stated that air quality issues were not that important to the general public.

One local agency in one area participating in the traditional approach stated that it engaged local stakeholders. Participants included metropolitan planning organization committees, local government, and business. However, there was not much public participation. The state agency administering the traditional program noted that the approach did not engage stakeholders in the same area but not in another. The lack of stakeholder engagement in that area was thought to be due to the lower level of resources spent by the state in the area.

A local agency that participated in an EAC-type voluntary approach rather than the traditional approach stated that the voluntary approach brought together elected officials and various other stakeholders. The state agency that administered the voluntary EAC-type approach agreed that local stakeholders were engaged in the process.

## Other Aspects of the Program

### *EAC Requirements versus CAA Nonattainment Area Requirements*

Table B-32 lays out in detail the requirements for EAC Program areas alongside the requirements the 14 nonattainment-deferred areas could have faced had they not pursued the EAC Program and instead

were designated nonattainment. Specifically, the table presents an outline of the general Subparts 1 and 2 requirements of the CAA. The presentation of the requirements in the table and the discussion here serves historical purposes only. Following the April 2004 area designations, the implementation program for the 8-hour standard had to be revised in light of a court decision that affected how areas were classified. This may have affected some of the EAC Program Areas if they had been designated nonattainment in April 2004 instead of participating in the EAC Program. Most of the Subpart 1 requirements in Table B-32 no longer apply to the areas that were originally placed under Subpart 1. EPA is currently developing rulemaking to address the requirements for the areas that were originally placed under Subpart 1. However, for historical purposes only the study performed a comparison of Subpart 1 nonattainment area requirements versus EAC area requirements, which is presented here. (The Marginal Subpart 2 areas are not included in the comparison here but can be found in Table B-32.)

In some respects, the EAC Program required more stringent requirements than a Subpart 1 nonattainment program. In other respects, however, the Subpart 1 program required more stringent requirements. And, in yet other ways, the requirements for the two types of areas were comparable.

Here are the major differences in requirements:

In a few respects, the EAC Program required more stringent requirements than a Subpart 1 nonattainment program:

- Earlier date for submission of an attainment demonstration SIP;
- Earlier attainment date;
- Earlier date for compliance with emission reductions needed for attainment; and
- Planning milestones such as progress reports for planning, which, if not met, would have caused the termination of the EAC deferral of the nonattainment designation.

In many respects, the Subpart 1 nonattainment program required more stringent requirements than the EAC Program:

- Nonattainment area NSR;
- General Conformity Program;
- Transportation Conformity Program including, but not limited to, the following requirements:
    - Consultation between air quality and transportation agencies on both the SIP and the transportation plan and Transportation Improvement Program
    - Transportation and emissions modeling requirement
    - Build/no build test
    - Hot spot test
    - Emission budget tests
    - “Freezes” if certain requirements are not me;
- RACT;
- Attainment had to be achieved as “expeditiously as practicable”;
- Failure to submit a SIP would ultimately result in sanctions and Federal Implementation Plans; and
- Longer period (10 years) for showing of maintenance with the standard if state/area requested redesignation to attainment.

- EAC Program areas only required to demonstrate maintenance of the standard for five years (although states for almost all of the EAC Program areas in the Southeast (EPA Region 4) submitted maintenance plans for 10 years).[27]

In two respects, the requirements for Subpart 1 and EAC Programs were comparable:

- An attainment demonstration using photochemical grid modeling, although the EAC modeling required that fewer episodes are modeled and
- Preparation of a revised SIP if the area failed to attain by its attainment date.

In addition, the Subpart 2 nonattainment classification would have been more stringent than the EAC Program in the case where an area (such as a marginal area) failed to attain by its attainment date. In that instance, it would have been reclassified to at least the next highest classification. The area would then have been subject to additional mandatory source control measures and planning requirements. However, a marginal area would not have been required to submit an attainment demonstration or to have satisfied other planning requirements.

Finally, it is worth noting that, pursuant to authority under Section 110 of the CAA, EPA has long required states to submit emission inventories to EPA as part of their SIP. The inventories have to contain information regarding the emissions of criteria pollutants and their precursors (e.g., VOCs). This applies to EAC and non-EAC Program areas in states. In 2002 EPA simplified and consolidated emission inventory reporting requirements, established new reporting requirements related to $PM_{2.5}$ and regional haze, and established new requirements for the statewide reporting of area source and mobile source emissions.[28]

## 3.2 Observations

### 3.2.1 Overall Observations Resulting from the Study

Because of the study's limitations, it is difficult to draw hard findings and conclusions. However, the study was able to make a number of observations about emission reductions, changes in air quality, and issues related to program design and process.

Overall, a number of states in the Northeast had serious concerns about the approach. The EAC program was generally popular with participating state and local officials. These officials indicated the EAC Program model provided the right combination of incentives, flexibility, and structure and was used to foster a collaborative environment that:

1) Encouraged local stakeholders to take ownership of the ozone air quality issue and to develop and adopt local measures;
2) Increased awareness of ozone air quality issues with key stakeholders and, to a degree, with the public; and

[27] EPA Region 4 worked with almost all of the participating EAC states in the Southeast – North Carolina, South Carolina, and Tennessee but not Georgia – to voluntarily agree to develop and submit maintenance plans that extended to 2017, 5 years past the year 2012 minimum date for EAC areas.

[28] "Consolidated Emissions Reporting Rule," 67 Federal Register 39602-39616, http://www.epa.gov/ttn/chief/cerr/cerr.pdf, June 10, 2002.

3) Helped establish working relationships between state environmental agencies and local government that may prove beneficial for future implementation of air quality standards.

**Emission Reductions**

For the vast majority of the areas included in this study, the EAC Program appeared to successfully encourage the development and adoption of quantifiable, local emission reduction control measures by the December 2005 deadline. Ninety-six percent of the total 388 measures implemented for the 20 areas included in the study were implemented by the EAC December 2005 deadline, according to EAC progress reports and SIPs. Estimated emission reductions from local measures collectively constituted an estimated nine percent or more of quantified $NO_x$ and VOC emissions reductions in seven of 18 EAC Program areas included in this study for which complete emissions reductions data were available (the remaining reductions were achieved from national and state measures). The local measures were "directionally correct" and should assist the areas in maintaining the ozone NAAQS.

According to many state and local officials, the program also resulted in quantifiable emission co-reductions of other pollutants, including particulate matter and/or air toxics.

**Air Quality**

The study analyzed the air quality improvements experienced by EAC Program areas in the eastern U.S. by comparing them to improvements achieved in nearby nonattainment areas that did not participate in the EAC program. (This could not be analyzed in the Colorado, Oklahoma and Texas EAC areas, because there were not ozone nonattainment areas located near enough to provide a comparison.) The analysis found that the changes in air quality in eastern EAC Program areas were consistent with those observed in non-EAC areas. Additionally, consistent with the expectation that most progress towards ozone attainment in the East would come generally from national measures such as vehicle standards and power plant controls, it appears that, based on air quality data, local EAC measures adopted and implemented in EAC Program areas in the East did not produce an early, demonstrable incremental improvement in air quality. Relative to non-EAC Program areas, the information compiled appears to indicate that, for EAC areas in the East, progress toward meeting the air quality standards on time was not adversely affected by two factors: (1) the absence of some or all of the nonattainment area requirements that traditional nonattainment areas face, or (2) population and vehicle miles traveled growth that most of the areas experienced during EAC Program implementation. Relative to non-EAC Program areas, these two factors also did not appear to adversely affect the ability of EAC areas in the East to attain the NAAQS by December 2007 (or earlier for many EAC areas).

The fact that local measures did not produce an early, demonstrable incremental improvement in air quality can be explained in part by the fact that quantified $NO_x$ and VOC emissions reduction estimates from *local* EAC measures represented a small part of emissions overall: (1) in EAC Program areas; (2) in states in which they are located, and (3) as compared to reductions achieved in each state through the $NO_x$ SIP call. The best way to measure the impact on air quality of the EAC local measures – and whether they contributed to the areas attaining early – would be to conduct incremental air quality modeling of the emissions reductions from those measures. Short of that, the reductions are so small relative to the emission reductions from federal and state measures that their impact is indiscernible.

All but one of the EAC areas did attain the ozone NAAQS by December 31, 2007; in fact, 15 of the 20 EAC areas attained the 8-hour ozone NAAQS by December 31, 2004 – prior to the required 2005 implementation date for the EAC control measures.

This study looked at ozone air quality through 2007. And while almost all the EAC areas met the ozone NAAQS before 2007, it remains to be seen what will happen to ozone air quality levels in these areas as they grow in the next 5 to 10 years. Ozone air quality in many of the areas will continue to be influenced by, among other things, state and national programs to reduce $NO_x$ and VOCs. Some state and local officials believe that local measures should benefit air quality in the future. EAC Program areas were required to develop plans to demonstrate how they would address emissions growth and maintain meeting the ozone NAAQS for five years (to 2012). They did so, and almost all the states in the southeastern U.S (EPA Region 4) with EAC Program areas submitted maintenance plans for 10 years.

The study also looked at whether the air quality modeling provided insight into what degree the "local" EAC measures contributed to additional improvements in air quality, beyond the improvements provided by the state and national measures. The only reliable way to quantify the air quality improvements from the EAC local measures is to model the local measures independently of the state and national measures. But the modeling performed for the EAC SIPs did not provide such an analysis. For this study the information available only allows for a review of whether the actual air quality improvement achieved is consistent with the level of improvement predicted by the model. After making this comparison, this study observes that the estimates in the modeled demonstration are consistent with the air quality achieved. Therefore, the modeling provided reasonable information.

It was beyond the scope of this study to analyze the improvements in short-term or long-term air quality that would have otherwise occurred in the affected EAC areas if they had followed the traditional requirements under the CAA associated with a nonattainment designation. For example, several of the nonattainment-deferred areas experienced new stationary source activity that may have been subject to permitting requirements under the CAA nonattainment NSR program had the same activities been undertaken while these areas had a designation of nonattainment. The proposed emissions increases for some of those sources were controlled under the CAA's PSD Program. As noted above, this study did not quantify emission changes in EAC versus non-EAC areas and is, therefore, unable to provide information on the impact on emissions of the absence in EAC areas of some or all of the nonattainment area requirements that traditional nonattainment areas face, including those of the Nonattainment NSR Program.

State and local agencies consulted did believe the EAC approach to be well suited for nonattainment-deferred areas that were new to the ozone air quality issue and had ozone air quality levels relatively close to the standard. Those areas did not face the same degree of ozone air quality challenge faced by some of the nation's largest areas and so, in that regard, their air quality problems were more manageable. EAC Program participants in these areas took ownership of their air quality problem in a way that was not likely, in the opinion of the state and local agencies consulted, to have occurred to the same degree under the traditional approach, absent a concerted EAC-type effort or unless the community was already active on environmental issues.

**Program Design and Process**

Some EAC Program areas did not experience the "collaborative environment" the EAC Program model fostered in other EAC Program areas. Based on the study discussions, several possible reasons emerged to help explain this:

- Insufficient technical support for EAC Program areas from EPA and the states;
- Insufficient state or local agency leadership to help start and/or shepherd the EAC Program process;
- Lack of public interest due to insufficient information about local air quality issues; and
- Ozone air quality problem believed to be solvable due to state and national measures alone so there was not much action perceived to be needed locally.

The state and local agencies implementing the EAC Program reported that, in order to succeed, the EAC program needed (1) the threat of reinstatement of the nonattainment designation as the consequence of failure to meet EAC Program requirements and (2) for the EAC Program to be part of the larger SIP program. The majority of state and local agencies consulted believed that states and local areas needed motivation to participate in the program for it to succeed.

The EAC Program required as much EPA staff resources or less than the staff resources EPA estimated would have been needed to implement the regular program for the same areas. The question of whether the EAC Program saved estimated human resources varied by EPA region. The study lacked data to assess the resource impact of the EAC program on the participating state and local agencies.

### 3.2.2 Specific Observations

**Quantitative Observations**

**Environmental Aspects**

The following seven quantitative observations relate to environmental aspects of the EAC Program study. They are based on a quantitative information gathered for 20 EAC Program areas – 14 nonattainment-deferred and 6 designated unclassifiable/attainment – and, thus, pertain to those areas.

**Observation 1: In the East air quality changes in EAC Program areas were consistent with air quality changes in non-EAC 8-hour ozone nonattainment areas in the same region.** Based on a study of meteorologically-controlled air quality data from 2001-2003 to 2005-2007, air quality changes in EAC Program areas in the East are consistent with changes in non-EAC Program areas in the East. Any pre-program concern that ozone air quality in EAC Program areas would suffer as compared to non-EAC Program areas does not appear in retrospect to have been justified, at least with respect to air quality measured through 2007. (The study did not quantify emission changes in EAC versus non-EAC areas and is, therefore, unable to comment on the impact on emissions of the absence in EAC areas of some or all of the nonattainment area requirements that traditional nonattainment areas face.) The study lacked adequate sites with meteorologically-controlled ozone air quality data to enable us to make comparisons for areas in the Central Southwest. Therefore, the study cannot comment on how those air quality gains in that region compare to other non-EAC ozone areas there. The study did not compare two individual cities because it is very difficult to determine if they are comparable. Comparing the range of reductions between two groups is more reasonable, as the study did for areas in the East.

**Observation 2: States relied largely on state and national measures for their attainment demonstrations.** Despite having quantified local measures, and, thus, satisfying one of the criteria necessary for a measure to be included in the attainment demonstration, states chose for the most part not to include those measures as part of the attainment demonstration. The study did not explore why states chose to include some measures in the attainment demonstration but not others.

**Observation 3: The overwhelming majority of the EAC Program areas included in the study attained the 8-hour ozone NAAQS despite growth in population and VMT.** Nineteen of the 20 EAC Program areas included in the study that attained the 8-hour ozone NAAQS by December 2007 did so despite most of them experiencing estimated growth in either VMT or population or both during implementation of the EAC Program (in several cases these growth rates met or exceeded national and regional growth rates). In fact, 15 of the 20 EAC areas attained the 8-hour ozone NAAQS by December 31, 2004, prior to the required 2005 implementation date for the EAC control measures. (It is also important to note that the remaining 9 attainment areas for which the study did not compile quantitative information also maintained their attainment status with respect to the 8-hour NAAQS through December 2007.)

**Observation 4: The EAC Program successfully encouraged local areas in the adoption and development of meaningful, local control measures in the majority of the EAC Program areas included in the study, representing a significant percentage of quantified $NO_x$ and VOC emissions in several of the areas included in the study.** Despite the uncertainty inherent in emission reduction estimates, the estimated individual and collective emissions reductions from these local measures constituted significant percentages of quantified $NO_x$ and VOC emissions in those areas. These measures are what the study terms "directionally correct". While they should help the areas maintain their ozone air quality levels, these measures did not produce a discernible, incremental change in ozone air quality levels that helped the areas meet the EAC requirement of attaining early by December 2007 (a requirement every area except Denver met). Twelve of nineteen nonattainment-deferred and attainment EAC Program areas included in the study that had complete emission reductions data had less than nine percent of their quantified emission reductions from local measures. This is likely due to one or more factors:

- Local measures were not adopted, which was the case for two areas;
- Attainment was demonstrated without including local measures;
- Certain measures did not lend themselves to quantification; and
- State determined that the potential emissions reductions were not great enough to justify the effort EPA requires to document those projected emissions reductions.

**Observation 5: Ninety-six percent of the total 388 measures implemented for the 20 areas included in the study were implemented by the EAC December 2005 deadline, according to the EAC progress reports and SIPs.** Conversely, four percent (i.e., 14 measures) of the 388 measures were not implemented by the EAC December 2005 deadline. Of the 14 measures not implemented by December 2005, one had quantified $NO_x$ and/or VOC emissions reductions associated with them and seven were implemented after 2005 -- in 2006 or 2007. Only one of the measures was modeled in an area's EAC SIP attainment demonstration.

**Observation 6: For the majority of EAC Program areas, quantified $NO_x$ and VOC emissions reduction estimates from local measures represented a small fraction of 2002 emissions overall in the respective EAC Program area, in the state in which the EAC area is located, and as compared to reductions achieved in that state through the $NO_x$ SIP call.** Comparing emissions reductions from local EAC measures to these other emissions values helps to explain, at least partly, why the improvements in air quality in EAC Program areas in the East are consistent with changes in air quality in non-EAC Program areas. The comparison helps to put the relative value of those estimated reductions into perspective against all emissions contributing to ozone formation. There arguably were

EAC measures adopted and implemented in EAC Program areas that might not have been considered had the areas been designated traditional nonattainment. But, in relative terms, the measures did not reduce total emissions very much and, thus, did not produce measurable incremental improvements in air quality.

**Observation 7: Air quality modeling contained in the SIPs for the 20 EAC areas included in the study predicted improvements in air quality that were generally consistent with the eventual observations.** The study addressed whether the modeling provided insight into what degree the "local" EAC measures contributed to additional improvements in air quality, beyond the improvements provided by the state and national measures. The only reliable way to quantify the air quality improvements from the EAC local measures is to model the local measures independently of the state and national measures. But the modeling performed for the EAC SIPs did not provide such an analysis. For this study the only assessment that could be performed was to determine whether the actual air quality improvement achieved is consistent with the level of improvement predicted by the model. After making this comparison, the study observes that the estimates in the modeled demonstration are consistent with the air quality achieved.

**Program Design Aspects**

The observation is related to the quantitative, programmatic aspects of the EAC Program study. It is based on a quantitative study of EPA resources expended relative to the whole EAC Program consisting of 29 areas – 14 nonattainment-deferred and 15 designated unclassifiable/attainment – and, thus, pertain to those areas.

**Observation 8: The EAC Program required as much EPA human resources or less than a hypothetical traditional approach depending on the EPA region implementing the program.** For EPA, the answer to the question of whether the EAC Program saved estimated human resources varied by EPA region. The study lacked data to quantitatively assess the resource impact of the EAC program on the state and local agencies.

**Qualitative Observations**

**Environmental Aspects**

The following two observations are related to the *qualitative* review of the environmental aspects of the EAC Program study. Observation 9 is based on information from EPA regional office and state agency permitting databases. Observation 10 is derived from information gathered though consultations with state and local agency officials.

**Observation 9: Less than half of the nonattainment-deferred areas experienced new stationary source activity that may have been subject to permitting under the CAA nonattainment NSR program had the same activities been undertaken while these areas had a designation of nonattainment.** Six of the 14 nonattainment-deferred areas experienced new stationary source activity that may have been subject to permitting under the CAA nonattainment NSR program had the same activities been undertaken while these areas had a designation of nonattainment, (this could be an underestimate given the lack of compete information on permitting activity). The proposed emissions increases from the new and modified sources in four of the six areas were controlled under the CAA's PSD program. (The study did not quantify emission changes in EAC versus non-EAC areas and is, therefore, unable to comment on the impact on emissions of the absence in EAC areas of some or all of

the nonattainment area requirements that traditional nonattainment areas face, including nonattainment NSR.)

**Observation 10: The state and local agencies implementing the EAC Program believe that the EAC activities generated direct environmental benefits other than ozone reduction.** A majority of the individuals consulted reported that EAC activities directly generated environmental benefits other than ozone reduction. The largest benefit came from reductions of $PM_{2.5}$ through such programs as alternative fuels, open burning bans, freight partnership, diesel and school bus retrofits, and idling reduction. EAC activities also generated reductions in GHG, air toxics, $NO_x$, and VOCs. However, several individuals consulted stated that no additional environmental benefits were generated directly from the EAC activities. This is partly because EAC control measures were selected from a list of existing state rules. In these cases, no local measures were developed for the EAC.

**Program Design Aspects**

The following four qualitative observations are based on a qualitative review of the program design aspects of the EAC Program study. The observations draw on information gathered through consultations with state and local agency officials.

**Observation 11: The state and local agencies implementing the EAC Program believe that the EAC Program, in order to succeed, needed (1) the threat of reinstatement of the nonattainment designation as the consequence of failure to meet EAC Program requirements and (2) for the EAC Program to be part of the larger SIP program.** The majority of the individuals consulted believed that states and local areas needed motivation to participate in the program for it to succeed. For many states and local areas, EAC participants were motivated to enter the program as nonattainment-deferred areas specifically to avoid the NSR and Conformity Program requirements for their 8-hour ozone areas. Those areas were also concerned about the impact of a nonattainment designation on economic development.

**Observation 12: The state and local agencies implementing the EAC Program believe the EAC Program gave local areas the flexibility to develop their own approach to meeting the 8-hour ozone standard that might not otherwise have been present under the traditional approach.** The majority of the individuals consulted stated that the EAC Program gave local areas the flexibility to develop their own approach. They believed that the opportunity for flexibility in local decision-making was critical to obtaining support for the program.

**Observation 13: The state and local agencies implementing the EAC Program believe the EAC Program effectively engaged and involved local stakeholders in the program and created positive working relationships.** The majority of the individuals consulted supported this statement. The diverse range of local stakeholders engaged in the EAC Program areas included local governments, elected officials, the media, councils of governments, industry, local businesses, utilities, chambers of commerce, environmentalists, and other organizations. According to the individuals consulted, the EAC Program model produced numerous intangible benefits, such as a greater public awareness of air quality issues and local stakeholder participation in air quality improvement than would have occurred under the traditional approach. The EAC Program is also credited with: (1) improving the working relationships between states and local stakeholders, and (2) helping create an infrastructure for stakeholder involvement in future air quality issues. The improved relationships and flexibility are

believed to have created an environment for local areas to consider measures that would not have been discussed outside of the EAC Program.

**Observation 14: The state and local agencies implementing the EAC Program believe that it is expected to result in continued reductions in ozone and air quality improvement activities and policies that were not foreseen, initially, as the EAC Program was implemented.** The majority of the individuals consulted believed that: (1) EAC efforts would lead to continued reductions in ozone and air quality improvement activities and policies that were not originally foreseen; and (2) programs adopted by the EAC would continue providing additional reductions beyond those already achieved or create a local "infrastructure" for further or continued action in the future. It is believed that some of the policies, projects and activities would not have occurred without the EAC Program. Several of the individuals consulted noted that the EAC control measures would remain in place for the foreseeable future. In addition, local organizations that did not address air quality issues prior to the EAC Program are now considering air quality issues in their areas.

### 3.2.3 Study Results Where Information is Insufficient or Too Ambiguous to Make an Observation

Observations did not emerge from information in three areas where the study lacked sufficient information or the information was too ambiguous:

- Program design aspects
  - EAC program efficiency;
- Environmental aspects
  - EAC program requirements versus Subpart 1 requirements; and
  - Conformity Program.

**Program Design Aspects**

**EAC Program Efficiency**

Based on the consultations with state and local officials, the EAC model is believed to be a more efficient way to deliver clean air quicker than the traditional nonattainment designation approach. However, the impact of the EAC Program on state and local resources is unclear, including whether the EAC approach saved money and resources for state and local agencies over the traditional approach. The majority of the individuals consulted believe the EAC model is a more efficient way to deliver clean air quicker than the traditional approach. Several of the individuals consulted believe that the EAC is a more efficient method for areas that: (1) are relatively close to the standard, and/or (2) have significant local stakeholder involvement.

Several of the individuals consulted believe that local areas spent more resources in the EAC Program than they would have in the traditional program. This is because local stakeholders are not as involved in the traditional method. However, these individuals consulted believed that the EAC benefits overshadowed the costs by:

- Saving resources in the long run;
- Developing control measures that accommodate economic growth;
- Developing good will between stakeholders;
- Providing local control over program activities; and,
- Avoiding nonattainment status.

Several other individuals consulted found it difficult to determine the impact of the EAC on state and local resources. They were divided on whether the EAC approach saved money and resources over the traditional approach. A few individuals consulted found that the EAC Program did not save money or resources over the traditional approach.

**Environmental Aspects**

**EAC Program Requirements versus Subpart 1 Requirements**

In comparing the differences between the EAC program and Subpart 1 area CAA requirements, the study did not arrive at a observation as to which approach would have produced the greater emission reductions and air quality improvement. As the qualitative information indicates, some requirements were more stringent for EAC Program areas and some more stringent for Subpart 1 areas. Relative to non-EAC Program areas, air quality in EAC areas in the East was not adversely affected by two factors: (1) the absence of some or all of the nonattainment area requirements that traditional nonattainment areas face or (2) by the fact that most of the areas experienced population and VMT growth during EAC Program implementation. Relative to non-EAC Program areas, these two factors also did not adversely affect the ability of EAC areas in the East to attain the NAAQS by December 2007 (or earlier for many EAC areas). However, it remains to be seen what will happen to ozone air quality levels in these areas as they grow in the next five to 10 years. Ozone air quality in many of the areas will continue to be influenced by, among other things, state and National programs to reduce $NO_x$ and VOCs. Moreover, EAC Program areas were required to demonstrate maintenance of the standard for five years (to 2012), although almost all the states in the Southeast (EPA Region 4) with EAC Program areas submitted maintenance plans for 10 years. These plans are in place to address emissions growth to ensure attainment of the ozone standard.

With respect to the relative burden of the CAA requirements, the individuals consulted clearly viewed not having to implement the Nonattainment NSR and Conformity Programs as a burden reduction. However, several state and local agencies consulted felt that reducing EAC Program's reporting requirements could have eased the resource burden of the EAC Program further. Other individuals consulted felt the benefits of the EAC Program outweighed the burden.

**Conformity Program**

The study lacked sufficient information on which to base a Conformity Program-specific observation as to the emissions and/or air quality impacts of not requiring the Conformity Program in EAC areas. Such an analysis was beyond the scope of this study. The study did find information that the Conformity Program applied in about one-half of the 14 EAC nonattainment-deferred areas for at least one criteria pollutant other than the 8-hour ozone standard. Six of the 14 nonattainment-deferred EAC Program areas were subject to the CAA Conformity Program requirement during the EAC Program (from June 14 2004 to April 15, 2008) for pollutants other than the 8-hour ozone NAAQS: the 1-hour ozone NAAQS, the $PM_{10}$ NAAQS, the $PM_{2.5}$ NAAQS and the carbon monoxide NAAQS.

## TABLE OF APPENDICIES

# APPENDICES

## Appendix A: List of State and Local Agencies Consulted

### Table A-1: State Agencies Consulted

| State | Contact |
|---|---|
| Colorado | • Mike Silverstein, Colorado Department of Public Health and Environment |
| Georgia | • Jimmy Johnston, Program Manager, Air Quality, Georgia Department of Natural Resources (Georgia DNR)<br>• Elizabeth Muncey, Environmental Engineer, Georgia DNR |
| Louisiana | • Jim Orgeron, Acting Program Manager, SIP Group, Louisiana Department of Environmental Quality |
| Maryland | • Brian Hug, Deputy Manager, Air Quality Program Planning, Maryland Department of Natural Resources (MDDNR)<br>• Randy Mosier, MDDNR |
| North Carolina | • Laura Boothe, Attainment Planning Branch Supervisor, North Carolina Department of Environment and Natural Resources (NCDENR) Division of Air Quality (DAQ)<br>• Sheila Holman, NCDENR DAQ |
| New Mexico | • Andy Berger, Control Strategies Section Chief, New Mexico Environment Department (NMED)<br>• Mark Jones, Environmental Analyst, Farmington Field Office, NMED |
| Oklahoma | • Leon Ashford, Environmental Programs Specialist, Oklahoma Department of Environmental Quality |
| South Carolina | • Renee Shealy, South Carolina Department of Health and Environmental Control (South Carolina DHEC)<br>• Melinda Mathias, South Carolina DHEC<br>• Robbie Brown, South Carolina DHEC<br>• Michael Monroe, South Carolina DHEC<br>• Adam Page, South Carolina DHEC<br>• Nelson Roberts, South Carolina DHEC |
| Tennessee | • Barry Stephens, Director, Air Pollution Control Division (APCD), Tennessee Department of Environment and Conservation (TDEC)<br>• Quincy Styke, Deputy Director, APCD, TDEC |
| Texas | • Kelly Keel, Team Leader, Texas Commission on Environmental Quality (TCEQ)<br>• Theresa Pella, SIP Section Manager, TCEQ<br>• Kim Herndon, TCEQ |

**Table A-1: State Agencies Consulted**

| State | Contact |
|---|---|
| Virginia | • Tom Ballou, Director, Air Data Analysis and Planning Division, Virginia Department of Environmental Quality |
| West Virginia | • Fred Durham, Deputy Director, Division of Air Quality, West Virginia Department of Environmental Protection and Assistant Director for Planning, West Virginia Department of Environmental Protection |

**Table A-2: Local Government Agencies Consulted**

| Area | Contact |
|---|---|
| **Nonattainment Deferred EAC Program Areas** | |
| Chattanooga, Tennessee/Georgia | • Bob Colby, Director, Chattanooga-Hamilton County Air Pollution Control Board, Tennessee |
| Denver-Boulder-Greeley-Fort. Collins-Loveland, Colorado | • Ken Lloyd, Denver Regional Air Quality Council |
| Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area) | • Sandra Yundice, Assistant County Administrator, Greenville County<br>• Kevin Robinson, Associate Planner, Planning Department, Greenville County<br>• John Owings, Manager of Air Planning, Greenville County<br>• Dan Powell, Planning Department, Greenville County |
| Northern Shenandoah Valley, Virginia | • Patrick Barker, Executive Director, Winchester-Frederick County Economic Development Commission |
| Greensboro-Winston Salem-High Point, North Carolina (Triad Area) | • Virginia G. Booker, Assistant Director, Piedmont Triad Council of Governments |
| Washington County, Maryland | • Jill Baker, Senior Planner, Washington County Department of Planning |
| **Attainment EAC Program Areas** | |
| Austin, Texas | • Cathy Stephens, Capital Area Metropolitan Planning Organization |
| Oklahoma City, Oklahoma | • Darla Hugaboom, Associate Planner, Transportation Division, Association of Central Oklahoma Governments |
| Lower Savannah-Augusta, South Carolina-Georgia | • Stephen Strohminger, Development Official, Aiken County, South Carolina |
| **Other Ozone Nonattainment Areas (Control Cases)** | |
| Knoxville, Tennessee | • Lynne A. Liddington, Director, Knox County, Air Quality Management, Department of Public Health |
| Rocky Mount, North Carolina | • Bob League, Transportation Planner, Rocky Mount Urban Area Metropolitan Planning Organization<br>• John Gessaman, President and Chief Executive Officer, Carolinas Gateway Partnership |

## Appendix B: Tables

### Table B-1: Year-to-Year Changes in 8-hour Ozone Design Values (ppm) from 2001-2003 to 2004-2007 for 14 Nonattainment-Deferred Early Action Compact (EAC) Program Areas and Six Attainment EAC Program Areas, Not Controlling for Meteorology

| EAC Program Areas | 2001-2003 Design Value | 2002-2004 Design Value | 2003-2005 Design Value | 2004-2006 Design Value | 2005-2007 Design Value | Percent Change 2001-2003 versus 2005-2007 |
|---|---|---|---|---|---|---|
| **Nonattainment-Deferred EAC Program Areas** | | | | | | |
| Berkeley and Jefferson Counties, West Virginia | 0.086 | 0.08 | 0.076 | 0.074 | 0.075 | -13% |
| Chattanooga, Tennessee-Georgia | 0.088 | 0.086 | 0.08 | 0.08 | 0.084 | -5% |
| Columbia, South Carolina (Central Midlands Area) | 0.089 | 0.086 | 0.083 | 0.082 | 0.082 | -8% |
| Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado | 0.087 | 0.084 | 0.084 | 0.081 | 0.085 | -2% |
| Fayetteville, North Carolina (Cumberland County) | 0.087 | 0.084 | 0.083 | 0.08 | 0.082 | -6% |
| Frederick Co, Virginia | 0.085 | 0.078 | 0.073 | 0.071 | 0.073 | -14% |
| Greensboro-Winston Salem-High Point, North Carolina (Triad Area) | 0.093 | 0.087 | 0.082 | 0.08 | 0.083 | -11% |
| Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area) | 0.087 | 0.084 | 0.081 | 0.083 | 0.083 | -5% |
| Hickory-Morganton-Lenoir, North Carolina (Unifour Area) | 0.088 | 0.082 | 0.077 | 0.075 | 0.078 | -11% |
| Johnson City-Kingsport-Bristol, Tennessee | 0.086 | 0.084 | 0.079 | 0.079 | 0.083 | -3% |
| Nashville, Tennessee | 0.086 | 0.083 | 0.082 | 0.083 | 0.084 | -2% |
| Roanoke, Virginia | 0.085 | 0.079 | 0.074 | 0.074 | 0.076 | -11% |
| San Antonio, Texas | 0.089 | 0.091 | 0.086 | 0.087 | 0.082 | -8% |
| Washington Co (Hagerstown), Maryland | 0.086 | 0.083 | 0.078 | 0.078 | 0.079 | -8% |
| **Attainment EAC Program Areas** | | | | | | |
| Austin, Texas | 0.084 | 0.085 | 0.082 | 0.082 | 0.08 | -5% |
| Berkeley-Charleston-Dorchester, South Carolina | 0.072 | 0.072 | 0.073 | 0.075 | 0.074 | 3% |
| Mountain Area of Western North Carolina (Asheville) | 0.083 | 0.081 | 0.078 | 0.078 | 0.079 | -5% |
| Oklahoma City, Oklahoma | 0.080 | 0.079 | 0.079 | 0.081 | 0.080 | 0% |
| Lower Savannah-Augusta, South Carolina-Georgia | 0.067 | 0.068 | 0.069 | 0.069 | 0.067 | 0% |
| Tulsa, Oklahoma | 0.083 | 0.079 | 0.079 | 0.079 | 0.080 | -4% |

Source: Air Quality System, U.S. Environmental Protection Agency (EPA).

**Table B-2: Year-to-Year Changes (and Percent Change) in 8-hour Air Quality Index Days from 2001 to 2007 for 14 Nonattainment-Deferred EAC Program Areas and 6 Attainment EAC Program Areas, Not Controlling for Meteorology (May to September Ozone Season)**

| EAC Program Area | 2001 | 2002 | 2003 | 2001-2003 Average | 2004 | 2005 | 2006 | 2007 | 2005-2007 Average | Change From 2001-2003 to 2005-2007 | Percent Change 2001-2003 to 2005-2007 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Nonattainment-Deferred EAC Program Areas** | | | | | | | | | | | |
| Berkeley and Jefferson Counties, West Virginia | 5.0 | 6.0 | 2.0 | 4.3 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | -3.3 | -77% |
| Chattanooga, Tennessee-Georgia | 5.0 | 31.0 | 3.0 | 13.0 | 1.0 | 1.0 | 6.0 | 4.0 | 3.7 | -9.3 | -72% |
| Columbia, South Carolina (Central Midlands Area) | 3.0 | 18.0 | 2.0 | 7.7 | 3.0 | 7.0 | 2.0 | 3.0 | 4.0 | -3.7 | -48% |
| Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado | 2.0 | 9.0 | 21.0 | 10.7 | 0.0 | 2.0 | 7.0 | 8.0 | 5.7 | -5.0 | -47% |
| Fayetteville, North Carolina (Cumberland County) | 4.0 | 18.0 | 4.0 | 8.7 | 0.0 | 8.0 | 0.0 | 2.0 | 3.3 | -5.3 | -62% |
| Frederick Co, Virginia | 5.0 | 9.0 | 1.0 | 5.0 | 1.0 | 0.0 | 1.0 | 0.0 | 0.3 | -4.7 | -93% |
| Greensboro-Winston-Salem-High Point, North Carolina (Triad Area) | 20.0 | 31.0 | 7.0 | 19.3 | 0.0 | 3.0 | 5.0 | 6.0 | 4.7 | -14.7 | -76% |
| Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area) | 12.0 | 27.0 | 4.0 | 14.3 | 2.0 | 3.0 | 4.0 | 3.0 | 3.3 | -11.0 | -77% |
| Hickory-Morganton-Lenoir, North Carolina (Unifour Area) | 2.0 | 10.0 | 3.0 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -5.0 | -100% |
| Johnson City-Kingsport-Bristol, Tennessee | 6.0 | 13.0 | 3.0 | 7.3 | 0.0 | 3.0 | 4.0 | 5.0 | 4.0 | -3.3 | -45% |
| Nashville, Tennessee | 7.0 | 21.0 | 6.0 | 11.3 | 1.0 | 4.0 | 7.0 | 15.0 | 8.7 | -2.7 | -24% |
| Roanoke, Virginia | 5.0 | 5.0 | 1.0 | 3.7 | 0.0 | 0.0 | 0.0 | 1.0 | 0.3 | -3.3 | -91% |
| San Antonio, Texas | 1.0 | 17.0 | 7.0 | 8.3 | 7.0 | 4.0 | 4.0 | 1.0 | 3.0 | -5.3 | -64% |
| Washington Co (Hagerstown), Maryland | 5.0 | 17.0 | 3.0 | 8.3 | 1.0 | 2.0 | 1.0 | 1.0 | 1.3 | -7.0 | -84% |
| **Attainment EAC Program Areas** | | | | | | | | | | | |
| Austin, Texas | 1.0 | 5.0 | 3.0 | 3.0 | 2.0 | 3.0 | 4.0 | 1.0 | 2.7 | -0.3 | -11% |
| Berkeley-Charleston-Dorchester, South Carolina | 0.0 | 1.0 | 0.0 | 0.3 | 1.0 | 0.0 | 1.0 | 0.0 | 0.3 | 0.0 | 0% |

**Table B-2: Year-to-Year Changes (and Percent Change) in 8-hour Air Quality Index Days from 2001 to 2007 for 14 Nonattainment-Deferred EAC Program Areas and 6 Attainment EAC Program Areas, Not Controlling for Meteorology (May to September Ozone Season)**

| EAC Program Area | 2001 | 2002 | 2003 | 2001-2003 Average | 2004 | 2005 | 2006 | 2007 | 2005-2007 Average | Change From 2001-2003 to 2005-2007 | Percent Change 2001-2003 to 2005-2007 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mountain Area of Western North Carolina (Asheville) | 2.0 | 14.0 | 0.0 | 5.3 | 0.0 | 1.0 | 1.0 | 1.0 | 1.0 | -4.3 | -81% |
| Oklahoma City, Oklahoma | 2.0 | 3.0 | 2.0 | 2.3 | 0.0 | 4.0 | 11.0 | 2.0 | 5.7 | 3.3 | 143% |
| Lower Savannah-Augusta, South Carolina-Georgia | 0.0 | 1.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -0.3 | -100% |
| Tulsa, Oklahoma | 4.0 | 5.0 | 9.0 | 6.0 | 0.0 | 6.0 | 6.0 | 2.0 | 4.7 | -1.3 | -22% |

Source: Air Quality System, EPA.

**Table B-3: Changes in Seasonal Average 8-hour Daily Maximum Ozone Concentrations (ppm) from 2001-2003 to 2005-2007 for 14 Nonattainment-Deferred EAC Program Areas and 6 Attainment EAC Program Areas, Controlled and Uncontrolled for Meteorology**

| EAC Program Area | Changes in Changes in Seasonal Average 8-hour Ozone Concentrations From 2001-2003 to 2005-2007 | | | | | |
|---|---|---|---|---|---|---|
| | Uncontrolled for Meteorology | | | Controlled for Meteorology | | |
| | 2001-2003 Average | 2005-2007 Average | Percent Change | 2001-2003 Average | 2005-2007 Average | Percent Change |
| **Nonattainment Deferred EAC Program Areas** | | | | | | |
| Berkeley and Jefferson Counties, West Virginia | 0.052 | 0.051 | -3% | 0.055 | 0.048 | -12% |
| Chattanooga, Tennessee-Georgia | 0.061 | 0.059 | -2% | 0.062 | 0.056 | -9% |
| Columbia, South Carolina (Central Midlands Area) | 0.056 | 0.056 | -1% | 0.058 | 0.054 | -6% |
| Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado | NA | NA | NA | NA | NA | NA |
| Fayetteville, North Carolina (Cumberland County) | 0.059 | 0.055 | -6% | 0.059 | 0.056 | -4% |
| Frederick Co, Virginia | 0.053 | 0.050 | -4% | 0.055 | 0.048 | -12% |
| Greensboro-Winston Salem-High Point, North Carolina (Triad Area) | 0.063 | 0.061 | -3% | 0.064 | 0.058 | -10% |
| Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area) | 0.058 | 0.058 | 0% | 0.061 | 0.055 | -10% |
| Hickory-Morganton-Lenoir, North Carolina (Unifour Area) | 0.057 | 0.055 | -4% | 0.059 | 0.052 | -11% |
| Johnson City-Kingsport-Bristol, Tennessee | 0.058 | 0.059 | 1% | 0.059 | 0.056 | -5% |
| Nashville, Tennessee | 0.061 | 0.062 | 2% | 0.065 | 0.058 | -11% |
| Roanoke, Virginia | 0.054 | 0.053 | -3% | 0.055 | 0.050 | -8% |
| San Antonio, Texas | 0.053 | 0.048 | -10% | 0.054 | 0.047 | -13% |
| Washington Co, Maryland (Hagerstown) | 0.055 | 0.054 | -3% | 0.057 | 0.051 | -10% |
| **Attainment EAC Program Areas** | | | | | | |
| Austin, Texas | 0.049 | 0.049 | -1% | 0.049 | 0.049 | 0% |
| Berkeley-Charleston-Dorchester, South Carolina | 0.045 | 0.047 | 3% | 0.047 | 0.047 | -1% |
| Mountain Area of Western North Carolina (Asheville) | 0.060 | 0.059 | -2% | 0.061 | 0.058 | -6% |
| Oklahoma City, Oklahoma | 0.059 | 0.057 | -3% | 0.059 | 0.055 | -6% |

**Table B-3: Changes in Seasonal Average 8-hour Daily Maximum Ozone Concentrations (ppm) from 2001-2003 to 2005-2007 for 14 Nonattainment-Deferred EAC Program Areas and 6 Attainment EAC Program Areas, Controlled and Uncontrolled for Meteorology**

| EAC Program Area | Changes in Changes in Seasonal Average 8-hour Ozone Concentrations From 2001-2003 to 2005-2007 | | | | | |
|---|---|---|---|---|---|---|
| | Uncontrolled for Meteorology | | | Controlled for Meteorology | | |
| | 2001-2003 Average | 2005-2007 Average | Percent Change | 2001-2003 Average | 2005-2007 Average | Percent Change |
| Lower Savannah-Augusta, South Carolina-Georgia | 0.037 | 0.042 | 12% | 0.040 | 0.041 | 3% |
| Tulsa, Oklahoma | 0.060 | 0.058 | -3% | 0.060 | 0.056 | -6% |

Source: Air Quality System. EPA and meteorological analysis by the Air Quality Assessment Group, Office of Air Quality Planning and Standards (OAQPS), using the method described in Camalier, L., Cox, W., Dolwick, P., 2007. The effects of meteorology on ozone in urban areas and their use in assessing ozone trends. Atmospheric Environment 41, 7127-7137.

**Table B-4: Changes in Seasonal Average 8-hour Ozone Daily Maximum Concentrations (ppm) from 2001-2003 to 2005-2007 (Meteorologically-Controlled) for 14 Nonattainment-Deferred EAC Program Areas, 6 Attainment EAC Program Areas and 18 Non-EAC Program Areas**

| EAC Program Area | 2001-2003 Average | 2005-2007 Average | Percent Change |
|---|---|---|---|
| **Nonattainment Deferred EAC Program Areas** | | | |
| Berkeley and Jefferson Counties, West Virginia | 0.055 | 0.048 | -12% |
| Chattanooga, Tennessee-Georgia | 0.062 | 0.056 | -9% |
| Columbia, South Carolina (Central Midlands Area) | 0.058 | 0.054 | -6% |
| Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado | NA | NA | NA |
| Fayetteville, North Carolina (Cumberland County) | 0.059 | 0.056 | -4% |
| Frederick Co, Virginia | 0.055 | 0.048 | -12% |
| Greensboro-Winston Salem-High Point, North Carolina (Triad Area) | 0.064 | 0.058 | -10% |
| Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area) | 0.061 | 0.055 | -10% |
| Hickory-Morganton-Lenoir, North Carolina (Unifour Area) | 0.059 | 0.052 | -11% |
| Johnson City-Kingsport-Bristol, Tennessee | 0.059 | 0.056 | -5% |
| Nashville, Tennessee | 0.065 | 0.058 | -11% |
| Roanoke, Virginia | 0.055 | 0.050 | -8% |
| San Antonio, Texas | 0.054 | 0.047 | -13% |
| Washington County , Maryland (Hagerstown) | 0.057 | 0.051 | -10% |
| **Attainment EAC Program Areas** | | | |
| Austin, Texas | 0.049 | 0.049 | 0% |
| Berkeley-Charleston-Dorchester, South Carolina | 0.047 | 0.047 | -1% |
| Mountain Area of Western North Carolina (Asheville) | 0.061 | 0.058 | -6% |
| Oklahoma City, Oklahoma | 0.059 | 0.055 | -6% |
| Lower Savannah-Augusta, South Carolina-Georgia | 0.040 | 0.041 | 3% |
| Tulsa, Oklahoma | 0.060 | 0.056 | -6% |
| **Non-EAC Program Areas in the EAC Region in the East** | | | |
| Atlanta, Georgia | 0.067 | 0.064 | -5% |
| Baltimore, Maryland | 0.066 | 0.060 | -9% |
| Birmingham, Alabama | 0.062 | 0.057 | -8% |
| Charlotte, North Carolina | 0.064 | 0.059 | -7% |
| Charleston, West Virginia | 0.055 | 0.049 | -10% |
| Cincinnati, Ohio | 0.064 | 0.059 | -9% |
| Huntington, West Virginia | 0.063 | 0.054 | -14% |
| Knoxville, Tennessee | 0.068 | 0.062 | -8% |
| Lexington, Kentucky | 0.055 | 0.052 | -5% |

**Table B-4: Changes in Seasonal Average 8-hour Ozone Daily Maximum Concentrations (ppm) from 2001-2003 to 2005-2007 (Meteorologically-Controlled) for 14 Nonattainment-Deferred EAC Program Areas, 6 Attainment EAC Program Areas and 18 Non-EAC Program Areas**

| EAC Program Area | 2001-2003 Average | 2005-2007 Average | Percent Change |
|---|---|---|---|
| Louisville, Kentucky | 0.063 | 0.058 | -8% |
| Memphis, Tennessee | 0.064 | 0.058 | -9% |
| Montgomery, Alabama | 0.052 | 0.048 | -9% |
| Philadelphia, Pennsylvania | 0.064 | 0.060 | -6% |
| Pittsburgh, Pennsylvania | 0.063 | 0.057 | -9% |
| Raleigh, North Carolina | 0.062 | 0.056 | -11% |
| Richmond, Virginia | 0.062 | 0.056 | -10% |
| Virginia Beach, Virginia | 0.056 | 0.052 | -7% |
| Washington, District of Columbia | 0.065 | 0.061 | -6% |

Source: Air Quality System. EPA and meteorological analysis by the Air Quality Assessment Group, OAQPS, using the method described in Camalier, L., Cox, W., Dolwick, P., 2007. The effects of meteorology on ozone in urban areas and their use in assessing ozone trends. Atmospheric Environment 41, 7127-7137.

## Table B-5: Control Measure Emission Reductions for Berkeley and Jefferson Counties, West Virginia

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Federal control measures | Y | Y | Before Dec 31, 2005 | 362.9 kg/d | 2.091% | 1,723.7 kg/d | 5.964% | 35.13% | Y | Y | 35.13% |
| Ozone action day program | N | Y | July 1, 2004 | 907.2 kg/d | 5.228% | 81.6 kg/d | 0.283% | 16.65% | N | N | |
| Public awareness program | N | Y | July 1, 2004 | 731.6 kg/d | 4.216% | 798.3 kg/d | 2.762% | 25.76% | N | N | |
| Bicycle/pedestrian measures | N | Y | Sep. 1, 2005 | 203.2 kg/d | 1.171% | 108.9 kg/d | 0.377% | 5.25% | N | N | |
| Reduce engine idling | N | Y | July 1, 2004 | 10.2 kg/d | 0.059% | 154.2 kg/d | 0.534% | 2.77% | N | N | |
| School bus engine retrofit | N | Y | Jan. 1, 2005 | 1.0 kg/d | 0.006% | 18.1 kg/d | 0.063% | 0.32% | N | N | |
| Voluntary -ground freight industry | N | Y | July 1, 2005 | 71.1 kg/d | 0.410% | 762.0 kg/d | 2.637% | 14.03% | N | N | |
| Open burning-increase compliance | N | Y | July 1, 2004 | 5.5 kg/d | 0.032% | 0.5 kg/d | 0.002% | 0.10% | N | N | |
| TOTALS | Y = 1 of 8 CM<br>N = 7 of 8 CM | Y = 8 of 8 CM<br>N = 0 of 8 CM | | 2,292.6 kg/d<br>922.4 t/yr | 13.211% | 3,647.3 kg/d<br>1,467.5 t/yr | 12.621% | 100.00% | Y = 1 of 8 CM<br>N = 7 of 8 CM | Y = 1 of 8 CM<br>N = 7 of 8 CM | 35.13% |

Definition assumptions for measures:

- State measure: measure adopted by states that applies in more than area in a state
- National measure: measure adopted by EPA that applies nationally or in a sub region
- Local measure: measures adopted by a local unit of government for the area or by the state for the specific area

## Table B-6: Control Measure Emission Reductions for Chattanooga, Tennessee-Georgia

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Federal control measures | Y | Y | Before Dec 31, 2005 | 14,455.1 kg/d | 17.281% | 21,386.0 kg/d | 27.922% | 72.72% | Y | Y | 72.72% |
| Light Duty Motor Vehicle I & M | Y | Y | April 2005 | 1,905.1 kg/d | 2.278% | 1,079.5 kg/d | 1.409% | 6.06% | Y | Y | 6.06% |
| Anti Motor Vehicle Tampering | Y | Y | Dec. 2004 | NQ | | NQ | | | N | N | |
| Volatile Organic Compounds Reductions | Y | Y | Dec. 2004 | | | | | | Y | Y | |
| Stage 1 Vapor Recovery (Tennessee) | Y | Y | May 2005 | 2,731.5 kg/d | 3.266% | | | 5.54% | Y | Y | 5.54% |
| Seasonal Open Burning Ban (Tennessee) | N | Y | May 2005 | 1,458.8 kg/d | 1.744% | 526.2 kg/d | 0.687% | 4.03% | Y | N | |
| Vehicle I & M plan | Y | Y | April 2005 | 1,905.1 kg/d | 2.278% | 1,079.5 kg/d | 1.409% | 6.06% | Y | Y | 6.06% |
| Ozone Action Days Program: Spare the Air (Tennessee) | N | Y | May 2004 | 178.7 kg/d | 0.214% | 137.0 kg/d | 0.179% | 0.64% | Y | N | |
| Ozone Action Days Program: Spare the Air (GA) | N | Y | May 2004 | 47.2 kg/d | 0.056% | 36.3 kg/d | 0.047% | 0.17% | Y | N | |
| Stage 1 Vapor Recovery (GA) | Y | Y | 2005 | 293.0 kg/d | 0.350% | | | 0.59% | Y | Y | 0.59% |
| Seasonal Open burning ban-ozone season (GA) | N | Y | 2005 Ozone season | 1,415.2 kg/d | 1.692% | 429.1 kg/d | 0.560% | 3.74% | Y | N | |
| Municipal Buses - Increased ridership (Tennessee) | N | Y | On-going | 3.6 kg/d | 0.004% | 2.7 kg/d | 0.004% | 0.01% | Y | N | |
| Intelligent Transportation System: Smartway | N | Y | Early 2005 | NQ | | NQ | | | N | N | |
| HELP Trucks | N | Y | June 2000 | NQ | | NQ | | | N | N | |
| Diesel Retrofits (Tennessee) | N | Y | May 2004 | 8.2 kg/d | 0.010% | 56.2 kg/d | 0.073% | 0.13% | Y | N | |
| Diesel Retrofits (GA) | N | Y | May 2004 | 1.8 kg/d | 0.002% | 16.3 kg/d | 0.021% | 0.04% | Y | N | |
| Bike Trails and Bike Racks at Work Sites | N | Y | Implemented | NQ | | NQ | | | N | N | |
| Pedestrian Greenways | N | Y | April 2004, March 2009 | NQ | | NQ | | | N | N | |
| Accelerated Replacement of On-Road Vehicles | N | N | 2006 | NQ | | NQ | | | N | N | |
| Bio-diesel and Alternative Fuel Vehicles (Tennessee) | N | Y | Dec. 2004 | | | 135.2 kg/d | 0.176% | 0.27% | Y | N | |
| Replacement of on- and off-road diesel vehicles | N | Y | 2005 | NQ | | NQ | | | N | N | |
| TOTALS | Y = 7 of 21 CM<br>N = 14 of 21 CM | Y = 20 of 21 CM<br>N = 1 of 21 CM | | 24,403.3 kg/d<br>9,818.5 t/yr | 29.175% | 24,884.1 kg/d<br>10,012.0 t/yr | 32.489% | 100.00% | Y = 14 of 21 CM<br>N = 7 of 21 CM | Y = 6 of 21 CM<br>N = 15 of 21 CM | 90.97% |

Definition assumptions for measures:

- State measure: measure adopted by states that applies in more than area in a state
- National measure: measure adopted by EPA that applies nationally or in a sub region
- Local measure: measures adopted by a local unit of government for the area or by the state for the specific area

## Table B-7: Control Measure Emission Reductions for Columbia, South Carolina (Central Midlands Area)

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Federal control measures | Y | Y | Before Dec 31, 2005 | 22,316.7 kg/d | 17.526% | 65,317.3 kg/d | 57.270% | 86.72% | Y | Y | 86.72% |
| Air Quality Contact | N | Y | March 2003 | | | | | | N | N | |
| Gas can exchange plan | N | Y | June 2004 | | | | | | N | N | |
| Promote land-use planning to promote air quality | N | Y | Jan. 2003 | | | | | | N | N | |
| Participate in Clean Cities | N | Y | July 2003 | | | | | | N | N | |
| Industry Advisory Panel | N | Y | Summer 2004 | | | | | | N | N | |
| Purchase electric instead of golf carts | N | Y | On-going | | | | | | N | N | |
| Purchase 15 CNG vehicles | N | Y | Late 2004 | | | | | | N | N | |
| Educate public; increase media alerts | N | Y | June 2003 | | | | | | N | N | |
| Speak to municipalities in County | N | Y | Spring 2003 | | | | | | N | N | |
| Flex/compress schedule- County employees | N | Y | On-going | | | | | | N | N | |
| Encourage carpooling | N | Y | On-going | | | | | | N | N | |
| Develop city and county energy plan | N | Y | On-going | | | | | | N | N | |
| Encourage mass transit | N | Y | On-going | | | | | | N | N | |
| Assign staff - air quality expert | N | Y | On-going | | | | | | N | N | |
| Encourage not overfilling fuel tank | N | Y | June 2003 | | | | | | N | N | |
| County employees-restrict mowing during ozone action days | N | Y | On-going | | | | | | N | N | |
| Land Development Code/Tree ordinances | N | Y | Jan. 2005 / TBD | | | | | | N | N | |
| Reduce NOx, VOC emissions at International Paper | N | Y | On-going | | | 2,485.4 kg/d | 2.179% | 2.46% | N | N | |
| Reduce NOx emissions from SCE&G - 2 coal fired boilers | N | Y | On-going | | | 10,928.6 kg/d | 9.582% | 10.81% | N | N | |
| School Bus Retrofits | N | Y | Dec. 2005 | 1.0 kg/d | 0.001% | | | 0.00% | N | N | |
| Gas Can Exchange Events - 250 cans were distributed | N | Y | June 2004 & Oct. 2004 | 1.0 kg/d | 0.001% | | | 0.00% | N | N | |
| Improvements to Park and Ride lot at Highway 378 and I-20 | N | Y | 2003 - ongoing | 1.1 kg/d | 0.001% | 0.6 kg/d | 0.001% | 0.00% | N | N | |
| Conversion of Commercial Vehicle Fleet to Propane | N | Y | 2005 | 1.6 kg/d | 0.001% | 2.0 kg/d | 0.002% | 0.00% | N | N | |
| Biodiesel Buses, University of South Carolina. | N | Y | 2002 | 0.0 kg/d | 0.000% | 0.0 kg/d | 0.000% | 0.00% | N | N | |
| University of South Carolina Ethanol Project | N | Y | On-going | 0.0 kg/d | 0.000% | 0.0 kg/d | 0.000% | 0.00% | N | N | |

## Table B-7: Control Measure Emission Reductions for Columbia, South Carolina (Central Midlands Area)

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Take a Break from the Exhaust program | Y | Y | On-going | 0.7 kg/d | 0.001% | 0.5 kg/d | 0.000% | 0.00% | N | N | |
| SC DHEC has a number of flex fuel vehicles that run almost exclusively on E85. | N | Y | FY 2005 / FY 2006 | 0.1 kg/d | 0.000% | 0.1 kg/d | 0.000% | 0.00% | N | N | |
| Smart Ride – Mass Transit Program | Y | Y | On-going | 0.2 kg/d | 0.000% | 0.3 kg/d | 0.000% | 0.00% | N | N | |
| Ethanol (E85) refueling station for public | N | Y | Oct. 2004 | 0.2 kg/d | 0.000% | 0.8 kg/d | 0.001% | 0.00% | N | N | |
| TOTALS | Y = 3 of 30 CM<br>N = 27 of 30 CM | Y = 30 of 30 CM<br>N = 0 of 30 CM | | 22,322.8 kg/d<br>8,981.5 t/yr | 17.531% | 78,735.7 kg/d<br>31,678.8 t/yr | 69.035% | 100.00% | Y = 1 of 30 CM<br>N = 29 of 30 CM | Y = 1 of 30 CM<br>N = 29 of 30 CM | 86.72% |

Definition assumptions for measures:

- State measure: measure adopted by states that applies in more than area in a state
- National measure: measure adopted by EPA that applies nationally or in a sub region
- Local measure: measures adopted by a local unit of government for the area or by the state for the specific area

## Table B-8: Control Measure Emission Reductions for Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Federal control measures | Y | Y | Before Dec 31, 2005 | 32,023.6 kg/d | 6.730% | 36,287.4 | 9.894% | 45.55% | Y | Y | 45.55% |
| Lower Reid vapor pressure | Y | Y | Mar. 25, 2004 | 9,071.8 kg/d | 1.907% | | | 6.05% | Y | Y | 6.05% |
| Reduce flash VOC emissions from condensate collection at various natural gas facilities | Y | N | by Dec. 31, 2007 | 49,895.2 kg/d | 10.486% | 0.0 kg/d | 0.000% | 33.27% | Y | Y | 33.27% |
| Control IC engines>500 HP | Y | Y | Dec. 31, 2005 | 4,989.5 kg/d | 1.049% | 17,236.5 kg/d | 4.700% | 14.82% | Y | Y | 14.82% |
| Control dehydration units | Y | Y | Dec. 31, 2005 | 453.6 kg/d | 0.095% | 0.0 kg/d | 0.000% | 0.30% | Y | Y | 0.30% |
| TOTALS | Y = 5 of 5 CM<br>N = 0 of 5 CM | Y = 4 of 5 CM<br>N = 1 of 5 CM | | 96,433.7 kg/d<br>38,799.5 t/yr | 20.266% | 53,523.9 kg/d<br>21,535.0 t/yr | 14.594% | 100.00% | Y = 5 of 5 CM<br>N = 0 of 5 CM | Y = 5 of 5 CM<br>N = 0 of 5 CM | 100.00% |

Definition assumptions for measures:

- State measure: measure adopted by states that applies in more than area in a state
- National measure: measure adopted by EPA that applies nationally or in a sub region
- Local measure: measures adopted by a local unit of government for the area or by the state for the specific area

## Table B-9: Control Measure Emission Reductions for Fayetteville, North Carolina (Cumberland County)

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Federal control measures | Y | Y | Before Dec 31, 2005 | 6,350.3 kg/d | 18.006% | 8,527.5 kg/d | 30.543% | 87.70% | Y | Y | 87.70% |
| Landscape ordinance - nonresidential | N | Y | Dec. 2005 | | | | | | N | N | |
| Smart growth audit | N | Y | Dec. 2005 | | | | | | N | N | |
| Pedestrian trails | N | Y | Dec. 2005 | | | | | | N | N | |
| Brownfield development | N | Y | On-going | | | | | | N | N | |
| Shared parking facilities | N | Y | Dec. 2005 | | | | | | N | N | |
| Green space inventory | N | Y | March 2004 | | | | | | N | N | |
| 185 vehicles converted to biodiesel | N | Y | Dec. 2005 | 4.5 kg/d | 0.013% | 2.7 kg/d | 0.010% | 0.04% | N | N | |
| Electrical outlets- reduce truck idling | N | Y | Oct. 2005 | | | | | | N | N | |
| Retrofit school buses | N | Y | by Summer 2005 | 381.0 kg/d | 1.080% | | | 2.25% | N | N | |
| Using ITS and dynamic message | N | Y | Dec. 2005 | | | | | | N | N | |
| Enhance mass transit | N | Y | Dec. 2005 | 226.8 kg/d | 0.643% | 7.3 kg/d | 0.026% | 1.38% | N | N | |
| Develop database-carpool | N | Y | June 2004 | | | | | | N | N | |
| Increase rural paratransit | N | Y | Dec. 2005 | | | | | | N | N | |
| Encourage Park and Ride for events | N | Y | On-going | | | | | | N | N | |
| Use landfill gas; support NC Green Power | N | Y | On-going; Spring 2004 | | | 12.7 kg/d | 0.045% | 0.07% | N | N | |
| Energy efficient buildings | N | Y | On-going | | | | | | N | N | |
| Energy reduction - LNB; water based paints | N | Y | On-going | | | | | | N | N | |
| Air Quality Coordinator | N | Y | May 2003 | | | | | | N | N | |
| Student outreach | N | Y | On-going | | | | | | N | N | |
| Public education outreach | N | Y | On-going | | | | | | N | N | |
| Speakers bureau | N | Y | On-going | | | | | | N | N | |
| Air quality web page | N | Y | On-going | | | | | | N | N | |
| Promote bus youth riders | N | Y | On-going | | | | | | N | N | |
| Education – libraries | N | Y | On-going | | | | | | N | N | |
| Open burning ban -ozone action days | Y | Y | June 2004 | 181.4 kg/d | 0.514% | 90.7 kg/d | 0.325% | 1.60% | Y | Y | 1.60% |
| Expand vehicle I & M | Y | Y | July 2003 | 544.3 kg/d | 1.543% | 635.0 kg/d | 2.274% | 6.95% | Y | Y | 6.95% |
| TOTALS | Y = 3 of 27 CM<br>N = 24 of 27 CM | Y = 27 of 27 CM<br>N = 0 of 27 CM | | 7,688.4 kg/d<br>3,093.4 t/yr | 21.800% | 9,276.0 kg/d<br>3,732.1 t/yr | 33.224% | 100.00% | Y = 3 of 27 CM<br>N = 24 of 27 CM | Y = 3 of 27 CM<br>N = 24 of 27 CM | 96.26% |

Definition assumptions for measures:

- State measure: measure adopted by states that applies in more than area in a state
- National measure: measure adopted by EPA that applies nationally or in a sub region
- Local measure: measures adopted by a local unit of government for the area or by the state for the specific area

## Table B-10: Control Measure Emission Reductions for Frederick County, Virginia

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Architectural and Industrial Paints | Y | Y | Implemented | 121.6 kg/d | 0.468% | | | 1.11% | Y | Y | 1.11% |
| Consumer Products | Y | Y | Implemented | 50.8 kg/d | 0.196% | | | 0.46% | Y | Y | 0.46% |
| Metal Cleaning | Y | Y | Implemented | 50.8 kg/d | 0.196% | | | 0.46% | Y | Y | 0.46% |
| Motor Vehicle Refinishing Paint | Y | Y | Implemented | 2.7 kg/d | 0.010% | | | 0.02% | Y | Y | 0.02% |
| Small Gasoline Engine Standards | Y | Y | Implemented | 736.6 kg/d | 2.838% | 24.5 kg/d | 0.127% | 6.95% | Y | Y | 6.95% |
| Non-road Diesel Engine Standards | Y | Y | Implemented | 42.6 kg/d | 0.164% | 250.4 kg/d | 1.296% | 2.68% | Y | Y | 2.68% |
| Locomotive Engine Standards | Y | Y | Implemented | | | 18.1 kg/d | 0.094% | 0.17% | Y | Y | 0.17% |
| Large Gasoline Engine Standards | Y | Y | Implemented | 61.7 kg/d | 0.238% | 225.0 kg/d | 1.165% | 2.62% | Y | Y | 2.62% |
| Spark Ignition Marine Engine Standards | Y | Y | Implemented | 3.6 kg/d | 0.014% | | | 0.03% | Y | Y | 0.03% |
| On-road Motor Vehicle Standards | Y | Y | Implemented | 2,821.3 kg/d | 10.871% | 4,662.9 kg/d | 24.136% | 68.37% | Y | Y | 68.37% |
| Ozone action days/public awareness -multiple activities | N | Y | Spring 2005 | 272.2 kg/d | 1.049% | 18.1 kg/d | 0.094% | 2.65% | Y | N | |
| VMT Reduction programs - multiple activities | N | Y | Spring 2005 | 136.1 kg/d | 0.524% | 272.2 kg/d | 1.409% | 3.73% | N | N | |
| Open burning restrictions | N | Y | Spring 2005 | 254.0 kg/d | 0.979% | 108.9 kg/d | 0.563% | 3.31% | N | N | |
| Engine idling restrictions - trucks and school buses | N | Y | Spring 2005 | | | 90.7 kg/d | 0.470% | 0.83% | N | N | |
| School bus/heavy duty diesel retrofit | N | Y | Spring 2005 | 1.8 kg/d | 0.007% | 0.9 kg/d | 0.005% | 0.02% | N | N | |
| Voluntary industrial reductions | N | Y | Spring 2005 | | | | | | N | N | |
| Regional Reduction of NOx Emissions | Y | Y | May 31, 2004 | | | | | | Y | N | |
| RACT Controls -- VOC only, no NOx reductions | Y | Y | Nov. 15, 2005 | 718.5 kg/d | 2.769% | 0.0 kg/d | 0.000% | 6.56% | Y | Y | 6.56% |
| Enhanced Ozone Forecasting tool | N | Y | 2005 | | | | | | N | N | |
| State Cutback Asphalt Regulation | Y | Y | Nov. 2005 | 0.9 kg/d | 0.003% | 0.0 kg/d | 0.000% | 0.01% | Y | Y | 0.01% |
| TOTALS | Y = 13 of 20 CM<br>N = 7 of 20 CM | Y = 20 of 20 CM<br>N = 0 of 20 CM | | 5,275.3 kg/d<br>2,122.5 t/yr | 20.327% | 5,671.7 kg/d<br>2,282.0 t/yr | 29.358% | 100.00% | Y = 14 of 20 CM<br>N = 6 of 20 CM | Y = 12 of 20 CM<br>N = 8 of 20 CM | 89.45% |

Definition assumptions for measures:

- State measure: measure adopted by states that applies in more than area in a state
- National measure: measure adopted by EPA that applies nationally or in a sub region
- Local measure: measures adopted by a local unit of government for the area or by the state for the specific area

## Table B-11: Control Measure Emission Reductions for Greensboro-Winston Salem-High Point, North Carolina (Triad Area)

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Federal control measures | Y | Y | Before Dec 31, 2005 | 36,287.4 kg/d | 14.012% | 362,951.2 kg/d | 118.488% | 97.34% | Y | Y | 97.34% |
| Open burning ban -ozone action days | Y | Y | June 2004 | 1,905.1 kg/d | 0.736% | 1,360.8 kg/d | 0.444% | 0.80% | Y | Y | 0.80% |
| Expand vehicle I & M | Y | Y | July 2002; July 2004 | 1,542.2 kg/d | 0.596% | 3,628.7 kg/d | 1.185% | 1.26% | Y | Y | 1.26% |
| Purchase newer, less polluting vehicles | N | Y | Jan. 2004 | 2.7 kg/d | 0.001% | 2.2 kg/d | 0.001% | 0.00% | N | N | |
| Convert to biodiesel for all vehicles | N | Y | Spring 2003 | | | | | | N | N | |
| Contract incentives for low emission vehicles | N | Y | Possible | | | | | | N | N | |
| Tax to support PART regional work program | N | Y | 2003 | | | | | | N | N | |
| Add 20 Park and Ride lots | N | Y | 2004-2007 | 4.5 kg/d | 0.002% | 8.0 kg/d | 0.003% | 0.00% | N | N | |
| Add 5 vans/yr to ridesharing | N | Y | Jan. 2004 | 1.7 kg/d | 0.001% | 1.7 kg/d | 0.001% | 0.00% | N | N | |
| Increase ridership on regional bus service | N | Y | On-going | 22.1 kg/d | 0.009% | 18.1 kg/d | 0.006% | 0.01% | N | N | |
| Expand carpooling - PART | N | Y | Jan. 2004 | 57.7 kg/d | 0.022% | 47.2 kg/d | 0.015% | 0.03% | N | N | |
| RJ Reynolds-Monaco-Ville - eliminate use of coal fired boilers during ozone season | N | Y | 2004 | | | 13.4 kg/d | 0.004% | 0.00% | Y | N | |
| Energizer-reduce vehicle fleet; 90% of forklifts-battery | N | Y | June 2004 | | | | | | N | N | |
| Duke-reduce mobile reading-56 trucks | N | Y | 2003 | | | 2.8 kg/d* | 0.001% | 0.00% | N | N | |
| Duke-idling reduction guidelines | N | Y | Summer 2004 | | | | | | N | N | |
| Diesel retrofits-50-100school buses | N | Y | 2004 | 42.3 kg/d | 0.016% | 57.2 kg/d | 0.019% | 0.02% | N | N | |
| No idling-all school buses | N | Y | 2003 | | | | | | N | N | |
| Energy efficient public buildings | N | Y | 2003 & ongoing | | | | | | N | N | |
| Flex, compress work schedule; telecommuting | N | Y | On-going | 469.7 kg/d | 0.181% | 385.2 kg/d | 0.126% | 0.21% | N | N | |
| ITS | N | Y | On-going | | | | | | N | N | |
| Encourage non-motorized transportation | N | Y | On-going | 693.4 kg/d | 0.268% | 569.2 kg/d | 0.186% | 0.31% | N | N | |
| Smart growth policies | N | Y | On-going | | | | | | N | N | |
| Truck stop electrification | N | Y | July 2004; July 2005 | 4.5 kg/d | 0.002% | 87.0 kg/d | 0.028% | 0.02% | N | N | |
| Reduce fleet emissions | N | Y | Oct. 2004 | | | | | | N | N | |
| Emission reduction clearinghouse | N | Y | April 2005 | | | | | | N | N | |
| Hospital transportation shuttle | N | Y | April 2004 | | | | | | N | N | |
| Enhance mass transit facilities | N | Y | 2004 & ongoing | | | | | | N | N | |

## Table B-11: Control Measure Emission Reductions for Greensboro-Winston Salem-High Point, North Carolina (Triad Area)

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Mass transit incentives | N | Y | Dec. 2005 | | | | | | N | N | |
| Commuter/intercity rail | N | Y | Fall 2004 | | | | | | N | N | |
| Feasibility of HOV/HOT lanes - I-40 | N | Y | Summer 2005 | | | | | | N | N | |
| TOTALS | Y = 3 of 30 CM<br>N = 27 of 30 CM | Y = 30 of 30 CM<br>N = 0 of 30 CM | | 41,033.3 kg/d<br>16,509.5 t/yr | 15.845% | 369,132.7 kg/d<br>148,518.2 t/yr | 120.506% | 100.00% | Y = 4 of 30 CM<br>N = 26 of 30 CM | Y = 3 of 30 CM<br>N = 27 of 30 CM | 99.39% |

Definition assumptions for measures:

- State measure: measure adopted by states that applies in more than area in a state
- National measure: measure adopted by EPA that applies nationally or in a sub region
- Local measure: measures adopted by a local unit of government for the area or by the state for the specific area

## Table B-12: Control Measure Emission Reductions for Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area)

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Federal control measures | Y | Y | Before Dec 31, 2005 | 37,920.3 kg/d | 16.998% | 60,962.8 kg/d | 45.767% | 76.509% | Y | Y | 76.51% |
| Develop stakeholder group-regulatory development | N | Y | On-going | | | 17,895.2 kg/d | 13.434% | 13.846% | N | N | |
| Ozone Action coordinator | N | Y | March 2003 | | | | | | N | N | |
| Low S fuels – ASAP | N | Y | On-going | | | | | | N | N | |
| ITS-design and implement | N | Y | 2003 / On-going | | | | | | N | N | |
| Encourage use of hybrid vehicles | N | Y | 2004-2005 | | | | | | N | N | |
| School buses-higher efficiency engines | N | Y | ASAP | | | | | | N | N | |
| Promote bike paths | N | Y | 2004 | | | | | | N | N | |
| Park & Ride to plants | N | Y | 2004 | | | | | | N | N | |
| Downtown shuttles; rapid transit bus | N | Y | 2004 | | | | | | N | N | |
| Free or reduced public transportation fares-ozone action days | N | Y | 2004 | | | | | | N | N | |
| Integrate transportation planning with land use planning | N | Y | 2004 | | | | | | N | N | |
| Review & update air emission inventory | N | Y | Fall 2003 | | | | | | N | N | |
| Seek reductions from major sources | N | Y | 2005 | | | 1,242.7 kg/d | 0.933% | 0.962% | N | N | |
| Develop program to purchase or repair smoking vehicles | N | Y | 2005 | | | | | | N | N | |
| Ban open burning of on-site commercial | N | Y | 2004 | | | | | | N | N | |
| Incentives for purchasing high efficiency, low emissions vehicles | N | Y | 2005 | | | | | | N | N | |
| Land use/transportation planning | N | Y | 2004 | | | | | | N | N | |
| Encourage use of green power; capture landfill emissions | N | Y | 2004 | | | | | | N | N | |
| Promote route efficiency for delivery vehicles and garbage trucks | N | Y | 2004 | | | | | | N | N | |
| Encourage alternate work schedules | N | Y | 2004 | | | | | | N | N | |
| Establish Park and Ride lots | N | Y | 2004 | | | | | | N | N | |
| Encourage carpooling; telecommuting | N | Y | 2004 | | | | | | N | N | |
| Establish active public awareness | N | Y | 2004 | | | | | | N | N | |
| Promote research in energy efficiency - local universities | N | Y | 2005 | | | | | | N | N | |
| Encourage use of alternate fuels | N | Y | On-going | | | | | | N | N | |
| Evaluate use of HOV on 3 interstates | N | Y | 2005 | | | | | | N | N | |
| Modify speed limits for optimum fuel efficiency | N | Y | 2005 or 2006 | | | | | | N | N | |

## Table B-12: Control Measure Emission Reductions for Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area)

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Develop process for minimizing impact of major building projects | N | Y | 2004 | | | | | | N | N | |
| Encourage community schools | N | N | | | | | | | N | N | |
| Improve landscape at county facilities | N | N | | | | | | | N | N | |
| Transco-early implementation of Phase 2 | N | Y | Dec. 2005 | | | 6,365.2 kg/d | 4.779% | 4.925% | N | N | |
| Duke Power- install advanced low NOx burners | N | Y | Oct. 2005 | | | 4,761.1 kg/d | 3.574% | 3.684% | N | N | |
| School Bus Retrofits | N | N | 2006 | 1.9 kg/d | 0.001% | | | 0.001% | N | N | |
| Gas Can Exchange Event - 115 cans were distributed | N | Y | June 2003 | 0.9 kg/d | 0.000% | | | 0.001% | N | N | |
| Truck Stop Electrification Project | N | Y | 2004 | 4.6 kg/d | 0.002% | 90.0 kg/d | 0.068% | 0.073% | N | N | |
| TOTALS | Y = 1 of 36 CM<br>N = 35 of 36 CM | Y = 33 of 36 CM<br>N = 3 of 36 CM | | 37,927.7 kg/d<br>15,260.0 t/yr | 17.001% | 91,317.0 kg/d<br>36,740.8 t/yr | 68.554% | 100.00% | Y = 1 of 36 CM<br>N = 35 of 36 CM | Y = 1 of 36 CM<br>N = 35 of 36 CM | 76.51% |

Definition assumptions for measures:

- State measure: measure adopted by states that applies in more than area in a state
- National measure: measure adopted by EPA that applies nationally or in a sub region
- Local measure: measures adopted by a local unit of government for the area or by the state for the specific area

## Table B-13: Control Measure Emission Reductions for Hickory-Morganton-Lenoir, North Carolina (Unifour Area)

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Federal control measures | Y | Y | Before Dec 31, 2005 | 11,430.5 kg/d | 18.424% | 120,791.6 kg/d | 147.007% | 94.94% | Y | Y | 94.94% |
| Open burning ban-ozone action days | Y | Y | June 2004 | 635.0 kg/d | 1.024% | 453.6 kg/d | 0.552% | 0.78% | N | N | |
| Local governments join NC Air Awareness Program | N | Y | 2004 | | | | | | N | N | |
| Enhanced awareness; outreach; educate | N | Y | 2003 / On-going | | | | | | N | N | |
| Energy conservation plan | N | Y | 2005 | 1.2 kg/d | 0.002% | 1.0 kg/d | 0.001% | 0.00% | N | N | |
| Staff person-air quality contact | N | Y | 2004 | | | | | | N | N | |
| Adopt local clean air policy | N | Y | 2005 | | | | | | N | N | |
| Landscape/tree ordinances | N | Y | 2003 / 2005 | | | | | | N | N | |
| Implement Smart Growth | N | Y | 2003 / 2005 | | | | | | N | N | |
| Encourage bicycle and pedestrian usage | N | Y | 2003 / 2005 | 5.0 kg/d | 0.008% | 4.0 kg/d | 0.005% | 0.01% | N | N | |
| Support coordination of planning organizations | N | Y | 2003 | | | | | | N | N | |
| Encourage compressed/flexible work | N | Y | 2004 | 3.7 kg/d | 0.006% | 3.2 kg/d | 0.004% | 0.00% | N | N | |
| Expand transit and ridesharing | N | Y | 2004 | 1.2 kg/d | 0.002% | 1.0 kg/d | 0.001% | 0.00% | N | N | |
| More efficient trafficking systems | N | Y | 2005 | | | | | | N | N | |
| Expand vehicle I& M | Y | Y | July 2003 - July 2005 | 725.7 kg/d | 1.170% | 725.7 kg/d | 0.883% | 1.04% | Y | Y | 1.04% |
| Clean Smokestacks Act | Y | Y | June 2005 | | | 4,490.6 kg/d | 5.465% | 3.22% | Y | Y | 3.22% |
| TOTALS | Y = 4 of 16 CM<br>N = 12 of 16 CM | Y = 16 of 16 CM<br>N = 0 of 16 CM | | 12,802.5 kg/d<br>5,151.0 t/yr | 20.636% | 126,470.7 kg/d<br>50,884.7 t/yr | 153.919% | 100.00% | Y = 3 of 16 CM<br>N = 13 of 16 CM | Y = 3 of 16 CM<br>N = 13 of 16 CM | 99.20% |

Definition assumptions for measures:

- State measure: measure adopted by states that applies in more than area in a state
- National measure: measure adopted by EPA that applies nationally or in a sub region
- Local measure: measures adopted by a local unit of government for the area or by the state for the specific area

## Table B-14: Control Measure Emission Reductions for Johnson City-Kingsport-Bristol, Tennessee

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Federal control measures | Y | Y | Before Dec 31, 2005 | 16,604.2 kg/d | 15.049% | 10,462.6 kg/d | 8.051% | 89.41% | Y | Y | 89.41% |
| Light Duty Motor Vehicle I & M | Y | Y | April 2005 | | | | | | Y | Y | |
| Anti Motor Vehicle Tampering | Y | Y | Dec. 2004 | NQ | | NQ | | | N | N | |
| Volatile Organic Compounds Reductions | Y | Y | Dec. 2004 | | | | | | N | N | |
| Ozone Action Day Program | N | Y | 2001 | 73.5 kg/d | 0.067% | 233.1 kg/d | 0.179% | 1.01% | Y | N | |
| Open burning ban during Ozone Action Days | Y | Y | Implemented | 2,137.3 kg/d | 1.937% | 762.0 kg/d | 0.586% | 9.58% | Y | Y | 9.58% |
| Transportation Emission Reduction Control Measures | N | Y | 2005-2007 | NQ | | NQ | | | N | N | |
| Stage I Vapor Recovery | Y | Y | Dec. 2004 | NQ | | NQ | | | N | N | |
| TOTALS | Y = 6 of 8 CM<br>N = 2 of 8 CM | Y = 8 of 8 CM<br>N = 0 of 8 CM | | 18,815.0 kg/d<br>7,570.1 t/yr | 17.053% | 11,457.7 kg/d<br>4,610.0 t/yr | 8.816% | 100.00% | Y = 4 of 8 CM<br>N = 4 of 8 CM | Y = 3 of 8 CM<br>N = 5 of 8 CM | 98.99% |

Definition assumptions for measures:

- State measure: measure adopted by states that applies in more than area in a state
- National measure: measure adopted by EPA that applies nationally or in a sub region
- Local measure: measures adopted by a local unit of government for the area or by the state for the specific area

## Table B-15: Control Measure Emission Reductions for Nashville, Tennessee

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Federal control measures | Y | Y | Before Dec 31, 2005 | 37,227.2 kg/d | 21.738% | 46,357.1 kg/d | 21.074% | 93.19% | Y | Y | 93.19% |
| Light Duty Motor Vehicle I & M | Y | Y | April 2005 | 2,330.6 kg/d | 1.361% | 67.1 kg/d | 0.031% | 2.67% | Y | Y | 2.67% |
| Anti Motor Vehicle Tampering | Y | Y | Dec. 2004 | NQ | | NQ | | | N | N | |
| Volatile Organic Compounds Reductions | Y | Y | Dec. 2004 | | | | | | Y | Y | |
| Traffic signal synchronization | N | Y | 2004-2006 | 235.9 kg/d | 0.138% | 190.5 kg/d | 0.087% | 0.48% | N | N | |
| New infrastructure-rideshare program | N | Y | 2004-2006 | 9.1 kg/d | 0.005% | 7.3 kg/d | 0.003% | 0.02% | N | N | |
| Trip reduction | N | Y | 2004-2006 | 61.7 kg/d | 0.036% | 48.1 kg/d | 0.022% | 0.12% | N | N | |
| Roadside assistance program | N | Y | Implemented | 28.1 kg/d | 0.016% | 28.1 kg/d | 0.013% | 0.06% | N | N | |
| Addition of HDGV2B Weigh Class Vehicles to existing IM program | N | Y | April 2005 | 40.8 kg/d | 0.024% | 20.9 kg/d | 0.009% | 0.07% | Y | N | |
| New pedestrian facilities; bikeways | N | Y | 2004-2006 | 72.6 kg/d | 0.042% | 55.3 kg/d | 0.025% | 0.14% | N | N | |
| HOV lanes - I-24,40 | N | Y | 2004-2007 | 19.1 kg/d | 0.011% | 15.4 kg/d | 0.007% | 0.04% | N | N | |
| Ban open burning-ozone action days | Y | Y | March 2004 | 99.8 kg/d | 0.058% | 383.7 kg/d | 0.174% | 0.54% | Y | Y | 0.54% |
| Improve bus ridership | N | Y | 2004-2006 | 9.1 kg/d | 0.005% | 9.1 kg/d | 0.004% | 0.02% | N | N | |
| New Rail Service (Nashville-Lebanon corridor) | N | Y | 2005-2006 | 54.4 kg/d | 0.032% | 27.2 kg/d | 0.012% | 0.09% | N | N | |
| Land use controls-reduce VMT | N | Y | 2004 and Beyond | 226.8 kg/d | 0.132% | 553.4 kg/d | 0.252% | 0.87% | N | N | |
| Air Quality Action Days | N | Y | Implemented | 426.4 kg/d | 0.249% | 1,088.6 kg/d | 0.495% | 1.69% | N | N | |
| TOTALS | Y = 5 of 16 CM<br>N = 11 of 16 CM | Y = 16 of 16 CM<br>N = 0 of 16 CM | | 40,841.5 kg/d<br>16,432.3 t/yr | 23.848% | 48,851.9 kg/d<br>19,655.3 t/yr | 22.209% | 100.00% | Y = 5 of 16 CM<br>N = 11 of 16 CM | Y = 4 of 16 CM<br>N = 12 of 16 CM | 96.40% |

Definition assumptions for measures:

- State measure: measure adopted by states that applies in more than area in a state
- National measure: measure adopted by EPA that applies nationally or in a sub region
- Local measure: measures adopted by a local unit of government for the area or by the state for the specific area

## Table B-16: Control Measure Emission Reductions for Roanoke, Virginia

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Architectural and Industrial Paints | Y | Y | Implemented | 337.5 kg/d | 0.799% | | | 1.24% | Y | Y | 1.24% |
| Consumer Products | Y | Y | Implemented | 161.5 kg/d | 0.383% | | | 0.59% | Y | Y | 0.59% |
| Metal Cleaning | Y | Y | Implemented | 147.9 kg/d | 0.350% | | | 0.54% | Y | Y | 0.54% |
| Motor Vehicle Refinishing Paint | Y | Y | Implemented | 143.3 kg/d | 0.340% | | | 0.53% | Y | Y | 0.53% |
| Small Gasoline Engine Standards | Y | Y | Implemented | 1,525.0 kg/d | 3.612% | 53.5 kg/d | 0.128% | 5.79% | Y | Y | 5.79% |
| Non-road Diesel Engine Standards | Y | Y | Implemented | 143.3 kg/d | 0.340% | 879.1 kg/d | 2.094% | 3.75% | Y | Y | 3.75% |
| Locomotive Engine Standards | Y | Y | Implemented | | | 1,008.8 kg/d | 2.403% | 3.70% | Y | Y | 3.70% |
| Large Gasoline Engine Standards | Y | Y | Implemented | 132.4 kg/d | 0.314% | 495.3 kg/d | 1.180% | 2.30% | Y | Y | 2.30% |
| Recreational Engine Standards | Y | Y | Implemented | 13.6 kg/d | 0.032% | 0.0 kg/d | 0.000% | 0.05% | Y | Y | 0.05% |
| On-road Motor Vehicle Standards | Y | Y | Implemented | 6,586.2 kg/d | 15.602% | 10,523.3 kg/d | 25.069% | 62.74% | Y | Y | 62.74% |
| Reduce locomotive idling | N | Y | Implemented | 0.0 kg/d | 0.000% | 138.8 kg/d | 0.331% | 0.51% | N | N | |
| Limit idling-school buses | N | Y | Implemented | 0.0 kg/d | 0.000% | 2.7 kg/d | 0.006% | 0.01% | N | N | |
| Retrofit 100 school buses- oxidation catalyst | N | Y | Summer 2005 | 2.7 kg/d | 0.006% | 8.2 kg/d | 0.019% | 0.04% | N | N | |
| Retrofit 102 school buses - oxidation catalyst | N | Y | End of 2005 | | | | | | N | N | |
| Bio-diesel solid waste trucks-purchased | N | Y | Implemented | 0.0 kg/d | 0.000% | 0.9 kg/d | 0.002% | 0.00% | N | N | |
| Ethanol alternative fuel vehicles | N | N | 2007 | | | | | | N | N | |
| Biodiesel ready trucks | N | N | 2007 | | | | | | N | N | |
| Hybrid vehicles | N | Y | Implemented | 0.9 kg/d | 0.002% | 0.9 kg/d | 0.002% | 0.01% | N | N | |
| Alternative fuel vehicles | N | Y | Implemented | 0.9 kg/d | 0.002% | 0.9 kg/d | 0.002% | 0.01% | N | N | |
| Implement effective environmental driving | N | Y | Implemented | | | | | | N | N | |
| Public education: Air Quality Action Day | N | Y | Implemented | | | | | | Y | N | |
| Timing of refueling vehicles | N | Y | Implemented | | | | | | Y | N | |
| Promote alternative fuel vehicles | N | Y | Implemented & on-going | | | | | | Y | N | |
| Media/public relations program | N | Y | Implemented | | | | | | Y | N | |
| Public transit incentives | N | Y | Implemented | | | | | | Y | N | |
| Bike Infrastructure and Amenities | N | Y | Urban implemented; Rural in progress | | | | | | Y | N | |
| Expand public education program | N | Y | Implemented & on-going | | | | | | Y | N | |
| Tree planting program | N | Y | On-going | | | | | | Y | N | |
| Mass transit to Blacksburg | N | Y | Implemented | 8.2 kg/d | 0.019% | 3.6 kg/d | 0.009% | 0.04% | Y | N | |
| Replace gas golf carts w/electric | N | Y | End of 2005 | | | 0.9 kg/d | 0.002% | 0.00% | N | N | |
| Replace gas mowers w/electric | N | Y | End of 2005 | 15.4 kg/d | 0.037% | 0.9 kg/d | 0.002% | 0.06% | N | N | |
| Open burning ban -expanded | N | Y | Implemented | 0.0 kg/d | 0.000% | 215.9 kg/d | 0.514% | 0.79% | N | N | |

## Table B-16: Control Measure Emission Reductions for Roanoke, Virginia

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Mandatory Restriction lawn equipment usage during ozone action days | Y | Y | Implemented | 712.6 kg/d | 1.688% | 472.9 kg/d | 1.127% | 4.35% | Y | Y | 4.35% |
| Voluntary Private Sector Restriction lawn equipment usage during ozone action days | N | Y | End of 2005 | 140.2 kg/d | 0.332% | 80.5 kg/d | 0.192% | 0.81% | Y | N | |
| Cradle to Cradle Design Competition | N | Y | End of 2005 | | | | | | N | N | |
| Regional Reduction in NOx emissions | Y | Y | May 31, 2004 | | | | | | Y | Y | |
| National Low Emission Vehicle Program | Y | Y | April 14, 1999 | | | | | | Y | Y | |
| Stage1 Vapor Recovery | Y | Y | Implemented | 1,593.0 kg/d | 3.774% | 0.0 kg/d | 0.000% | 5.84% | Y | Y | 5.84% |
| CTG RACT -- CTG VOC RACT and NOx RACT | Y | Y | Initiated 2005 | 996.1 kg/d | 2.360% | 716.7 kg/d | 1.707% | 6.28% | Y | Y | 6.28% |
| State Cutback Asphalt Regulation | Y | Y | Initiated 2005 | 4.5 kg/d | 0.011% | | | 0.02% | Y | Y | 0.02% |
| Enhanced Ozone Forecasting tool | Y | Y | 2005 | | | | | | N | N | |
| TOTALS | Y = 17 of 41 CM<br>N = 24 of 41 CM | Y = 39 of 41 CM<br>N = 2 of 41 CM | | 12,665.2 kg/d<br>5,095.8 t/yr | 30.002% | 14,603.9 kg/d<br>5,875.8 t/yr | 34.789% | 100.00% | Y = 26 of 41 CM<br>N = 15 of 41 CM | Y = 16 of 41 CM<br>N = 25 of 41 CM | 97.72% |

Definition assumptions for measures:

- State measure: measure adopted by states that applies in more than area in a state
- National measure: measure adopted by EPA that applies nationally or in a sub region
- Local measure: measures adopted by a local unit of government for the area or by the state for the specific area

## Table B-17: Control Measure Emission Reductions for San Antonio, Texas

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| ORVR, on-road and non-road federal measures | Y | Y | Implemented | 28,667.0 kg/d | 15.644% | 21,309.8 kg/d | 10.495% | 52.34% | Y | Y | 52.34% |
| Point source emission reductions from power plants | Y | Y | Implemented | 961.6 kg/d | 0.525% | 35,842.9 kg/d | 17.652% | 38.54% | Y | Y | 38.54% |
| Degreasing controls | N | Y | by Dec. 2005 | 85 % | | | | | N | N | |
| Reduced Stage I vapor recovery exemption level from 125k gal/mo to 25k gal/mo | N | Y | by Dec. 2005 | 5,270.7 kg/d | 2.876% | 0.0 kg/d | 0.000% | 5.52% | Y | N | |
| Energy efficiency / Renewable energy projects--TCEQ | N | Y | On-going | 0.0 kg/d | 0.000% | 54.4 kg/d | 0.027% | 0.06% | N | N | |
| Transportation emission reduction measures (TERMs) | N | Y | by Dec. 2005 | 834.6 kg/d | 0.455% | 290.3 kg/d | 0.143% | 1.18% | Y | N | |
| Transportation Demand Management (TDM) | N | Y | by Dec. 2005 | 27.2 kg/d | 0.015% | 23.6 kg/d | 0.012% | 0.05% | N | N | |
| Alternative Fuel Vehicles | N | Y | On-going | 28.1 kg/d | 0.015% | 312.5 kg/d | 0.154% | 0.36% | N | N | |
| Lawnmower Recycling Program | N | Y | by Dec. 31, 2005 | 51.8 kg/d | 0.028% | 2.2 kg/d | 0.001% | 0.06% | N | N | |
| Texas Emission Reduction Program (TERP)--upgrade on and nonroad mobile source diesel engines with cleaner equipment | N | Y | by Dec. 31, 2005 | 0.0 kg/d | 0.000% | 1,814.4 kg/d | 0.894% | 1.90% | Y | N | |
| Portable Fuel Container Rule | Y | Y | by Dec. 31, 2005 | 45 % | | | | | Y | Y | |
| Truck Stop Anti-idling program | N | Y | by Dec. 31, 2005 | | | | | | N | N | |
| Windshield Wiper Fluid | Y | Y | by Dec. 31, 2005 | | | | | | N | N | |
| Public education program | N | Y | by Dec. 31, 2005 | | | | | | N | N | |
| TOTALS | Y = 4 of 14 CM<br>N = 10 of 14 CM | Y = 14 of 14 CM<br>N = 0 of 14 CM | | 35,841.2 kg/d<br>14,420.5 t/yr | 19.559% | 59,650.0 kg/d<br>23,999.8 t/yr | 29.377% | 100.00% | Y = 6 of 14 CM<br>N = 8 of 14 CM | Y = 3 of 14 CM<br>N = 11 of 14 CM | 90.88% |

Definition assumptions for measures:

- State measure: measure adopted by states that applies in more than area in a state
- National measure: measure adopted by EPA that applies nationally or in a sub region
- Local measure: measures adopted by a local unit of government for the area or by the state for the specific area

## Table B-18: Control Measure Emission Reductions for Washington County, Maryland (Hagerstown)

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Other federal control measures | Y | Y | Before Dec 31, 2005 | 108.3 kg/d | 0.449% | 1369.8 kg/d | 4.776% | 18.06% | Y | Y | 18.06% |
| On-road Motor Vehicle Standards | Y | Y | Implemented | 861.8 kg/d | 3.573% | 3093.5 kg/d | 10.786% | 48.33% | Y | Y | 48.33% |
| Small Gasoline Engine Standards | Y | Y | Implemented | | | | | | N | N | |
| Gasoline Marine Engine Standards | Y | Y | Implemented | | | | | | N | N | |
| Large gasoline Engine Standards | Y | Y | Implemented | | | | | | N | N | |
| Ride sharing/commuter connections | N | Y | Implemented | 0.3 kg/d | 0.001% | 0.3 kg/d | 0.001% | 0.01% | N | N | |
| Transit programs | N | Y | Implemented | 7.4 kg/d | 0.031% | 6.4 kg/d | 0.022% | 0.17% | N | N | |
| Park and Ride lots | N | Y | Implemented | 1.8 kg/d | 0.007% | 1.8 kg/d | 0.006% | 0.04% | N | N | |
| Telecommuting | N | Y | Implemented | 3.1 kg/d | 0.013% | 3.3 kg/d | 0.012% | 0.08% | N | N | |
| Ozone action days | N | Y | by July 2005 | | | | | | N | N | |
| Public education outreach | N | Y | by June 2005 | | | | | | N | N | |
| E-gov/e-commerce enhancement | N | Y | by Dec. 2005 | 1.6 kg/d | 0.007% | 0.3 kg/d | 0.001% | 0.02% | N | N | |
| New jobs tax credit | N | Y | Implemented | 1.6 kg/d | 0.007% | 1.9 kg/d | 0.006% | 0.04% | N | N | |
| Growth management program | N | Y | Implemented | 13.2 kg/d | 0.055% | 15.4 kg/d | 0.054% | 0.35% | N | N | |
| Signal system enhancements | N | Y | FY 2004 | 10.2 kg/d | 0.042% | 3.1 kg/d | 0.011% | 0.16% | N | N | |
| Incident Management/Intelligent Transportation System | N | Y | Implemented | 17.6 kg/d | 0.073% | 8.0 kg/d | 0.028% | 0.31% | N | N | |
| On-road vehicle replacement | N | Y | End of 2005 | 1.5 kg/d | 0.006% | 13.7 kg/d | 0.048% | 0.19% | N | N | |
| Vehicle Emissions Inspection Program | Y | Y | Implemented | 480.8 kg/d | 1.993% | 562.5 kg/d | 1.961% | 12.75% | Y | Y | 12.75% |
| OTC- consumer products | Y | Y | Implemented | 108.9 kg/d | 0.451% | 0.0 kg/d | 0.000% | 1.33% | Y | Y | 1.33% |
| OTC-architectural and industrial maintenance | Y | Y | Implemented | 92.2 kg/d | 0.382% | 0.0 kg/d | 0.000% | 1.13% | Y | Y | 1.13% |
| OTC-portable fuel containers | Y | Y | Implemented | 54.4 kg/d | 0.226% | 0.0 kg/d | 0.000% | 0.67% | N | N | |
| OTC-low emissions paint | Y | Y | Implemented | 26.3 kg/d | 0.109% | 0.0 kg/d | 0.000% | 0.32% | Y | Y | 0.32% |
| Off-road vehicle replacements | Y | Y | Feb. 2002; Jan. 2004 | | | | | | N | N | |
| RACT Controls -- Post 1999 inventory RACT | Y | Y | Implemented | 0.0 kg/d | 0.000% | 1,312.3 kg/d | 4.576% | 16.04% | N | N | |
| TOTALS | Y = 12 of 24 CM<br>N = 12 of 24 CM | Y = 24 of 24 CM<br>N = 0 of 24 CM | | 1,791.0 kg/d<br>720.6 t/yr | 7.425% | 6,392.3 kg/d<br>2,571.9 t/yr | 22.287% | 100.00% | Y = 6 of 24 CM<br>N = 18 of 24 CM | Y = 6 of 24 CM<br>N = 18 of 24 CM | 81.92% |

Definition assumptions for measures:

- State measure: measure adopted by states that applies in more than area in a state
- National measure: measure adopted by EPA that applies nationally or in a sub region
- Local measure: measures adopted by a local unit of government for the area or by the state for the specific area

## Table B-19: Control Measure Emission Reductions for Austin, Texas

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Federal control measures | Y | Y | Before Dec 31, 2005 | 1,787.2 kg/d | 1.302% | 76,865.8 kg/d | 58.181% | 78.43% | Y | Y | 78.43% |
| I & M Onboard Diagnostics & Low Income Repair Program | N | Y | by Dec. 31, 2005 | 3,474.5 kg/d | 2.531% | 2,921.1 kg/d | 2.211% | 6.38% | Y | N | |
| Heavy-duty diesel Idling restrictions (April 1 to October 31). | N | Y | by Dec. 31, 2005 | 0.0 kg/d | 0.000% | 607.8 kg/d | 0.460% | 0.61% | Y | N | |
| Portable Fuel Container Rule | Y | Y | by Dec. 31, 2004 | 807.4 kg/d | 0.588% | 0.0 kg/d | 0.000% | 0.81% | Y | Y | 0.81% |
| Reduced Stage I vapor recovery exemption level from 125k gal/mo to 25k gal/mo | N | Y | by Dec. 31, 2005 | 4,427.1 kg/d | 3.225% | 0.0 kg/d | 0.000% | 4.41% | Y | N | |
| Emission Reduction Program-- financial incentives to retrofit or replace on & nonroad diesel engines | N | Y | by Dec. 31, 2005 | 0.0 kg/d | 0.000% | 1,814.4 kg/d | 1.373% | 1.81% | Y | N | |
| Degreasing controls | N | Y | by Dec. 31, 2005 | 5,034.9 kg/d | 3.668% | 0.0 kg/d | 0.000% | 5.02% | Y | N | |
| Cutback Asphalt | N | Y | by Dec. 31, 2005 | 934.4 kg/d | 0.681% | 0.0 kg/d | 0.000% | 0.93% | Y | N | |
| Energy efficiency / Renewable energy projects--TCEQ | N | Y | On-going | | | | | | N | N | |
| Power Plant Reductions--enforceable commitments by area power plants | N | N | by Dec. 31, 2006 | | | | | | N | N | |
| Low emission diesel for fleets | Y | Y | On-going | | | | | | N | N | |
| Transportation emission reduction measures (TERMs) | N | Y | On-going | 753.0 kg/d | 0.549% | 653.2 kg/d | 0.494% | 1.40% | Y | N | |
| Clean Air Partners Program (CLEAN AIR Force of Central TX) the area. | N | Y | Ongoing | | | | | | N | N | |
| Access management regulations or guidelines for new or re-development emissions. | N | Y | On-going | | | | | | N | N | |
| Alternate commute infrastructure requirements | N | Y | On-going | | | | | | N | N | |
| Reduce use of drive-through lanes on ozone action days | N | Y | On-going | | | | | | N | N | |
| Expedited permitting for mixed use, transit-oriented or in-fill-development | N | Y | On-going | | | | | | N | N | |
| Airport Clean Air Plan--electric or alternative fuels for airport ground service equipment and shuttle buses | N | Y | On-going | | | | | | N | N | |
| Low VOC striping material--require use of reformulated striping material products | N | Y | On-going | | | | | | N | N | |
| Open burning restrictions during peak ozone season. | N | Y | On-going | | | | | | N | N | |
| Tree planting program using low VOC-emitting trees | N | Y | On-going | | | | | | N | N | |

# Table B-19: Control Measure Emission Reductions for Austin, Texas

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Local commitment to State's 5% per year energy usage reduction program | N | Y | On-going | | | | | | N | N | |
| Shift electric load profile to nighttime period | N | Y | On-going | | | | | | N | N | |
| Environmental dispatch of power plants | N | Y | On-going | | | | | | N | N | |
| Incentives for purchase of low emission vehicles | N | Y | On-going | | | | | | N | N | |
| Adopt a school bus replacement program | N | Y | On-going | | | 198.8 kg/d | 0.151% | 0.20% | N | N | |
| Increased enforcement of speed limits and smoking vehicle restrictions. | N | Y | On-going | | | | | | N | N | |
| Business evaluation of fleet usage | N | Y | On-going | | | | | | N | N | |
| Commute solutions programs-compressed work week; carpool/alternative transportation incentives; flexible work schedule; transit pass subsidized by employer, teleworking, etc | N | Y | On-going | | | | | | N | N | |
| Offer employees direct deposit to reduce vehicle use | N | Y | On-going | | | | | | N | N | |
| Provide e-Government services to reduce VMT | N | Y | On-going | | | | | | N | N | |
| Fueling vehicles in evening | N | Y | On-going | | | | | | N | N | |
| Urban Heat Island/Cool cities program | N | Y | On-going | | | | | | N | N | |
| Expand and quantify ongoing resource conservation programs | N | Y | On-going | | | | | | N | N | |
| Electric utilities develop customer incentives for installation of energy efficient appliances / technologies. | N | Y | On-going | | | | | | N | N | |
| Construction-related emissions on ozone action days clauses in public contracts | N | Y | On-going | | | | | | N | N | |
| Ensure emission reductions in SEPs, BEPs, and similar agreements | N | Y | On-going | | | | | | N | N | |
| Ozone action day education program | N | Y | On-going | | | | | | N | N | |

## Table B-19: Control Measure Emission Reductions for Austin, Texas

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Ozone Action Day specific reduction measures program | N | Y | On-going | | | | | | N | N | |
| Education program to delay landscaping work on high ozone days. | N | Y | On-going | | | | | | N | N | |
| Residential electric lawnmower exchange program | N | Y | 1997, 2002 & 2003 | | | | | | N | N | |
| State Agency Voluntary Commute Reduction Projects commuting. | N | Y | Voluntary | | | | | | N | N | |
| TOTALS | Y = 3 of 42 CM<br>N = 39 of 42 CM | Y = 41 of 42 CM<br>N = 1 of 42 CM | | 17,218.4 kg/d<br>6,927.7 t/yr | 12.543% | 83,061.1 kg/d<br>33,419.1 t/yr | 62.871% | 100.00% | Y = 9 of 42 CM<br>N = 33 of 42 CM | Y = 2 of 42 CM<br>N = 40 of 42 CM | 79.24% |

Definition assumptions for measures:

- State measure: measure adopted by states that applies in more than area in a state
- National measure: measure adopted by EPA that applies nationally or in a sub region
- Local measure: measures adopted by a local unit of government for the area or by the state for the specific area

## Table B-20: Control Measure Emission Reductions for Berkeley-Charleston-Dorchester, South Carolina

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Appoint Ozone Action Coordinator | N | Y | 2003 | | | | | | N | N | |
| Add ozone alert to county website | N | Y | 2003 | | | | | | N | N | |
| Expand electronic transactions | N | Y | On-going | | | | | | N | N | |
| Develop, implement ozone public education plan | N | Y | Begin FY 2004 | | | | | | N | N | |
| Expand use of hybrid cars | N | Y | FY 2005 | | | | | | N | N | |
| Use right size - county fleet | N | Y | FY 2005 | | | | | | N | N | |
| Include fuel efficiency/emission ratings | N | Y | FY 2005 | | | | | | N | N | |
| Purchase vehicles/light trucks to meet new standards | N | Y | On-going | | | | | | N | N | |
| Purchase heavy duty diesel trucks to meet new standards | N | Y | On-going | | | | | | N | N | |
| Convert to use of low-sulfur gasoline | N | Y | On-going | | | | | | N | N | |
| Consider pilot test for county fleets | N | Y | FY 2005 | | | | | | N | N | |
| Best practices for fueling | N | Y | FY 2004 | | | | | | N | N | |
| Land use plan-develop mass transit | N | Y | On-going | | | | | | N | N | |
| Limit emissions from counties small engines | N | Y | Over 5 yrs | | | | | | N | N | |
| Ask garages to limit idling | N | Y | FY 2004 | | | | | | N | N | |
| Energy conservation at county bldgs | N | Y | FY 2004 | | | | | | N | N | |
| Expand flexible hrs-county employees | N | Y | FY 2004 | | | | | | N | N | |
| Encourage walking, biking, car pooling | N | Y | FY 2005 | | | | | | N | N | |
| Form regional stakeholders group | N | Y | FY 2004 | | | | | | N | N | |
| Remain current w/stakeholders | N | Y | On-going | | | | | | N | N | |
| Support programs to reduce ozone for SCDOT | N | Y | On-going | | | | | | N | N | |
| Set the example-telecommuting; carpooling; flex schedules; alternate fuel vehicles | N | Y | On-going | | | | | | N | N | |
| Educational programs | N | N | TBD | | | | | | N | N | |
| Schools-add sidewalks, increase bus usage; restrict vehicle idle times | N | N | TBD | | | | | | N | N | |
| Ozone conditions-TV | N | Y | May 2004 | | | | | | N | N | |
| Educate public - festivals, lecturer, brochure | N | N | TBD | | | | | | N | N | |
| Planning for future green spaces | N | Y | On-going | | | | | | N | N | |
| Cluster development, Smart Growth, mass transit | N | Y | On-going | | | | | | N | N | |
| Conserve energy in county property | N | Y | June 2003 | | | | | | N | N | |
| Designate Ozone Action Coordinator | N | Y | March 2003 | | | | | | N | N | |
| Zoning ordinance-landscape buffers | N | Y | Sep. 2000 | | | | | | N | N | |
| Implement Greenspace initiative | N | Y | Sep. 2000 | | | | | | N | N | |

## Table B-20: Control Measure Emission Reductions for Berkeley-Charleston-Dorchester, South Carolina

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Encourage development of non-polluting industries | N | Y | On-going | | | | | | N | N | |
| Encourage recycling goods | N | Y | On-going | | | | | | N | N | |
| Increase focus-composting | N | Y | On-going | | | | | | N | N | |
| Install passive gas vents-landfill | N | Y | Prior to 2004 | | | | | | N | N | |
| Purchase 2 alternative fuel vehicles for Sheriff Dept | N | Y | February 2004 | | | | | | N | N | |
| Best management practices-engines | N | Y | On-going | | | | | | N | N | |
| Staggered work schedule | N | Y | On-going | | | | | | N | N | |
| TOTALS | Y = 0 of 39 CM<br>N = 39 of 39 CM | Y = 36 of 39 CM<br>N = 3 of 39 CM | | 0.0 kg/d<br>0.0 t/yr | 0.000% | 0.0 kg/d<br>0.0 t/yr | 0.000% | 0.00% | Y = 0 of 39 CM<br>N = 39 of 39 CM | Y = 0 of 39 CM<br>N = 39 of 39 CM | 0.00% |

Definition assumptions for measures:

- State measure: measure adopted by states that applies in more than area in a state
- National measure: measure adopted by EPA that applies nationally or in a sub region
- Local measure: measures adopted by a local unit of government for the area or by the state for the specific area

## Table B-21: Control Measure Emission Reductions for Mountain Area of Western North Carolina (Asheville)

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Federal control measures | Y | Y | Before Dec 31, 2005 | 5,443.1 kg/d | 13.564% | 42,909.8 kg/d | 69.295% | 96.04% | Y | Y | 96.04% |
| Open burning ban -ozone action days | Y | Y | June 2004 | 453.6 kg/d | 1.130% | 362.9 kg/d | 0.586% | 1.62% | Y | Y | 1.62% |
| Expand vehicle I & M | Y | Y | July 2005 | 544.3 kg/d | 1.356% | 635.0 kg/d | 1.026% | 2.34% | Y | Y | 2.34% |
| TOTALS | Y = 3 of 3 CM<br>N = 0 of 3 CM | Y = 3 of 3 CM<br>N = 0 of 3 CM | | 6,441.0 kg/d<br>2,591.5 t/yr | 16.050% | 43,907.7 kg/d<br>17,666.0 t/yr | 70.906% | 100.00% | Y = 3 of 3 CM<br>N = 0 of 3 CM | Y = 3 of 3 CM<br>N = 0 of 3 CM | 100.00% |

Definition assumptions for measures:

- State measure: measure adopted by states that applies in more than area in a state
- National measure: measure adopted by EPA that applies nationally or in a sub region
- Local measure: measures adopted by a local unit of government for the area or by the state for the specific area

## Table B-22: Control Measure Emission Reductions for Oklahoma City, Oklahoma

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Federal control measures | Y | Y | Before Dec 31, 2005 | 4,753.7 kg/d | 2.779% | 21,918.3 kg/d | 13.917% | 99.60% | Y | Y | 99.60% |
| Transportation system improvements - intersection improvement, signal modification/interconnection, continuous left turn lanes | N | Y | 2004-2005 | 54.4 kg/d | 0.032% | 35.6 kg/d | 0.023% | 0.34% | Y | N | |
| Bike/pedestrian facilities | N | Y | 2005 | NQ | | NQ | | | N | N | |
| Intelligent Transportation Systems Projects | N | Y | 2004-2005 | 16.1 kg/d | 0.009% | | | 0.06% | N | N | |
| TOTALS | Y = 1 of 4 CM<br>N = 3 of 4 CM | Y = 4 of 4 CM<br>N = 0 of 4 CM | | 4,824.2 kg/d<br>1,941.0 t/yr | 2.821% | 21,953.9 kg/d<br>8,833.0 t/yr | 13.940% | 100.00% | Y = 2 of 4 CM<br>N = 2 of 4 CM | Y = 1 of 4 CM<br>N = 3 of 4 CM | 99.60% |

Definition assumptions for measures:

- State measure: measure adopted by states that applies in more than area in a state
- National measure: measure adopted by EPA that applies nationally or in a sub region
- Local measure: measures adopted by a local unit of government for the area or by the state for the specific area

## Table B-23: Control Measure Emission Reductions for Lower Savannah-Augusta, South Carolina-Georgia

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Air Quality Contact-ozone education/outreach | N | Y | March 2003 | | | | | | N | N | |
| Stage I Vapor Recovery (GA) | Y | Y | Dec. 2005 | 1,460.6 kg/d | 1.139% | | | 31.20% | Y | Y | 31.20% |
| Delay/reschedule mowing on ozone action days | N | Y | July 2003 | | | | | | N | N | |
| Delay/reschedule landscaping activities on ozone action days | N | Y | July 2003 | | | | | | N | N | |
| Don't top off fuel tanks | N | Y | July 2003 | | | | | | N | N | |
| Turn off lights/computers | N | Y | July 2003 | | | | | | N | N | |
| Restrict painting-ozone action days | N | Y | July 2003 | | | | | | N | N | |
| Promote employee awareness of ozone issues | N | Y | July 2003 | | | | | | N | N | |
| Change work schedule | N | Y | July 2003 | | | | | | N | N | |
| Seek information on alternative fuels | N | N | TBD | | | | | | N | N | |
| Reduce idling especially during high ozone days | N | Y | 2003 | | | | | | N | N | |
| Stricter controls on illegal burning | N | Y | 2003 | | | | | | N | N | |
| Replace vehicles with latest emission reduction vehicles | N | N | TBD | | | | | | N | N | |
| Community education | N | Y | 2003 / On-going | | | | | | N | N | |
| Switch vehicles to bio-diesel | N | Y | 2002 | | | | | | N | N | |
| Low-sulfur Type II fuels in all vehicles | N | Y | July 2003 | | | | | | N | N | |
| Promote Early Action Plan | N | Y | July 2003 | | | | | | N | N | |
| Commuter Choice Program | N | Y | May 2003 | | | | | | N | N | |
| Install Intelligent Transportation System equipment along major routes | N | N | Post 2007 | | | | | | N | N | |
| Revise ordinances to promote bike/pedestrian | N | Y | June 2003 | | | | | | N | N | |
| Establish minimum tree planting requirements | N | Y | June 2003 | | | | | | N | N | |
| Ban or limit open burning (SC local) | N | Y | Implemented | | | | | | N | N | |
| Encourage carpool to lunch | N | Y | 2003 | | | | | | N | N | |
| Install workplace occupancy sensors -reduce energy | N | Y | 2003-2004 | | | | | | N | N | |
| Use reflective paint to reduce energy consumption | N | Y | 2003-2004 | | | | | | N | N | |
| Purchase Energy Star products | N | Y | 2003 | | | | | | N | N | |
| Stakeholder development | N | Y | June 2003 | | | | | | N | N | |
| Public education program | N | Y | July 2003 | | | | | | N | N | |
| Purchase test alt fuel vehicles | N | Y | June 2004 | | | | | | N | N | |
| Monitor/reduce engine idling | N | Y | June 2004 | | | | | | N | N | |
| Open burning ban -ozone season (GA) | N | Y | May 2005 | 1,587.6 kg/d | 1.238% | 644.1 kg/d | 0.513% | 47.67% | Y | N | |
| Voluntary smog alerts | N | Y | July 2004 | | | | | | N | N | |

## Table B-23: Control Measure Emission Reductions for Lower Savannah-Augusta, South Carolina-Georgia

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Stage I Vapor Recovery (SC) | Y | Y | Dec. 2005 | 988.8 kg/d | 0.771% | | | 21.12% | N | N | |
| Maintain vehicles at peak efficiency and replaced with more efficient | N | Y | On-going | | | | | | N | N | |
| Reinforce prohibit idling when not in use | N | Y | On-going | | | | | | N | N | |
| Promote use of alternative fuel vehicles | N | Y | Dec. 2004 | | | | | | N | N | |
| Protect natural areas; minimize use of motorized vehicles; pesticides | N | Y | On-going | | | | | | N | N | |
| Enforce existing Tree Ordinance-developments | N | Y | On-going | | | | | | N | N | |
| Increase bike and pedestrian routes | N | Y | On-going | | | | | | N | N | |
| Community education | N | Y | On-going | | | | | | N | N | |
| Enforce existing open burning restrictions (GA local) | N | Y | On-going | | | | | | N | N | |
| Support Long Range Transportation Plan | N | Y | On-going | | | | | | N | N | |
| Support initiatives-rural public transportation | N | Y | On-going | | | | | | N | N | |
| Incorporate Early Action Plan-municipal plans | N | Y | On-going | | | | | | N | N | |
| TOTALS | Y = 2 of 44 CM<br>N = 42 of 44 CM | Y = 40 of 44 CM<br>N = 4 of 44 CM | | 4,037.0 kg/d<br>1,624.3 t/yr | 3.149% | 644.1 kg/d<br>259.2 t/yr | 0.513% | 100.00% | Y = 2 of 44 CM<br>N = 42 of 44 CM | Y = 1 of 44 CM<br>N = 43 of 44 CM | 31.20% |

Definition assumptions for measures:

- State measure: measure adopted by states that applies in more than area in a state
- National measure: measure adopted by EPA that applies nationally or in a sub region
- Local measure: measures adopted by a local unit of government for the area or by the state for the specific area

## Table B-24: Control Measure Emission Reductions for Tulsa, Oklahoma

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Federal control measures | Y | Y | Before Dec 31, 2005 | 9,870.2 kg/d | 5.951% | 50,784.2 kg/d | 26.209% | 96.20% | Y | Y | 96.20% |
| Transportation Emission Reduction Strategy - roadway expansion and intersection improvement projects | N | Y | Dec. 31, 2005 | 18.1 kg/d | 0.011% | 2,376.8 kg/d | 1.227% | 3.80% | Y | N | |
| | | | | | | | | | | | |
| TOTALS | Y = 1 of 2 CM<br>N = 1 of 2 CM | Y = 2 of 2 CM<br>N = 0 of 2 CM | | 9,888.3 kg/d<br>3,978.5 t/yr | 5.962% | 53,161.0 kg/d<br>21,389.0 t/yr | 27.435% | 100.00% | Y = 2 of 2 CM<br>N = 0 of 2 CM | Y = 1 of 2 CM<br>N = 1 of 2 CM | 96.20% |

Definition assumptions for measures:

- State measure: measure adopted by states that applies in more than area in a state
- National measure: measure adopted by EPA that applies nationally or in a sub region
- Local measure: measures adopted by a local unit of government for the area or by the state for the specific area

## Table B-25: Control Measure Emission Reductions for South Carolina (Statewide)

| Control Measure Implementation | | | | Emission Reductions | | | | | Model Demonstration | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Measure Description | State or National Measure (Y/N) | Implemented by December 2005 (Y/N) | Implementation Date | VOC Reduction | | NOx Reduction | | % of Total Quantified Emissions Reductions (NOx & VOC) | Measure Modeled (Y/N) | Of Modeled Measures, State or National? (Y/N) | % of Attainment Demo Emissions Reductions (NOx & VOC) |
| | | | | Amount of Reduction | % of EAC Area Total VOC Emissions | Amount of Reduction | % of EAC Area Total NOx Emissions | | | | |
| Ozone forecast/outreach, education | N | N | | | | | | | N | N | |
| Open Burning-ban household trash burning | Y | Y | 2005 | 1,734.8 kg/d | 0.314% | 365.4 kg/d | 0.068% | 0.76% | N | N | |
| SC NOx Control Regulation - new sources | Y | Y | 2005 | | | 7,240.1 kg/d | 1.356% | 2.63% | N | N | |
| Assist local areas in determining emission reductions | Y | N | | | | | | | N | N | |
| Clean Air Initiatives for Governmental Entities | Y | Y | April 2005 | | | | | | N | N | |
| Smart highways | Y | Y | 2005 | | | | | | N | N | |
| NOx reduction-large facilities | Y | Y | April 2005 | | | 31,068.0 kg/d | 5.821% | 11.28% | N | N | |
| Appalachian Area Local Control Measure Reductions | N | Y | By Dec 31, 2005 | 37,927.7 kg/d | 6.864% | 91,317.0 kg/d | 17.109% | 46.93% | N | N | |
| Central Midlands Local Control Measure Reductions | N | Y | By Dec 31, 2005 | 22,322.8 kg/d | 4.040% | 78,735.7 kg/d | 14.751% | 36.70% | N | N | |
| Charleston Area Local Control Measure Reductions | N | Y | By Dec 31, 2005 | 0.0 kg/d | 0.000% | 0.0 kg/d | 0.000% | 0.00% | N | N | |
| Lower Savannah Local Control Measure Reductions | N | Y | By Dec 31, 2005 | 4,037.0 kg/d | 0.731% | 644.1 kg/d | 0.121% | 1.70% | N | N | |
| TOTALS | Y = 6 of 11 CM<br>N = 5 of 11 CM | Y = 9 of 11 CM<br>N = 2 of 11 CM | | 66,022.3 kg/d<br>26,563.7 t/yr | 11.948% | 209,370.1 kg/d<br>84,238.7 t/yr | 39.226% | 100.00% | Y = 0 of 11 CM<br>N = 11 of 11 CM | Y = 0 of 11 CM<br>N = 11 of 11 CM | 0.00% |

Definition assumptions for measures:

- State measure: measure adopted by states that applies in more than area in a state
- National measure: measure adopted by EPA that applies nationally or in a sub region
- Local measure: measures adopted by a local unit of government for the area or by the state for the specific area

## Table B-26: Comparison of EAC $NO_x$ and VOC Emissions Reductions to the 2002 Emissions for the 20 EAC Program Areas, Emissions for the States in Which They Are Located, and the $NO_x$ SIP Call Emission Reductions in Those States

| EAC Area Description | NOx Emissions Reductions and Base Year Inventory (tons/year) | | | | | | | | | VOC Emissions Reductions and Base Year Inventory (tons/year) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EAC Area Emission Reductions | | | 2002 NOx Emissions Inventory | | | 2000-2006 NOx SIP Call Reductions | | | EAC Area Emission Reductions | | | 2002 VOC Emissions Inventory | | |
| | National & State Measures | Local Measures | Total | State-wide Emissions | EAC Area Emissions | | | | | National & State Measures | Local Measures | Total | State-wide Emissions | EAC Area Emissions | |
| **Nonattainment-Deferred EAC Program Areas** | | | | | | | | | | | | | | | |
| **Berkeley and Jefferson Counties, WV** (Eastern Panhandle EAC) | 694 | 774 | 1,467 | 382,514<br>0.2% 0.2% 0.4% | 11,627<br>6.0% 6.7% 12.6% | | 80,346<br>0.9% 1.0% 1.8% | | | 146 | 776 | 922 | 129,882<br>0.1% 0.6% 0.7% | 6,982<br>2.1% 11.1% 13.2% | |
| **Chattanooga, TN-GA** (Chattanooga Area EAC) | 9,473 | 539 | 10,012 | 1,221,179<br>0.8% 0.0% 0.8% | 30,816<br>30.7% 1.7% 32.5% | | 45,717<br>20.7% 1.2% 21.9% | | | 8,566 | 1,253 | 9,819 | 1,076,957<br>0.8% 0.1% 0.9% | 33,654<br>25.5% 3.7% 29.2% | |
| **Columbia, SC** (Central Midlands EAC) | 26,280 | 5,398 | 31,679 | 355,640<br>7.4% 1.5% 8.9% | 45,888<br>57.3% 11.8% 69.0% | | 21,298<br>123.4% 25.3% 148.7% | | | 8,979 | 2 | 8,981 | 386,585<br>2.3% 0.0% 2.3% | 51,232<br>17.5% 0.0% 17.5% | |
| **Denver-Boulder-Greeley-Ft Collins-Love, CO** (Denver Area EAC) | 21,535 | 0 | 21,535 | 319,555<br>6.7% 0.0% 6.7% | 147,563<br>14.6% 0.0% 14.6% | | NA | | | 38,800 | 0 | 38,800 | 528,877<br>7.3% 0.0% 7.3% | 191,449<br>20.3% 0.0% 20.3% | |
| **Fayetteville, NC** (Fayetteville Area EAC) | 3,723 | 9 | 3,732 | 608,616<br>0.6% 0.0% 0.6% | 11,233<br>33.1% 0.1% 33.2% | | 42,695<br>8.7% 0.0% 8.7% | | | 2,847 | 246 | 3,093 | 586,759<br>0.5% 0.0% 0.5% | 14,190<br>20.1% 1.7% 21.8% | |
| **Frederick County, VA** (Northern Shenandoah Valley EAC) | 2,085 | 197 | 2,282 | 513,247<br>0.4% 0.0% 0.4% | 7,773<br>26.8% 2.5% 29.4% | | 19,552<br>10.7% 1.0% 11.7% | | | 1,855 | 267 | 2,122 | 442,588<br>0.4% 0.1% 0.5% | 10,442<br>17.8% 2.6% 20.3% | |
| **Greensboro-Winston Salem-High Point, NC** (Triad Area EAC) | 148,039 | 480 | 148,518 | 608,616<br>24.3% 0.1% 24.4% | 123,245<br>120.1% 0.4% 120.5% | | 42,695<br>346.7% 1.1% 347.9% | | | 15,987 | 523 | 16,510 | 586,759<br>2.7% 0.1% 2.8% | 104,193<br>15.3% 0.5% 15.8% | |
| **Greenville-Spartanburg-Anderson, SC** (Appalachian Area EAC) | 24,528 | 12,213 | 36,741 | 355,640<br>6.9% 3.4% 10.3% | 53,594<br>45.8% 22.8% 68.6% | | 21,298<br>115.2% 57.3% 172.5% | | | 15,257 | 2 | 15,259 | 386,585<br>3.95% 0.00% 3.95% | 89,760<br>17.00% 0.00% 17.00% | |
| **Hickory-Morganton-Lenoir, NC** (Unifour Area EAC) | 50,881 | 4 | 50,885 | 608,616<br>8.4% 0.0% 8.4% | 33,059<br>153.9% 0.0% 153.9% | | 42,695<br>119.2% 0.0% 119.2% | | | 5,147 | 5 | 5,151 | 586,759<br>3.95% 0.00% 3.95% | 24,962<br>17.00% 0.00% 17.00% | |
| **Johnson City-Kingsport-Bristol, TN** (Tri-Cities Area EAC) | 4,516 | 94 | 4,610 | 570,102<br>0.8% 0.0% 0.8% | 52,289<br>8.6% 0.2% 8.8% | | 45,717<br>9.9% 0.2% 10.1% | | | 7,541 | 30 | 7,570 | 436,716<br>1.7% 0.0% 1.7% | 44,391<br>17.0% 0.1% 17.1% | |
| **Nashville, TN** (Nashville Area EAC) | 18,833 | 822 | 19,655 | 570,102<br>3.3% 0.1% 3.4% | 88,503<br>21.3% 0.9% 22.2% | | 45,717<br>41.2% 1.8% 43.0% | | | 15,956 | 476 | 16,432 | 436,716<br>3.7% 0.1% 3.8% | 68,905<br>23.2% 0.7% 23.8% | |
| **Roanoke, VA** (Roanoke Area EAC) | 5,693 | 183 | 5,876 | 513,247<br>1.1% 0.0% 1.1% | 16,890<br>33.7% 1.1% 34.8% | | 19,552<br>29.1% 0.9% 30.1% | | | 5,028 | 68 | 5,096 | 442,588<br>1.1% 0.0% 1.2% | 16,985<br>29.6% 0.4% 30.0% | |

## Table B-26: Comparison of EAC $NO_x$ and VOC Emissions Reductions to the 2002 Emissions for the 20 EAC Program Areas, Emissions for the States in Which They Are Located, and the $NO_x$ SIP Call Emission Reductions in Those States

| EAC Area Description | NOx Emissions Reductions and Base Year Inventory (tons/year) | | | | | | | | | | VOC Emissions Reductions and Base Year Inventory (tons/year) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EAC Area Emission Reductions | | | 2002 NOx Emissions Inventory | | | | | | 2000-2006 NOx SIP Call Reductions | EAC Area Emission Reductions | | | 2002 VOC Emissions Inventory | | | | | |
| | National & State Measures | Local Measures | Total | State-wide Emissions | | | EAC Area Emissions | | | | National & State Measures | Local Measures | Total | State-wide Emissions | | | EAC Area Emissions | | |
| **San Antonio, TX** (San Antonio Area EAC) | 22,995 | 1,005 | 24,000 | 1,894,105 | | | 81,696 | | | NA | 11,921 | 2,500 | 14,420 | 1,349,140 | | | 73,729 | | |
| | | | | **1.2%** | **0.1%** | **1.3%** | **28.1%** | **1.2%** | **29.4%** | | | | | **0.9%** | **0.2%** | **1.1%** | **16.2%** | **3.4%** | **19.6%** |
| **Washington County , MD (Hagerstown)** (Washington Co. EAC) | 2,550 | 22 | 2,572 | 297,586 | | | 11,540 | | | 10,474 | 697 | 23 | 721 | 261,351 | | | 9,705 | | |
| | | | | **0.9%** | **0.0%** | **0.9%** | **22.1%** | **0.2%** | **22.3%** | **24.3%** | **0.2%** | **24.6%** | | **0.3%** | **0.0%** | **0.3%** | **7.2%** | **0.2%** | **7.4%** |
| **Attainment EAC Program Areas** | | | | | | | | | | | | | | | | | | | |
| **Austin, TX** (Austin Area EAC) | 30,926 | 2,493 | 33,419 | 1.894.105 | | | 53.155 | | | NA | 1,044 | 5,884 | 6,928 | 1.349.140 | | | 55.232 | | |
| | | | | **1.6%** | **0.1%** | **1.8%** | **58.2%** | **4.7%** | **62.9%** | | | | | **0.1%** | **0.4%** | **0.5%** | **1.9%** | **10.7%** | **12.5%** |
| **Berkeley-Charleston-Dorchester, SC** (Charleston Area EAC) | 0 | 0 | 0 | 355,640 | | | 81,670 | | | 21,298 | 0 | 0 | 0 | 386,585 | | | 49,201 | | |
| | | | | **0.0%** | **0.0%** | **0.0%** | **0.0%** | **0.0%** | **0.0%** | **0.0%** | **0.0%** | **0.0%** | | **0.0%** | **0.0%** | **0.0%** | **0.0%** | **0.0%** | **0.0%** |
| **Asheville, NC** (Mountain Area of Western NC EAC) | 17,666 | 0 | 17,666 | 608,616 | | | 24,915 | | | 42,695 | 2,592 | 0 | 2,592 | 586,759 | | | 16,146 | | |
| | | | | **2.9%** | **0.0%** | **2.9%** | **70.9%** | **0.0%** | **70.9%** | **41.4%** | **0.0%** | **41.4%** | | **0.4%** | **0.0%** | **0.4%** | **16.1%** | **0.0%** | **16.1%** |
| **Oklahoma City, OK** (Central Area EAC) | 8,819 | 14 | 8,833 | 448,240 | | | 63,365 | | | NA | 1,913 | 28 | 1,941 | 363,218 | | | 68,813 | | |
| | | | | **2.0%** | **0.0%** | **2.0%** | **13.9%** | **0.0%** | **13.9%** | | | | | **0.5%** | **0.0%** | **0.5%** | **2.8%** | **0.0%** | **2.8%** |
| **Savannah-Augusta, SC-GA** (Lower Savannah-Augusta Area EAC) | 0 | 259 | 259 | 1,006,717 | | | 50,488 | | | 21,298 | 986 | 639 | 1,624 | 1,026,826 | | | 51,576 | | |
| | | | | **0.0%** | **0.0%** | **0.0%** | **0.0%** | **0.5%** | **0.5%** | **0.0%** | **1.2%** | **1.2%** | | **0.1%** | **0.1%** | **0.2%** | **1.9%** | **1.2%** | **3.1%** |
| **Tulsa, OK** (Tulsa Area EAC) | 20,433 | 956 | 21,389 | 448.240 | | | 77.961 | | | NA | 3,971 | 7 | 3,979 | 363.218 | | | 66.727 | | |
| | | | | **4.6%** | **0.2%** | **4.8%** | **26.2%** | **1.2%** | **27.4%** | | | | | **1.1%** | **0.0%** | **1.1%** | **6.0%** | **0.0%** | **6.0%** |
| **South Carolina** (Statewide) | 15,560 | 68,679 | 84,239 | 355,640 | | | 214,751 | | | 21,298 | 698 | 25,866 | 26,564 | 386,585 | | | 222,327 | | |
| | | | | **4.4%** | **19.3%** | **23.7%** | **7.2%** | **32.0%** | **39.2%** | **73.1%** | **322.5%** | **395.5%** | | **0.2%** | **6.7%** | **6.9%** | **0.3%** | **11.6%** | **11.9%** |

Sources: 2002 National Emissions Inventory, EAC SIPs, Table 3 of http://www.epa.gov/airmarkt/progress/docs/2006-NBP-Report.pdf

## Table B-27: Population Change from 2002 to 2006 in 14 Nonattainment-Deferred EAC Program Areas

| Geographic Area | Population Estimates | | Percent Change 2002 to 2006 |
|---|---|---|---|
| | July 1, 2002 | July 1, 2006 | |
| United States | 287,888,021 | 298,754,819 | 4% |
| South | 103,188,427 | 108,894,582 | 6% |
| West | 65,476,021 | 69,141,582 | 6% |
| | | | |
| West Virginia | 1,804,146 | 1,818,470 | 1% |
| West Virginia (rest of state) | 1,677,789 | 1,670,493 | 0% |
| Berkeley and Jefferson Counties, West Virginia | 126,357 | 147,977 | 17% |
| | | | |
| Georgia | 8,597,927 | 9,363,941 | 9% |
| Georgia (rest of state) | 8,479,304 | 9,237,319 | 9% |
| Tennessee | 5,788,333 | 6,038,803 | 4% |
| Tennessee (rest of state) | 5,440,181 | 5,686,258 | 5% |
| Chattanooga, Tennessee-Georgia (Georgia portion) | 118,623 | 126,622 | 7% |
| Chattanooga, Tennessee-Georgia (Tennessee portion) | 348,152 | 352,545 | 1% |
| Chattanooga, Tennessee-Georgia | 466,775 | 479,167 | 3% |
| | | | |
| South Carolina | 4,101,122 | 4,321,249 | 5% |
| South Carolina (rest of state) | 3,489,190 | 3,671,291 | 5% |
| Columbia, South Carolina (Central Midlands Area) | 611,932 | 649,958 | 6% |
| | | | |
| Colorado | 4,500,122 | 4,753,377 | 6% |
| Colorado (rest of state) | 1,529,450 | 1,603,723 | 5% |
| Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado | 2,970,672 | 3,149,654 | 6% |
| | | | |
| North Carolina | 8,313,494 | 8,856,505 | 7% |
| North Carolina (rest of state) | 8,009,400 | 8,557,445 | 7% |
| Fayetteville, North Carolina (Cumberland County) | 304,094 | 299,060 | -2% |
| | | | |
| Virginia | 7,285,707 | 7,642,884 | 5% |

## Table B-27: Population Change from 2002 to 2006 in 14 Nonattainment-Deferred EAC Program Areas

| Geographic Area | Population Estimates | | Percent Change 2002 to 2006 |
|---|---|---|---|
| | July 1, 2002 | July 1, 2006 | |
| Virginia (rest of state) | 7,198,425 | 7,546,432 | 5% |
| Frederick Co, Virginia | 87,282 | 96,452 | 11% |
| | | | |
| North Carolina | 8,313,494 | 8,856,505 | 7% |
| North Carolina (rest of state) | 6,841,625 | 7,319,383 | 7% |
| Greensboro-Winston Salem-High Point, North Carolina (Triad Area) | 1,471,869 | 1,537,122 | 4% |
| | | | |
| South Carolina | 4,101,122 | 4,321,249 | 5% |
| South Carolina (rest of state) | 3,047,632 | 3,216,134 | 6% |
| Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area) | 1,053,490 | 1,105,115 | 5% |
| | | | |
| North Carolina | 8,313,494 | 8,856,505 | 7% |
| North Carolina (rest of state) | 7,964,526 | 8,496,649 | 7% |
| Hickory-Morganton-Lenoir, North Carolina (Unifour Area) | 348,968 | 359,856 | 3% |
| | | | |
| Tennessee | 5,788,333 | 6,038,803 | 4% |
| Tennessee (rest of state) | 5,379,476 | 5,619,535 | 4% |
| Johnson City-Kingsport-Bristol, Tennessee | 408,857 | 419,268 | 3% |
| | | | |
| Tennessee | 5,788,333 | 6,038,803 | 4% |
| Tennessee (rest of state) | 4,518,728 | 4,669,256 | 3% |
| Nashville, Tennessee | 1,269,605 | 1,369,547 | 8% |
| | | | |
| Virginia | 7,285,707 | 7,642,884 | 5% |
| Virginia (rest of state) | 7,050,213 | 7,403,797 | 5% |
| Roanoke, Virginia | 235,494 | 239,087 | 2% |
| | | | |
| Texas | 21,762,430 | 23,507,783 | 8% |

## Table B-27: Population Change from 2002 to 2006 in 14 Nonattainment-Deferred EAC Program Areas

| Geographic Area | Population Estimates | | Percent Change 2002 to 2006 |
|---|---|---|---|
| | July 1, 2002 | July 1, 2006 | |
| Texas (rest of state) | 20,107,591 | 21,703,771 | 8% |
| San Antonio, Texas | 1,654,839 | 1,804,012 | 9% |
| | | | |
| Maryland | 5,441,349 | 5,615,727 | 3% |
| Maryland (rest of state) | 5,306,649 | 5,471,979 | 3% |
| Washington Co (Hagerstown), Maryland | 134,700 | 143,748 | 7% |

Source: U.S.Census Bureau, Green Book

For partial counties, the population estimates are for the entire county, while the EAC Program Area includes only part of the county. This includes the Columbia, South Carolina (Central Midlands Area); Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado; and Hickory-Morganton-Lenoir, North Carolina (Unifour Area) areas.

## Table B-28: Population Change from 2002 to 2006 in 6 Attainment EAC Program Areas

| Geographic Area | Population Estimates | | Percent Change 2001 to 2006 |
|---|---|---|---|
| | July 1, 2002 | July 1, 2006 | |
| United States | 287,888,021 | 298,754,819 | 4% |
| South | 103,188,427 | 108,894,582 | 6% |
| West | 65,476,021 | 69,141,582 | 6% |
| | | | |
| Texas | 21,762,430 | 23,507,783 | 8% |
| Texas (rest of state) | 20,414,966 | 21,994,218 | 8% |
| Austin, Texas | 1,347,464 | 1,513,565 | 12% |
| | | | |
| South Carolina | 4,101,122 | 4,321,249 | 5% |
| South Carolina (rest of state) | 3,538,543 | 3,718,071 | 5% |
| Berkeley-Charleston-Dorchester, South Carolina | 562,579 | 603,178 | 7% |
| | | | |
| North Carolina | 8,313,494 | 8,856,505 | 7% |
| North Carolina (rest of state) | 8,028,063 | 8,557,529 | 7% |
| Mountain Area of Western North Carolina (Asheville) | 285,431 | 298,976 | 5% |
| | | | |
| Oklahoma | 4,101,122 | 4,321,249 | 5% |
| Oklahoma (rest of state) | 2,993,955 | 3,163,407 | 6% |
| Oklahoma City, Oklahoma | 1,107,167 | 1,157,842 | 5% |
| | | | |
| Georgia | 8,597,927 | 9,363,941 | 9% |
| Georgia (rest of state) | 8,305,429 | 9,062,656 | 9% |
| South Carolina | 4,101,122 | 4,321,249 | 5% |
| South Carolina (rest of state) | 3,798,745 | 4,013,887 | 6% |
| Lower Savannah-Augusta, South Carolina-Georgia (Georgia portion) | 302,377 | 307,362 | 2% |
| Lower Savannah-Augusta, South Carolina-Georgia (South Carolina portion) | 292,498 | 301,285 | 3% |
| Lower Savannah-Augusta, South Carolina-Georgia | 594,875 | 608,647 | 2% |
| | | | |
| Oklahoma | 4,101,122 | 4,321,249 | 5% |

## Table B-28: Population Change from 2002 to 2006 in 6 Attainment EAC Program Areas

| Geographic Area | Population Estimates | | Percent Change 2001 to 2006 |
|---|---|---|---|
| | July 1, 2002 | July 1, 2006 | |
| Oklahoma (rest of state) | 3,281,801 | 3,480,011 | 6% |
| Tulsa, Oklahoma | 819,321 | 841,238 | 3% |

Source: U.S.Census Bureau, Green Book

For partial counties, the population estimates are for the entire county, while the EAC Program Area includes only part of the county. This includes the Mountain Area of Western North Carolina (Asheville) area.

## Table B-29: Vehicle Miles Traveled (VMT) Change from 2002 to 2006
## In 14 Nonattainment-Deferred EAC Program Areas

| Geographic Areas | VMT Estimates | | Percent Change 2002 to 2006 |
|---|---|---|---|
| | 2002 | 2006 | |
| United States | 2,822,279 | 3,014,116 | 7% |
| South | 1,120,903 | 1,225,953 | 9% |
| West | 585,246 | 645,007 | 10% |
| | | | |
| West Virginia | 19,544 | 20,885 | 7% |
| West Virginia (rest of state) | 18,264 | 19,637 | 8% |
| Berkeley and Jefferson Counties, West Virginia | 1,279 | 1,248 | -2% |
| | | | |
| Georgia | 106,727 | 113,532 | 6% |
| Georgia (rest of state) | 106,159 | 112,927 | 6% |
| Tennessee | 68,315 | 70,596 | 3% |
| Tennessee (rest of state) | 63,907 | 66,131 | 3% |
| Chattanooga, Tennessee-Georgia (Georgia portion) | 569 | 605 | 6% |
| Chattanooga, Tennessee-Georgia (Tennessee portion) | 4,408 | 4,465 | 1% |
| Chattanooga, Tennessee-Georgia | 4,976 | 5,070 | 2% |
| | | | |
| South Carolina | 47,074 | 50,199 | 7% |
| South Carolina (rest of state) | 39,866 | 42,397 | 6% |
| Columbia, South Carolina (Central Midlands Area) | 7,208 | 7,802 | 8% |
| | | | |
| Colorado | 43,539 | 48,641 | 12% |
| Colorado (rest of state) | 19,458 | 21,669 | 11% |
| Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado | 24,081 | 26,972 | 12% |
| | | | |
| North Carolina | 80,200 | 101,515 | 27% |
| North Carolina (rest of state) | 77,420 | 98,539 | 27% |
| Fayetteville, North Carolina (Cumberland County) | 2,780 | 2,976 | 7% |
| | | | |

## Table B-29: Vehicle Miles Traveled (VMT) Change from 2002 to 2006 In 14 Nonattainment-Deferred EAC Program Areas

| Geographic Areas | VMT Estimates | | Percent Change 2002 to 2006 |
|---|---|---|---|
| | 2002 | 2006 | |
| Virginia | 77,396 | 81,095 | 5% |
| West Virginia (rest of state) | 76,260 | 80,084 | 5% |
| Frederick Co, Virginia | 1,136 | 1,011 | -11% |
| | | | |
| North Carolina | 80,200 | 101,515 | 27% |
| North Carolina (rest of state) | 63,849 | 83,865 | 31% |
| Greensboro-Winston Salem-High Point, North Carolina (Triad Area) | 16,351 | 17,650 | 8% |
| | | | |
| South Carolina | 47,074 | 50,199 | 7% |
| Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area) | 10,887 | 11,535 | 6% |
| South Carolina (rest of state) | 36,187 | 38,664 | 7% |
| | | | |
| North Carolina | 80,200 | 101,515 | 27% |
| North Carolina (rest of state) | 77,197 | 97,785 | 27% |
| Hickory-Morganton-Lenoir, North Carolina (Unifour Area) | 3,003 | 3,730 | 24% |
| | | | |
| Tennessee | 68,315 | 70,596 | 3% |
| Tennessee (rest of state) | 64,428 | 66,508 | 3% |
| Johnson City-Kingsport-Bristol, Tennessee | 3,887 | 4,088 | 5% |
| | | | |
| Tennessee | 68,315 | 70,596 | 3% |
| Tennessee (rest of state) | 52,439 | 51,493 | -2% |
| Nashville, Tennessee | 15,876 | 19,103 | 20% |
| | | | |
| Virginia | 77,396 | 81,095 | 5% |
| Virginia (rest of state) | 74,909 | 78,510 | 5% |
| Roanoke, Virginia | 2,487 | 2,585 | 4% |
| | | | |
| Texas | 217,820 | 238,256 | 9% |

## Table B-29: Vehicle Miles Traveled (VMT) Change from 2002 to 2006 In 14 Nonattainment-Deferred EAC Program Areas

| Geographic Areas | VMT Estimates | | Percent Change 2002 to 2006 |
|---|---|---|---|
| | 2002 | 2006 | |
| Texas (rest of state) | 202,853 | 221,891 | 9% |
| San Antonio, Texas | 14,967 | 16,365 | 9% |
| | | | |
| Maryland | 53,758 | 56,302 | 5% |
| Maryland (rest of state) | 51,872 | 54,266 | 5% |
| Washington Co (Hagerstown), Maryland | 1,886 | 2,036 | 8% |

Source: The VMT numbers come from the National Emissions Inventory's VMT estimates, which are derived from the Highway Performance Monitoring System (HPMS). It is important to note that they are subject to significant uncertainty that can cause over or underestimates. HPMS was designed to collect statewide data to populate a national database that would be used to: (1) assess the performance and condition of the nationwide transportation system; and, (2) help guide national investment priorities. The sampling techniques were designed for these purposes. They may not be appropriate for estimating small changes in VMT in smaller geographic areas such as the areas included in this study. While the margin of error at the statewide and national level is acceptable for the purposes that HPMS was designed for, it is unclear whether the margin of error at the nonattainment areas scale would render the study inconclusive (see http://www.fhwa.dot.gov/policy/ohpi/hpms/abouthpms.htm).

For partial counties, the VMT estimates are for the entire county, while the EAC Program Area includes only part of the county. This includes the Columbia, South Carolina (Central Midlands Area); Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado and Hickory-Morganton-Lenoir, North Carolina (Unifour Area) areas.

## Table B-30: VMT Change From 2002 to 2006 in 6 Attainment EAC Program Areas

| Geographic Area | VMT Estimates | | Percent Change 2002 to 2006 |
|---|---|---|---|
| | 2002 | 2006 | |
| United States | 2,822,279 | 3,014,116 | 7% |
| South | 1,120,903 | 1,225,953 | 9% |
| West | 585,246 | 645,007 | 10% |
| | | | |
| Texas | 217,820 | 238,256 | 9% |
| Texas (rest of state) | 204,732 | 223,931 | 9% |
| Austin, Texas | 13,088 | 14,325 | 9% |
| | | | |
| South Carolina | 47,074 | 50,199 | 7% |
| South Carolina (rest of state) | 41,425 | 43,947 | 6% |
| Berkeley-Charleston-Dorchester, South Carolina | 5,649 | 6,252 | 11% |
| | | | |
| North Carolina | 80,200 | 101,515 | 27% |
| North Carolina (rest of state) | 77,085 | 97,509 | 26% |
| Mountain Area of Western North Carolina (Asheville) | 3,115 | 4,006 | 29% |
| | | | |
| Oklahoma | 45,732 | 48,689 | 6% |
| Oklahoma (rest of state) | 31,938 | 34,493 | 8% |
| Oklahoma City, Oklahoma | 13,793 | 14,196 | 3% |
| | | | |
| Georgia | 106,727 | 113,532 | 6% |
| Georgia (rest of state) | 103,992 | 110,483 | 6% |
| South Carolina | 47,074 | 50,199 | 7% |
| South Carolina (rest of state) | 43,020 | 46,179 | 7% |
| Lower Savannah-Augusta, South Carolina-Georgia (Georgia portion) | 2,736 | 3,049 | 11% |
| Lower Savannah-Augusta, South Carolina-Georgia (South Carolina portion) | 4,054 | 4,020 | -1% |
| Lower Savannah-Augusta, South Carolina-Georgia | 6,790 | 7,069 | 4% |
| | | | |
| Oklahoma | 45,732 | 48,689 | 6% |

## Table B-30: VMT Change From 2002 to 2006 in 6 Attainment EAC Program Areas

| Geographic Area | VMT Estimates | | Percent Change 2002 to 2006 |
|---|---|---|---|
| | 2002 | 2006 | |
| Oklahoma (rest of state) | 35,093 | 37,215 | 6% |
| Tulsa, Oklahoma | 10,639 | 11,474 | 8% |

Source: The VMT numbers come from the National Emissions Inventory's VMT estimates, which are derived from the Highway Performance Monitoring System (HPMS). It is important to note that they are subject to significant uncertainty that can cause over or underestimates. HPMS was designed to collect statewide data to populate a national database that would be used to: (1) assess the performance and condition of the nationwide transportation system; and, (2) help guide national investment priorities. The sampling techniques were designed for these purposes. They may not be appropriate for estimating small changes in VMT in smaller geographic areas such as the areas included in this study. While the margin of error at the statewide and national level is acceptable for the purposes that HPMS was designed for, it is unclear whether the margin of error at the nonattainment areas scale would render the study inconclusive (see http://www.fhwa.dot.gov/policy/ohpi/hpms/abouthpms.htm).

For partial counties, the VMT estimates are for the entire county, while the EAC Program Area includes only part of the county. This includes the Mountain Area of Western North Carolina (Asheville) area.

## Table B-31: EPA Resources for Traditional Approach versus EAC Program

| | EPA Full Time Equivalent (FTE) | | Number of EPA Federal Register Actions (pages) | Federal Register Cost* |
|---|---|---|---|---|
| | Regional Offices | Headquarters | | |
| **Hypothetical Areas – Traditional Approach** | | | | |
| Estimate for resources required for a typical nonattainment area from State Implementation Plan (SIP) development through redesignation to attainment (about 4.5 years). | | | | |
| Headquarters | NA | 13.05 | 0 | $0 |
| Regions | 11.5 to 44.2 | NA | 28 (715 pages) actions to 46 actions (1,085 pages) | $349,635 to $530,565 |
| *Subtotal* | 11.5 to 44.2 | 13.05 | 28 (715 pages) actions to 46 actions (1,085 pages) | $349,635 to $530,565 |
| Resources required for a typical attainment area | | | | |
| Headquarters | 0 | 0 | 0 | $0 |
| Regions | 0 | 0 | 0 | $0 |
| *Subtotal* | 0 | 0 | 0 | $0 |
| *Total estimate for hypothetical nonattainment and attainment areas* | 11.5 to 44.2 | 13.05 | 28 (715 pages) actions to 46 actions (1,085 pages) | $349,635 to $530,565 |
| **EAC Program**** | | | | |
| Estimate for resources includes program startup (about 6 years). | | | | |
| Headquarters | NA | 7.174 | 11 actions (326 pages) | $159,414 |
| Regions | 16.66 | NA | 44 actions (235 pages) | $114,915 |
| *Total for all EAC Program Areas* | 16.66 | 7.174 | 55 actions (561 pages) | $274,329 |

Source: EPA Headquarters and Regional Office Staff

*Assumes current Federal Register of $489 per page.

**EPA resources expended on the EAC Program were not tracked during EAC Program implementation. Therefore, the resource numbers presented here for the EAC Program are "after the fact" estimates.

**Steps for Completing Resource Estimates for Table:**

Note: For the traditional approach, assume no resources expended on SIP program for attainment areas.

**Step 1:** Determine the year 2000 population and classification for the 14 nonattainment-deferred areas that they would have had if they had not become EAC Program areas but instead became traditional nonattainment areas

**Step 2:** Sort the areas by year 2000 population.

| Nonattainment-Deferred EAC Program Area | 2000 Population | 8-Hour Nonattainment Classification* |
|---|---|---|
| **Small (<250,000)** | | |
| Frederick Co, Virginia | 82,794 | Subpart 1 |
| Berkeley and Jefferson Counties, West Virginia | 118,095 | Subpart 1 |
| Washington County, Maryland (Hagerstown) | 131,923 | Subpart 1 |
| Johnson City-Kingsport-Bristol, Tennessee | 206,611 | Subpart 1 |
| Roanoke, Virginia | 235,932 | Subpart 1 |
| **Mid size (250,000 to 800,000)** | | |
| Fayetteville, North Carolina (Cumberland County) | 302,963 | Subpart 1 |
| Hickory-Morganton-Lenoir, North Carolina (Unifour Area) | 309,512 | Subpart 1 |
| Chattanooga, Tennessee-Georgia | 372,264 | Subpart 1 |
| Columbia, South Carolina (Central Midlands Area) | 494,518 | Subpart 1 |
| Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area) | 799,147 | Subpart 1 |
| **Large (> 800,000)** | | |
| Nashville, Tennessee | 1,097,810 | Subpart 1 |
| Greensboro-Winston Salem-High Point, North Carolina (Triad Area) | 1,285,879 | Marginal |
| San Antonio, Texas | 1,559,975 | Subpart 1 |
| Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado | 2,811,580 | Subpart 1 |

*The classification the areas would have had, at least initially, had they not become EAC Program areas and instead pursued the traditional route.

**Step 3:** Determine what size and classification of traditional area resource estimate needed and list the areas here:

- Small Subpart 1 nonattainment area;
- Mid size Subpart 1 nonattainment area; and
- Large Subpart 1 nonattainment area.

**Step 4:** Regions 3, 4, 6, and 8 develop estimates of "average" resources (e.g., FTE and Federal Register actions with pages) required for the three types of areas listed in step 3 based on regional experience with other Subpart 1 areas.

- Estimate should encompass SIP development through redesignation to attainment (about 4.5 years);
- Estimate should include all regional resources (e.g., technical and policy/planning staff, regional counsel, management);
- Estimate should be averages based on regional experience with one or more examples of each type of area listed in Step 3; and
- If a region lacks an example to use for one or two of the area types, then no estimate should be submitted for those types except that:
    - Region 6 should use examples of marginal or moderate areas to develop their estimates.

**Step 5:** Calculate "average," per area resource estimate (of the regional estimates) for each area type for each resource to produce the following:

| **Area Type** | **"Average" Regional Resource Estimates Across The Areas In Each Region That Would Have Had Subpart 1 Areas** |
|---|---|
| Small Subpart 1 nonattainment areas | Region 3:<br>• FTE: 1.9<br>• Federal Register Actions: 2<br>• Federal Register Pages: 59<br>• Federal Register Cost*: $28,851 |
| Mid size Subpart 1 nonattainment areas | Region 3:<br>• FTE: 1.9<br>• Federal Register Actions: 2<br>• Federal Register Pages: 60<br>• Federal Register Cost*: $29,340<br>Region 4:<br>• FTE: 0.25<br>• Federal Register Actions: 4<br>• Federal Register Pages: 130<br>• Federal Register Cost*: $63,570 |

| Area Type | "Average" Regional Resource Estimates Across The Areas In Each Region That Would Have Had Subpart 1 Areas |
|---|---|
| Large Subpart 1 nonattainment areas | Region 4:<br>• FTE: 0.18<br>• Federal Register Actions: 2<br>• Federal Register Pages: 30<br>• Cost*: $14,670<br>Region 8:<br>• FTE: 6.3<br>• Federal Register Actions: 4<br>• Federal Register Pages: 35<br>• Cost*: $17,115 |

*Federal Register costs are assumed to be current: $163/column or $489/page at 3 columns per page.

**Step 6:** Multiply the range of "average" resource estimate for each area type by the number of areas in that type as follows:

- Small Subpart 1 nonattainment area
  - Average FTE resource estimate * 5 nonattainment deferred EAC Program areas = 9.5
  - Average Federal Register action resource estimate * 5 nonattainment deferred EAC Program areas = 10
  - Average Federal Register pages resource estimate * 5 nonattainment deferred EAC Program areas = 295
  - Average Federal Register cost estimate * 5 nonattainment deferred EAC Program areas = $144,255;
- Mid size Subpart 1 nonattainment area
  - Average FTE resource estimate * 5 nonattainment deferred EAC Program areas = 1.25 to 9.5
  - Average Federal Register action resource estimate * 5 nonattainment deferred EAC Program areas = 10 to 20
  - Average Federal Register pages resource estimate * 5 nonattainment deferred EAC Program areas = 300 to 650
  - Average Federal Register cost estimate * 5 nonattainment deferred EAC Program areas = $146,700 to $317,850; and
- Large Subpart 1 nonattainment area
  - Average FTE resource estimate * 4 nonattainment deferred EAC Program areas = 0.72 to 25.2
  - Average Federal Register action resource estimate * 4 nonattainment deferred EAC Program areas = 8 to 16
  - Average Federal Register pages resource estimate * 4 nonattainment deferred EAC Program areas = 120 to 140
  - Average Federal Register cost estimate * 4 nonattainment deferred EAC Program areas = $58,680 to $68,460.

**Step 7:** Estimate the total EPA regional resources that would have been required had the 14 EAC Program areas been traditional nonattainment areas as follows:

- Total FTE resources: 11.5 to 44.2 = 9.5 (total for small Subpart 1 nonattainment areas) + 1.25 to 9.5 (total for mid size Subpart 1 nonattainment areas) + 0.72 to 25.2 (total large Subpart 1 nonattainment area);
- Total Federal Register actions: 28 to 46 = 10 (total for small Subpart 1 nonattainment areas) + 10 to 20 (total for mid size Subpart 1 nonattainment areas) + 8 to 16 (total for large Subpart 1 nonattainment area);
- Total Federal Register pages: 715 to 1,085 = 295 (total for small Subpart 1 nonattainment areas) + 300 to 600 (total for mid size Subpart 1 nonattainment areas) + 120 to 140 (total for large Subpart 1 nonattainment area); and
- Total Federal Register cost: $349,635 to $530,565 = $144,255 (total for small Subpart 1 nonattainment areas) + $146,700 to $317,850 (total for mid size Subpart 1 nonattainment areas) + $58,680 to 68,460 (total for large Subpart 1 nonattainment area).

**Step 8:** Estimate the total EPA headquarters resources that would have been required had the 14 EAC Program areas been traditional nonattainment areas as follows:

- 2.9 FTE per year to support SIP development (primarily responding to issues from Regions; does not include development of SIP policy and guidance), including Office of Air Quality Planning and Standards (2.5/year), Office of Transportation and Air Quality (0.2/year) and Office of General Counsel (0.2/year);
- Total FTE resources: 13.05 = 2.9 FTE per year * 4.5 years; and
- No resources required for SIP area-specific Federal Register actions since those are all issued by the regions.

**Step 9:** Estimate the total EPA resources that would have been required had the 14 EAC Program areas been traditional nonattainment areas as follows:

- Total FTE resources 24.5 to 57.2 = 13.05 (total headquarters FTE resources) + 11.5 to 44.2 (total regional FTE resources);
- Total Federal Register actions 28 to 46 = 0 (total headquarters Federal Register actions) + 28 to 46 (total regional Federal Register actions);
- Total Federal Register pages 715 to 1,085 = 0 (total headquarters Federal Register pages) + 715 to 1,085 (total regional Federal Register pages); and
- Total Federal Register cost: $349,635 to $530,565 = $0 (total headquarters Federal Register cost) + $347,635 to $530,565 (total regional Federal Register cost).

**Step 10:** Estimate the total EPA resources that were devoted to the EAC Program from the program's start thru April 2008 (about 6 years; excluding this study):

- Total FTE resources 23.8 = 7.174 (total headquarters FTE resources: OAQPS -- 6.244 FTE, OTAQ -- 0.2 FTE, OGC -- 0.73 FTE) + 16.66 (total regional FTE resources: Region 3 -- 5 FTE; Region 4 – 1.36 FTE; Region 6 -- 3.6 FTE; Region 8 -- 6.7 FTE);
- Total Federal Register actions 55 = 11 (total headquarters Federal Register actions: OAQPS -- 11 Federal Register actions) + 44 (total regional Federal Register actions: Region 3 -- 11 Federal Register actions; Region 4 -- 6 Federal Register actions; Region 6 -- 25 Federal Register actions; Region 8 -- 2 Federal Register actions);
- Total Federal Register pages 561 = 326 (total headquarters Federal Register pages: OAQPS-- 326 pages) + 235 (total EPA regional Federal Register pages: Region 3 -- 136 pages; Region 4 -- 37 pages; Region 6 -- 45 pages; Region 8 -- 17 pages); and
- Total Federal Register Cost $274,329 = 561 pages * $489/page (Federal Register costs are assumed to be current: $163/column or $489/page at 3 columns per page. This is to ensure that the comparison with EAC costs is on a consistent basis.).

**Table B-32: Summary of Requirements for Nonattainment-Deferred EAC 8-Hour Ozone Areas Compared to a Summary of Requirements for Clean Air Act (CAA) Subpart 1 and Subpart 2 Marginal 8-hour Ozone Nonattainment Areas**

| Element | Early Action Compacts | Subpart 1 Area Requirements | Subpart 2/Marginal Area Requirements |
|---|---|---|---|
| **IMPORTANT NOTE:** The subpart 1 and 2 requirements presented here are the requirements that EPA interprets as applying to the 14 EAC nonattainment-deferred areas had they not become EAC Program areas but had instead become designated nonattainment areas under the CAA. The list below constitutes only an outline of the general requirements of the CAA. It should not be relied on for regulatory purposes but serves for historical information purposes only. In December 2006, the US Court of Appeals for the DC Circuit issued an opinion that vacated EPA's rule that placed certain 8-hr ozone nonattainment areas under subpart 1 of the CAA (the Court's mandate issued on August 29, 2007). All but one of the EAC areas had design values consistent with the marginal classification under subpart 2 had EPA's rule initially placed them under subpart 2. Most of the subpart 1 requirements in the 3rd column of this table no longer apply to the areas that were originally placed under subpart 1. EPA is currently developing rulemaking to address the requirements for the areas that were originally placed under subpart 1. | | | |
| Attainment Dates | Attainment not later than December 31, 2007. Failure to attain by this date will result in the nonattainment designation becoming effective. But if an area failed to achieve milestones, including attaining the 8-hour ozone standard on or before December 31, 2007, the area will have been deemed in violation of the Compact and will have been subject to the full planning requirements under applicable CAA standard SIP processes including requirements defined as part of the EPA's 8-hour implementation rulemaking. Such an area would have been subject to the same requirements and deadlines which would have been effective under the CAA and the EPA's 8-hour designation rulemaking had it not participated in this program, with no preferential delays or exemptions from the EPA. | Attainment is as expeditiously as practicable, but no later than 5 years after nonattainment designation: June 15, 2009 (may extend up to 10 years based on specified considerations) | CAA requirements: Attainment is as expeditiously as practicable, but no later than 3 years from CAA Amendments enactment; 40 Code of Federal Regulations 51.903 (a) requires attainment within 3 years after designation, or by June 15, 2007. |
| Reasonable Further Requirement | None | "Annual incremental emissions reductions" | None |

**Table B-32: Summary of Requirements for Nonattainment-Deferred EAC 8-Hour Ozone Areas Compared to a Summary of Requirements for Clean Air Act (CAA) Subpart 1 and Subpart 2 Marginal 8-hour Ozone Nonattainment Areas**

| Element | Early Action Compacts | Subpart 1 Area Requirements | Subpart 2/Marginal Area Requirements |
|---|---|---|---|
| Milestone Compliance Determination | Must include clearly measurable milestones for the development and implementation of the plan. Local areas will assess and report their progress against milestones in a regular, public process, at least every six months starting June 2003 and ending December 2007.<br><br>Milestones will include, at a minimum:<br>- Completion of emissions inventories and modeling;<br>- Adoption of control strategies that demonstrate attainment;<br>- Completion and adoption of the early action SIP revision;<br>- Attainment not later than December 31, 2007; and<br>- Post-attainment demonstration and plan updates.<br><br>By June 30, 2006, compact areas must certify progress toward attainment since previous milestone, e. g., continued implementation and progress toward improvement in air quality and emissions reductions. | Not required as such; contingency measures supposed to be implemented upon failure to meet Reasonable Further Progress (RFP) | No specific requirement |

**Table B-32: Summary of Requirements for Nonattainment-Deferred EAC 8-Hour Ozone Areas Compared to a Summary of Requirements for Clean Air Act (CAA) Subpart 1 and Subpart 2 Marginal 8-hour Ozone Nonattainment Areas**

| Element | Early Action Compacts | Subpart 1 Area Requirements | Subpart 2/Marginal Area Requirements |
|---|---|---|---|
| Attainment demonstration submission | Emission inventories will be used to develop SIP quality modeling episodes that perform within the EPA's accepted margin of accuracy, including a base case and future case on or before December 31, 2007. Therefore, inventories must sufficiently account for projected future growth in ozone precursor emissions, particularly from stationary, non-road, and on-road mobile sources.<br><br>Local area must carefully document modeling approach, and work will be supported and reviewed by the state and concurrently reviewed by the EPA.<br><br>Quantifiable emission reduction measures will be integrated into the future case to produce one or more control cases. These control cases will be used to indicate the relative effectiveness of different measures and aid in selecting appropriate measures.<br><br>Prior to plan implementation the control strategies should be determined based on model results from a control case episode that shows achievement of the 8-hour ozone standard on or before December 31, 2007 through implementation of the control strategies.<br><br>Communities will continue to develop other episodes as necessary to fully represent the variety of situations that typically contribute to ozone production in the area and to support the plan with the most current information and tools. Other episodes may also indicate necessary revisions to ensure that sufficient emission reduction measures are selected and implemented to continue to achieve target ozone concentration levels.<br><br>By December 31, 2004, states must submit a SIP consisting of the local plan, including all adopted control measures that demonstrate attainment of the 8-hour ozone National Ambient Air Quality Standard (NAAQS) by December 31, 2007. | Attainment demonstration required. EPA sets date that can be no later than 3 years after designation (due June 15, 2007). | Not required |
| Nonattainment New Source Review (NSR) and Reasonably Available Control Technology | Not required. | 100 tons per year (any needed SIP revision due June 15, 2007) | 100 tons per year (any SIP revision due June 15, 2007) |

**Table B-32: Summary of Requirements for Nonattainment-Deferred EAC 8-Hour Ozone Areas Compared to a Summary of Requirements for Clean Air Act (CAA) Subpart 1 and Subpart 2 Marginal 8-hour Ozone Nonattainment Areas**

| Element | Early Action Compacts | Subpart 1 Area Requirements | Subpart 2/Marginal Area Requirements |
|---|---|---|---|
| (RACT) major source applicability | | | |
| Nonattainment NSR offsets | Not required. | New/modified source emissions must be offset at least on a 1 to 1 basis (any SIP revision due June 15, 2007) | New/modified source emissions must be offset at least on a 1.1 to 1 (any SIP revision due June 15, 2007) |
| Nonattainment NSR permits | Not required. | Permits required (any SIP revision due June 15, 2007) | Construction permits for new or modified major stationary sources<br>pre-1990 permit program corrections (any SIP revision due June 15, 2007) |
| Reclassification to higher classification | No reclassification requirement. | NA | Required to reclassify to a higher classification if area does not meet attainment date |
| RACT control for nitrogen oxides ($NO_x$) | Not required. | None specified | None specified |
| $NO_x$ control for NSR | Not required. | None specified | Any SIP revision due June 15, 2007 |

**Table B-32: Summary of Requirements for Nonattainment-Deferred EAC 8-Hour Ozone Areas Compared to a Summary of Requirements for Clean Air Act (CAA) Subpart 1 and Subpart 2 Marginal 8-hour Ozone Nonattainment Areas**

| Element | Early Action Compacts | Subpart 1 Area Requirements | Subpart 2/Marginal Area Requirements |
|---|---|---|---|
| Emission inventory | Required using the most current tools available for at least one recent episode in order to support the early action plan. Emission inventories must include:<br>- 1999 or later episode reflective of a typical ozone season exceedance that meets the EPA episode selection guidance to ensure that representative meteorological regimes are considered;<br>- MOBILE6 data with link based Travel Demand Model mobile data in urban areas;<br>- NONROAD model data adjusted for local equipment populations and usage rates;<br>- Area source entered into database when possible on local survey data.<br>Further episode inventories will also be developed over time to fully represent the variety of situations that typically contribute to ozone production in the area and to include the most recent developments.<br>Emission inventories will be compared and analyzed for trends in emission sources over time.<br><br>By December 31, 2004, states must submit a SIP consisting of the local plan, including all adopted control measures that demonstrate attainment of the 8-hour ozone NAAQS by December 31, 2007. | Required in nonattainment area; no express requirement for updates or emission statements (due by June 15, 2007) | Comprehensive emissions inventory within 2 years of enactment (or designation); update every 3 years (until area attains). Provision for submission to state of annual emissions statements from volatile organic compounds (VOCs) and $NO_x$ stationary sources (due June 15, 2006) |
| Reasonably Available Control Measures (RACM)/RACT | Not required per se but, after all adopted federal and state or tribal controls that have been or will be implemented by the attainment date of December 31, 2007 are accounted for in the modeling, the local area will adopt additional local controls, as necessary, to demonstrate attainment of the 8-hour standard by December 31, 2007. As an initial matter, by June 16, 2003, the local area will identify and describe the local control measures that will be considered during the local planning process. The June 16, 2003 deadline for describing the control measures under consideration must be met to maintain eligibility in the program. While failure to list a measure at this stage would not preclude its adoption later, it is important to develop a reasonably complete initial list of measures. This will provide the public with clear information on the measures under consideration, will help ensure that interested parties are fully aware of the level of effort and local | General requirement for RACM, including RACT (due by June 15, 2007)* | Pre-1990 RACT fix-up for Control Technique Guidelines (CTGs) and major source RACT |

**Table B-32: Summary of Requirements for Nonattainment-Deferred EAC 8-Hour Ozone Areas Compared to a Summary of Requirements for Clean Air Act (CAA) Subpart 1 and Subpart 2 Marginal 8-hour Ozone Nonattainment Areas**

| Element | Early Action Compacts | Subpart 1 Area Requirements | Subpart 2/Marginal Area Requirements |
|---|---|---|---|
| | commitment that is necessary, and will demonstrate that the local area is making progress toward meeting the critical March 31, 2004 deadline for adoption of local measures. The resulting local plan must be completed and submitted to the state or tribal leader by March 31, 2004 for inclusion in the SIP. The local plan shall include measures that are specific, quantified, and permanent, and that if approved by EPA, will be federally enforceable SIP revisions. The March 31, 2004 submission also will include specific implementation dates for the adopted local controls, as well as detailed documentation and reporting processes.<br><br>Controls will be implemented as soon as practicable, but not later than December 31, 2005.<br><br>Controls will be designed and implemented by the community with full stakeholder participation.<br><br>All control measures will be incorporated by the state into the SIP and submitted to the EPA for review and approval. In the event that areas wish to add or substitute measures after SIP submittal, plan modifications will be treated as SIP revisions and facilitated by the state.<br><br>By June 16, 2003, compact areas were required to identify/describe local control measures that are being considered during the planning process and the control measures must be met to maintain program eligibility. By March 31, 2004, the resulting local plan, including control measures, must be completed and submitted to the state by this date for inclusion in the SIP. By December 31, 2005, compact areas must implement the local control measures that have been incorporated into the SIP. | | |

**Table B-32: Summary of Requirements for Nonattainment-Deferred EAC 8-Hour Ozone Areas Compared to a Summary of Requirements for Clean Air Act (CAA) Subpart 1 and Subpart 2 Marginal 8-hour Ozone Nonattainment Areas**

| Element | Early Action Compacts | Subpart 1 Area Requirements | Subpart 2/Marginal Area Requirements |
|---|---|---|---|
| Inspection and maintenance program | Not required. | Nothing specified | Pre-1990 Marginal inspection and maintenance programs, with changes that were required following the 1990 CAA amendments. |
| Conformity (transportation and general) | Not required. | Required (also required of subpart 2 areas) (conformity applies 1 year after the effective date of designations; transportation conformity requirements for metropolitan areas must be in place by then); conformity determinations for new project approvals that occur after date also due | No additional requirement specified in subpart 2. (Subpart 1 provision applies to all subpart 2 areas) |
| Consequences of failure to attain | See entry for "Reclassification to higher classification" | EPA to specify additional requirements; up to 10 more years to attain | Area receives a higher classification for failure to attain |

**Table B-32: Summary of Requirements for Nonattainment-Deferred EAC 8-Hour Ozone Areas Compared to a Summary of Requirements for Clean Air Act (CAA) Subpart 1 and Subpart 2 Marginal 8-hour Ozone Nonattainment Areas**

| Element | Early Action Compacts | Subpart 1 Area Requirements | Subpart 2/Marginal Area Requirements |
|---|---|---|---|
| Maintenance | The plan must include a component to address emissions growth at least 5 years beyond December 31, 2007, ensuring that the area will remain in attainment of the 8-hour standard during that period. This future attainment maintenance analysis may employ one or more of the following or any other appropriate techniques necessary to make such a demonstration:<br>- Modeling analysis showing ozone levels below the 8-hour standard in 2012;<br>- An annual review of growth (especially mobile and stationary source) to ensure control measures and growth assumptions are adequate;<br>- Identification and quantification of federal, state, and/or local measures indicating sufficient reductions to offset growth estimates.<br><br>The plan must also detail a continuing planning process that includes modeling updates and modeling assumption verification (particularly growth assumptions). Modeling updates and planning processes must consider and evaluate:<br>- all relevant actual new point sources;<br>- impacts from potential new source growth; and<br>- future transportation patterns and their impact on air quality in a manner that is consistent with the most current adopted Long Term Transportation Plan and most current trend and projections of local motor vehicle emissions.<br><br>If the review of growth demonstrates that adopted control measures are inadequate to address growth in emissions, additional measures will be added to the plan. Local planning processes should prepare for this possibility. | Requirement for maintenance plans (with 2 consecutive 10-year demonstrations of maintenance) for areas requesting redesignation from nonattainment to attainment | No additional specificity |
| Contingency measures | See entry for "Reclassification to higher classification" | Required for failure to make RFP or attainment | NA |

**Table B-32: Summary of Requirements for Nonattainment-Deferred EAC 8-Hour Ozone Areas Compared to a Summary of Requirements for Clean Air Act (CAA) Subpart 1 and Subpart 2 Marginal 8-hour Ozone Nonattainment Areas**

| Element | Early Action Compacts | Subpart 1 Area Requirements | Subpart 2/Marginal Area Requirements |
|---|---|---|---|
| Public Involvement | Public involvement will be conducted in all stages of the planning and implementation process. Public education programs will be used to raise awareness regarding issues, opportunities for involvement in the planning process, implementation of control strategies, and any other issues important to the area. Interested stakeholders will be involved in the planning process as early as possible. Planning meetings will be open to the public, with posted meeting times and locations. Plan drafts will be publicly available, and the drafts process will have sufficient opportunities for comment from all interested stakeholders. Public comment on the proposed final plan will follow the normal SIP revision process as implemented by the state. Semi-annual reports detailing, at a minimum, progress toward milestones, will be publicly presented and publicly available. | Required | Required |

*EPA's Phase 2 implementation rule had a two-tier approach for RACT for subpart 1 areas. If an area demonstrated attainment within 5 years after designation, the attainment demonstration was deemed to have met the RACT requirement (i.e., no separate requirement for CTG RACT or major source non-CTG RACT). If the area demonstrated attainment beyond 5 years after designation, then the area had to meet RACT requirements similar to a subpart 2 moderate area, which would have meant CTG RACT and major source non-CTG RACT. However, the DC Circuit Court vacated our placing any area under subpart 1, so that provision of the rule is now on hold pending EPA's publication of a rule that addresses the former subpart 1 areas.

Sources:

1. For EAC requirements: "Protocol For Early Action Compacts Designed To Achieve and Maintain the 8-Hour Ozone Standard," June 19, 2002, http://www.epa.gov/ttn/naaqs/ozone/eac/20020619_eac_protocol.pdf.
2. For subpart 1 and marginal area requirements: June 2, 2003 NPRM 68 Federal Register 32864.

## Appendix C: Approach for Calculating National (Federal) Measure Emission Reductions

### Introduction

This appendix provides the approach for developing estimates of emission reductions from national (federal) measures. In the 20 areas for which quantitative information was compiled for this study, four areas quantified the emissions reductions from implementation of federal measures that contributed to emission reductions towards attainment: Austin, Texas; Frederick County, Virginia; Roanoke, VA; and San Antonio, Texas. One other area partially estimated emissions reductions from federal measures: Washington County (Hagerstown), Maryland.

To provide as complete as possible an accounting of the federal emissions reductions, the study developed an approach for developing estimates of the emission reductions from federal measures. The study performed the calculation for following 14 areas (including the one area with partial federal measure estimates but excluding two areas that did not provide sufficient information to develop the estimates and the four areas that developed their own estimates):

### Nonattainment-Deferred Areas

- Berkeley and Jefferson Counties, West Virginia;
- Chattanooga, Tennessee-Georgia;
- Columbia, South Carolina (Central Midlands Area);
- Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado;
- Fayetteville, North Carolina (Cumberland County);
- Greensboro-Winston Salem-High Point, North Carolina (Triad Area);
- Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area);
- Hickory-Morganton-Lenoir, North Carolina (Unifour Area);
- Johnson City-Kingsport-Bristol, Tennessee;
- Nashville, Tennessee; and
- Washington County (Hagerstown), Maryland.

### Attainment Areas

- Mountain Area of Western North Carolina (Asheville);
- Oklahoma City, Oklahoma; and
- Tulsa, Oklahoma,

**Three-Step Process**
Generally, the approach consisted of three steps:

- **Step 1:** The first step is to calculate the difference in emissions in the base year (typically, a year between 1999 and 2002) and emissions in the 2007 control case. The emissions studied were the emissions that served as inputs into the air quality model used to demonstrate attainment. The number represents the total of state, local and federal emissions reductions, as well as emission increases resulting from population and industrial growth. Documentation for the emission inventory numbers can be found in the state and federal technical support documents developed to support the EAC Program SIPs (http://www.epa.gov/ttn/naaqs/ozone/eac/index.htm#EAC_Main).
- **Step 2:** Next, the emissions numbers in Tables B-5 to B-25, Appendix B for state and local measures that were quantified and modeled for each area were subtracted from the number derived in Step 1. For the one area with partial emission estimates from national measures, the emissions numbers subtracted from the number derived in Step 1 included emissions estimates for some, but not all, national measures. The resulting number for each area represents a reasonable *estimate* of emission reductions from federal measures in 13 of the 14 EAC areas. For the area with a partial estimate, the resulting number for each area represents a reasonable estimate of *other* emission reductions from federal measures. It is also important to note that of the 14 areas, the numbers for three areas derived in this step also include emission reductions from some state measures: Chattanooga, Tennessee-Georgia; Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado; and Nashville, Tennessee.
- **Step 3:** Finally**,** a new "Federal Measures" (or "Other Federal Measures") entry was created in each of the tables in Appendix B for the 14 areas to provide the number developed in Step 2.

**Step One: Calculating Overall Emission Reduction Number**
This table contains the calculations described in Step 1 above. The calculations are based on emissions information taken from the states' EAC SIP submittals.

| EAC Areas | Total Modeled $NO_x$ Reductions in Tons/Day from Base Year to 2007 | Total Modeled VOC Reductions in Tons/Day from Base Year to 2007 |
|---|---|---|
| **Nonattainment-Deferred EAC Program Areas** | | |
| Berkeley and Jefferson Counties, West Virginia | 1.9 | 0.4 |
| Chattanooga, Tennessee-Georgia | 27.43 | 26.9 |
| Columbia, South Carolina (Central Midlands Area) | 72 | 24.6 |
| Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado | 59 | 106.3 |
| Fayetteville, North Carolina (Cumberland County) | 10.2 | 7.8 |

| EAC Areas | Total Modeled $NO_x$ Reductions in Tons/Day from Base Year to 2007 | Total Modeled VOC Reductions in Tons/Day from Base Year to 2007 |
|---|---|---|
| Frederick County, Virginia | N/A | N/A |
| Greensboro-Winston Salem-High Point, North Carolina (Triad Area)[1] | 405.6 | 43.8 |
| Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area) | 67.2 | 41.8 |
| Hickory-Morganton-Lenoir, North Carolina (Unifour Area)[2] | 138.9 | 13.4 |
| Johnson City-Kingsport-Bristol, Tennessee | 12.63 | 20.74 |
| Nashville, Tennessee | 51.62 | 43.76 |
| Roanoke, Virginia | N/A | N/A |
| San Antonio, Texas | N/A | N/A |
| Washington County (Hagerstown), Maryland | 5.54 | 1.85 |
| **Attainment EAC Program Areas** | | |
| Austin, Texas | N/A | N/A |
| Berkeley-Charleston-Dorchester, South Carolina | N/A | N/A |
| Mountain Area of Western North Carolina (Asheville) | 48.4 | 7.1 |
| Oklahoma City, Oklahoma | 24.2 | 5.3 |
| Lower Savannah-Augusta, South Carolina-Georgia | N/A | N/A |
| Tulsa, Oklahoma | 58.6 | 10.9 |

[1] The Greensboro estimate includes substantial $NO_x$ reductions from a local electric generating unit.
[2] The Hickory estimate includes $NO_x$ reductions from a local electric generating unit.

**Steps Two and Three: Deriving an Estimate of Emission Reductions from Federal Measures and Creating an Entry in the Appendix B Tables**

This table indicates which types of measures that were quantified and modeled were subtracted from the number derived in Step 1 to derive an estimate of emission reductions from federal measures. It also indicates whether federal measures exist as a stand-alone entry in the Appendix B table or whether specific federal measures are listed.

| EAC Areas | Calculation to Create "Federal Measure" Entry in Appendix B Tables |
|---|---|
| **Nonattainment-Deferred EAC Program Areas** | |
| Berkeley and Jefferson Counties, West Virginia | For this area, the state of West Virginia modeled only national measures. The SIP did not provide any specific estimates for individual state and national measures. Therefore, Table B-5 contains an entry for national measures that is the number in Step 1 above. |
| Chattanooga, Tennessee-Georgia | Tennessee modeled state and national control measures, as well as several local measures. The Table B-6 contains an entry for national measures that was calculated by subtracting estimates for the modeled state and local measures contained in Table B-6 from the number in Step 1 above. The Chattanooga reduction estimate also includes estimates of the VOC emission reductions attributed to implementation of the statewide VOC reductions rule. |
| Columbia, South Carolina (Central Midlands Area) | South Carolina modeled only federal control measures. Table B-7 contains an entry for national measures that is the number in Step 1 above. |
| Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado | Colorado modeled state and national control measures. The Table B-8 contains an entry that includes national measures that was calculated by subtracting estimates for the modeled state measures contained in Table B-8 from the number in Step 1 above. The Denver reduction estimate for federal measures also includes estimates of the $NO_x$ and VOC emission reductions attributed to implementation of the state's motor vehicle I/M program.[3] |

[3] The estimates of the $NO_x$ and VOC emission reductions attributed to implementation of the state's motor vehicle I/M program are embedded in the MOBILE6.2 emissions modeling work. The MOBILE6.2 model is used to project emission reductions from vehicle fleets from Federal tailpipe requirements and from fleet turnover with newer, less-polluting vehicles replacing older vehicles. When states run the MOBILE6.2 model, flags can be tripped in the model for the applicable I/M program being implemented for that year. The MOBILE6.2 model then uses all these data inputs to calculate predicted future year emission reductions (as in from a 2002 fleet to a 2007 fleet).

| EAC Areas | Calculation to Create "Federal Measure" Entry in Appendix B Tables |
|---|---|
| Fayetteville, North Carolina (Cumberland County) | North Carolina modeled state and national control measures. The Table B-9 contains an entry for national measures that was calculated by subtracting estimates for the modeled state measures contained in Table B-9 from the number in Step 1 above. |
| Frederick County, Virginia | Table B-10 contains estimates the state provided of emissions reductions from federal measures. |
| Greensboro-Winston Salem-High Point, North Carolina (Triad Area) | North Carolina modeled state and national control measures, as well as a local measure. The Table B-11 contains an entry for national measures that was calculated by subtracting estimates for the modeled state and local measures contained in Table B-11 from the number in Step 1 above. |
| Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area) | South Carolina modeled only federal control measures. Table B-12 contains an entry for national measures that is the number in Step 1 above. |
| Hickory-Morganton-Lenoir, North Carolina (Unifour Area) | North Carolina modeled state and national control measures. The Table B-13 contains an entry for national measures that was calculated by subtracting estimates for the modeled state measures contained in Table B-13 from the number in Step 1 above. |
| Johnson City-Kingsport-Bristol, Tennessee | Tennessee modeled state and national control measures, as well as a local measure. The Table B-14 contains an entry for national measures that was calculated by subtracting estimates for the modeled state and local measures contained in Table B-14 from the number in Step 1 above. |
| Nashville, Tennessee | Tennessee modeled state and national control measures, as well as a local measure. The Table B-15 contains an entry for national measures that was calculated by subtracting estimates for the modeled state and local measures contained in Table B-15 from the number in Step 1 above. The Chattanooga reduction estimate also includes estimates of the VOC emission reductions attributed to implementation of the statewide VOC reductions rule. |
| Roanoke, Virginia | Table B-16 contains estimates the state provided of emissions reductions from federal measures. |
| San Antonio, Texas | Table B-17 contains estimates the state provided of emissions reductions from federal measures. |
| Washington County (Hagerstown), Maryland | Maryland modeled state and national control measures. The Table B-18 contains an entry for *other* national measures that was calculated by subtracting estimates for the state and national measures contained in Table B-18 from the number in Step 1 above. |

| EAC Areas | Calculation to Create "Federal Measure" Entry in Appendix B Tables |
|---|---|
| **Attainment EAC Program Areas** | |
| Austin, Texas | Table B-19 contains estimates that the state provided of emissions reductions from federal measures as a whole. |
| Berkeley-Charleston-Dorchester, South Carolina | N/A |
| Mountain Area of Western North Carolina (Asheville) | North Carolina modeled state and national control measures. The Table B-21 contains an entry for national measures that was calculated by subtracting estimates for the modeled state measures contained in Table B-21 from the number in Step 1 above. |
| Oklahoma City, Oklahoma | Oklahoma modeled local and national control measures. The Table B-22 contains an entry for national measures that was calculated by subtracting the estimate for the modeled local measure contained in Table B-22 from the number in Step 1 above. |
| Lower Savannah-Augusta, South Carolina-Georgia | N/A |
| Tulsa, Oklahoma | Oklahoma modeled local and national control measures. The Table B-24 contains an entry for national measures that was calculated by subtracting the estimate for the modeled local measure contained in Table B-24 from the number in Step 1 above. |

## Appendix D: Brief Profile of the 14 Nonattainment-Deferred Areas and Six Attainment EAC Program Areas Included in this Study

### 14 Nonattainment-Deferred Areas:

**Berkeley and Jefferson Counties, West Virginia**
The Eastern Panhandle Region Early Action Compact (EAC) Program Area in West Virginia includes both Berkeley and Jefferson Counties. Both counties are relatively rural in character. Berkeley County covers 321 square miles and includes the City of Martinsburg, a city of roughly 15,000 people. The entire population of Berkeley County is approximately 76,000. Jefferson County is smaller, covering 212.4 square miles with a population of approximately 42,190. The three largest towns in Jefferson County are Charles Town (2,907), Ranson (2,951) and Bolivar (1,045). Historically, there had been little reason to site an air pollution monitor in the area due to its relatively low population and largely rural nature. More recently, growth in Berkeley and Jefferson Counties has largely been residential in character with few new large air pollution sources. Nevertheless, an ozone monitor was set up in Martinsburg, West Virginia that began operating in 2000 with complete quality assured ozone season data becoming available starting in 2001.

**Chattanooga, Tennessee-Georgia**
The Chattanooga, Tennessee-Georgia EAC Program Area is located on the southeastern side of Tennessee at the Tennessee-Georgia border. It consists of the unclassifiable/attainment counties of Marion County, Tennessee and Walker County, Georgia and the nonattainment-deferred counties of Hamilton and Meigs County, Tennessee and Catoosa County, Georgia. The population of the area is 372,264.

**Columbia, South Carolina (Central Midlands Area)**
The Columbia EAC Program Area consists of two nonattainment-deferred counties, Richland and Lexington and two unclassifiable/attainment counties, Newberry and Fairfield. It is located in the center of the state surrounding the City of Columbia, the capitol of South Carolina. The population is 494,518.

**Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado**
The Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado EAC area is located on the plains directly adjacent and east of the Front Range Mountains of the Colorado section of the Rocky Mountains. Metro-Denver is located in a slight depression area or shallow bowl (at 5,280 feet) with slightly rolling prairie areas to the north, east, and south. At the southern extend, a ridge called the Palmer Divide extends perpendicular to the Front Range and to the west of the entire area are the foothills (typically 9,000 feet) of the Front Range Mountains. The population of the Denver-Boulder-Greeley-Fort Collins-Loveland, Colorado area is approximately 2.5 million and contains the major cities of Denver, Aurora, Fort Collins, Boulder, Longmont, Loveland, Golden, and Greeley.

**Fayetteville, North Carolina (Cumberland County)**
The Fayetteville EAC Program Area consists of Cumberland County and is located in southeastern North Carolina. Cumberland County was nonattainment-deferred. It is a mixture of urban and rural lands. The 2000 census population for Cumberland County was 302,963, some of which is rural -- 20,540 -- and most of which lies within the Urbanized Area Boundary -- 282,423. Population density is also varied. Because of the difference in land use and densities, care was exercised when proposing and

selecting strategies to be implemented by such diverse jurisdictions. The Cantonment Area of Fort Bragg Military Reservation and Pope Air Force Base are also located within Cumberland County.

**Frederick County, Virginia**
The Northern Shenandoah Valley EAC Area consists of the City of Winchester and Frederick County and is located in the Valley and Ridge Region of Virginia that includes the Northern Shenandoah Valley and the Appalachian Ridge. The major urban center of the area is the City of Winchester that is surrounded by the suburban/rural Frederick County. Much of the western portion of Frederick County is mountainous and forested rural area associated with the Appalachian Ridge. The majority of the area's population (82,794 in 2000) and industry is centered in and around Winchester, Virginia. The area's monitor is located in Northeastern Frederick County just south of the West Virginia border.

**Greensboro-Winston Salem-High Point, North Carolina (Triad Area)**
The Triad EAC Program Area is located in the northern central portion of North Carolina. The nonattainment-deferred counties in the EAC Program Area were Rockingham, Caswell, Forsyth, Guilford, Alamance, Davie, Davidson and Randolph. The unclassifiable/attainment counties in the EAC Program Area were Surry, Yadkin and Stokes. Population of the Triad EAC Program Area is 1,285,879.

**Greenville-Spartanburg-Anderson, South Carolina (Appalachian Area)**
The Appalachian (Greenville-Spartanburg-Anderson), North Carolina EAC Program Area is in the northwest section of South Carolina. It consists of the nonattainment-deferred counties of Spartanburg, Greenville and Anderson and the unclassifiable/attainment counties of Cherokee, Pickens and Oconee. The larger cities in the area include Greenville and Spartanburg. The population of the Appalachian EAC Program Area is 310,000.

**Hickory-Morganton-Lenoir, North Carolina (Unifour Area)**
The Unifour area includes Alexander, Burke, Caldwell, and Catawba Counties. All of these counties were nonattainment-deferred. It is located in the central eastern portion of the state. The population for the EAC Program Area is 1,300,000. The City of Hickory noted a period of unprecedented growth in the 1990s. This was accompanied by an increased reliance on non-public transportation. The increase in vehicles miles traveled that resulted contributed to such challenges as congestion and air pollution. Thus, beginning in the summer of 1998, the City of Hickory has been very active in trying to reduce air pollution in the Unifour area. Caldwell County and Catawba County have been very active as well. There are two ozone monitors in Unifour EAC Program Area. One is located in Lenoir, Caldwell County and the other in Taylorsville, Alexander County.

**Johnson City-Kingsport-Bristol, Tennessee**
The Johnson City-Kingsport-Bristol, Tennessee EAC Program Area is located in the far Northeast corner of the state. It consists of two nonattainment-deferred counties, Sullivan and Hawkins and four unclassifiable/attainment counties, Washington, Unicoi, Carter and Johnson. The population of the area is 207,000. Hawkins and Sullivan Counties are located in the ridge and valley section of the East Grand Division of the state bordering Virginia.

**Nashville, Tennessee**
The Nashville, Tennessee EAC Program Area is located in the north central portion of the state and consists of eight counties. Five of the counties are nonattainment-deferred. These include Davidson,

Rutherford, Williamson, Wilson and Sumner Counties. The attainment counties are Robertson, Cheathan and Dickson Counties. The population of the area is 1,098,000.

**Roanoke, Virginia**
The Roanoke EAC Program Area is located within the Blue Ridge Mountain area of Virginia and has typical topographic characteristics of such a mountain and valley area. The major urbanized center area is located in a valley and made up of the Cities of Roanoke and Salem, along with the Town of Vinton, where the ozone monitor for the area is located. The more suburban and rural Roanoke County, with Botetourt, surrounds this core urban area to the North. The major commercial transportation corridor of Interstate 81 runs through the entire area from north to south, which is just to the west of the urban core. A significant portion of Northwestern Botetourt County is rural and part of the Jefferson National Forest.

The total land area of the Roanoke EAC Program Area is 851 square miles. According to the 2000 Census, the population was 235, 932, with a population density of 277 per square mile. The projected population growth in the Roanoke Area by expected by 2010 is 244,499 persons.

**San Antonio, Texas**
San Antonio is located in south central Texas, SSW of Austin. The San Antonio EAC Program Area consisted of four counties -- Bexar, Comal, Guadalupe and Wilson – with a population of 1,559,975 in 2000. The area has always been in attainment with the 1-hour ozone standard, but was not consistently able to maintain the 8-hr standard. In 2004, the San Antonio area was designated as nonattainment for the 8-hr ozone standard, but achieved the standard in 2007. The Alamo Area Council of Governments was the local lead for the EAC.

**Washington County (Hagerstown), Maryland**
Washington County is located in west-central Maryland, bounded by Pennsylvania, Virginia, and West Virginia. The county extends east to South Mountain, south to the merging of the Shenandoah and Potomac Rivers, north to the Pennsylvania border, and west to Sideling Hill Creek. It is bordered by the Appalachian Highlands, and situated at the center of the Cumberland Valley with low rolling hills, cultivated valleys, woodlands, and moderate elevations of 500-800 feet above sea level. Hagerstown, the county seat, is located in the center of the county and approximately 75 miles west of Washington, DC, and Baltimore.

Washington County enjoys a high employment rate and moderate incomes, with a lower cost of living than nearby metropolitan areas. According to the 2000 Census and the Maryland Department of Labor, Washington County had a population of 131,923 people, as well as 49,726 households and a workforce of 70,857 people. Projected population growth in Washington County is expected to increase from the 2000 levels, but not at the same rate from 1990 to 2000. The total land area in the county is 485 square miles. The population density is relatively small compared to the counties in the Baltimore and Washington, DC areas, which have a population density over 1,000 people per square mile.

**Six Attainment EAC Program Areas:**

**Austin, Texas**
Austin is located in south central Texas, NNE of San Antonio. The Austin EAC Program Area consisted of five counties – Bastrop, Caldwell, Hays, Travis and Williamson – with a population of

1,249,763 in 2000. The area has always been in attainment with the 1-hour ozone standard, but was not consistently able to maintain the 8-hr standard.

**Berkeley-Charleston-Dorchester, South Carolina**
The Berkeley-Charleston-Dorchester, South Carolina EAC Program Area consists of Dorchester, Berkeley and Charleston Counties. It is located around the Charleston area on and around the Atlantic Coast. Charleston is the largest city in the area. The ozone monitor is located in Berkeley County.

**Mountain Area of Western North Carolina (Asheville)**
The Mountain Area Compact is a diverse region of five Western North Carolina counties comprising more than 2400 square miles. According to 2002 estimates, County populations range from 212,907 in Buncombe to 20,192 in Madison. Henderson (93,033), Haywood (55,299) and Transylvania (29,997) fall within those extremes. Population density, total workforce and infrastructure development exhibit similar county-to-county variation. Services and retail trade are strong factors in each local economy, reflecting the area's popularity for retirement living and for travel and tourism. All of the Mountain Area EAC counties were designated unclassifiable/attainment.

**Oklahoma City, Oklahoma**
Oklahoma City is located in central Oklahoma. The Oklahoma City or Central Oklahoma EAC Program Area consisted of seven counties: Canadian, Cleveland, Grady, Lincoln, Logan, McClain, and Oklahoma. In 2000 the area had a population of 1,083,346. The area has always been in attainment with the 1-hour ozone standard, but was not consistently able to maintain the 8-hr standard.

**Lower Savannah-Augusta, South Carolina-Georgia**
The Lower Savannah-Augusta, South Carolina-Georgia EAC Program Area is located in the southern central portion of South Carolina just south and west of Columbia. The area includes the Aiken-Augusta Area. The EAC Program Area consists of Aiken, Orangeburg, Barnwell, Calhoun, Allendale and Bamberg Counties in South Carolina and Richmond and Columbia Counties in Georgia. There are monitors each located in Barnwell and Aiken Counties in South Carolina. There are also ozone monitors in Richmond and Columbia Counties in Georgia.

**Tulsa, Oklahoma**
Tulsa is located in northwestern Oklahoma. The Tulsa EAC Program Area consisted of five counties: Tulsa county and portions of Creek, Osage, Rogers, and Wagoner. In 2000 the area had a population of 803,235. The area has been in attainment with the 1-hour standard, but has not consistently maintained the 8-hr standard.

## Appendix E: Summary of Discussions with State and Local Agencies

This appendix contains a complete summary of the discussions held with state and local officials as part of this study. It is organized into two parts. The first part contains the discussions held with state and local officials involved in the Early Action Compact (EAC) Program. The second part contains the discussions held with state and local officials with respect to the traditional State Implementation Plan (SIP) program. Each part is organized by study question with the responses under headings for each respondent.

## EAC PROGRAM AREA DISCUSSIONS

1) **Is the EAC model a more efficient way to deliver clean air to citizens in these areas (versus the traditional nonattainment designation approach)? If so, how? If not, why?**

## STATE ENVIRONMENTAL AGENCIES

### Colorado Department of Public Health and Environment (CDPHE)

The CDPHE believed that the EAC was a good program. By not having to address standard nonattainment requirements, the EAC Program made it easier to bring industry and other parties into the stakeholder process. The program design worked well for the CDPHE. It contained good incentives to succeed. First, Denver had the motivation to sign up for and implement the program in order to gain relief from the Transportation Conformity and Nonattainment New Source Review (NSR) Program requirements. Second, Denver had the flexibility to pick and choose control measures. Although Denver fell short of its goal and violated the standard at one monitor, the controls helped the city offset significant growth.

### Georgia DNR Department of Natural Resources (Georgia DNR)

Georgia DNR believed that the EAC Program is more efficient for areas that are very close to the standard. Areas that are well above the standard, such as Atlanta, are not appropriate to participate in the program. The EAC helps states by deferring the Nonattainment NSR and Transportation Conformity Program requirements. States do not have to use as many resources on areas that do not need to meet these requirements. The EAC Program in Georgia did not go well but the state learned how to work with similar programs.

### Louisiana Department of Environmental Quality (LDEQ)

LDEQ stated that the EAC Program is a more efficient approach. The state considered it important to avoid nonattainment status because of the resources needed to meet the requirements of the Nonattainment NSR and Conformity Programs. In addition, Louisiana DEQ believed that the EAC approach required a little less outreach than needed for the traditional approach.

### Maryland DNR Department of Natural Resources (MDDNR)

MDDNR believed that the EAC approach is a more efficient method for areas that are relatively close to the standard. In these situations, a few local measures, coupled with state, regional, and national programs, are all that is needed to bring the area into attainment. The EAC Program is not the right model for areas further from the standard that need more measures to reach attainment.

**New Mexico Environment Department (NMED)**
The EAC approach has some advantages over the traditional approach. The EAC approach is more collaborative. The San Juan County EAC enjoyed wide stakeholder representation, including the oil and gas industry, utilities, and local governments. The EAC Program was much better received than a nonattainment designation would have been by stakeholders. The process produced a healthy, productive dialogue among stakeholders. It also provided them with an opportunity for networking and an understanding of the challenges facing the area.

**North Carolina Department of Environment and Natural Resources (NCDENR)**
NCDENR found it difficult to say which approach is more efficient. It is possible that the EAC Program areas reached attainment earlier than they would have otherwise. The EAC Programs were proactive in fostering partnerships. This led to new ideas, local ownership, and may have resulted in greater efficiency. Overall, the EAC generated a more positive working situation between the state and participating areas than would have occurred under the traditional approach.

In the North Carolina EAC Program areas, local stakeholders appeared to be willing to do anything feasible to obtain better air quality. As awareness of the issue increased, local governments and business looked for more things to do to improve air quality. Businesses in the EAC Program areas were willing to participate in the idle reduction strategy. Local stakeholders stepped forward to become part of the effort to reach a common goal.

Awareness of air quality issues, and local activity, was greater in EAC Program areas than in other areas of state where the state did not place as much emphasis on local measures. Without the EAC approach, the areas participating in the program most likely would not have implemented so many activities, due primarily to the fact that the EAC Program areas were projected to attain with federal and state measures alone.

**Oklahoma Department of Environmental Quality (OKDEQ)**
Oklahoma DEQ believed the EAC was more efficient. The EAC Program provided an incentive for Tulsa and Oklahoma City to proactively address air quality issues earlier than they would have otherwise. The threat of receiving a nonattainment designation was a critical factor in their decisions.

**South Carolina Department of Health and Environmental Control (South Carolina DHEC)**
The EAC Program was more efficient because it obtained cleaner air sooner than would have otherwise occurred. The EAC Program made more sense than the traditional route for areas that were close to the standard. The education that occurred in these areas was extremely important. Stakeholders realized that the decisions they make everyday have an impact on air quality.

In addition, local stakeholders would not have been as involved without the EAC Program. The traditional method creates more of an adversarial relationship. The EAC Program created better relationships with all parties involved in the process. Through the EAC Program, the state established better working relationships with local governments than they ever had in the past.

**Tennessee Department of Environment and Conservation (TDEC)**
The EAC is more efficient. The traditional approach creates a lot of resentment. Under the traditional approach, the Tennessee DEC becomes an extension of EPA. As a result, the state bears criticism for administering the mandatory measures required under nonattainment designation. In addition, localities

are not inclined to make an effort to improve air quality if they think that the area will be designated nonattainment anyway. The areas are not motivated to do anything locally.

During the EAC, the state created partnerships with stakeholders that it never would have had to otherwise. Transportation conformity is supposed to drive conversations with localities. Importantly, however, the EAC Program attracted the attention and involvement of local elected officials. At the local level, action starts to happen when local elected officials become involved in an issue.

In addition, the EAC changed the dynamic of addressing air quality issues. Citizens and industry become involved voluntarily in the program. By getting involved, citizens develop ownership of the air quality in their community. This offers the public an opportunity to solve a problem with "good old American knowledge and hard work". It gives people hope that they can do something about the quality of life in their area. That is very important. Public involvement also brings about changes in personal lifestyles to keep the air clean. In addition, the public also develops a better understanding of the connection between air quality and health during air quality action days.

At first, all of the areas in Tennessee tried to get into the EAC Program. The prospect of becoming an EAC Program had everyone working hard initially. Knoxville and Memphis did not become EAC Program areas but they still moved forward with measures. For example, both locations lowered the speed limits in their counties.

Tennessee will see a lot of Code Orange days with the new standard. The state will draw upon the EAC coalitions to continue their work to address the new standard.

**Texas Commission on Environmental Quality (TCEQ)**
It depends on the circumstances. The EAC Program is not necessarily more efficient than the traditional method.

**Virginia Department of Environmental Quality (VADEQ)**
The EAC was more efficient and a less burdensome process. Because they had never been out of compliance, the two areas in Virginia were new to air quality issues. The EAC process allowed them to design a plan to address their problems without getting bogged down in the requirements of nonattainment areas. Both areas felt they had more control through the EAC process.

There were some initial problems as the state educated local elected officials and others on the need to address air quality. Once the process was underway, the participants developed a plan rather quickly. Virginia felt that the local areas were much more involved in EAC Program areas than they would have been otherwise.

The EAC Program reduces demand on state resources but increases demand for local resources. If the areas had not been in attainment, however, local officials and the Virginia DEQ and the Virginia Department of Transportation would have had to do more work to meet the Conformity and Nonattainment NSR Program requirements. Neither community would have been able to meet conformity standards without assistance

**West Virginia DEP**
It partly depends on what an area has to do in the program. Local measures may be more efficient in concept but will not work if local stakeholders are not engaged in the process. It really depends on a case-by-case basis.

West Virginia is a small state with large power plants and the remnants of a manufacturing base. Berkeley and Jefferson Counties were likely to come into attainment through national and regional measures alone. The EAC addressed maintenance in the area until 2012. A traditional SIP would have addressed maintenance in the area until 2018. Due to high growth in Berkeley and Jefferson Counties, the area was perhaps better suited to the EAC concept that encouraged the incorporation of local measures to address growth.

## LOCAL GOVERNMENT AGENCIES

**Capital Area Metropolitan Planning Organization (CAMPO, Austin, Texas)**
CAMPO (Austin, Texas) could not definitively answer whether the EAC is more efficient because it had never participated in the traditional approach. But, the EAC Program did speed up the timing of emissions reductions. It normally takes five years (from nonattainment designation to SIP submittal) to get emissions reductions. The desire of EAC participants to clean up the air as quickly as possible did generate quicker results. The program's flexibility and a desire to avoid nonattainment lead to a greater local investment in air quality issues.

**Chattanooga-Hamilton County APCD Air Pollution Control Board (CHCAPCD)**
The EAC model is more efficient. The EAC Program generated local support by pointing out that Chattanooga would receive clean air sooner by participating in the voluntary program. If the area had gone through the traditional approach, the response from stakeholders would not have been as positive. For example, the area volunteered to do an inspection and maintenance program. The program has been successful. Not everyone likes the program but stakeholders accept it. If EPA had proposed the inspection and maintenance program, however, there would have been more opposition from the community. In general, the community needs jobs and economic growth. So, it made a difference not having to address the Nonattainment NSR Program with economic development prospects. Due in part to the early action compact and its success, Volkswagen selected the Chattanooga area in July 2008 as the site for its new U.S. manufacturing facility and headquarters.

**Denver Regional Air Quality Council (RAQC)**
The EAC is generally more efficient than the traditional approach. Deferral of a nonattainment designation provided an incentive for Denver to do things much sooner than it would have through the traditional approach. In that sense, the EAC Program achieved its desired result. By requiring a SIP, however, the process is still pretty inflexible. It is not much more flexible than the traditional process. If Denver had taken the traditional route, the area would have been designated as "marginal" nonattainment. The City would have had to conduct an inventory but the not air quality modeling that the EAC Program required. This would have required a rather minimal paperwork exercise. No new measures would have been required.

**Winchester-Frederick County Economic Development Commission (Northern Shenandoah Valley, Virginia)**
The EAC process is more efficient and equitable than the traditional process. Although some regulatory requirements were non-negotiable, Frederick County had more influence in deciding how and what to control throughout the program. The traditional approach would not have recognized the measures already undertaken by point sources in the area.

**Greenville County, South Carolina Government**
The EAC is a very valuable tool. The main value of the program is that it lets local areas come into compliance through their own methods. This approach works better than EPA telling an area to do specific measures. Although the command and control method may have achieved the same results, it certainly would not have created the same dynamic and strong partnerships at the local level.

The traditional approach would have generated resistance from industry. Under this approach, Greenville County would have been repeating EPA requirements. The EAC process brought in stakeholders from the planning sector, chamber of commerce, business, local governments (three counties in Upstate South Carolina), and industry. Government did not tell private or nonprofit entities what to do to improve air quality. Instead, the EAC Program enabled a consensus-based approach that encouraged sharing the expertise, thoughts, and ideas of all stakeholders. This approach allowed stakeholders to develop and implement their own strategies.

The EAC Program did not take less effort by Greenville County. Because the County would have encountered resistance from the private sector if it had gone through traditional approach, the EAC Program was more efficient from that standpoint.

**Aiken County, South Carolina Government (Lower Savannah)**
Initially, the EAC Program was better than the nonattainment route. Public participation was good at the first set of meetings. For example, thirty or forty people came to the meetings when the Lower Savannah area first started the program. But, attendance dropped off after the area produced three years of clean air quality data. Local governments had the perception that the problem had been solved. Representatives of small municipalities, Aiken County public schools, public works, and other public entities stopped coming to the meetings. However, representatives of large companies kept participating.

Georgia and South Carolina handled their own portions of the EAC Program Area. In general, more proactive measures were conducted to improve air quality through the EAC Program.

**ACOG (Oklahoma City)**
The EAC was a more efficient model for Oklahoma City. The program provided an opportunity to get the message out and capture the attention of local stakeholders. People paid attention to the issue because it involved a tangible situation. No one would have listened otherwise.

**Piedmont Triad Council of Governments (PTCOG)**
The EAC Program was definitely more efficient than the traditional approach. The EPA set the standard that participants had to meet. The program required accountability and local government commitment from participating areas. In return, EPA provided participants with the flexibility to develop local strategies without having to do a lot of peripheral activities.

**Washington County Government**
The EAC is not more or less efficient than the traditional approach. But, the approach made the EAC Program effective. It provided participants with a "gentle" introduction to air quality issues. This allowed the state time to educate local officials. Washington County had the opportunity to become more engaged in the program. The County also had the opportunity to educate the public about air quality issues. Citizens also became aware they could play a role in improving air quality.

**a) What has been the impact of EACs on State and local resources?**

**STATE ENVIRONMENTAL AGENCIES**

**Colorado DPHE**
It is difficult to quantify the resource impact of the program. The Colorado DPHE saved money and staff time in the EAC planning process. The state did not have to involve all stakeholders in the process. For example, the EAC reduced the number of meetings because the state only had to address affected industry groups. It did not have to work with all industries located in the area. The EAC Program also reduced travel time by the state. However, the state still had to develop and meet all requirements of a SIP.

**Georgia DNR**
Local stakeholders spent more resources in the EAC Program than they would have in the traditional program. This is because local stakeholders would not have been as involved in the traditional method. Under the traditional approach, industry would pretty much have been the only stakeholder involved in the process.

**Louisiana DEQ**
Participation by the Mayor's office in Shreveport and local government made the EAC process a lot easier.

**Maryland DNR**
For Maryland DNR's response to this question, see question 1.b. below.

**New Mexico ED**
The state expended a little less resources for the EAC compared to what it would have under the traditional approach. It is difficult to estimate the impact on local areas.

**North Carolina DENR**
More state and local resources were expended in the participating areas than would have been used without the EAC Program. But, it has been a positive investment. Local measures will become even more critical with the upcoming standard. The EAC is a good model to follow.

**Oklahoma DEQ**
The use of state resources in an EAC Program is more intensive up front than it would be with a wait-and-see approach. The state provided technical support to the EAC Program areas. The council of governments managed the local programs. The outreach activities included many meetings to engage stakeholders and to develop advertising campaigns that involved public service announcements (PSAs).

In the long run, however, participation in the EAC may save resources by avoiding nonattainment designation. Participation is certainly worth the "insurance" policy that areas receive by avoiding nonattainment status.

**South Carolina DHEC**
It is not clear whether more state resources were used in the EAC Program than would have been expended in a traditional approach. In a traditional nonattainment area, more people are involved in "bureaucratic exercises" dealing with the Transportation Conformity and Nonattainment NSR Programs. Conversely, in EAC Program areas, the resources are used more efficiently on implementing "air quality improvement efforts".

**Tennessee DEC**
It took the state a lot of time to convince areas to participate in the EAC Program. The resources expended in the EAC Program have been a worthwhile investment. Results are always greater when local areas embrace a program.

**Texas CEQ**
Even though awareness was already raised in Texas' EAC Program areas, state resources were still required as there was a lot of back and forth time spent with the local EAC participants and EPA on several issues.

**Virginia DEQ**
In general, the EAC process reduced the amount of resources required by the state to address air quality in the participating areas. There were fewer resource and administrative requirements such as the conformity process, nonattainment permits, and offset requirements.

At the local level, it is likely that slightly more resources were required to set up local programs, websites, and provide outreach. But, the state believes that both EAC Program areas saw this as a worthwhile investment.

**West Virginia Department of Environmental Protection (West Virginia DEP)**
For West Virginia DEP's response to this question, see question 1.b. below.

**LOCAL GOVERNMENT AGENCIES**

**CAMPO (Austin, Texas)**
A regional committee of local and regional governmental entity staff handled the planning work for the EAC Program. The state contributed by passing legislation that funds air quality planning and implementation in near nonattainment areas in Texas and adopting several state rules that reduced emissions in the Austin area.

**Chattanooga-Hamilton County APCD**
The EAC activities did raise public awareness in Chattanooga-Hamilton County APCD more than would have occurred under the traditional approach. This required more local resources than would have been used in the traditional approach. For example, Chattanooga-Hamilton County APCD decided to claim credit for its voluntary action day program. The County now regrets this decision. It spent a "huge" amount of money (between $30,000 to 35,000 per year) to meet EPA requirements for

documenting the effectiveness of the program. The County had to conduct random telephone sampling to estimate participation and associated emissions reductions. This resulted in a lot of effort and expenditure for an insignificant environmental benefit. The County would not seek to claim credit for such activities again. The county, instead, now puts the same amount of money into other actions, such as radio and television advertisements.

**Greenville County, South Carolina Government**
The EAC approach made more resources available to Greenville County than would have been available through the traditional approach. Local stakeholders stepped up, took ownership of the program, and tried to implement control measures. For example, the Sierra Club suggested offering tax incentives to purchase low emission vehicles and they worked with the state legislature on the bill until it passed in June 2006.

Note: Greenville County began exploring the generation of green power as a result of one strategy conceived through the EAC process and included in the report. As a result Greenville County entered into an agreement with a company to produce green power. This project will begin in fall 2008.

Greenville County, South Carolina Government did not add any additional staff for the EAC. But, the County did add air quality duties to the work of existing staff.

**Denver RAQC**
The EAC had a significant impact on resources. Modeling and processing requirements took resources to complete. Denver received assistance from different areas, including the EPA ($100,000) the Denver Area Metropolitan Planning Organization (MPO), and the Colorado Department of Transportation.

**Winchester-Frederick County Economic Development Commission (Northern Shenandoah Valley, Virginia)**
The Virginia DEQ and the EDC worked together to sell the EAC Program to local elected officials in the City of Winchester and Frederick County. Consultants developed and implemented parts of a follow-on EAP. Overall, the EAC cost the County more upfront than the traditional approach. But, the program was worth the expense to avoid nonattainment status.

**Aiken County, South Carolina Government (Lower Savannah)**
Aiken County, South Carolina Government (Lower Savannah) did not hire new staff to work on the EAC. Aiken County primarily had one staff person working on the EAC. Other counties also used core staff for the EAC Program. The main expenses were for newspaper advertisements and public meeting handouts.

**ACOG (Oklahoma City)**
Oklahoma City definitely spent more resources on the EAC than it would have in the traditional approach.

**Piedmont Triad COG**
For Piedmont Triad COG's response to this question, see question 1.b. below.

**Washington County Government**
For Washington County Government's response to this question, see question 1.b. below.

**b) Did the EAC approach save money and resources over the traditional approach?**

**STATE ENVIRONMENTAL AGENCIES**

**Colorado DPHE**
It is difficult to compare the resource allocations under the two different approaches. However, the state did save money and staff time in the planning process. Although it saved some resources by not having to involve all stakeholders, the state still had to allocate resources to SIP development.

**Georgia DNR**
The program was resource intensive for Georgia in the short term because the EAC Program areas were not familiar with air quality issues. The state had to spend resources and time traveling to teach participants about air quality issues. In the long run, the EAC Program saved the state resources. But, the Chattanooga Tennessee-Georgia EAC Program areas lost some of the gains when designated nonattainment for $PM_{2.5}$.

**Louisiana DEQ**
Louisiana DEQ made several visits to Shreveport to assist in development of the EAC there.

**Maryland DNR**
Maryland DNR expended more resources through the EAC approach than would have been required in the traditional SIP approach. The additional resources were needed to complete the requirement for ongoing progress reports. The administrative requirements were burdensome and felt very similar to the SIP approach.

**New Mexico ED**
For New Mexico ED's response to this question, see question 1.a. above.

**North Carolina DENR Department of Environment and Natural Resources (NCDENR)**
Overall, the EAC cost North Carolina DENR more in resources than the traditional approach. The state had to attend more meetings and do more modeling runs than would have necessary under traditional approaches. However, North Carolina DENR does not believe that comparing resource expenditures is an appropriate method for an EAC Program study. The benefits of EACs outweigh the costs.

**Oklahoma DEQ**
Oklahoma DEQ expended more resources initially on the EAC Program than it would have by waiting to see whether the areas became nonattainment. In the long run, however, the EAC Program may save the state resources. The EAC approach is certainly worth the "insurance" policy that the areas receive by avoiding nonattainment designation.

**South Carolina DHEC**
It is difficult to determine whether the EAC approach saved resources for South Carolina DHEC. The state did not hire additional staff or spend additional money on the program. Instead, staff shifted focus from technical SIP work to working with local EAC Program areas. Under the traditional approach, the state would not have conducted as much outreach to local areas. The EAC Program areas would have attained with federal and state measures alone. Consequently, there was more local activity

under the EAC approach. If new modeling had been required, however, the EAC approach would have required additional resources from the state.

**Tennessee DEC**
Overall, the EAC process may have cost Tennessee DEC more in resources. But, the EAC Program Area benefited by having measures tailored to local conditions that still provided for economic growth.

The EAC Program did cost Tennessee DEC more time and resources initially. The state had to work with the local area to develop consensus and ownership of the project. Once the EAC Program was in place, however, the state did not have the battles with elected officials it has had in the past under the traditional approach. The EAC Program allowed stakeholders to develop local measures instead of spending time arguing over issues. It is hard to put a price on building good will. However, the enormous good will built through the EAC Program has been priceless.

**Texas CEQ**
Overall, Texas CEQ had to allocate more staff time for the EAC approach. The amount of local resources spent on the program depends on the individual area. The Austin, Texas area is zealous in its approach to the environment. It wanted to do everything. So, it devoted a lot of time and resources to the EAC Program.

San Antonio saved money and resources by participating in the EAC. The City did not have to do the work or develop the measures that would be required for a traditional nonattainment SIP. So, the City had less work to do than it would have if designated nonattainment.

North East Texas conducted an outreach and education campaign. The level of effort was not more intensive than it would have been without the EAC Program.

**Virginia DEQ**
Virginia did not see a big cost difference between the EAC and traditional approaches. The EAC effort required more initial work and resources from the state. But, the traditional approach would have required more state resources over time.

Under the EAC approach, local areas are more willing to contribute resources because they have greater responsibility for the program. Areas that are designated nonattainment rely more on the state for resources. So, it is difficult to say whether one approach is more costly than the other.

**West Virginia Department of Environmental Protection (West Virginia DEP)**
In West Virginia, the EAC approach required fewer resources at the state level than needed to conduct rulemaking for a traditional SIP. Virginia conducted the modeling. However, the EAC Program required more resources at the local level to engage stakeholders.

**LOCAL GOVERNMENT AGENCIES**

**CAMPO (Austin, Texas)**
It is difficult to compare because CAMPO (Austin, Texas) has never done the traditional approach. A regional committee of local and regional governmental entity staff conducted the planning work. The

state contributed funding for air quality planning and implementation in near-nonattainment areas and adopting several state rules that reduced emissions in the Austin area.

**Chattanooga-Hamilton County APCD**
Chattanooga-Hamilton County APCD could not think of instances in which the EAC Program saved money and resources.

**Greenville County, South Carolina Government**
For Greenville County, South Carolina Government's response to this question, see question 1.a. above.

**Denver RAQC**
For Denver RAQC's response to this question, see question 1.a. above.

**Winchester-Frederick County Economic Development Commission (Northern Shenandoah Valley, Virginia)**
The EAC cost Frederick County more initially but it was worth the expense to avoid nonattainment status. It did save other affected community stakeholders (businesses and citizens).

**Aiken County, South Carolina Government (Lower Savannah)**
It is difficult to say whether the EAC saved money and resources. The same outreach activities would have been conducted with the traditional approach. However, Aiken County, South Carolina Government (Lower Savannah) would also have had to deal with conformity under the traditional approach. So, the EAC Program may have saved some resources.

**ACOG (Oklahoma City)**
The EAC Program did not save Oklahoma City money or resources.

**Piedmont Triad COG**
Without the EAC Program, air quality activities would have occurred in Greensboro and Winston-Salem but not in the rural areas and smaller towns as those areas were not equipped to take on the issue.

**Washington County Government**

**2) What have been other impacts, intended or not, if any, of EACs on local communities and State air agencies?**

**STATE ENVIRONMENTAL AGENCIES**

**Colorado DPHE**
Overall, the EAC Program had a positive impact. The EAC brought a considerable number of elected officials onboard quickly to think about air quality issues. Many local officials, especially at the county level, became involved in the process because they had to sign the EAC memorandum of understanding (MOU). This level of participation does not usually occur with the traditional approach. However, there was a feeling of failure when the area became nonattainment. In particular, the oil and gas industry felt that all the emission reductions they did might not have affected the outcome.

**Georgia DNR**
Local stakeholders did develop an improved awareness of air quality issues. But, the improvements are due to the "$PM_{2.5}$ focus area" program, an EAC-type effort to avoid nonattainment designation, and not the EAC Program.

**Louisiana DEQ**
There is more local participation under the EAC approach.

**Maryland DNR**
Local stakeholders participated more quickly and to a greater degree than they would have under the traditional approach. The EAC schedule made it necessary for stakeholders to become involved in the initial stages of the program. Washington County developed a working relationship with stakeholders early in the process. The County also had to obtain much-needed assistance with air quality modeling.

**North Carolina DENR**
The EAC Program led to the adoption of local measures that could not have been mandated by the state. The measures would not have been discussed without the flexibility of the EAC Program. The outreach activities also led to a greater awareness and continued enthusiasm for air quality issues. Local areas have asked the state whether another EAC Program can be done for the 2008 ozone standard.

The Hickory, EAC Program Area continues to hold monthly meetings. In June 2008, Hickory will hold a 2nd annual conference in June to discuss air quality issues with industry and the public. The Fayetteville and Triad EAC Program areas have hired air quality coordinators. Fayetteville changed their roads and bus routes to improve air quality. In addition, Fayetteville established more dialogue with Fort Bragg on air quality issues. These types of activities will continue in the future.

**New Mexico ED**
The EAC has had a snowball effect on awareness of air quality issues. The state established a task force to work on the EAC. After the EAC Program ended, the state created a successor group. The new task force attracts approximately 80 attendees from federal, state, local, and tribal governments to regularly scheduled meetings. In addition to other issues, the task force is preparing the groundwork to meet the next standard.

**Oklahoma DEQ**
The EAC Program produced positive and negative impacts. On the positive side, the Department of Environmental Quality received $500,000 from the state Department of Transportation for ozone modeling. The program enhanced air quality awareness among elected officials and the public in EAC Program areas. The Tulsa and Oklahoma City Councils of Governments made greater efforts to get the word out on ozone action days. Overall, the cost/benefit analysis came out favorably, although the benefits were fuzzy.

On the negative side, the state became frustrated with the pace of required data submittal from local areas. However, Oklahoma DEQ viewed the biannual reporting requirement as worth the effort to avoid nonattainment designation.

**South Carolina DHEC**
South Carolina DHEC conducted a statewide EAC Program. Consequently, the state found it difficult to compare the impacts among local areas. The EAC Program generated substantial support in local areas. For example, Charleston did not have a problem with the 1997 8-hour National Ambient Air Quality Standard (NAAQS). Although it did not, therefore, have to participate, Charleston still became very engaged in the EAC Program. Darlington and Florence were in a similar position but were also very engaged in the process.

The EAC Program helped communication between the state and local areas. When the $PM_{2.5}$ NAAQS changed, the state already had a direct line of contact with the local areas. In addition, coalitions are being formed and partnerships expanded to develop a multi-pollutant approach now that the new ozone NAAQS is final.

**Tennessee DEC**
As a result of the EAC Program, the public pays more attention and understands the air quality index much better. The public is also more aware of personal actions they can take to improve air quality. In Williamson County, local officials host a weekly program on the community access channel. The area never had anything like that before the EAC Program.

**Texas CEQ**
The EAC generated a range of benefits in Texas. Texas CEQ made a commitment to provide Texas Emission Reduction Plan funds to each EAC Program Area. These local programs would not have been funded without the EAC Program.

Local governments developed an increased awareness of air quality issues that would not have taken place without the EAC Program. The EAC also led to cooperation among local stakeholders. Austin, Texas voluntarily adopted an inspection and maintenance program. After state permits were issued, the city obtained voluntary emissions reductions from industry. In San Antonio and North East Texas, the EAC Programs established a level of cooperation between industry and other local stakeholders. San Antonio provided information to industry seeking a permit to retrofit equipment that would reduce emissions. The City also obtained voluntary agreements to reduce emissions after permits were in place.

**Virginia DEQ**
The EAC increased the involvement of local stakeholders in air quality issues. Elected officials and citizens became more aware of air quality issues.

**West Virginia DEP**
The EAC fosters local engagement in air quality issues. Local stakeholders have to become involved if the program is to work. However, West Virginia DEP is not sure how much time local governments still spend on EAC activities. There were no real downsides to the EAC Program other than the reporting requirements.

## LOCAL GOVERNMENT AGENCIES

### CAMPO (Austin, Texas)

The EAC has produced only positive impacts in Austin, Texas. The program raised awareness and acceptance by local elected officials and stakeholders of the need to improve air quality. The EAC provided local flexibility to solve the local air quality problem. This made it easier for the five participating counties, including two rural areas, to make hard decisions and develop emission reduction strategies that consider the varied issues and circumstances of the jurisdictions in the region. The EAC also led to better coordination between state and local officials.

### Chattanooga-Hamilton County APCD

Public awareness of air quality issues increased in Chattanooga-Hamilton County APCD as a result of the EAC. People began thinking about air quality and how to improve it.

### Denver RAQC

The EAC process led to more outreach, awareness and voluntary action than would have occurred otherwise. Local stakeholders completed a lot of work related to air quality in a short period of time. Heightened awareness of the ozone situation was the greatest impact of the program. Without the increased awareness, Denver would not have received funding from the transportation planning process. The heightened awareness also generated support from industry. In particular, the oil and gas industry would not have been as involved in finding emissions reductions.

### Winchester-Frederick County Economic Development Commission (Northern Shenandoah Valley, Virginia)

The EAC Program raised awareness and educated the public on air quality issues. A wide range of stakeholders participated in the process. The process went very smoothly. Control measures were selected through a consensus-building process that bridged a lot of gaps among stakeholders. As a result, implementation occurred much smoother than if outstanding differences had still remained among stakeholders. This helped unite the community. It also brought organizations together that are now working on projects beyond the EAC Program. In addition, the program led to a shift in lifestyle activities among residents. Virginia DEQ gained a lot of credibility among local communities as a result of the EAC Program.

### Greenville County, South Carolina Government

The EAC has had a good impact on Greenville County. The County was designated attainment for the 1997 standard. The EAC Program also provided another benefit for Greenville County. It provided an opportunity for the County to collaborate with Upstate Forever, Save Our Saluda, Sierra Club, and other organizations working to improve air quality. The organizations worked together on all twenty-three strategies and some subsets as well, such as Breathe Better Air at School ($B^2$@School) program at Fountain Inn Elementary School. Now the $B^2$@School program is being expanded to Sevier Middle School.

In addition, the Sierra Club suggested offering tax incentives for low emission vehicles. The organization went before the legislature to get funding for this measure. The Duke Power - Leed Steam Plant, the largest emitter of nitrogen oxides ($NO_x$) in the upstate area, brought together a number of its constituents. They decided to convert the boilers at the plants to low $NO_x$ emitting boilers. This was a

$15 million commitment. The second largest $NO_x$ emitter in the upstate area, Transco, had thirteen compressors that had no controls at all. Transco installed low $NO_x$ boilers early because of its involvement with the EAC.

**Aiken County, South Carolina Government (Lower Savannah)**
The EAC increased awareness of air quality issues in the Lower Savannah area. For example, the EAC was a factor in the prominence of the air quality outreach at the local Earth Day event. Small municipalities learned a lot about air quality through the EAC Program. Recently, local environmental organizations have spurred on a lot of improvements. However, the EAC was ahead of this recent movement in bringing about local improvements.

**ACOG (Oklahoma City)**
The EAC Program raised awareness of air quality issues.

**Piedmont Triad (COG)**
The EAC generated positive impacts in the area. The Triad had been facing a lot of pressure to make significant changes, such as becoming more energy efficient. The pressure came from a number of factors including: MPO requirements, conformity, nonattainment avoidance, and sound economic development.

The EAC Program linked air quality issues to smart growth initiatives and the planning process. This complemented the work of the MPOs in the area. The EAC accelerated the emphasis on greenways, bikeways, pedestrian planning, and other smart growth-type initiatives. The public supported these measures because of the linkage to air quality issues. The impetus for these activities was greatly strengthened by the EAC.

**Washington County Government**
The biggest impact of the EAC was raising public awareness of air quality issues. People became aware that air quality is not just a "city" issue and that rural areas also play a role in maintaining air quality.

**3) Would the program have succeeded without the threat of nonattainment designation or without the program being part of the larger SIP effort?**

**STATE ENVIRONMENTAL AGENCIES**

**Colorado DPHE**
No, it would not have succeeded without the threat of nonattainment. Local areas needed a "driver" to motivate them to participate in the program. The threat of being designated nonattainment compelled areas to participate in the EAC.

**Georgia DNR**
The local communities would not have participated at all without the threat of nonattainment.

**Louisiana DEQ**
Louisiana DEQ probably would not have participated. The threat of nonattainment designation motivated Louisiana DEQ to participate.

**Maryland DNR**
Maryland DNR would not have participated without the threat of nonattainment. It wanted to minimize the Nonattainment NSR and Conformity Program requirements.

**North Carolina DENR**
Some areas might participate without the threat under the right circumstances. Initially, the threat of nonattainment designation motivated the Mountain Area EAC to participate in the EAC. However, the local stakeholders decided to continue participating in the EAC Program even though the area was in attainment.

**New Mexico ED**
There is not much rationale for an area to join the EAC Program without the threat of nonattainment. The EAC Program encourages areas to take a proactive approach to avoid nonattainment status.

**Oklahoma DEQ**
It is doubtful that there would be willingness to participate in the EAC without the threat of nonattainment.

**South Carolina DHEC**
It is not clear if the threat of nonattainment needs to be a factor. South Carolina DHEC hoped it would have participated without being concerned about nonattainment designation. The possibility of nonattainment status was considered an incentive to take actions earlier to improve air quality. South Carolina DHEC's continued "early action" effort demonstrates the desire to meet national standards before nonattainment designations occur.

**Tennessee DEC**
States and localities need a driver to motivate participation in the EAC. The concern over nonattainment designation led Tennessee DEC to participate. The state did not want to have to deal with the Transportation Conformity Program or the economic development issues associated with the Nonattainment NSR Program.

**Texas CEQ**
San Antonio would not have participated without the concern of nonattainment designation. The other two areas might have participated. However, Austin, Texas probably would not have adopted the inspection and maintenance program.

**Virginia DEQ**
Initially, Winchester, Virginia (as part of the Frederick County, Virginia area) probably would not have participated without the threat of nonattainment. Virginia DEQ spent a lot of time in Winchester convincing them to join the EAC. Winchester selected the EAC as the lesser of two evils. However, local attitudes have changed after participating in the program. Communities now see the value of addressing air quality issues and participating in the EAC Program.

**West Virginia DEP**
West Virginia DEP stated emphatically that it would not have participated without the threat of nonattainment. The state was concerned about the economic consequences of nonattainment. The

EAC created a local dynamic to participate in the program. Originally, Winchester, Virginia was motivated to participate. This spurred the Berkeley and Jefferson Counties to approach the state with interest in the program. Afterwards, Hagerstown, Maryland became interested in participating. Berkeley and Jefferson Counties put together $200,000 for emissions inventory and control strategy development.

**LOCAL GOVERNMENT AGENCIES**

**CAMPO (Austin, Texas)**
Austin, Texas would have participated without the threat of nonattainment. It is a very motivated area. However, the state would not have been as involved without the concern over nonattainment designation. Due to that concern, the state committed to emission reductions in the Austin area that they probably would not have otherwise.

**Chattanooga-Hamilton County APCD**
The EAC Program absolutely would not have succeeded without the threat of nonattainment designation. Chattanooga-Hamilton County APCD participated in the program out of concern over the impact of a nonattainment designation on economic development.

**Denver RAQC**
The EAC Program probably would not have had as much participation without the threat of nonattainment. Denver entered the program while designated attainment but became nonattainment afterwards. However, the City joined the program to avoid nonattainment designation.

**Winchester-Frederick County Economic Development Commission (Northern Shenandoah Valley, Virginia)**
The County would not have been able to get local business involved in the process without the threat of nonattainment. It would have been much harder to persuade businesses to join the program. Moreover, the program's methods would not have been as balanced because stakeholder involvement would have suffered.

**Greenville County, South Carolina Government**
No, the program would not have succeeded in Greenville County without an incentive. It took the threat of nonattainment to nudge the elected officials to move forward with the efforts. Greenville County, South Carolina Government had to spend some time to educate the public officials. Public officials tend to think of air quality problems as a regional problem and not a local problem. The opportunity to take control of developing solutions to the problem appealed to them. Local officials appreciated having the opportunity to develop solutions instead of having EPA devise solutions for them.

**Aiken County, South Carolina Government (Lower Savannah)**
It is doubtful that anyone would have participated without the threat of nonattainment. However, it is possible that some larger corporations, such as Kimberly-Clark, Bridgestone, and Pepperidge Farm, might have participated because they have had "green" outreach programs since 2000.

**ACOG (Oklahoma City)**
The EAC Program would not have succeeded without the threat of nonattainment.

**Piedmont Triad (COG)**
The EAC Program would have been much less efficient without the threat of nonattainment. Concern over nonattainment designation makes local governments and elected officials become more aware of air quality issues. The program's deadlines provide the motivating force to reduce emissions. If EPA does another program, two factors will motivate participation in the program. Increased awareness of air quality issues will be one factor, while the desire to avoid nonattainment will be the other.

**Washington County Government**
The EAC Program would not work without the threat of nonattainment. Localities do not know what to do about air quality issues. They need the prodding of a nonattainment designation to become involved in the process.

**4) Were the Compacts successful at engaging and involving stakeholders at the local level? Were there intangible outcomes from stakeholder engagement such as increasing local awareness that may provide for air quality benefits and better decisions in the future?**

**STATE ENVIRONMENTAL AGENCIES**

**Colorado DPHE**
The EAC did succeed in engaging local stakeholders. The EAC Program compelled the state to go beyond working with the "usual" stakeholder groups. The state contacted county commissioners it had not worked with before to sign the EAC MOU. Public interest in the EAC Program was about the same level as with other issues. But, environmentalists may have been more involved in this issue. The media took a real interest in the program. This proved to be helpful in obtaining the support of local elected officials.

**Georgia DNR**
Georgia learned a lot from the early stages of the EAC process. It is important to have local investment in the program. However, it was the process for the $PM_{2.5}$ focus area that successfully engaged local stakeholders. The increased involvement of stakeholders occurred in most areas of the state with the exception of the Chattanooga area.

**Louisiana DEQ**
It is unclear whether stakeholder involvement increased. The progress reports did not require an appraisal of stakeholder involvement.

**Maryland DNR**
There was a fair degree of stakeholder engagement. Businesses did not participate much initially. The program did produce benefits. Air quality forecasting now covers Washington County. Additionally, local businesses and governments now participate in ozone action day programs.

**New Mexico ED**
The EAC absolutely increased the level of stakeholder involvement. Public engagement in the process was the largest benefit of the program. The state also developed good relationships and had good outcomes with the press and local television.

San Juan County, New Mexico created an ozone task force to study the impacts of ozone in area. In April 2002, the group started talking to the public about ozone, its sources, and its health effects. Public interest and awareness of air quality increased in response to the outreach. When the EAC Program was announced, local governments were asked if they wanted to participate. San Juan County and three localities within the county decided to participate in the program.

**North Carolina DENR**
The EAC Program increased local stakeholder participation and produced intangible results. North Carolina DENR has had an outreach program since 1997. The EAC Program helped enhance those efforts. As a result, the state's outreach efforts are better now. The outreach generated broad stakeholder representation in all of the North Carolina EAC Program areas. Local people now talk to other local people about air quality issues. The state's efforts also created clean air advocates at the local level.

The EAC Program also helped develop relationships that are being used to address other issues. For example, the EAC Program paid off in Hickory. When Hickory became nonattainment for $PM_{2.5}$, it already had an air quality effort underway through the EAC Program.

**Oklahoma DEQ**
The EAC did increase stakeholder engagement and produce intangible benefits. Because of the EAC Program, political leaders are aware of the ozone problem. The general public is aware of air quality issues. The business community also shows willingness to participate in improving air quality. The state sees evidence that this level of involvement will continue. For example, the state has submitted voluntary "maintenance" flex-plans for Tulsa and Oklahoma City with additional emissions reductions included in those plans.

**South Carolina DHEC**
The EAC Programs engaged local governments, environmentalists, councils of governments, industry, and state agencies. The state focused most of its efforts on the nonattainment-deferred areas of Columbia and Greenville. Consequently, stakeholder involvement was greater in those areas. But, the Aiken area and Charleston area also had a good level of local involvement. Rural areas that did not have as much to do still maintained good contact with stakeholders

There is no comparison to the way things were before the EAC Program. The relationship and communication between the state and local stakeholders was not nearly as strong prior to the EAC Program. These stakeholders have expressed an interest in participating again if given the opportunity.

The EAC Program enhanced the state's relationship with stakeholders. This has already proved to be important. The South Carolina legislature must approve all proposed regulations. The state has to demonstrate stakeholder support for a regulation before the legislature will approve it. The state was able to tighten the open burning ban and $NO_x$ reduction regulations. But, the state would have not been able to obtain the stakeholder support needed to get the regulations passed without the improved relationships from the EAC Program.

**Tennessee DEC**
The EAC Program enhanced stakeholder support and produced intangible benefits. Bigger results always occur when local areas are fully invested in a program. The EAC built good will partnerships with stakeholders.

The Tennessee Environmental Board has a member who represents counties and another member representing cities. The state is very interested in the EAC concept. It is exploring whether states and localities can build on previous programs to continue the EAC concept. Because of the EAC Program, Tennessee now has the infrastructure in place to meet the new standard quicker. It will continue doing more of the same thing to meet the new standard. The state would like to have the opportunity to participate in another EAC Program.

**Texas CEQ**
The three EAC Program areas in Texas already had an increased level of awareness of air quality issues prior to the start of the EAC Program. During the EAC, there was extensive local involvement to develop and agree on control measures. Those groups are still active. However, stakeholder participation in environmental issues had already been high before Austin, Texas became an EAC Program Area.

**Virginia DEQ**
The EAC generates much more grass roots involvement than traditional programs. This is due to the small size of the areas. It is also due to the fact that participants are involved in the process from the very beginning. The task forces in both EAC Program areas had a very diverse mix of people.

**West Virginia DEP**
There was extensive stakeholder involvement in the EAC. All participants appeared to want to find workable control strategies. The state is already involved with stakeholders on the $PM_{2.5}$ standard.

**LOCAL GOVERNMENT AGENCIES**

**CAMPO (Austin, Texas)**
The EAC Program generated stakeholder involvement and intangible benefits. The regional stakeholder workgroups developed lists of control measures to help ensure acceptance by stakeholders. They also received commitments from stakeholders for future action

**Chattanooga-Hamilton County APCD**
The EAC did bring stakeholders together in Chattanooga-Hamilton County APCD. Through discussions, local stakeholders identified about twelve measures for the program. In general, suggestions from local stakeholders are better received than ideas from government.

**Denver RAQC**
The EAC Program generated a greater level of engagement from a wider range of local stakeholders than found in other issues. Stakeholders are now much more aware of air quality issues. The oil and gas industry, refining industry, and transportation community all became involved in the process. The EAC Program also helped lead to an expansion in the outreach program from $50,000 to $2.5 million. The area was expanded while it was part of the EAC Program and brought in 2 new counties that had never before addressed ozone.

**Winchester-Frederick County Economic Development Commission (Northern Shenandoah Valley, Virginia)**
The EAC Program did generate stakeholder involvement and intangible benefits. The business community was recognized for the proactive measures done prior to EAC. The SHENAIR program is an example of the benefits associated with the EAC Program.

**Greenville County, South Carolina Government**
The EAC has been successful in raising stakeholder involvement. Local stakeholders had limited awareness of air quality issues before Greenville County, South Carolina Government started the EAC Program. The County's outreach focused on reaching one community or school at a time. This approach took more time but did raise awareness. The control measures also raised public awareness. The car care, gas can and lawn mower exchange events as well as public presentations and setting up booth are community wide events helped spread the message to citizens that they could take personal actions to improve air quality. Citizens now discuss aspects of air quality that they would not have known about prior to the EAC. At stakeholder meetings, for example, citizens are aware of particulates, the new standards, and other air quality issues. In early 2007, newspaper articles about air quality began to regularly appear and local TV stations made air quality forecast a regular part of the weather forecast.

The EAC process created partnerships and relationships that will come in handy in the future. Mitsubishi, Michelin, BMW, Milliken, and other private organizations joined the stakeholders' committee. Greenville County, South Carolina Government could not have paid the hourly rate necessary to bring these people in to get their technical expertise. Instead, these very knowledgeable technical experts participated in the EAC free of charge. They, and South Carolina DHEC, have helped county staff interpret EPA guidance and are continuing to help Greenville County with air quality issues. In addition, businesses helped sponsor community events.

**Aiken County, South Carolina Government (Lower Savannah)**
The EAC did engage local stakeholders in the Lower Savannah area during the early stages of the process. During the past year, the entire metropolitan area has been working proactively on $PM_{2.5}$. Many of the same people involved in the EAC are working on $PM_{2.5}$. The relationships established during the EAC Program made the collaboration on $PM_{2.5}$ much easier.

**Association of Central Oklahoma Governments (ACOG)**
The Oklahoma City EAC definitely did engage local stakeholders. There has not been a lot of spin-off progress yet. However, the community is better prepared because of EAC involvement. In addition, the EAC laid the groundwork for future outcomes.

**Piedmont Triad (COG)**
The EAC Program generated stakeholder involvement and intangible benefits. The EAC stakeholder group continues to meet quarterly. It consists of Duke Power, RJ Reynolds, local officials, environmentalists, and chambers of commerce.

**Washington County Government**
Due to rural nature of the region, Washington County did not have much stakeholder participation. There is not much industry in the county. The issues were not that important to the general public.

However, there may have been indirect benefits from the outreach program. People now understand what they can do to improve air quality.

**5) Did the compact agreements give local areas the flexibility to develop their own approach to meeting the 8-hour ozone standard that the program touted?**

**STATE ENVIRONMENTAL AGENCIES**

**Colorado DPHE**
EAC may possibly have provided flexibility to local areas. The RAQC is the lead planning organization for SIP development for Denver. However, the state and Air Quality Control Commission retain regulatory authority. The state adopts rules that apply statewide or in a geographic subset. RAQC and the state did have more flexibility designing the EAC than available in other programs.

RAQC did a lot of outreach with local governments. In return, RAQC received input and help from affected cities and counties. Local governments do not usually adopt ozone control measures. Under the EAC, however, local governments did conduct more ozone outreach programs.

**Georgia DNR**
The EAC Program may have given local areas greater flexibility. But, the EAC Program areas in Georgia did not take advantage of the added flexibility.

**Louisiana DEQ**
The EAC did provide local flexibility. The EAC Program Area had the opportunity to develop a list of potential measures appropriate for the individual characteristics of the community. In addition, the EAC Program did create a different dynamic between the state and the locality. This dynamic probably led to a willing and receptive response to the program from the local area.

**Maryland DNR**
The traditional SIP approach affords some flexibility to local areas. While the EAC offered a little more flexibility, Maryland DNR believed that the program felt very much like a SIP exercise.

**New Mexico ED**
Yes, the flexibility was key for buy in and gave the local participants the ability to make their own decisions.

**North Carolina DENR**
The EAC emphatically did provide flexibility to local areas. North Carolina DENR presented the EAC Program areas with a list of state and federal control measures that would improve air quality. The EAC Program areas had the flexibility to select measures from the list that would work with the individual characteristics of their own communities.

For example, in the Triad EAC, local businesses joined in to help the area reach attainment on time. Duke Power installed a Selective Catalytic Reduction control system a year early. Duke Power also installed remote reading of meters in the area to reduce vehicle idling. RJ Reynolds agreed to switch fuel in the summertime from coal to natural gas to reduce their $NO_x$ emissions.

**Oklahoma DEQ**
The opportunity for flexibility in local decision-making was critical in obtaining support for the program.

**South Carolina DHEC**
The EAC provided programmatic and local flexibility. Air quality models indicated that the areas would come into attainment through existing federal programs. This provided flexibility to the state and local areas. Each of the EAC Program areas adopted control measures that made sense for their own areas. For example, an area might be interested in pursuing an anti-idling program to save fuel. The area would find it easier to implement the program after being informed of the air quality benefits by the state.

**Tennessee DEC**
The EAC Program provided flexibility to local areas. National measures were primarily responsible for bringing the areas into attainment. However, the EAC allowed local areas to contribute to the effort to improve air quality. At times, the local programs included controversial measures such as lowering the speed limits for truckers. In order to be in the EAC Program, Chattanooga-Hamilton County APCD asked for an inspection and maintenance program, which was a controversial move.

**Texas CEQ**
Local areas, in conjunction with state approval, did receive flexibility in selecting control measures. The EAC Program areas implemented area-specific state rules and measures that were included in the air quality modeling performed for the areas' plans. In addition, some local measures were included in EAC Programs but which did not model.

**Virginia DEQ**
Virginia DEQ stated that EAC Program provided flexibility.

**West Virginia DEP**
West Virginia DEP stated that EAC Program provided a lot of flexibility.

**LOCAL GOVERNMENT AGENCIES**

**CAMPO (Austin, Texas)**
The EAC Program did provide local flexibility. After looked at the emissions for each of the five participating counties, the EAC workgroup set a target emissions reduction commitment level for each county and seven cities in the region (the largest city in each county plus two additional cities). In addition, multi-county measures such as inspection and maintenance programs were implemented in two urban counties and several measures were implemented through state rule (at the request of the local governments) in all five counties.

**Chattanooga-Hamilton County APCD**
In general, the EAC gave local areas greater flexibility.

**Denver RAQC**
The EAC gave Denver the flexibility to focus on specific industries of interest.

**Winchester-Frederick County Economic Development Commission (Northern Shenandoah Valley, Virginia)**
The EAC clearly gave areas the opportunity to develop a flexible approach. This was a strong selling point for obtaining the support of a skeptical community that was showing resistance to an unknown program.

**Greenville County, South Carolina Government**
The EAC Program did provide local flexibility.

**Aiken County, South Carolina Government (Lower Savannah)**
The EAC did provide local flexibility in the Lower Savannah area. Local stakeholders developed a list of voluntary and industrial measures that produced noticeable improvements. The local areas developed what they thought would be best for each individual source or sources.

**Association of Central Oklahoma Governments (ACOG)**
Yes, but the EAC Program did not have the strength to get areas to choose measures. Instead, they waited for designation before they would do anything. Having a percent reduction target would have changed things.

**Piedmont Triad (COG)**
The EAC did provide for a more flexible approach. A local stakeholder group put together an initial list of more than one hundred measures. After meeting monthly for one year, the group winnowed the list down to thirty measures. Afterwards, the group submitted and received approval for the measures from the participating local governments.

**Washington County Government**
The EAC may have provided local flexibility. However, there was not much Washington County could do at the local level. Whatever emissions reductions the County generated would be a drop in the bucket compared to those coming from all the federal and state programs. Washington County's activities focused primarily on educational outreach.

**6) Are there environmental benefits as a direct result of the EAC activities regarding pollutants other than ozone?**

**STATE ENVIRONMENTAL AGENCIES**

**Colorado DPHE**
There have been additional environmental benefits from the EAC. Air toxics have been lowered by the reduced VOC emissions from lower Reid vapor pressure gasoline. In addition, reductions in $NO_x$ emissions improved visibility and regional haze.

**Georgia DNR**
There were no other benefits directly resulting from EAC activities. The EAC Program areas selected control measures from a list of state rules. The EAC Program areas developed no local measures. For example, Augusta selected open burning as a local control measure. However, the state rules for open burning were used for Augusta rather than Augusta creating a local regulation.

**Louisiana DEQ**
Generally, the EAC Program Area did not get a lot of emissions reductions.

**Maryland DNR**
There were little environmental co-benefits as a direct result of the EAC activities regarding pollutants other than ozone.

**New Mexico ED**
There were no new local or state measures as a result of the EAC; those are a "work in progress." The area, though, did add a third air quality monitor. The EAC Program paved the way for a larger task force.

**North Carolina DENR**
The EAC Program produced additional direct benefits. The idling reduction and biofuel programs adopted by EAC Program areas reduced particulate matter (PM) emissions. The open burning ban also contributes to PM reductions but it was a state rule already in place prior to the EAC Program. Additionally, local ordinances reduced vehicle miles traveled by promoting walkable communities. This will reduce PM and carbon dioxide ($CO_2$) emissions as well.

**Oklahoma DEQ**
The EAC Program did produce additional direct benefits. As a result of the EAC Program, Oklahoma DEQ added a third air quality monitor. In addition, the very successful EAC Program paved the way for a larger taskforce.

**South Carolina DHEC**
The EAC Program generated additional direct benefits. South Carolina DHEC is building upon its ozone EAC Program to develop $PM_{2.5}$ and greenhouse gas (GHG) emission reductions programs.

**Tennessee DEC**
The EAC Program did produce additional direct benefits. The state promoted alternate fuels in the EAC Program. By reducing $NO_x$ emissions, alternative fuels help lower PM as well. The open burning ban has also helped reduce PM, carbon dioxide, air toxics and volatile organic compounds (VOCs).

**Texas CEQ**
Texas CEQ did not measure per se, but other pollutants benefits were possible. For example inspection and maintenance could benefit Colorado and PM.

**Virginia DEQ**
The EAC Program provided multiple direct environmental benefits. Roanoke is now looking at reducing $PM_{2.5}$ and GHG. As a result of the EAC Program, Winchester is much more interested in air quality issues of all types. Its residents are more educated and involved in air quality issues than before the EAC Program. Most importantly, the EAC Program spawned the SHENAIR project with NOAA to address air quality in the Northern Shenandoah Valley.

**West Virginia DEP**
EAC Programs, such as the reduced idling and freight partnership programs, have reduced NOx, PM, and air toxics.

## LOCAL GOVERNMENT AGENCIES

**CAMPO (Austin, Texas)**
Control measures adopted during the EAC Program have led to additional environmental benefits. Several measures reduce $CO_2$. The inspection and maintenance program reduces air toxics and PM. The school bus retrofits reduce PM and air toxics.

**Chattanooga-Hamilton County APCD**
The EAC activities have led to other environmental benefits. The inspection and maintenance program reduces combustion. The burn bans reduces PM, air toxics, and greenhouse gases.

**Denver RAQC**
The EAC Program has primarily generated VOC reductions. The reductions from the oil and gas industry have reduced some air toxics, but not by very much.

**Winchester-Frederick County Economic Development Commission (Northern Shenandoah Valley, Virginia)**
Not sure of any non-ozone environmental benefits.

**Greenville County, South Carolina Government**
The EAC Program did produce additional direct benefits. EPA Region 4 and South Carolina DHEC have been working with Greenville County, South Carolina Government on the $PM_{2.5}$ issue.

Note: A new $PM_{2.5}$ monitor was placed at a location that all agreed met EPA siting guidelines. County officials continue working with DHEC to site an additional $PM_{2.5}$ monitor in Spartanburg. The cooperative spirit the EAC has provided also allowed us to collectively site two new ozone monitors that all agreed met EPA siting guidelines.

**Aiken County, South Carolina Government (Lower Savannah)**
EAC measures to reduce ozone have also helped lower $PM_{2.5}$. The measures include diesel retrofits and the recent popularity of biodiesel in the area. One biodiesel plant is already in the area and another is being built. Lower Savannah is just under the limit for the $PM_{2.5}$ air quality standard. The area might have exceeded the $PM_{2.5}$ standard if not for the EAC activities.

**ACOG (Oklahoma City)**
Oklahoma City did not experience any other benefits from the EAC activities.

**Piedmont Triad (COG)**
The EAC Program did generate additional direct benefits. The North Carolina DENR Clean Smokestacks program continues to reduce PM and sulfates. Additional emissions reductions have occurred through the biodiesel and diesel retrofit programs.

**Washington County Government**
The EAC Program may have helped reduce PM emissions.

**7) To what extent did the EAC activities provide for longer-term emission reductions or create a local "infrastructure" for further or continued action in the future?**

## STATE ENVIRONMENTAL AGENCIES

### Colorado DPHE

The Colorado DPHE adopted regulations without expiration dates for the EAC Program. As a result, the regulations will provide long-term environmental benefits. In addition, the planning capacity developed by the Fort Collins area during the EAC Program will be valuable because the area is now designated nonattainment for the 8-hour ozone standard. The RAQC has also become successful at securing grant dollars to conduct outreach work.

### Georgia DNR

Aside from the learning experience, the local EAC activities did not provide much capacity for continued action in the future. For example, Walker and Catoosa County commissioners, two local EAC Program Area stakeholders, have not carried EAC efforts forward.

The EAC Program did facilitate inter-state collaboration. Prior to the EAC Program, Georgia and South Carolina had little, if any, coordination on emission control measures. Since the EAC Program, the two states have been working together on reducing $PM_{2.5}$ emissions.

### Louisiana DEQ

The control measures enacted for the EAC are permanent.

### Maryland DNR

Air quality forecasting now covers Washington County. In addition, local businesses and governments participate in ozone action day programs

### New Mexico ED

After the program ended, the EAC task force formed a successor group. The new task force attracts about 80 attendees to the regularly scheduled meetings. There is an oversight group composed of representatives from tribal, federal, state, and local governments. The task force developed a document with control measures for planning agencies in the state. This prepared the groundwork for the next standard.

### North Carolina DENR

Local stakeholders developed an awareness of air quality issues through the EAC Program. Because of this, air quality issues will continue to be raised by the activities initiated during the EAC that involve metropolitan planning. For example, air quality is an element in the smart growth principles adopted in planning districts during the EAC. These activities will continue. It is important that the parties implementing the program are government entities that will remain in place long term. Additionally, several of the EAC Program areas established Air Awareness outreach positions to promote public education and outreach. These activities are expected to continue.

**Oklahoma DEQ**
The participating communities developed an understanding of air quality issues through the EAC activities. As a result, the communities now understand regional haze and mercury issues. This will pay dividends for the new standard.

**South Carolina DHEC**
The EAC Program areas are continuing their air improvement efforts. As a result of the EAC Program, the state and local stakeholders have established an ongoing dialogue. The participants discuss the new ozone standard and the need for continued efforts to improve air quality.

**Tennessee DEC**
Due to the anti-backsliding measure, the state and locals have pledged to do everything necessary to stay within the SIP. The EAC activities developed an infrastructure that remains in place for further or continued action in the future.

**Texas CEQ**
Each of the EAC Program areas has made a commitment to implement the programs through 2012. In addition, public awareness of air quality has influenced local planning activities, particularly in Austin, Texas.

**Virginia DEQ**
Both of the EAC Program areas are committed to keeping the programs going. Financial support and the new standard will help keep that commitment alive. Roanoke, for example, wants to expand air quality measures beyond ozone to address $PM_{2.5}$ and GHG. In addition, Roanoke has inquired about funding for woodstove changeout programs. Winchester has developed a website, conducted significant outreach, and committed to funding an air quality coordinator.

**West Virginia DEP**
West Virginia DEP created the position of a regional economic development coordinator to coordinate the EAC activities. This position will likely continue to be funded in the future.

**LOCAL GOVERNMENT AGENCIES**

**CAMPO (Austin, Texas)**
A regional group of elected officials and staff will continue to work on air quality issues. (This group just developed an 8-hour Ozone Flex Program that has been approved at the state and local level and is awaiting EPA approval). The EAC control measures in the SIP will continue to be implemented for the foreseeable future. In addition, there is no talk of stopping the local measures used in the EAC Program.

**Chattanooga-Hamilton County APCD**
The burn ban and inspection and maintenance program in Chattanooga-Hamilton County APCD are in the SIP and will remain in effect as long as necessary.

**Denver RAQC**
The EAC Program has helped the City to deal with future air quality issues. In addition, the emissions reductions from the oil and gas industry will continue into the future

**Winchester-Frederick County Economic Development Commission (Northern Shenandoah Valley, Virginia)**
The County will need to stay involved in air quality issues because the ozone problem can return. All the relevant stakeholders are more willing to work together since the EAC Program.

**Greenville County, South Carolina Government**
The "local 'infrastructure'" is the strong partnership created during the process with public and private organizations.

Several activities will help continue emissions reductions:

- The B2@School program is planned for all of the Elementary Schools in the County.
- Reducing lawn mowing and having a student patrol encouraging buses and parents not to idle.
- Safe route to school to encourage walking.

Unfortunately, HOV lanes were not implemented but they will continue with community awareness campaign.

**Aiken County, South Carolina Government (Lower Savannah)**
There is a framework in place for continued action. In addition, South Carolina Electric and Gas added gas turbines and switched to a wood pellet fuel as a permanent measure.

**ACOG (Oklahoma City)**
The EAC activities did provide assistance for longer-term emission reductions. Oklahoma City is now aware of the type of projects to look for in the future. In addition, the ACOG will likely devote ½ FTE to air quality issues. Hopefully, in the future, the ACOG will have 1 FTE working on air quality issues.

**Piedmont Triad (COG)**
The EAC created an infrastructure to address air quality issues in the future. PTCOG will continue to take the lead in the effort to improve air quality in the area. The EAC is the platform they will build on for future activities.

As a result of the EAC, a number of regional organizations and programs (PTCOG, regional transportation authority, Triad Air Quality Program, and North Carolina Solar Center) have formed an effective network/infrastructure that continues to work on regional air quality issues.

**Washington County Government**
The awareness of air quality issues developed through the EAC Program has established a foundation for future action.

**8) Will EAC activities result in continued reductions in ozone and air quality improvement activities/policies that were not foreseen at the time the EACs were developed?**

**STATE ENVIRONMENTAL AGENCIES**

**Colorado DPHE**
The EAC established an atmosphere that helped create alliances to push the oil and gas industry for emissions reductions. As a result, the state obtained large emissions reductions earlier than would have occurred without the program. The state continues to ask for additional reductions and plans to do so in the future as well. The EAC Program also provided the stimulus for the state to pursue statewide controls on oil and gas facilities to help with ozone air quality in the Front Range area of Colorado.

**Georgia DNR**
No activities were identified.

**Louisiana DEQ**
Yes, but no activities were identified.

**Maryland DNR**
Due to the EAC Program, air quality forecasting now covers Washington County. Local businesses and governments now participate in ozone action day programs.

**North Carolina DENR**
The EAC led to the development of policies and projects that would not have been implemented otherwise. These include: a school bus anti-idling program, increased use of biodiesel, alternative modes of transportation, expanded bus routes, and policies requiring sidewalks and green-spaces.

**South Carolina DHEC**
Some measures in South Carolina were in the planning process prior to the new ozone NAAQS, such as a lawn mower exchange. However, stakeholders became interested in the initiatives because of the EAC Programs.

"Capacity building", described in the air quality context as the increased capacity of a local area to continue the air quality improvement effort, continues to take place in South Carolina's EAC Program areas. This is beneficial because local efforts will be important to meet the new standard. Transportation related efforts will also be important. In this regard, South Carolina DHEC is "leading by example" through carpooling and other measures. These efforts are offshoots of the EAC Program.

**Tennessee DEC**
The EAC Program began with a core group of individuals. However, public participation in the program grew as larger numbers of people began taking voluntary efforts to improve air quality.

**Texas CEQ**
The EAC led to a range of programs that would not have otherwise occurred. These include: an inspection and maintenance program in Austin, Texas; cement kiln and CPS voluntary reductions in

San Antonio; airport emissions reductions; lawn mower trade-in programs; and retrofits with natural gas for compressor engines in North East Texas.

**Virginia DEQ**
The EAC stimulated offshoots such as a green building program in Roanoke.

**LOCAL GOVERNMENT AGENCIES**

**CAMPO (Austin, Texas)**
The EAC control measures will be continued and will continue to reduce ozone. Two new regional activities have been implemented, a region-wide ride share website for twenty-two participating counties and an ozone watch/warning system implemented in conjunction with the state.

**Chattanooga-Hamilton County APCD**
The EAC activities will lead to continued reductions. The EAC led the local Air Pollution Control Board to collaborate more with the Health Department. This relationship will continue in the future. The EAC Program also helped promote greater use of greenways, bikeways and similar measures. Chattanooga-Hamilton County APCD continues to pursue extended bikeways.

**Denver RAQC**
The EAC Program created an awareness of ozone that will continue.

**Winchester-Frederick County Economic Development Commission (Northern Shenandoah Valley, Virginia)**
The EAC Program has created an infrastructure for further action. The EAC fostered a closer working relationship between state and local governments. By working together on the EAC Program, the different levels of government developed a level of trust that will make it easier to work together on future air quality issues. In addition, public awareness of air quality issues that began during the EAC Program continues to grow. The EAC Program also led to the creation of the SHENAIR project with NOAA to address air quality in the Northern Shenandoah Valley (http://www.isat.jmu.edu/shenair/).

**Greenville County, South Carolina Government**
Activities will continue because there is still a lot of room for growth. The County would like to get high school and college students to do PSAs. It would like to get some grant money to do a pilot program for PSAs and to do a statewide PSA.

Greenville County, South Carolina Government has discussed continuing the EAC strategies. Although there is no longer any requirement to submit EAC reports, the County sends copies of progress reports to the state and US EPA under a grant requirement. The County also continues working with and record information from Trees Greenville and Garden Clubs on the $B^2$@School program.

**Aiken County, South Carolina Government (Lower Savannah)**
Lower Savannah continues to do public outreach.

**ACOG (Oklahoma City)**
Nothing yet has happened in Oklahoma City.

**Piedmont Triad (COG)**
PTCOG believes the rate of air quality progress will continue.

**Washington County Government**
No activities were cited.

**9) What improvements could be made to the program to make it better?**

**STATE ENVIRONMENTAL AGENCIES**

**Colorado DPHE**
The resources needed to implement the EAC Program were about the same as would be required to reach attainment through the traditional SIP process. It is important that the EAC Program remain part of SIP process. The Colorado DPHE also felt that the 6-month progress reports were appropriate and not burdensome.

**Georgia DNR**
Georgia DNR believes that the two EAC Program areas were given too much latitude without any technical assistance. In retrospect, the state would have given local areas more guidance on what they needed to do. Georgia would have also stressed that measures adopted by EAC Program areas need to be local measures accompanied by local responsibility.

Georgia DNR believes EPA needs to provide initial assistance to EAC Program areas by suggesting control measures to help local stakeholders get started. Georgia DNR believes EPA must also provide technical assistance to the EAC Program areas throughout the duration of the program.

It is critical that the right elected officials are involved and provide leadership in the process. Georgia DNR believes EPA also needs to be certain that elected officials provide an authentic commitment to participate in the program. Even so, the turnover of elected officials provides a challenge to continuity of the process. The stakeholders who will be impacted by the control measures also need to be involved in the process.

Georgia DNR believes the following elements have been important to the success of Georgia's $PM_{2.5}$ focus areas:

- Educate areas about the problem;
- Provide areas with appropriate local control measures;
- Involve all stakeholders impacted by the measures; and
- Provide technical assistance and help areas stay focused on control measures that will make a difference.

Georgia DNR believes the EAC Program is too resource intensive. For example, the requirements for the formal EAC submittal to EPA for approval were overly burdensome. In this instance, Georgia had to submit the following information: 1) a conceptual description of the ozone problem; 2) an emissions inventory; and; 3) an atmospheric modeling and attainment demonstration. The effort needed to compile this information took about the same amount of resources needed for an attainment SIP.

Georgia believes that these elements are unnecessary for a voluntary program and should not be required in future programs.

**Louisiana DEQ**
The EAC requirements should be eased. Due to resource constraints, less stringent modeling should be required.

**Maryland DNR**
The program was too heavy on process. The biannual reporting requirement was overly burdensome for states and localities. It added another level of pressure to state agencies. Maryland DNR submitted fresh reports each time rather than presenting a pro forma response. As a result, the state had to submit a large amount of paperwork each time. Maryland DNR emphasized that the biannual reporting requirement added another level of pressure to state agencies.

EPA expectations are unclear. The state received little feedback from EPA on the progress reports. Although the air quality staff knew the situation was okay, other state departments and localities expected some type of approval or acknowledgement from EPA. To improve the reporting process, Maryland DNR recommends that EPA require that states complete a checklist that would be followed by an EPA recognition/response letter.

The EAC Program created an uneven playing field. When the EAC Program was conceived, Maryland DNR already had a program in place to control emissions at the state level. However, the state did not get credit for it in the EAC Program as part of their base statewide control program.

**New Mexico ED**
EPA should ensure continued funding for EAC Program areas. A functioning partnership with EPA Regional Offices is important to a successful program. New Mexico ED also believed that the semi-annual reporting was appropriate but more frequent reporting would be burdensome.

**North Carolina DENR**
More time needs to be built into the timetable to make it a more realistic schedule. One of the state's biggest concerns was having enough time to have the Compact signed. In addition, the EAC Program works much better in smaller areas.

North Carolina DENR made several concessions to environmentalists. The state extended its modeling time to cover a full 10-year period to 2017. There had been concern that the EAC Program did not cover a maintenance program. Although the state was required to do 5 years of modeling, it agreed to model for an additional 5-year period. In addition, North Carolina DENR agreed to conduct annual reviews for new source and VMT growth.

**Oklahoma DEQ**
EPA must provide funds for participating areas through a grant system. The grant program could require matching funding from recipients. Oklahoma DEQ could not have performed the ozone modeling needed for the EACs without funding from the state Department of Transportation. EPA 105 funding enabled the state to develop a modeling capability but did not provide the capacity to refine the system for the EAC Program areas.

The biannual reporting requirement was worth the effort to avoid nonattainment designation.

**South Carolina DHEC**
The reporting requirement was burdensome and time consuming. In addition, the reporting procedures were confusing. EPA needs to develop a clearer reporting format.

South Carolina DHEC also had problems calculating emissions reductions. It would be very helpful to have a computer program that conducted the calculations. With such a program in place, the state would not have to take so much time to develop an extensive narrative description. The program should be available to local stakeholders to assist with calculating emissions. This might assist them in their decision making as well.

**Tennessee DEC**
EPA should consider offering incentives to participate in the program. If the Clean Air Act (CAA) is reopened, an EAC Program should be included in the Act. In the meantime, EPA should consider announcing another EAC Program before or coinciding with issuance of a new nonattainment area boundary memo.

**Texas CEQ**
The EAC Program should be confined to just demonstrating attainment. The state felt that it was bonus on resources not having to do RFP or transportation conformity. With respect to timing, the EAC process did not match traditional or required attainment dates. In fact, the EAC process was not earlier, it was later. Finally, the EAC Program provided local areas more say in their "destinies."

**Virginia DEQ**
The reporting requirements were burdensome and redundant. The need to produce bi-annual reports was counterproductive and took resources away from the program. Less frequent reporting would have the same or more value.

Virginia had limited resources to devote to the program. EPA Region 3 did allow Supplemental Environmental Project money to be used for diesel retrofits. An EPA grant or loan program would help EAC Program areas implement local measures. For example, Roanoke is looking for grant for a woodstove changeout program.

**West Virginia DEP**
There were no real downsides to the EAC Program other than the reporting requirements. The bi-annual reporting requirement was overly burdensome for EPA regions and states. Less frequent reporting would accomplish the same purpose.

EPA should provide assistance for the technical work needed to fulfill EAC requirements. The assistance could come through a matching grant or by providing technical resources.

**LOCAL GOVERNMENT AGENCIES**

**CAMPO (Austin, Texas)**
The EAC needs to remain part of a SIP to have credibility. states and local areas need an incentive to participate in an EAC Program. It is important that local areas retain the flexibility to develop their

own control measures. In addition, a minimum emission reduction target requirement should be considered to address environmental concerns. Progress reports are important but the EAC requirements were somewhat burdensome. An annual progress report would be preferable to the semi-annual reports required by the EAC.

**Chattanooga-Hamilton County APCD**
Chattanooga-Hamilton County APCD could not think of anything that should be done to change the program. The County did not believe the reporting requirement was burdensome. Instead, it kept them focused on the program. The County did the reports cumulatively so information only had to be added periodically.

**Denver RAQC**
One year is too short of a time frame for SIP development. In addition, the legal issues need greater clarity. They are difficult for local areas to comprehend.

**Winchester-Frederick County Economic Development Commission (Northern Shenandoah Valley, Virginia)**
The reporting requirements of the EAC Program were repetitious. A new program should have a more simplified reporting process. The new process should be more quantitative. A checklist may be an appropriate method of reporting progress. In addition, education needs to be a critical component in the initial stages of the program.

**Greenville County, South Carolina Government**
The reporting requirement takes a lot of paperwork and meetings to keep up with but it is not onerous. However, EPA should adopt a standard electronic form for the progress report for local governments to submit to South Carolina DHEC and from South Carolina DHEC to EPA.

**Aiken County, South Carolina Government (Lower Savannah)**
Aiken County, South Carolina Government (Lower Savannah) did not have any outstanding concerns. The main concern had been the difficulty EAC organizers had keeping people involved after improvements had been made in local air quality. However, SCDHEC sent out a letter to EAC stakeholders requesting their participation in $PM_{2.5}$ discussions. In the letter, stakeholders became aware of state and federal support for the meetings and programs. It also let them know that $PM_{2.5}$ is a regional, not just local, problem. There was a great response to the invitation. The Lower Savannah group is working again. There is a bigger response when SCDHEC is involved.

**ACOG (Oklahoma City)**
The EAC Program did not have the strength to get areas to choose measures. The program would be stronger by incorporating a percentage reduction target. This would have improved the local program. The Ozone Flex program is much stronger than the EAC. The EPA's Ozone Flex Program forced ACOG to do much more public participation. Local businesses were more involved in the Ozone Flex Program.

**Piedmont Triad (COG)**
Money should be provided to local areas for administrative costs. PTCOG did not believe that the EAC reporting requirements were burdensome. The EAC Program had fewer reporting requirements than in

other situations that include EPA funding. Those situations require additional paperwork. For example, the EAC reporting requirements were much easier than the requirements for water quality grants.

**Washington County Government**
No areas for improvement were cited.

**10) Would you do it again?**

**STATE ENVIRONMENTAL AGENCIES**

**Colorado DPHE**
Colorado DPHE would participate in the EAC Program again because of the strong incentives to come into attainment. For example, the EAC process in the Four Corners area helped bring many stakeholders together, including representatives from the oil and gas industry.

**Georgia DNR**
Georgia would do the program again. The state learned a lot from this first experience and its collaboration with South Carolina DHEC. Georgia would like EPA to allow states to do an EAC Program for the 2008 ozone standard. However, in order to do the EAC Program again, the state would need to find a way to stretch its resources. At present, Georgia does not know how it would fund participation again.

**Louisiana DEQ**
Louisiana DEQ would join the program again. The state would like an EAC Program for the new standard to start soon so that areas can get started right away.

**Maryland DNR**
Maryland DNR's participation would depend upon the area under consideration. Washington County would not participate because it became nonattainment for $PM_{2.5}$. Maryland DNR would enter a rural area on the Eastern Shore if it received credit for its existing program to control emissions at the state level.

**New Mexico ED**
New Mexico ED would consider participating if the EAC Program provided funding.

**North Carolina DENR**
North Carolina DENR would join the program again because of the need to obtain emissions reductions from local measures. Because of the commitment to clean air in the EAC Program areas, less outreach will be needed to educate stakeholders for the 2008 ozone standard.

Local areas appreciate being able to take action to fix air quality problem before being designate nonattainment. The EAC communities were very proactive and progressive in developing activities. The EAC approach elicits a more positive response from stakeholders than does the traditional approach.

The state received negative reactions to the traditional process. Local areas expressed much frustration when the $PM_{2.5}$ nonattainment designations were announced. The EPA/state simply labeled an area

nonattainment rather than offering to develop a collaborative approach to solving the air quality problem. Being designated nonattainment for $PM_{2.5}$ took away the benefits that had been obtained by participating in the EAC. This produced a negative reaction to the EAC concept.

**West Virginia DEP**
West Virginia DEP would support another EAC in Martinsburg because the local stakeholders were engaged in the process. However, it may not support an EAC in other areas because of uncertainty over the level of local participation.

**LOCAL GOVERNMENT AGENCIES**

**CAMPO (Austin, Texas)**
CAMPO (Austin, Texas) said they would absolutely participate again.

**Denver RAQC**
Denver would do the program again.

**Chattanooga-Hamilton County APCD**
Chattanooga-Hamilton County APCD would absolutely do the program again.

**Winchester-Frederick County Economic Development Commission (Northern Shenandoah Valley, Virginia)**
Winchester-Frederick County Economic Development Commission (Northern Shenandoah Valley, Virginia) would definitely participate again.

**Greenville County, South Carolina Government**
Greenville County would participate again. The County will continue to write and distribute progress even if there is not another EAC Program.

**Aiken County, South Carolina Government (Lower Savannah)**
Yes, Aiken County, South Carolina Government (Lower Savannah) would participate again.

**ACOG (Oklahoma City)**
Oklahoma City would definitely participate in the EAC again. It just signed an Ozone Flex agreement.

**Piedmont Triad (COG)**
The PTCOG area would enthusiastically participate in another EAC Program. Another EAC Program would reflect positively on EPA's understanding of motivation and management.

**Washington County Government**
Washington County is a rural area that never had to think about air quality. The County did not understand the problem or what to do because it had never been designated nonattainment for any pollutant. Maryland DNR encouraged Washington County to become an EAC Program Area. The County wanted to be proactive in addressing the problem. It also wanted to avoid transportation conformity. The County relied heavily on the state for technical assistance because it lacked the ability and necessary resources. Midway through the EAC process, however, Washington County learned it would have to do transportation conformity for the $PM_{2.5}$ standard.

Washington County appreciated the EAC concept and "gentler" approach to air quality issues. The County did not fully understand what it was getting into before agreeing to participate in the program. It did not realize that the EAC would be such a labor intensive process that required more work than just doing conformity. If the area had been designated nonattainment, the County's involvement would have been limited to attending MPO meetings to deal with conformity issues. Consequently, Washington County would not likely participate in an EAC Program again. It would take less effort to go through the traditional process.

## TRADITIONAL AREA PROGRAM DISCUSSIONS

**1) Is the traditional model a more or less efficient way to deliver clean air to citizens in these areas (versus the EAC approach)? If so, how? If not, why?**

## STATE ENVIRONMENTAL AGENCIES

### North Carolina DENR

The Rocky Mount area felt that it was unfairly designated nonattainment when EPA made designations for the 8-hour ozone standard. Seventy-five percent of the emissions causing the problem in Rocky Mount came from the Raleigh-Durham-Chapel Hill, North Carolina area. The remaining twenty-five percent of the emissions came from Fayetteville, NC.

The traditional approach was not more efficient in Rocky Mount. It did not generate support for environmental measures in the local area. The EAC Program approach would have helped to change attitudes and generate local support for the program in Rocky Mount.

### Tennessee DEC

Due to the restrictive nature of the process, the traditional model is a less efficient method of improving air quality. The EAC Program provides areas with the opportunity to utilize control measures that work best for local conditions without imposing the regulatory burden. This allows participants to buy into the program instead of feeling that they are being told what they must do. The collaborative dialog among participants provides for a more efficient method of reaching attainment status.

Instead of following the traditional approach, five areas in Tennessee adopted voluntary EAC-type activities. The Chattanooga EAC developed an inspection and maintenance (I/M) program that brought the area into attainment. Due to the overwhelming benefits from the EAC Program, the American Lung Association withdrew its opposition and supported the program. The traditional route would not have provided an opportunity for Chattanooga to implement an I/M program.

The selection criteria used by the EAC Program also contributes to the efficiency of the program. Modeling is a central part of the EAC Program process. The EAC Program only selects locations that demonstrate through modeling that they have the capability to come into attainment through voluntary measures. As a result, local areas were selected for the EAC Program if they had an opportunity for success. Since it would have been required under the traditional approach, the modeling aspect of the EAC Program is neither more nor less of a burden. The selection criteria made the EAC Program a more efficient approach than the traditional model.

**LOCAL GOVERNMENT AGENCIES**

**Rocky Mount Urban Area MPO and Carolinas Gateway Partnership (Rocky Mount)**
Rocky Mount officials could not compare the two approaches because they are not familiar with the EAC Program process.

Nonetheless, it is important for a local area to have personal contact with state and federal agencies. Rocky Mount had good pre-existing working relationships with North Carolina Department of Transportation and the Federal Highway Administration. The agencies were very cooperative in providing needed assistance. This enabled Rocky Mount to comply with program requirements without difficulty. In comparison, larger urban areas may have more difficulty meeting program requirements under the traditional approach.

The redesignation process takes a very long time under the traditional approach. It would be beneficial to local areas if the time period could be shortened.

**Knox County, Air Quality Management, Department of Public Health (Knoxville, Tennessee)**
Knoxville went through much of the EAC Program process. At the air quality summit in 2003, the EAC Program process brought leaders together at an early stage to think about the consequences of nonattainment designation. It was very much in favor of the EAC Program from a political standpoint.

However, the modeling came up a little short for participation in the program. Knoxville started out with an 8-hour ozone design value of 91 parts per billion (ppb), but the amount of voluntary reductions needed was too immense. If not for a severe summer with higher ozone levels, the area would have come into attainment. Knoxville responded by carrying through with many of the voluntary measures initially formulated during the EAC Program process. Consequently, it can be viewed as an area that went through an EAC-type process but within a traditional framework.

The opportunity to do an EAC would be helpful but it is not known whether it would be more efficient. The cost of Knoxville's program was just as much due to needed modeling and staff resources as required by the traditional approach.

**2) What has been the impact of the traditional approach on State and local resources?**

**STATE ENVIRONMENTAL AGENCIES**

**North Carolina DENR**
Rocky Mount was close to the standard and relied on existing federal and state measures to attain.

**Tennessee DEC**
The resource allocation for Tennessee's voluntary programs was a burden but required by law. Modeling is a central component in the EAC Program process. The state agency paid the University of Tennessee $300,000 a year to conduct required modeling. However, modeling would have been required under the traditional approach as well. So, the modeling aspect of Tennessee's voluntary program was not considered to be more or less burdensome.

The EAC Program process required more effort in the early stages as opposed to the heavy back loading of the traditional program. Although the voluntary EAC Program approach cost a little bit more upfront, it produced a greater yield of benefits.

**LOCAL GOVERNMENT AGENCIES**

**Rocky Mount Urban Area MPO and Carolinas Gateway Partnership (Rocky Mount)**
The process is time consuming but it is also a great learning experience. As a result of going through the traditional approach, Rocky Mount officials are more sympathetic to making improvements to enhance air quality.

**Knox County, Air Quality Management, Department of Public Health (Knoxville, Tennessee)**
Four local areas worked with Tennessee DEC, and independently as well, to try to create a unified SIP. As noted, Knoxville's program cost the same as the traditional approach. The resource cost was sizeable but unavoidable.

Because of its larger resource base, Knox County was able to do more voluntary measures. This was due to the large size of the metropolitan area and to the accompanying tax base that is associated with such a population base.

**3) Did the traditional approach require more money and resources over the EAC approach?**

**STATE ENVIRONMENTAL AGENCIES**

**North Carolina DENR**
In the short term, it took the state fewer resources to work with Rocky Mount under the traditional approach. The EAC Program process requires a lot of resources up front but has long-term benefits that are not realized by the traditional approach.

**Tennessee DEC**
More local resources would be required for a locally-driven EAC-type approach than for the traditional approach.

**LOCAL GOVERNMENT AGENCIES**

**Rocky Mount Urban Area MPO and Carolinas Gateway Partnership (Rocky Mount)**
Rocky Mount used about five full time equivalents during the process. Officials believe that more staff time is required in the traditional approach. However, the resource burden was not overtaxing for the City.

**Knox County, Air Quality Management, Department of Public Health (Knoxville, Tennessee)**
More local resources would be required for a locally-driven EAC-type approach than for the traditional approach.

**4) What have been other impacts, intended or not, if any, of the traditional approach on local communities and State air agencies?**

**STATE ENVIRONMENTAL AGENCIES**

**North Carolina DENR**
Rocky Mount is an economically depressed area that is losing population and jobs. It felt stung by the nonattainment designation. Conversely, the EAC Program process does help areas that accept the need to improve air quality.

**Tennessee DEC**
The traditional approach can breed resentment. Conversely, the EAC Program motivates people by getting stakeholders to buy into the process.

**LOCAL GOVERNMENT AGENCIES**

**Rocky Mount Urban Area MPO and Carolinas Gateway Partnership (Rocky Mount)**
State agencies and EPA required substantial work products. Rocky Mount conducted public hearings. Rocky Mount came out of nonattainment quickly. Officials felt that Rocky Mount came out of nonattainment more quickly than the EAC Program areas.

**Knox County, Air Quality Management, Department of Public Health (Knoxville, Tennessee)**
Programs are easier to justify to the general public under the traditional approach. Politics are removed from programs when they are backed up by regulatory requirements. Under the traditional approach, local areas can point out that they are required by EPA (or another agency) to implement certain measures. It was much harder politically to implement some measures that were adopted voluntarily by a local area (e.g., reduced speed limits for trucks). So, it is easier to implement programs under the traditional approach.

**5) Was the traditional approach successful at engaging and involving stakeholders at the local level?**

**STATE ENVIRONMENTAL AGENCIES**

**North Carolina DENR**
The traditional approach engaged stakeholders in the Raleigh-Durham-Chapel Hill, North Carolina area but did not engage stakeholders in Rocky Mount. However, the state did not focus too many resources in Rocky Mount since it had an 8-hour ozone design value of 85 ppb when designated nonattainment.

**Tennessee DEC**
The voluntary EAC-type approach adopted by Tennessee and implemented by the Clean Air Coalition definitely engaged local stakeholders in areas that were required to do the traditional process. The voluntary approach provides incentives to local areas to participate. For example, stakeholders in the Knoxville and Memphis areas became involved in the hope of getting an EAC.

**LOCAL GOVERNMENT AGENCIES**

**Rocky Mount Urban Area MPO and Carolinas Gateway Partnership (Rocky Mount)**
Yes, the traditional approach successfully engaged and involved stakeholders at the local level.

**Knox County, Air Quality Management, Department of Public Health (Knoxville, Tennessee)**
Knoxville did not follow the traditional approach. But, the voluntary program used by Knoxville did bring together county mayors, local congressmen, and various other stakeholders.

6) **Were there intangible outcomes from stakeholder engagement such as increasing local awareness that may provide for air quality benefits and better decisions in the future?**

**STATE ENVIRONMENTAL AGENCIES**

**Tennessee DEC**
Tennessee DEC's voluntary program increased public awareness, built alliances, and provided for a dialog between stakeholders. The program also promoted behavioral changes in the public.

**LOCAL GOVERNMENT AGENCIES**

**Rocky Mount Urban Area MPO and Carolinas Gateway Partnership (Rocky Mount)**
Industry, MPO committees on technical coordination and transportation advising, and local government were well engaged in the process. There was not much public participation.

The Long Range Transportation Plan produced many benefits. Rocky Mount intends to follow the plan.

The situation encouraged adjacent areas to work together by taking a multi-region approach.

**Knox County, Air Quality Management, Department of Public Health (Knoxville, Tennessee)**
Knoxville is considered to be a college town that has many progressive-minded people. There were a lot of complaints that not enough had been done to improve the natural environment in the community. This may provide the foundation for future activities. Also, the pathway of communication between stakeholders is now much more open. The improved communication contributed to the formation of the regional clean air coalition.

7) **Did the traditional approach give local areas the flexibility to develop their own approach to meeting the 8-hour ozone standard?**

**STATE ENVIRONMENTAL AGENCIES**

**North Carolina DENR**
The traditional approach provides less opportunity and less incentive for local areas to develop their own approach. There is also less interaction between government and business in the traditional approach. On the other hand, the EAC Program's powerful incentives encourage government and business to act more like partners.

**Tennessee DEC**
Under the CAA there is no local flexibility in the traditional approach. In particular, section 182 of the CAA does not provide any flexibility. Memphis applied for and received a reclassification of its ozone classification but did not reach attainment. As a result, Memphis is ineligible to receive an extension. Knoxville is in limbo because of the uncertainty for subpart 1 ozone nonattainment areas as a result of a court vacature of EPA's implementation rulemaking.

**LOCAL GOVERNMENT AGENCIES**

**Rocky Mount Urban Area MPO and Carolinas Gateway Partnership (Rocky Mount)**
No, Rocky Mount followed the lead of North Carolina DENR, Federal Highway Administration, and transportation groups. Rocky Mount representatives are satisfied with this approach. Local areas would not know how to do it differently. It is difficult for local areas to develop alternative approaches to complex issues when the state already has a good approach. It is hard to have expertise at local level.

**Knox County, Air Quality Management, Department of Public Health (Knoxville, Tennessee)**
No, but the EAC Program does.

**8) Are there environmental benefits as a direct result of traditional approach activities regarding pollutants other than ozone?**

**STATE ENVIRONMENTAL AGENCIES**

**North Carolina DENR**
No, the focus is on reducing ozone precursors. In the traditional approach, there are a lot more requirements that need to be met. The goal is to meet those minimum requirements. Conversely, the EAC Program is an open-minded process. There is a fundamental difference between the two approaches. Under the traditional approach, the state has to solve the problem. Under the EAC Program model, the group works to solve the problem. This leads to more innovative solutions.

**Tennessee DEC**
Under the traditional approach, the Stage I vapor recovery provided for an alleviation of air toxics. However, this applied to the EAC Program process as well.

Chattanooga voluntarily asked for an I/M program that was politically unpopular but resulted in a Volkswagen plant coming into the area. This would not have been allowed under the traditional program. In addition, speed limit reductions were powerful measures but would not have been done if an area relied upon the traditional approach.

The state responded to an increased interest in environmental issues by making the AQI available to the public.

**LOCAL GOVERNMENT AGENCIES**
**Rocky Mount Urban Area MPO and Carolinas Gateway Partnership (Rocky Mount)**
There may be benefits for other pollutants but Rocky Mount representatives are not aware of what them.

**Knox County, Air Quality Management, Department of Public Health (Knoxville, Tennessee)**
Many of the measures implemented under the voluntary approach were done for ozone but had an effect on $PM_{2.5}$ and regional haze.

**9) To what extent did traditional approach activities provide for longer term emission reductions or create a local "infrastructure" for further or continued action in the future?**

**STATE ENVIRONMENTAL AGENCIES**

**North Carolina DENR**
The EAC Program approach provided these benefits to a greater extent. The traditional approach is more short sighted and does not get local, long-term emissions reductions. Neither Rocky Mount nor Raleigh-Durham-Chapel Hill, North Carolina has hired an AQ coordinator. Also, neither area has an AQ-focused central task force

**Tennessee DEC**
The traditional approach locks in control measures and contingency measures for an extended period of time. This approach also provides for continued and more concrete control measures.

Under the voluntary approach, the state of Tennessee created a regional Clean Air Coalition to bring together county mayors and other influential individuals to develop a cohesive clean air plan. The Coalition continues to operate. It illustrates the ongoing gains from the EAC Program.

Tennessee DEC would not have to conduct the same level of stakeholder outreach in another EAC-type program. Much of the groundwork has already been established. Tennessee believes that behavioral changes are going to be the factor that decides whether an area will be able to reach attainment in the future. Because lifestyle changes will be voluntary by design, the best way to encourage them is through an EAC-type program.

**LOCAL GOVERNMENT AGENCIES**

**Rocky Mount Urban Area MPO and Carolinas Gateway Partnership (Rocky Mount)**
The traditional approach created a close working relationship between parties within the Metropolitan Statistical Area and the state. The relationship has proven to be beneficial. In addition, Rocky Mount learned from the experience.

**Knox County, Air Quality Management, Department of Public Health (Knoxville, Tennessee)**
A great deal of information went out to the public during the voluntary program. This generated an awareness of air quality issues. Incentives were given to Knox County and Knoxville employees to participate in the smart trips program. The program also generated advocacy for increased bus routes, especially to outlying areas. In general, the process helped to lay the groundwork for programs such as I/M.

**10) Will traditional approach activities result in continued reductions in ozone and air quality improvement activities/policies that were not foreseen at the time of designation?**

**STATE ENVIRONMENTAL AGENCIES**

**North Carolina DENR**
No, traditional approach activities are not expected to produce unforeseen reductions.

**Tennessee DEC**
Desulfurization will result in mercury reductions that were not foreseen. This will help out mercury-impaired waters.

**LOCAL GOVERNMENT AGENCIES**
**Rocky Mount Urban Area MPO and Carolinas Gateway Partnership (Rocky Mount)**
In general, public awareness of air quality issues increased. The growing awareness may lead to vehicle emissions reductions if the public changes personal behavior patterns by driving less or filling up at appropriate times. Otherwise, it may be too early to tell if unforeseen reductions will emerge. All measures may not be in place yet.

**Knox County, Air Quality Management, Department of Public Health (Knoxville, Tennessee)**
Most of the voluntary activities ran their course. Additional reductions will be seen with accompanying growth to the area. One criticism of the voluntary approach is that it keeps initial momentum going but falters once the initial catalyst has been removed. For example, rising gas prices had an initial effect but have since leveled off. Programs are permanent under the traditional approach. These programs generate more long-term reductions.

**11) What improvements could be made to the traditional approach to make it better?**

**STATE ENVIRONMENTAL AGENCIES**

**North Carolina DENR**
Before designations occur, the state should be given an opportunity to address air quality issues to see if problems can be solved through control measures, both at the state and local level. Those data should be used as the basis for designations. In addition, the CAA is punitive. The state was forced to obtain VOC reductions when they are unnecessary.

**Tennessee DEC**
EPA needs to write rules that will not get vacated. The heavy reliance on EPA rules that have been vacated has put the state in a bad situation.

**LOCAL GOVERNMENT AGENCIES**

**Rocky Mount Urban Area MPO and Carolinas Gateway Partnership (Rocky Mount)**
Anything to speed up the conformity process would be beneficial. Rocky Mount representatives did not know how to improve the process.

**Knox County, Air Quality Management, Department of Public Health (Knoxville, Tennessee)**
A Knoxville representative believes that politics at the federal level are immense. The traditional approach cannot really be changed without some major reform (e.g., Clean Air Interstate Rule and Clean Air Mercury Rule). Either way, local areas would find it helpful to receive guidance on how to implement programs under the traditional approach.

For the EAC Program, a local area must be close to the standard to participate in the program. That is the key to the program. By being close to the standard, the area is predisposed to succeed. It is the only way to realistically expect the EAC Program to work in an area.

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