December 19, 2003

Mr. J. I. Palmer, Jr., Regional Administrator
USEPA, Region 4
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303

Dear Mr. Palmer:

As a requirement for continued participation in South Carolina's 8-Hour Ozone Early Action Compact, enclosed you will find the December 2003 Progress Report completed by participating counties and the South Carolina Department of Health and Environmental Control (DHEC). Enclosure 1 includes the report for DHEC and Enclosure 2 includes the report for each participating county, grouped by the following areas:

Appalachian: Anderson, Cherokee, Greenville, Oconee, Pickens, Spartanburg
Catawba: Chester, Lancaster, Union, York
Pee Dee: Chesterfield, Darlington, Dillon, Florence, Marion, Marlboro
Waccamaw: Georgetown, Horry, Williamsburg
Santee Lynches: Clarendon, Kershaw, Lee, Sumter
Berkeley-Charleston-Dorchester: Berkeley, Charleston, Dorchester
Low Country: Beaufort, Colleton, Hampton, Jasper
Lower Savannah: Aiken, Allendale, Bamberg, Barnwell, Calhoun, Orangeburg
Central Midlands: Fairfield, Lexington, Newberry, Richland
Upper Savannah: Abbeville, Edgefield, Greenwood, Laurens, Saluda

The modeling and emissions inventory components of the early action process remain on schedule. Meetings continue to be held with local stakeholder groups to assist in determining the emission reduction strategies that will be included in the final local Early Action Plans due to EPA in March 2004. DHEC has requested assistance from EPA, Region 4 in determining emission reductions from proposed strategies.

Thank you for the assistance and support EPA has provided in this process. We look forward to continuing to work with EPA as we implement measures to achieve cleaner air sooner for South Carolina and our neighboring states. Should you have questions or desire additional information, please do not hesitate to contact Jim Joy, Chief of DHEC's Bureau of Air Quality at (803) 898-4123 or Henry Phillips of his staff at (803) 898-3260.

Sincerely,

R. Lewis Shaw, P.E.
Deputy Commissioner
Environmental Quality Control

Enclosures:
1. South Carolina DHEC December 2003 Progress Report
2. December 2003 Progress Reports for Participating Local Areas

cc: Kay Prince, EPA Region 4
County Officials (no attachments*)
Ron Methier, GA Dept. of Natural Resources (no attachments*)
Keith Overcash, NC Dept. of Environmental and Natural Resources (no attachments*)
EQC District Directors (no attachments*)

*All those not receiving attachments will be notified when materials are placed on website.

Statewide Initiatives and Emission Reduction Strategies

Early Action Compact Milestone December, 2003
List of Emission Reduction Strategies Under Consideration
Bureau of Air Quality – DHEC
State of South Carolina

Based on stakeholder consultation and taking into consideration resource and political constraints, the following control measures under consideration can be reasonably implemented. It is anticipated these measures under consideration will assist South Carolina in achieving and/or maintaining the 8-hour ozone standard by 2007 and beyond.

Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed date for implementation	Geographic area and/or local government
Ozone Forecast/Outreach and Education	The Division of Emissions, Modeling and Support develops a forecast for the 8-hour ozone standard. The forecast is for four areas within South Carolina. These areas include the Upstate, Central Midlands, Central Savannah River and Pee Dee. The Catawba area, including Chester, Lancaster and York counties is included in North Carolina's forecast through a cooperative partnership. A link for the Catawba forecast is included on DHEC's website. This year, 2003, was the first year that South Carolina forecasted for the Pee Dee area. The Division of Air Planning, Development and Outreach is responsible for disseminating the ozone forecast to interested individuals and groups across the state, primarily during the summer months. The forecast serves as a public health advisory to protect those persons who are most at risk to the effects of ozone.	Directionally Sound	Ongoing	Forecast Areas: Upstate area - Anderson, Oconee, Pickens, Greenville, Abbeville, Laurens, Greenwood, Spartanburg, Cherokee, and, Union counties. Central Midlands area – Newberry, Fairfield, Kershaw, Lexington, Richland, Calhoun, Kershaw, and, Sumter. Central Savannah River area – Allendale, Barnwell, Aiken, Saluda, Edgefield, and, McCormick. Pee Dee area – Lee, Darlington, Florence, and, Chesterfield
Support activities implemented by local areas participating in the EAC	SC has been and will continue to work with EPA to assist local areas in determining the emission reduction strategies that will assist the area in achieving emission reductions needed for attaining and maintaining the 8-hour ozone standard within their respective area. The Division of Air Planning, Development and	Directionally Sound	Ongoing	Statewide

Refer to the December 2003 Progress Reports submitted by individual areas for additional activities.

Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed date for implementation	Geographic area and/or local government
	Outreach continues to develop a Resource Guide for Air Quality Improvement that contains useful information to assist counties in planning for cleaner air sooner. This guide is a work-in-progress in which DHEC will continue to search for new information and ask that any information gathered and/or found by counties be shared so that it can be added and used for the benefit of everyone. This guide consists of informational text, pamphlets, hand-outs, useful websites, and other resources that will serve as a tool for county planning. Fact sheets have either been developed or revised to assist with understanding ozone, ozone monitoring and the ozone design value. Copies of these fact sheets were included in the June 2003 submittal. Forms for the milestones have been developed by the Division and provided to the participating areas to assist with the reporting aspect of the EAC. These forms were approved by EPA and were shared with other states involved in the EAP process.			
Open Burning	Revise the existing state regulation (R.61-62.2, Prohibition of Open Burning) to reduce statewide NOx/PM/CO emissions. The DHEC Board granted initial approval of the proposed regulation on October 9, 2003. An informational forum was held on November 24, 2003. Final approval by the DHEC Board will be requested January 8, 2004, for submittal to the state legislature.	Currently Evaluating	Promulgation should occur by June 2004. Implementation expected by 2005.	Statewide
South Carolina NOx Control Regulation	This proposed regulation is designed to help control the growth of NOx emissions statewide and focuses on sources currently not subject to NOx control requirements. This proposed regulation would apply to new NOx sources but would exempt units that are regulated by other NOx regulations with equivalent requirements. The DHEC Board granted initial approval of the proposed regulation on October 9, 2003. An informational forum was held on November 24, 2003.	Currently Evaluating (See Attachment 1)	Promulgation should occur by June 2004. Implementation expected by 2005.	Statewide

Refer to the December 2003 Progress Reports submitted by individual areas for additional activities.

Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed date for implementation	Geographic area and/or local government
	Final approval by the DHEC Board will be requested January 8, 2004, for submittal to the state legislature.			
CAIGE	Develop, implement and market a plan for reducing ground-level ozone precursors by state government.	Voluntary efforts Directionally Sound	April 2005	Statewide
Smart Highways	A plan to ensure transportation plans, programs and projects consider statewide and local air quality goals. Certain aspects of the Transportation Conformity regulations may be incorporated into such a plan.	Not applicable		Statewide
Initiative to reduce NOx emissions from large facilities within South Carolina	Staff within the Bureau of Air Quality, have met with some of the "larger" facilities in South Carolina to negotiate NOx emissions through the permitting process. Those reductions will be made available once they are finalized.	Currently Evaluating	April 2005	Statewide
Tier 2 standards	Federal emission standard for passenger cars, light trucks, and larger passenger vehicles. Program designed to focus on reducing the emissions most responsible for the ozone and particulate matter impact from these vehicles, including NOx and VOCs.	Currently Evaluating (See Attachment 2)	Phase in period 2004-2007	Statewide
Low Sulfur	Program to reduce average gasoline sulfur levels nationwide	Currently Evaluating (See Attachment 2)	Phase in period 2004-2007	Statewide
NOx SIP Call	Federal Rule calling for SIP revision that requires sources in 17 states, including South Carolina to reduce summertime NOx emissions.	18 percent reduction in NOx (See Attachment 2)	2004	Statewide

Refer to the December 2003 Progress Reports submitted by individual areas for additional activities.

Estimated Reductions Achieved by NOx Control Standards from Uncontrolled Levels

Source Type	Control Technology and/or Emission Limit	Percent Reduction from Uncontrolled
Boilers and Water Heaters		
Natural Gas Fired Boilers		
≥10mmBTU/hr and < 100mmBTU/hr	Low NOx Burners or equivalent technology capable of achieving 30ppmv @ 3% O2 Dry (0.036 lb/mmBTU)	50%[1]
≥100mmBTU/hr	Low NOx Burners + Flue Gas Recirculation or equivalent technology capable of achieving 30 ppmv @ 3% O2 Dry (0.036 lb/mmBTU)	50- 60%[1]
Distillate Oil Fired Boilers		
≥10mmBTU/hr and < 100mmBTU/hr	Low NOx Burners or equivalent technology capable of achieving 0.15 lb/mmBTU	50%[1]
≥100mmBTU/hr	Low NOx Burners + Flue Gas technology capable of achieving 0.14 Recirculation or equivalent lb/mmBTU	60%[1]
Residual Oil Fired Boilers		
≥10mmBTU/hr and < 100mmBTU/hr	Low NOx Burners or equivalent technology capable of achieving 0.3 lb/mmBTU	50%[1]
≥100mmBTU/hr	Low NOx Burners + Flue Gas Recirculation or equivalent technology capable of achieving 0.3 lb/mmBTU	60%[1]

Refer to the December 2003 Progress Reports submitted by individual areas for additional activities.

Multiple Fuel Boilers	The emission limits for boilers burning multiple fuels are calculated in accordance with the formulas below. Additional fuels shall be addressed on a case-by-case basis.	
≥10mmBTU/hr and < 100mmBTU/hr	E_n = [(0.036 lb/mmBTU H_{np}) + (0.15 lb/mmBTU H_{do}) + (0.3 lb/mmBTU H_{ro}) + (0.35 lb/mmBTU H_c) + (0.2 lb/mmBTU H_w)]/(H_{np} + H_{do}+ H_{ro} + H_c + H_w) where: E_n is the nitrogen oxides emission limit (expressed as NO_2), ng/J (lb/million Btu) H_{np} is the heat input from combustion of natural gas, H_{do} is the heat input from combustion of distillate oil H_{ro} is the heat input from combustion of residual oil, H_c is the heat input from combustion of coal, H_w is the heat input from combustion of wood residue.	≈50%[1]
≥100mmBTU/hr	E_n = [(0.036 lb/mmBTU H_{np}) + (0.14 lb/mmBTU H_{do}) + (0.3 lb/mmBTU H_{ro}) + (0.25 lb/mmBTU H_c) + (0.2 lb/mmBTU H_w)]/(H_{np} + H_{do}+ H_{ro} + H_c + H_w) where: E_n is the nitrogen oxides emission limit (expressed as NO_2), ng/J (lb/million Btu) H_{np} is the heat input from combustion of natural gas, H_{do} is the heat input from combustion of distillate oil H_{ro} is the heat input from combustion of residual oil, H_c is the heat input from combustion of coal. H_w is the heat input from combustion of wood residue.	≈60%[1]
Wood Residue Boilers		
All types	Combustion controls to minimize NOx emissions or equivalent technology capable of achieving 0.20 lb/mmBTU	0-50%[2]
Coal Fired Stoker Fed Boilers		
< 250 mmBTU/hr	Combustion controls to minimize NOx emissions or equivalent technology capable of achieving 0.35 lb/mmBTU	34%[3]

Refer to the December 2003 Progress Reports submitted by individual areas for additional activities.

≥ 250 mmBTU/hr	Combustion controls to minimize NOx emissions or equivalent technology capable of achieving 0.25 lb/mmBTU	53%[3]
Pulverized Coal Fired Boilers		
< 250 mmBTU/hr	Low NOx Burners + Combustion controls to minimize NOx emissions or equivalent technology capable of achieving 0.35 lb/mmBTU	50%[1]
≥ 250 mmBTU/hr	Low NOx Burners + Combustion controls to minimize NOx emissions + SCR or equivalent technology capable of achieving 0.14 lb/mmBTU	70%+[1]
Municipal refuse fired boilers		
< 250 mmBTU/hr	Combustion modifications to minimize NOx emissions + Flue Gas Recirculation or equivalent technology capable of achieving 200 ppmv @12% CO_2 (0.35 lb/mmBTU)	12%[3]
≥ 250 mmBTU/hr	Staged Combustion and Automatic Combustion Air Control + SCR or equivalent technology capable of achieving 0.18 lb/mmBTU	55%[3]
Internal Combustion Engines		
Compression Ignition	Timing Retard ≤ 4° + Turbocharger w/ Intercooler or equivalent technology capable of achieving 490 ppmv @ 15% O_2 (7.64 gm/bhp-hr)	20-30%[1]
Spark Ignition	Lean Burn Technology or equivalent technology capable of achieving 1.0 gm/bhp-hr	87%[1]
Landfill or Digester Gas Fired	Lean Burn Technology or equivalent technology capable of achieving 1.25 gm/bhp-hr	≈50%[EST]

Refer to the December 2003 Progress Reports submitted by individual areas for additional activities.

Gas Turbines		
Simple Cycle – Natural Gas		
< 50 Megawatts	Combustion Modifications (e.g. dry low-NOx combustors) to minimize NOx emissions or equivalent technology capable of achieving 25 ppmv @ 15% O_2 Dry (0.054 lb/mmBTU)	81%[4]
≥ 50 Megawatts	Combustion Modifications (e.g. dry low-NOx combustors) to minimize NOx emissions or equivalent technology capable of achieving 9.0 ppmv @ 15% O_2 Dry (0.033 lb/mmBTU)	84%[1]
Combined Cycle – Natural Gas		
< 50 Megawatts	Dry Low-NOx Combustors or equivalent technology capable of achieving 9.0 ppmv @ 15% O_2 Dry (0.033 lb/mmBTU)	84%[1]
≥ 50 Megawatts	Dry Low-NOx Combustors + SCR or equivalent technology Capable of achieving 3.0 ppmv @ 15% O_2 Dry (0.011lb/mmBTU)	94%[1]
Simple Cycle - Distillate oil combustion		
< 50 Megawatts	Combustion Modifications and water injection to minimize NOx emissions or equivalent technology capable of achieving 42 ppmv @ 15% O_2 Dry Basis (0.16 lb/mmBTU)	68%[1]
≥ 50 Megawatts	Combustion Modifications and water injection to minimize NOx emissions or equivalent technology capable of achieving 42 ppmv @ 15% O_2 Dry Basis (0.16 lb/mmBTU)	68%[1]
Combined Cycle - Distillate oil combustion		
< 50 Megawatts	Dry Low-NOx Combustors with water injection, or equivalent technology capable of achieving 42 ppmv @ 15% O_2 Dry Basis (0.16 lb/mmBTU)	68%[1]

Refer to the December 2003 Progress Reports submitted by individual areas for additional activities.

≥ 50 Megawatts	Dry Low-NOx Combustors, water injection, and SCR or Equivalent technology capable of achieving 10.0 ppmv @ 15% O_2 Dry Basis (0.038 lb/mmBTU)	90%[1]
Landfill Gas Fired	Water or steam injection or low NOx turbine design or equivalent technology capable of achieving 25 ppmv @ 15% O_2 (0.097 lb/mmBTU)	48%[4]
Cement Kilns		
All	Low NOx Burner or equivalent technology capable of achieving a 30% reduction from uncontrolled levels	30%
Fluidized Bed Combustion (FBC) Boiler:		
Coal Fired	SNCR- Urea (Selective Noncatalytic Reduction - Urea) capable of achieving 0.07 lbs/mmBTU (51.8 ppm @ 3% oxygen)	75%[1]
Wood Fired	SNCR- Urea (Selective Noncatalytic Reduction - Urea) capable of achieving 0.07 lbs/mmBTU (51.8 ppm @ 3% oxygen)	55%[1]
Recovery Furnaces		
All	4th level or air to recovery furnace/good combustion practices or equivalent technology capable of achieving 100 ppm @8% oxygen	0-30%[5]
Lime Kilns		
All	Combustion controls or equivalent technology capable of achieving 175 ppm @ 10% oxygen	25%[3]
Fuel Combustion Sources Not Otherwise Specified: (Examples include but are not limited to process heaters, dryers, furnaces, ovens, duct burners, incinerators, and smelters)		

Refer to the December 2003 Progress Reports submitted by individual areas for additional activities.

All	Low NOx Burners or equivalent technology capable of achieving 30 ppmv @ 3% O_2 Dry (0.036 lb/mmBTU)	0-60%[1]

[1] – EPA 456/F-99-066R "EPA Technical Bulletin – Nitrogen Oxides (NO_x), Why & How thet are Controlled", Nov. 1999.
[2] – EPA 453/R-94-022 "Alternative Control Techniques Document – NO_x Emissions from Industrial/Commercial/ Institutional Boilers", March 1994
[3] – Compared with emissions from EPA's AP-42 "Compilation of Air Pollutant Emission Factors"
[4] – EPA's "Emission Factor Documentation for AP-42 Section 3.1 Stationary Gas Turbines", April 2000
[5] - Information found on EPA's RACT/BACT/LAER Clearinghouse plus information found in the Willamette PSD permit review (SC).

Utility Reductions from EGUs in the NOx SIP Call

Utility	*1998 Emissions*[1] **(tons/day)**	*2007 Emissions* **(tons/day)**	*2012 Emissions* **(tons/day)**
Progress Energy	13.76	30.97	30.97
SCE&G	147.8	84.06	84.06
Santee Cooper	151.65	21.34	30.97
Duke Power	17.21	13.70	13.70
Total	330.42 tons/day	150.07	159.70
Reduction from 1998 Levels	-	54.6%	51.7%

[1]- Emission data represents modeling episode only.

Note: Data is for the EGU units under the NOx Trading Program Only.

Reductions from Tier II and Low Sulfur Fuel Regulatory Changes

(For May 1998 Episode & Future Years Using Mobile6 Model)

Year	Mobile On-Road Emissions (tons/day)	% Reduction from 1998 Levels
1998	345	-
2007	153	55.6%
2010	128	62.9%
2012	116	66.3%

Refer to the December 2003 Progress Reports submitted by individual areas for additional activities.

These are the Draft Plans of Emission Reduction Strategies for the Appalachian Region submitted for the December 10, 2003 Early Action Compact Milestone.

Early Action Compact – List of Possible Emission Reduction Strategies Under Consideration
Upstate Counties of Anderson, Greenville, and Spartanburg (South Carolina)
Adopted by the Upstate Air Quality Steering Committee, December 2, 2003

Based on stakeholder consultation and taking into consideration resource and political constraints, the following control measures are under consideration pending modeling that demonstrates compliance in 2007 by SCDHEC. It is anticipated these measures under consideration will assist the County of Anderson, Greenville, Spartanburg, South Carolina, in achieving and/or maintaining the 8-hour ozone standard by 2007.

Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
1. Support SCDHEC statewide efforts to reduce ozone levels. Priority A	• Develop stakeholder group to support and participate in modeling efforts. • Develop stakeholder group to participate in development of regulations (NOx – BACT (Best Available Control Technology Economically Achievable), restrict open burning).	Equivalent to removing 359,500 cars from the road or 7190 tons of VOC	Ongoing	Area: Countywide. Agency: SCDHEC, local governments.

Findings

a. The NOx Control Regulation will directly affect most combustion sources:
   i. NOx control regulations require technology that meets "BACT limits found in the BACT/BACT/LAER Clearinghouse" for all new or modified sources of NOx. DHEC Response to Comments, "Boilers" (July 16, 2003).
   ii. Low NOx burners ("LNB") or the equivalent are required technology for existing sources replacing burners, and new construction must meet NOx Guidelines. NOx Control Regulations, Sections III-IV.
   iii. DHEC "cannot to date predict with any accuracy what additional reductions [in NOx levels]" will be achieved from the NOx Control Regulation, if any, for the Upstate in excess of current strategies. DHEC Response to Comments, S.C. Chamber of Commerce, Response to No. 8.
   iv. DHEC modeling shows attainment without the NOx Control Regulation by 2010. Id.
   v. Technology upgrades and tune-up requirements will incur capital and operations/maintenance costs. A cost/benefit analysis is not complete on the regulations, but costs are believed to be outweighed by costs of non-attainment. Id.

b. VOC Best Available Control Technology ("BACT") regulations are proposed for any new source construction permit where the net VOC emissions increase is 100 TPY since July 1, 1979:
   i. The "actual emissions" definition is revised to be more stringent than Federal standards by limiting the analysis to "the average rate, in tons per year, at which the unit actually emitted [VOC] during a two-year period which preceeded the particular date and which is representative of normal source operations." Draft R.61-62.5, Standard No. 5.1, Section I.A.3 (April 28, 2000).
   ii. VOC BACT will be triggered by "new construction" when the "net VOC emissions increase exceeds 100 tons per year" since July 1, 1979. Id. at Section II.B.
   iii. DHEC has not conducted modeling on the affects of the more stringent BACT for VOCs on ozone levels in the Upstate.

Priority A: those strategies that should be implemented in the short term. Priority B: those strategies that should be implemented in the long term.
The Upstate Air Quality Steering Committee adopted these strategies on May 13, 2003 and authorized submittal to the County Councils of Anderson, Greenville, and Spartanburg, South Carolina. The County Councils of Anderson, Greenville, and Spartanburg adopted these strategies on May 20,2003, June 3, 2003, and May 19, 2003, respectively.

Advantages

a. NOx Control Regulations:

   i. Modeling the affect on ozone attainment by the NOx Control Regulation will give certainty to the cost benefit analysis, the anticipated affects on a designation of non-attainment, and implementation of the EAC plans in the Upstate.
   ii. Revisions to the NOx Control Regulation for technology requirements may preclude industrial development and expansion in Upstate.
   iii. If modeling demonstrates ozone reductions, the state-wide regulation would reduce costs of non-attainment for the Upstate.

b. VOC BACT Control Regulations:
   i. The proposal substantially increases the number of sources subject to BACT controls for VOCs, and VOCs are a precursor to ozone.
   ii. If modeling demonstrates ozone reductions, the state-wide regulation would reduce costs of non-attainment for the Upstate.

Disadvantages

a. NOx Control Regulations:
   i. The EAC plan, in part, is being pursued to avoid costly limits on industrial growth like BACT technology requirements, so the NOx Control Regulation undermines that objective. The need for the EAC is diminished as a result.
   ii. BACT technology for replacements and combustion burners as required could prove costly and deter industrial development in Upstate.
   iii. The NOx reduction from a state-wide NOx Control Regulation are not modeled and are unknown.

b. VOC BACT Control Regulations:
   i. The costs of BACT to local industry may be significant, including deterrence to industrial development and expansion in the Upstate.
   ii. The applicability of BACT-like standards to sources less than 250 TPY was a primary rationale for undertaking the EAC process to avoid non-attainment; adopting the regulation in the Upstate jeopardizes the rationale.
   iii. The regulation changes presume the most recent two years are representative of pollutant loadings for the plant; allowing comparison to any two consecutive years over the past ten years would more accurately represent normal industry operations.
   iv. Modeling, to date, does not demonstrate reduction in VOCs under the BACT Regulation and will have an affect on ozone levels in the Upstate.

Recommendation

a. Further evaluate statewide NOx Control Regulations until modeling demonstrates a reduction in ozone levels in the Upstate will result.
b. Further evaluate statewide VOC BACT Control Regulations until modeling demonstrates a reduction in ozone levels in the Upstate will result.

Cost of implementation

Cost/benefit analysis underway

Priority A: those strategies that should be implemented in the short term. Priority B: those strategies that should be implemented in the long term.
The Upstate Air Quality Steering Committee adopted these strategies on May 13, 2003 and authorized submittal to the County Councils of Anderson, Greenville, and Spartanburg, South Carolina. The County Councils of Anderson, Greenville, and Spartanburg adopted these strategies on May 20,2003, June 3, 2003, and May 19, 2003, respectively.

Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
2. Designate an Ozone Action Coordinator Priority A	• Designate a staff person in each County who will be responsible for coordination of counties ozone programs.	Not applicable.	March 2003	Area: Countywide. Agency: local governments.

Findings

Two scenarios could be considered under this measure:

i. Allow one central ozone action coordinator to coordinate with representatives from Anderson, Greenville, and Spartanburg.

Advantages

a. All three county representatives would have a central person to share and disseminate the same information related to ozone alerts, air quality activities, committee meetings, etc.
b. One central person would represent Anderson, Greenville, and Spartanburg on regional issues, statewide meetings, etc.
c. Ensures coordinated efforts and timely responses to DHEC and EPA.

Disadvantages

a. A central person may not have the appropriate information to speak on behalf of all three counties.

ii. Allow each county to have its own ozone action coordinator.

Advantages

a. Each county's coordinator would have the appropriate knowledge to represent his/her county.
b. Each county's coordinator would be the official spoke person for members of the Steering Committee or Elected Officials of each county.

Disadvantages

a. Information may not be equally shared amongst all three coordinators.
b. Lack of a central coordinator may make it difficult to coordinate meetings, share information equally, and provide timely responses to DHEC and EPA.

Cost of implementation

a. In either scenario, there would not be a need to fund an additional position as current staff already working on air quality matters in each county would absorb the tasks and duties assigned to these coordinator positions.
b. If expenses cannot be absorbed within the current budget appropriations, it is recommended that a budget of approximately $5,000 be allocated by each county to cover expenses such as traveling, attending conferences, publications, etc.
c. Cost per Ton: Not applicable.

Potential Revenue Sources

Not applicable.

Conclusion

a. Either system should work as long as the three counties have representatives working together in a coordinated fashion.

Priority A: those strategies that should be implemented in the short term. Priority B: those strategies that should be implemented in the long term.
The Upstate Air Quality Steering Committee adopted these strategies on May 13, 2003 and authorized submittal to the County Councils of Anderson, Greenville, and Spartanburg, South Carolina. The County Councils of Anderson, Greenville, and Spartanburg adopted these strategies on May 20,2003, June 3, 2003, and May 19, 2003, respectively.

b. The appropriate authority, e.g., County Administrator, should officially appoint the Ozone Action Coordinator.

Priority A: those strategies that should be implemented in the short term. Priority B: those strategies that should be implemented in the long term.
The Upstate Air Quality Steering Committee adopted these strategies on May 13, 2003 and authorized submittal to the County Councils of Anderson, Greenville, and Spartanburg, South Carolina. The County Councils of Anderson, Greenville, and Spartanburg adopted these strategies on May 20,2003, June 3, 2003, and May 19, 2003, respectively.

Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
3. Seek low sulfur fuels as early as possible. Priority A	• Continue to coordinate with representatives of Colonial and Plantation pipelines, refiners, and State representatives to ensure that the upstate has the opportunity to receive low sulfur fuels at the earliest date as they can be provided.		Ongoing	Area: Countywide Agency: local governments.

Findings

a. Low sulfur gasoline enables properly equipped vehicles emissions control systems to work at maximum effectiveness.
b. EPA recognized this and has adopted Tier 2 vehicle standards and complimentary new gasoline sulfur specifications.
c. EPA's new specification for vehicles and fuels are expected to reduce ozone precursors (NOx) by up to 95% from current levels.
d. EPA's program begins 1/1/2004. Fuels requirements phase in during 2004, 2005.
e. Vehicle standards apply to new sales and continue to become more effective as fleets turn over.
f. Ultra low sulfur diesel (ULSD) enables properly equipped engines/vehicles emissions control systems to work at maximum effectiveness.
g. ULSD alone without new engine standards does nothing to reduce ozone precursors. Vehicle and engine manufacturers should be added as a major focus to this effort. The State needs to find ways to accelerate fleet turnover to the new vehicle/engine standards that are designed to go with the fuel.
h. EPA recognized this and has adopted new diesel vehicle/engine standards and complimentary new diesel sulfur specifications.
i. EPA's new specification for vehicles and fuels are expected to reduce ozone precursors (NOx - 90%, VOC - 70%) from current levels.
j. EPA's program begins 6/1/2006. Fuels requirements phase in through 2009.
k. Vehicle standards apply to new sales and continue to become more effective as fleets turn over.
l. SC's ozone problems are now being identified. SC is due to nominate nonattainment counties in 2003. Early Action Compact plans are due to EPA 2004, a state SIP to follow by 12/31/04, with controls to be implemented by 12/31/05.

Advantages

a. Low sulfur gasoline does reduce NOx in existing vehicles, but only with minor impact. The key is matching new vehicle standards and lower sulfur fuels.

Disadvantages

a. Tier 2 gasoline alone does not get the maximum NOx reduction from gasoline vehicles without accompanying vehicle exhaust treatment improvements.
b. The fungible fuel distribution system that currently serves SC will specify federal fuels on the federal fuels schedule. It is currently running on a very tight and closely managed schedule. Making new space in that system to segregate fuels (either gasoline or diesel) may not be available, or if it is, it may be expensive and inconsistent.
c. If we can manage to get Tier 2 gasoline to SC early, product and distribution costs will add to consumer expense.
d. ULSD alone without new engine standards does nothing to reduce ozone precursors. Aftermarket additions to existing engines can reduce PM with use of ULSD, but does not reduce ozone precursors.
e. Even if supply could be found, very protective segregation in the distribution system to keep spec at 15ppm sulfur (current diesel is 500ppm sulfur) would require severe constraints on distribution system and may not be possible, unless ULSD was delivered direct from a supplier (trucked). Distribution costs in this scenario are expected to be disproportionate.

Priority A: those strategies that should be implemented in the short term. Priority B: those strategies that should be implemented in the long term.
The Upstate Air Quality Steering Committee adopted these strategies on May 13, 2003 and authorized submittal to the County Councils of Anderson, Greenville, and Spartanburg, South Carolina. The County Councils of Anderson, Greenville, and Spartanburg adopted these strategies on May 20,2003, June 3, 2003, and May 19, 2003, respectively.

Cost of implementation

a. EPA estimates the Tier 2 program to increase vehicle costs $100 to $200 per vehicle and incremental fuel manufacturing cost to be 2 cpg. Other costs may be associated with distribution and segregation. API estimated incremental production costs to be 3-4cpg with additional distribution costs.
b. Costs of getting Tier 2 gasoline to market earlier than required by federal law vary by supplier and distribution route. Projects scheduled for federal compliance are nearing completion now and moving them forward (from 1/1/2004) is not possible. Where limited amounts of Tier 2 gasoline can be made early distribution/segregation logistics will determine incremental cost.
c. EPA estimates the ULSD highway diesel program to increase vehicle costs $1200 to $1900 per vehicle and incremental fuel manufacturing cost to be 4-5 cpg. Other costs may be associated with distribution and segregation. API estimated incremental production costs to be 9cpg with distribution costs, manufacturing and emissions control fuel economy penalties adding ass much as another 6cpg.
d. Costs of getting ULSD to market earlier than required by federal law vary by supplier and distribution route. In most instances projects scheduled for federal compliance are already underway and moving them forward is not possible. Where limited amounts of ULSD can be made early distribution/segregation logistics will determine incremental cost.

Potential Revenue Sources

Not applicable.

Conclusion

a. There is no need to pursue acceleration of clean gasoline deliveries, as they will be fully implemented by the 12/31/05 Early Action Compact controls implementation date.
b. It may be beneficial to continue to look for ways to bring in ULSD early if the state can also find ways to accelerate fleet turnover to the new vehicle/engine standards that are designed to go with the fuel. Vehicle and engine manufacturers should be added as a major focus to this effort.
c. Tie in fleet turnover effort with Strategies #6, #12.
d. Add new Strategies in areas of: 1. Conversion of municipal fleets (busses, trucks, city vehicles), 2. Incentives conversion of heavy duty vehicles
e. The major roadblocks in bringing in early fuels are the inability to speed up refinery projects that are already well underway on planned schedules and potentially insurmountable distribution logistics. Identification of revenue sources is not key to resolution of these issues.

Priority A: those strategies that should be implemented in the short term. Priority B: those strategies that should be implemented in the long term.
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Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
4. Design and implement congestion management and Intelligent Transportation System (ITS) measures. Priority A	• Implement congestion management projects: intersection and signalization improvements to alleviate traffic congestion, therefore, reducing emissions from idling vehicles; • Implement Intelligent Traffic Systems such as automated advisory/alert messages to drivers on interstate highways. For example: advise motorist about an accident ahead and the use of alternate routes to avoid congestion, which minimize emissions from idle vehicles. • Encourage and support improved traffic operational planning, engineering and maintenance for existing and future transportation infrastructure.		2003 and ongoing	Area: Cities and Counties major corridors. Agency: GRATS, SPATS, and ANATS.

Findings

a. ITS provides a relatively inexpensive strategy for the mitigation of congestion leading to harmful emissions.
b. GRATS has concluded a Congestion Management Plan (CMS) that can be used for the implementation of ITS for the Greenville urban area.
c. SPATS has several CMS studies underway for major corridors within the Spartanburg urban area; these studies will form the basis for the Spartanburg ITS system.
d. I-85 in both Greenville and Spartanburg counties has permanent variable message boards that would allow motorists to alter their routes in the event of a incident ahead. These boards will be on line shortly.
e. SPATS has provided funds to the city of Spartanburg to coordinate all signals within and on the periphery of the city within a single system.

Advantages

a. Relatively inexpensive and proactive solution to mitigate congestion.
b. Empowers motorists to alter routes in the event of incidents.
c. Can mitigate congestion on both urban arterials and interstate highways.

Disadvantages

a. Some needed funding may not yet be in place, or obligated for other projects.

Cost of implementation

Cost per Ton

Potential Revenue Sources: SPATS, GRATS. ANATS, three County Transportation Committees.

Conclusion

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ITS remains one of the best solutions in solving traffic problems leading to congestion and emissions of pollutants. Once ITS systems are implemented within the areas interested, work needs to be done to coordinate their effect over a multi-county area. Past, ongoing, and future CMS studies should form the basis for future ITS implementation and coordination.

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Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
5. Use of hybrid vehicles. Priority A	• Encourage people, public and private organizations to purchase hybrid vehicles as they replace vehicles/fleet • Encourage that 10% of public agencies fleet have hybrid vehicles (use of hybrid vehicles does not require changes in infrastructure for dispensing fuel). • Encourage public agencies to require purchasing hybrid electric vehicles (HEVs) through the State vehicle contract.		Counties: 2004-2005. Other local governments as soon as practical.	Area: countywide. Agency: local governments.

Findings

a. The use of conventional cars impose external costs on society, i.e., environmental pollution, health problems attributed to air pollution, greenhouse gases, changes in climate, dependence on imported oil, and cost of securing oil supplies. These external costs are usually borne by governments; therefore, there is justification for governments to pay the incremental cost of purchasing HEVs for their fleets. Not only will governments help with relieving society from the external costs imposed by conventional cars, but they will also help in building up the demand of HEVs. This would allow manufacturers to reduce their costs to the point where HEVs become attractive at the retail level. (http://www.gvsc.ca/hybrid.html#today)
b. Hybrid vehicles use two or more sources of power. Currently, these vehicles use electricity generated from batteries and mechanical power generated by an internal combustion engine.
c. Hybrid electric vehicles produce low emissions and more miles per gallon.
d. HEVs never have to be plugged in to recharge the batteries since they recharge as the vehicles operate.
e. The federal government provides tax incentives to individuals who purchase new clean fuel vehicles or HEVs (see strategy # 12 for tax incentives).
f. Federal and private funding sources for R&D: the federal government, through the Department of Energy, has partner with automobile manufacturers to share the cost of developing a comprehensive HEV research and development program.
g. Manufacturers are also addressing off-highway applications with the production of hybrid trucks, trams and shuttle buses. (http://www.evi-usa.com/aboutus.htm)
h. Toyota (Prius) and Honda (Insight and the Civic Hybrid) have produced hybrid vehicles.
i. Ford introduced its concept environmentally friendly SUV in April 2003. The Ford Escape Hybrid will be available to consumers in late summer 2004 and identified fleet customers later in 2003. (http://www.fordvehicles.com/escapehybrid/frameset.asp; http://www.hybridcars.com/default.htm).
j. Ford also announced that the new 2006 Ford Futura mid-size car will be its next hybrid vehicle and it is planning to launch it in 2005.
k. General Motors (http://www.ott.doe.gov/hev/gmaccomp.html) plans to launch several new HEV models between model years 2004 and 2007 as follows:
    a. 2004: The Chevrolet Silverado and GMC Sierra. These will be available first to fleets; in fall 2004 they will be available to the public.
    b. 2005: The Saturn Vue will carry a Super Ultra Low Emissions Vehicle rating.
    c. 2006: The Chevrolet Equinox SUV.
    d. 2007: The Chevrolet Tahoe and the GMC Yukon SUVs. This same year GM will offer the hybrid system used on the Equinox on the Chevrolet Malibu sedan.
l. DaimlerChrysler (http://www.ott.doe.gov/hev/dcaccomp.html) plans to release the hybrid Dodge Ram pickup in 2005 and the Mercedes S-class in 2006.
m. Also Mitsubishi, Nissan, Fiat, Renault, and Subaru are developing their own HEVs. (http://www.ott.doe.gov/hev/faqs_ans1.html)

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n. It is unclear if the majority of consumers are aware of the existence of the new technology and benefits that HEVs offer, i.e., improved air quality, health and financial incentives. Manufacturers and local dealers should establish a more aggressive marketing campaign describing these benefits to create consumer awareness of their availability locally.
o. Motorists traveled more than 2.8 trillion miles in 2002 in the country. (http://money.cnn.com/2003/07/18/pf/autos/bc.autos.deaths.reut)
p. There are 22 million SUVs on U.S. roads. This is approximately 10 percent of the total number of vehicles. (http://money.cnn.com/ 2003/07/18/pf/ autos/bc.autos. deaths.reut)
q. State and local governments around the country are purchasing HEVs for their fleets. For example, SCDHEC purchased a Toyota Prius and a Honda Insight; King County, WA purchased twenty (20) Toyota Prius cars at a total cost of $375,000. (http://www.metrokc.gov/procure/ green/bul66.htm#1)
r. National initiative to assist state and local governments purchase low-emission, energy-efficient fleet vehicles: this national purchasing alliance will allow local and state agencies to pool their purchasing power. By doing it, agencies will obtain fuel-saving hybrid vehicles with favorable contract provisions. The leading agency will be King County, Washington. King County and the project sponsors will develop the national solicitation for hybrid vehicles over the next few months. U.S. Communities, the National Association of Counties (NACo), and the Center for a New American Dream sponsor this program. State, county, city, school, and regional government entities will be able to join the solicitation once it is complete. The solicitation will be available for bidding in late 2003 or early 2004. Other national founding co-sponsors include: the National Institute of Governmental Purchasing (NIGP), National League of Cities (NLC), the U.S. Conference of Mayors (USCM) and the Association of School Business Officials International (ASBO). No fees will be charged to public agencies to access and use these contracts. (http://www.afdc.nrel.gov/whatsnew.shtml)

Advantages

a. Improve air quality by producing less pollution. HEVs emissions meet the Ultra Low Emission Vehicle (ULEV) regulations that exists today (the strictest are the zero emission vehicles -- ZEVs) (http://www.gvsc.ca/hybrid.html).
b. Reduce global warming by cutting greenhouse emissions.
c. Save money by taking advantage of the one-time federal income tax deduction or federal tax credits when purchasing a brand new vehicle and by refueling less often as HEVs travel up to 700 miles between fill-ups.
d. Save fuel consumption and reduce exhaust emissions, e.g., when the vehicle is idle, the engine in hybrid vehicles turns “OFF” and turns “ON” when is accelerated. Fuel economy is about twice that of conventional cars (http://www.gvsc.ca/hybrid.html)
e. Use of electric outlets to recharge battery is not needed, e.g., hybrid vehicles do not need to be plugged in to an electric outlet to recharge batteries.
f. Reduce reliance on imported oil.
g. Improve mileage per gallon.
h. There is no need to develop new infrastructure to refuel HEVs as they currently use gasoline for the internal combustion engines.

Disadvantages

a. The incremental cost of HEVs is about US $6,000 more than comparable conventional vehicles (http://www.gvsc.ca/hybrid.html). The cost of purchasing HEVs up front may be high for a new vehicle; however, this is somehow offset by the tax incentives that the federal income tax and some States offer (see strategy #12).
b. HEVs may not be available on time locally for mass retail purchases to meet the new air quality standards established by EPA by 2007. This, however, maybe reversed by the national initiative to assist state and local governments to purchase HEVs led by King County, WA, which would increase the demand of HEVs provided there is enough participation from these agencies.
c. Sometimes owners must deal with inherited mechanical problems that new technologies create until manufacturers acquire sufficient knowledge to fix those problems before new HEVs leave manufacturing plants. This is more a nuisance for the owner than a cost, as manufacturers provide warranties that cover the repairs.

d. It would be hard to change consumers' minds to purchase HEVs in mass, as conventional vehicles have been available in the market for the past several decades.

Cost of implementation
Cost per Ton: to be determined later.

Potential Revenue Sources
a. Grants from USEPA to local governments:
   i. In 2001, King County, WA received a grant from EPA as part of a new national transportation partnership program to purchase hybrid vehicles for its fleet.
   ii. King County received a grant to purchase hybrid cars for the local Flexcar program, a county-supported car-sharing program. "Carsharing is similar to car rental; the main differences are that an individual can use the carsharing vehicle for as short a time period as one hour, and that the cars are located in the communities rather than at a central car rental location." (http://www.commuterpage.com/carshare.htm)
   iii. It is unclear whether EPA is currently providing grants to local governments to purchase HEVs.

Conclusion
The expanded use of HEVs would definitely improve the air quality in the Upstate. To create consumer awareness, manufacturers and, especially, local dealers should establish a more aggressive marketing campaign describing the benefits that purchasing and driving HEVs provide financially and to the environment. The Air Quality Steering or Staff Advisory Committees should meet with local car dealers to discuss topics such as the availability of HEVs in the Upstate, how dealers perceive the outlook of the demand of HEVs in the area, etc.

Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
6. Use higher efficiency engines for school buses. Priority A	• Require purchase of high efficiency engines for school buses as they are replaced. In South Carolina, the SC Department of Education is in charge of maintenance of school buses. DHEC is working with SC Department of Education to obtain grants from EPA. • Promote an Adopt-a-School-Bus program. • Endorse a statewide recommendation for the State to take the lead.		As soon as practical.	Area: countywide. Agency: State and local governments.

Findings

a. South Carolina school buses traveled 78,200,000 miles during the 2002-2003 school year.
b. Upstate South Carolina (Greenville, Spartanburg, Anderson, Pickens, and Cherokee counties school buses traveled 14,643,070 miles during the 2002-2003 school year.
c. South Carolina school buses generate 1,133 tons of NO_x per year; with the Upstate portion is 212 tons of NO_x per year.
d. South Carolina bus fleet consists of 5,016 buses in total, with 852 buses in the Upstate.
e. Fifty percent (50%) of South Carolina buses are older than 1990 in age and generate 795 tons of NO_x per year, The buses with ages older than 1990 produce NO_x at a rate of 18.5 grams per mile traveled (based on an average of AP 42 emission factor for buses manufactured between 1980-1989).
f. The buses with ages of 1990 and newer generate 338 tons of NO_x per year; with the Upstate portion is 63 tons of NO_x per year.
g. The buses with ages of 1990 and newer produce NO_x at a rate of 7.8 grams per mile travel (based on an average of AP 42 emission factor for buses manufactured between 1990-2001).
h. A new school bus produce NO_x at a rate of less than 6.49 grams per mile traveled (based on an average of AP 42 emission factor for buses manufactured in 2001) and by the year 2007 with the uses of ultra-low sulfur diesel fuel, catalyst systems and particulate traps should be in the range of 1-2 grams per mile traveled.
i. For each school bus replaced by a regular new bus the State of South Carolina can reduces NO_x emissions by around 500 pounds per year per bus (based on 19,000 mile per year average Upstate rates). And for each school bus replaced by a high efficiency engines (2007) new bus the State of South Carolina can reduces NOx emissions by around 700 pounds per bus per year.
j. For example replacing all school buses older than 1990 with new 2003 buses would reduce NO_x emissions in South Carolina by 517 tons per year with the Upstate portion is 112 tons of NO_x per year.
k. Savings of $700 per year per bus per year in fuel cost (due to better fuel economy 10 mpg (new) vs. 6.5 mpg (older) and saving an additional maintenance costs for the older buses of $2,000 per bus per year is also expected (12.2 cents a mile additional).
l. Marshall Casey of Department of Education provided much of the data needed to perform this analysis and was on great assistance.
m. Grants are available from EPA for bus retrofits and should be explored (Dale Aspy EPA). Partnerships will be necessary to provide matching funds to secure grants due to state funding being improbable at this time.
n. New buses cost around $60,000.
o. Retrofitting and older bus cost on average of $20,000- $25, 0000.
p. Adopt a bus program guideline attached as an example (Houston TX)

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Advantages

a. This strategy provides reduction in NO_X throughout the upstate with significant positive impact of air quality around sensitive receptors (children).
b. This strategy provide for a strong base for a partnering program.
c. This strategy provide for a strong educational components.
d. Grants are available to help with the cost of replacing and retrofitting buses.
e. Adopt a Bus program and Accelerated Replacement and helps the Department of Education and the environment.

Disadvantages

a. The cost per Ton of NOx reduction is significant (grants and partnerships need to be aggressively explored to off-set costs)

Cost of implementation

Cost per Ton:

a. Retrofit ($30,000-$80,000) based on older buses continuing to be in services.
b. Accelerated Replacement ($90,000-240,000) based on older buses continuing to be in services.

Potential Revenue Sources

Revenue can be generated form EPA grants and local partnerships.

Conclusion

This strategy should be included in the early action plan and grants and partnerships need to be aggressively explored to off-set costs.

Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
7. To reduce vehicle miles traveled by developing efficient user-friendly transit systems. Priority A	• Integrate transportation planning with land use planning so public transit can make a comprehensive contribution to economic development and mobility; • Remove local barriers to densification in downtowns, infill areas, and transit stations and corridors; • Encourage transit authorities to offer a free trolley service running in a loop in downtown areas, especially during lunch hours; • Establish mass transportation between a plant and a park-and-ride site. • Encourage car pooling (see Public Initiative No. 23; • Encourage local government to increase pedestrian/bicycle infrastructure spending (the Upstate spends 2¢ per person compared to SC spending 22¢ per person). • Establish safer bike routes with better signs marking lanes and routes. • Encourage mass transit (transportation choices and alternatives): While the only local mass transit choice that is currently available in some areas is the transit bus, example of future options such as bus rapid transit, commuter passenger service offered by trains on existing rail systems, a diesel multiple unit or "light rail". • Increase highway funding for bike paths, walking or mass transit including high-speed rail.		2004	Area: Countywide. Agency: local transit authorities.

7a. Offer free or reduced transportation cost on high ozone days. Priority A	MASS TRANSIT: • Implement a coordinated high ozone day alert action plan to include public notification and free or reduced ozone fares from the transportation providers.		2004	Area: Multi-County. Agency: local transit providers and related agencies.

Findings

a. Several Cities across the U.S. offer free or reduced rides during high ozone alert days.
b. The key to the program is a good alert system notifying the public of high ozone days so that they can utilize the transit system

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Advantages
a. Free or reduced fares can assist in persuading persons to utilize transit especially during the critical ozone days.
b. One full bus is equivalent to taking 60 passenger cars off of the roadways.
c. Increased ridership could encourage demand for a more effective and efficient transit system.

Disadvantages
a. The additional cost associated with lost fares during high alert days.
b. Potential operational problems resulting from a sudden increase in ridership on High Ozone days.

Cost of implementation
a. Costs associated with advertising and public notice of the program.
b. Supplementing the lost revenue during free or reduced rides.
c. Potential increase in operational costs due to a spike in ridership during alert days.
d. Cost per Ton

Potential Revenue Sources
a. Corporate sponsorship and partnership to defer the costs.
b. Local funding from municipalities.
c. Possible grants.
d. License tag sales.

Conclusion
Many metropolitan areas have had success with offering free or reduced fares during sever ozone alert days. In Delaware for example, their transit system, referred to as DART, has experienced an average increase of 24% in ridership during high alert days. While offering free or reduced fares will not bring an area into attainment, it can be used as one tool to help "manage" air quality. Reduced or free rides may also encourage additional transit use during other times of the year. The negative aspects associated with this initiative Is the increased cost associated with lost fare revenue. This cost can be reduced with a combination of both public and private sources.

The most important result of this initiative is the increase in public awareness of the importance or air quality and the use of transit as an alternative form of transportation.

7b. Develop incentive programs and opportunity for citizens to choose alternative transportation modes. Establish intermodal connections with an emphasis on mass transit.. Priority A	WALKING/BIKING: • Encourage local government to increase pedestrian/bicycle infrastructure spending (the Upstate spends 2¢ per person compared to SC spending 22¢ per person). • Establish safer bike routes with better signs marking lanes and routes. • Increase highway funding for bike paths, walking or		2004	Area: Multi-County. Agency: Related agencies.

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	mass transit including high-speed rail. Support the federal transportation enhancement program. • Install bike racks on all transit vehicles to encourage intermodal transportation. New buses purchased through the state's bus purchase program will have bike racks. PARK and RIDE: • Establish mass transportation between a plant and a park-and-ride site. CARPOOLING: • Work with local government to offer incentives for employees to car pool. MASS TRANSIT: • Offer a free trolley service running in a loop in downtown areas and nearby restaurants, especially during lunch hours; • Research past feasibility studies on free downtown shuttles. Potential for sponsorship with local area restaurants and businesses for a lunch time shuttle - could defer the operational costs of the endeavor. • Support mass transit (transportation choices and alternatives): While the only local mass transit choice that is currently available in some areas is the transit bus, example of future options such as bus rapid transit, commuter passenger service offered by trains on existing rail systems, a diesel multiple unit or "light rail" should be supported.			

Findings

General*:*

a. Motor vehicles is responsible for nearly 80 percent of carbon monoxide and 50 percent of nitrogen oxide emissions in the U.S.
b. 60% of the pollution created by automobile emissions happens in the first few minutes of operation, before pollution control devices can work effectively. Since "cold starts" create high levels of emissions, shorter car trips are more polluting on a per-mile basis than longer trips. The use of alternative transportation modes such as walking, biking as well as creating intermodal connections through park and ride and carpooling programs can eliminate some of these trips.

Please refer to Strategy #14: Land Use and Transportation.

Statewide Multi-Modal Transportation Plan Recommendations:
Walking/Biking:

a. Provide 4' paved shoulders on statewide bicycle tour routes, Palmetto Trail.
b. Implement low-cost bicycle improvements by restriping 5-lane routes for wide outside lanes when resurfaced.
c. Include bike and pedestrian facilities in new projects consistent with local bicycle and pedestrian plans.
d. Adopt a standard cross section for two-lane primary highways that includes 4'paved shoulders.
e. Include sidewalk or separate multi-use paths on all non-freeway urban highway projects.
f. Continue to install, upgrade and maintain sidewalks to ensure accessibility for disabled persons

Intermodal Connections:
a. Consolidate passenger transportation service in intermodal facilities wherever feasible.
b. Improve ground transportation linkages – highways and transit – to commercial airports.
c. Work with SCPA to evaluate a rail-to-truck intermodal terminal outside of Charleston urban area.

Transit:
a. Collaborate with local governments to develop long-range financial plans for all existing transit systems.
b. Evaluate and improve the apportionment process for State Mass Transit funds.
c. Work with MPOs to develop effective, productive paratransit and fixed route transit in each MPO area.
d. Work with COGs to improve coordination of rural human service transportation services.
e. Identify local transit services needed to support intercity rail and high-speed rail service.

Rail
a. Continue to coordinate with freight railroads and SC Department of Commerce Rail Section.
b. Identify improvements to address freight rail bottlenecks and facilitate high-speed rail service.
c. Pursue creation of a statewide fund to purchase abandoned railroad right-of-way.

WalkingInfo.org on the Benefits of Walking: http://www.walkinginfo.org/pp/benefits/enviroben/index.htm

Park and Ride:
a. Currently Charlotte Area Transit System (CATS) has about 50 park and ride lots. You can park your car and catch your bus, vanpool or carpool, or lock your bike at a bike rack and board a bus. Not all of the lots are utilized at this time, and some were constructed in the early 1980s. CATS purchases their own land whenever possible to build park and ride lots. The lots are situated usually on the perimeter of the City in conjunction with the express bus service. Sounds like the lots are successful because CATS offers many route options at many different time slots during peak commute hours with no stops. (Elizabeth Presutti, CATS); http://www.charmeck.nc.us/Departments/CATS/Virtual+Transit/Park+%27N%27+Rides.htm
b. Coordinating park and rides for Clemson game days has been discussed at past staff committee meetings (Lowe's Motor Speedway has them); University of Florida shuttles from Jacksonville to Gainesville for the Jacksonville Jaquar games;
c. Many colleges have their own shuttles and connect to transit.

Park and Ride resource: http://www.ehtf.org.uk/publication_report48.asp

Carpooling*:*
a. According to the US Census (2000 data), in the Upstate SC

Jurisdiction	Pop/percent who drove alone	Pop/percent who pooled
Anderson	63,407 (83%)	9,557 (12%)

Cherokee	18,161 (79%)	3,849 (16%)
Greenville	151,339 (81%)	23,070 (12%)
Oconee	23,849 (80%)	4,354 (14%)
Pickens	92,079 (86%)	6,692 (12%)
Spartanburg	96,278 (82%)	15,538 (13%)

Link:
http://factfinder.census.gov/servlet/BasicFactsServlet?_basicfacts=1&_mult1=8561015&_geo2=010&_current=&_action=_subjectSelected&_child_geo_id=&_lang=enAt (OR www.census.gov; American Factfinder; Economic Characteristics: Employment, Income, Poverty and More)

b. Pre-tax Commuter Program http://www.fhwa.dot.gov/tea21/h2400-ix.htm
c. Wachovia in Charlotte has a tax write-off for commuters.

Advantages

Walking/Biking:

a. A short, four-mile round trip by bicycle keeps about 15 pounds of pollutants out of the air we breathe. (WorldWatch Institute)
b. Health, Transportation, Economic Development, Environment, Quality of Life benefits

Park and Ride:

a. Reduce vehicle miles traveled (VMT) and congestions.
b. Reduce fuel consumption and travel costs.
c. Increase mobility options.
d. Increased use of high occupant vehicle travel.
e. Hands-free time to prepare for the day.
f. Public/Private partnerships.
g. Can provide a relatively safe place to meet and keep a car for the day.
h. Makes use of gray fields and big box retail areas.

Disadvantages

General:

a. Challenge to change ordinances to allow these facilities.

Park and Ride:

a. Increase travel time.
b. Possible increase in vehicle miles traveled.
c. Challenge to find locations for lots. In areas that are heavily congested, it is very difficult for CATS to get permission from private land owners and developers to agree to use the facilities for a park and ride lot. The owners and developers are afraid of the liability and the increase in wear on their facilities. Many of the existing paved lots were not built for heavy commercial vehicle use. Thus, the buses are causing are great deal of wear and tear on the asphalt, requiring resurfacing.

Cost of implementation

Costs associated with advertising and public notice of the program.

Potential Revenue Sources

a. Corporate sponsorship and partnership to defer the costs
b. Local funding from municipalities.
c. Possible grants.
d. License tag sales.

Conclusion

The most important result of this initiative is the increase in public awareness of the importance or air quality and behavior change via the use of alternative transportation on a day-to-day basis.

Priority A: those strategies that should be implemented in the short term. Priority B: those strategies that should be implemented in the long term.
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Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
8. Review and update air emission inventory for the Upstate. Priority A	• Ensure all industrial sources still operating. Review industrial sources for plant closures. • Identify major sources of NOx. • Map the locations of point sources (10% of point sources cannot be found). • Map the specific locations and the area sources where coal is burned.	NO_X: Over 1,000 tpy of NO_X emissions (possibly as much as 3,156 tpy) may be overstated in the Upstate area source emission inventory. VOC: Over 7,000 tpy of VOC emissions (possibly as much as 20,191 tpy) may be overstated in the Upstate area source emission inventory.	Fall 2003 Prior to final Urban Airshed Model runs	Area: Countywide. Agency: SCDHEC.

Findings

NO_X

a. The emission inventory represents the "base case" for the Urban Airshed Model, which is a 1998/1999 high ozone episode.
b. Initial March 24, 2003 Upstate point source NO_X inventory included 178 sources, 7 of which were identified as closed.
c. Revised July 11, 2003 Upstate point source NO_X inventory includes 233 point sources, 40 of which are identified as closed (see attachment 8-1).
d. Upstate point source NO_X inventory includes addresses for all sources (see attachment 8-1).
e. Upstate point source NO_X inventory lists six "major" NO_X sources greater than 100 tons per year (see attachment 8-2).
f. Upstate point source NO_X emissions are 10,455 tpy.
g. NO_X emissions from Upstate point sources are ~7% of the total South Carolina point source NO_X emissions (139,865 tpy).
h. NO_X emissions from Upstate point sources are ~17% of the total Upstate NO_X emissions (63,328 tpy)(see attachment 8-3).
i. Upstate area source NO_X inventory includes four industrial sub-categories, coal, residual oil, distillate oil, and natural gas combustion.
j. Upstate area source NO_X emissions are 5,711 tpy.
k. NO_X emissions from Upstate area sources are ~25% of the total South Carolina area source NO_X emissions (22,534 tpy).
l. NO_X emissions from Upstate area sources are ~9% of the total Upstate NO_X emissions (63,328 tpy)(see attachment 8-3).
m. Upstate area source industrial coal combustion NO_X emissions equal 1,973 tpy (the largest area source), which is ~35% of the area source category.
n. Upstate area source industrial residual oil NO_X emissions equal 613 tpy (third largest area source), which is ~11% of the area source category.
o. Upstate area source industrial natural gas NO_X emissions equal 570 tpy (fifth largest area source), which is ~10% of the area source category.
p. Upstate area source industrial NO_X emissions (coal, residual oil, and natural gas) are 3,156 tpy, which is ~55% of the total area source emissions.
q. Upstate area source industrial NO_X emissions (coal, residual oil, and natural gas) are 3,156 tpy, which is ~30% of the total point source emissions.
r. Business directories list eight fuel dealers in the Upstate that supply coal, two in Anderson, two in Greenville, and four in Spartanburg.
s. Three Upstate dealers are no longer in business, and three no longer sell coal.

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t. One Upstate dealer sells 30 tpy of coal to residential customers only.
u. One Upstate dealer sells 1,000 tpy of coal to residential customers and 85,000 tpy of coal to four non-residential customers.
v. Two Upstate non-residential customers use a total of 20,000 tpy of coal in Anderson County, and both are included in the point source inventory.
w. One Upstate non-residential customer uses 45,000 tpy of coal in Cherokee County, and is included in the point source inventory.
x. One Upstate non-residential customer uses 20,000 tpy of coal in Pickens County, and is included in the point source inventory.
y. One Upstate utility in Anderson County uses 505,000 tpy of coal, and is included in the point source inventory.
z. All non-residential and utility coal combustion in the Upstate is at facilities listed in the point source inventory.
aa. 1,030 tpy of residential coal generates ~6 tpy of NO_X emissions, the area source inventory for residential coal combustion lists 15 tpy of NO_X emissions.
bb. Coal use in South Carolina has been increasing for utilities, steady for industries, and declining for residential use (see attachment 8-4).
cc. Coal use in the Upstate is ~3% of the total South Carolina coal usage (see attachment 8-4).
dd. Coal use by one utility plant in the Upstate is ~3% of the total utility company coal usage (see attachment 8-4).
ee. Area source industrial coal emissions based on difference between coal consumption reported to Energy Information Administration (EIA) and reported to DHEC on Air Emission Inventory.
ff. Coal consumption greater than 1,000 tons per year reported to EIA.
gg. DHEC assigned unaccounted industrial coal consumption (difference) based on county population (~180,000 tons/year in six Upstate Counties).
hh. EPA emission factor 21.7 lb NO_X per ton coal used to estimate emissions (pulverized coal fired boiler).
ii. DHEC requires air permits for coal-fired boilers greater than 20 million Btu/hr (~1,500 lb/hr coal fired).
jj. Boilers with air permits should file air emission inventory reports.
kk. Many small/exempt boilers do not fire pulverized coal, and are probably stokers.
ll. EPA emission factor for stoker boilers is no more than 11 lb NO_X per ton coal fired.
mm. Change in emission factor would reduce NO_X emissions from coal-fired industrial area sources from 1,973 tpy down to 1,000 tpy.

<u>VOC</u>
a. July 11, 2003 Upstate point source VOC inventory includes 270 point sources, 52 of which are identified as closed (see attachment 8-1).
b. Upstate point source VOC inventory includes addresses for all sources (see attachment 8-1).
c. Upstate point source VOC inventory lists 22 “major” VOC sources greater than 100 tons per year.
d. Upstate point source VOC emissions are 8,160 tpy.
e. VOC emissions from Upstate point sources are ~20% of the total South Carolina point source VOC emissions (41,034 tpy).
f. VOC emissions from Upstate point sources are ~5% of the total Upstate VOC emissions (164,764 tpy)(see attachment 8-3).
g. Upstate area source VOC inventory includes three industrial sub-categories, process emissions from synthetic fibers, pharmaceuticals, and bakeries.
h. Upstate area source VOC emissions are 55,801 tpy.
i. VOC emissions from Upstate area sources are ~29% of the total South Carolina area source VOC emissions (193,951 tpy).
j. VOC emissions from Upstate area sources are ~34% of the total Upstate VOC emissions (164,764 tpy)(see attachment 8-3).
k. Upstate area source industrial process VOC emissions from synthetic fibers equal 6,843 tpy, which is ~12% of the area source category.
l. Upstate area source industrial process VOC emissions from pharmaceuticals equal 111 tpy, which is less than 1% of the area source category.
m. Upstate area source industrial process VOC emissions from bakeries equal 248 tpy, which is less than 1% of the area source category.
n. Upstate area source industrial process VOC emissions (7,202 tpy) are 88% of the point source VOC emissions (8,160 tpy).
o. Several major industrial VOC sources in the Upstate are regulated by Maximum Achievable Control Technology (MACT) Standards, which require significant reductions in VOC emissions.
p. Some VOC reductions by major sources in the Upstate to comply with MACT standards occurred after the 1999 “base case” inventory.

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q. Residential wood burning in fireplaces is the largest VOC area source in the Upstate (12,989 tpy), which is 23% of the area source category.
r. Very little wood is burned in residential fireplaces during the Ozone Season (April – October).
s. Residential wood burning in fireplaces produces more VOC in the Upstate than industrial point sources.

Advantages
a. May eliminate over 1,000 tpy of NO_X emissions and over 7,000 tpy of VOC emissions from Upstate area source inventory used for Urban Airshed Model.

Disadvantages
a. More in-depth investigation could lead to discovery that some Upstate industrial point sources have not correctly completed past DHEC Air Emission Inventories.

Cost of implementation
a. Cost per Ton – Not Applicable.
b. Time associated with review of air emission inventory estimation methods.

Potential Revenue Sources
Not Evaluated

Conclusion
NO_X

The area source inventory for industrial coal combustion appears to be over-stated. All coal burned in the Upstate at non-residential sources is at facilities included in the point source inventory. The area source NO_X emissions of 1,973 tpy attributed to coal combustion at industrial sources should be modified. The area source emissions from industrial coal combustion should be eliminated, reduced by approximately 97% using the percentage of state-wide coal usage, reduced by approximately one-half based on more representative emission factors, or reduced using some measure other than population. Although the Upstate has seen a significant investment in new manufacturing facilities in recent years (and corresponding population growth), it is highly unlikely any new facilities have the ability to burn coal.

There may be similar issues with the area source NO_X emissions attributed to residual oil and natural gas combustion at Upstate industrial facilities (combined NO_X emissions of 1,183 tpy). These should be investigated further with DHEC. Formation of a committee or workgroup should be considered to assist DHEC with review and adjustment of the emission inventory to better characterize the Upstate.

VOC

The area source VOC inventory for industrial process emissions may be over-stated. The VOC process emissions from synthetic fibers and pharmaceuticals may already be included in the point source inventory (combined VOC emission of ~7,000 tpy). The area source inventory also includes VOC emission from residential wood burning in fireplaces, which does not normally occur during the ozone season (~13,000 tpy). As with the NO_X area source inventory, the VOC area source inventory should be investigated further with DHEC to better characterize the Upstate.

Attachment 8-1
Upstate NO_X and VOC Point Sources

County	SC Air permit Number	Facility Name	NO_X (tpy)	VOC (tpy)	Street	City	ZIP	Inv. Year
ANDERSON	0200-0004	DUKE ENERGY:LEE	3,557	14	ROAD S-4-178	PELZER	29669	1999
ANDERSON	0200-0031	OWENS CORNING:ANDERSON	303	175	HIGHWAY 81	ANDERSON	29624	1999
ANDERSON	0200-0011	MILLIKEN:PENDLETON	69	58	HIGHWAY 76/28 & C-4-229	PENDLETON	29670	1999
ANDERSON	0200-0018	MICHELIN:SANDY SPRING	51	133	HIGHWAY 76	ANDERSON	29677	1997
ANDERSON	0200-0058	ISOLA LAMINATE SYSTEMS PENDLETON	45	113	500 WESTINGHOUSE DRIVE	PENDLETON	29670	1999
ANDERSON	0200-0050	VYTECH	18	137	5201 OLD PEARMAN DAIRY ROAD	ANDERSON	29625	1999
ANDERSON	0200-0032	MILLIKEN:CUSHMAN	15	3	409 GOSSETT DRIVE	WILLIAMSTON	29697	1999
ANDERSON	0200-0036	HEXCEL SCHWEBEL INC	11	43	2200 SOUTH MURRAY AVENUE	ANDERSON	29621	1999
ANDERSON	0200-0061	ANDERSON MEDICAL CENTER	11	0	800 NORTH FANT STREET	ANDERSON	29621	1995
ANDERSON	0200-0014	SPRINGS INDUSTRIES:WAMSUTTA	10	9	1649 PEARMAN DAIRY ROAD	ANDERSON	29623	1999
ANDERSON	0200-0005	BASF:ANDERSON	10	76	MASTERS BLVD & HWY 29	ANDERSON	29624	1999
ANDERSON	9900-0113	SLOAN CONSTRUCTION:ANDERSON	9	0	BELHAVEN RD EXT	ANDERSON	29622	1996
ANDERSON	0200-0034	BLAIR MILLS LP	7	3	115 LITTLE STREET	BELTON	29627	1999
ANDERSON	9900-0041	PICKENS CONSTRUCTION INC	6	0	415 MCGEE ROAD	ANDERSON	29621	1996
ANDERSON	0200-0009	LAFRANCE:MT VERNON	6	0	HWY 28/MAIN ST	LA FRANCE	29656	1995
ANDERSON	9900-0045	ASHMORE:#2	5	0	300 MCGEE RD	ANDERSON	29621	1995
ANDERSON	0200-0127	HYDRO ALUMINUM NORTH AMERICA	5	81	BLAKE DAIRY ROAD	BELTON	29627	1999
ANDERSON	9900-0107	F & R ASPHALT:PLANT #2	4	0	HWY 88	PENDLETON	29646	1995
ANDERSON	0200-0033	MAXXIM MEDICAL	3	0	308 CHURCH ST	HONEA PATH	29654	1997
ANDERSON	0200-0117	PLASTIC OMNIUM	3	217	5100 OLD PEARMAN DAIRY ROAD	ANDERSON	29625	1999
ANDERSON	0200-0045	MOUNT VERNON MILLS:WILLIAMSTON	3	0	BROAD STREET	WILLIAMSTON	29697	1995
ANDERSON	0200-0048	APACHE PRODUCTS:ANDERSON	2	51	107 SERVICE ROAD	ANDERSON	29622	1995
ANDERSON	0200-0056	TRANSMONTAIGNE:BELTON-SE	2	19	HWY 20 NORTH	BELTON	29627	1999
ANDERSON	0200-0100	MAYFAIR MILLS:STARR (CLOSED)	2	3	SC HWY 81	STARR	29684	1997
ANDERSON	0200-0047	CHIQUOLA INDUSTRIAL PROD:CHIQUOLA-CLOSED	1	0	CHICQUOLA AVENUE	HONEA PATH	29654	1997
ANDERSON	0200-0084	FRIGIDAIRE:ANDERSON	1	1	101 MASTERS BLVD	ANDERSON	29622	1996
ANDERSON	0200-0116	SPRINGS INDUSTRIES:LYONS-CLOSED	1	1	435 E SHOCKLEY FERRY RD	ANDERSON	29624	1997
ANDERSON	0200-0043	RYOBI TECHNOLOGIES INC	1	26	1428 PEARMAN DAIRY RD	ANDERSON	29625	1997
ANDERSON	0200-0093	GOODMAN CONVEYOR	1	47	HIGHWAY 178 S	BELTON	29627	1995
ANDERSON	0200-0153	TAYLOR PALLETS INC	0	0	3571 ABBEVILLE HWY	ANDERSON	29624	2000

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Attachment 8-1
Upstate NO_X and VOC Point Sources

County	SC Air permit Number	Facility Name	NO_X (tpy)	VOC (tpy)	Street	City	ZIP	Inv. Year
ANDERSON	0200-0147	GRIFFIN THERMAL PRODUCTS	0	7	100 HURRICANE CREEK RD	PIEDMONT	29673	2000
ANDERSON	0200-0095	FIBERTECH CORP	0	8	250 S DEPOT ST	PENDLETON	29070	1999
ANDERSON	0200-0102	METROMONT:BELTON	0	0	BELLHAVEN RD EXT	ANDERSON	29621	1997
ANDERSON	0200-0096	CLEMSON UNIVERSITY:ARF	0	3	500 LEBANON RD	PENDLETON	29670	1995
ANDERSON	9900-0332	THOMAS CONCRETE:ANDERSON	0	0	124 MOATS FOWLER ROAD	ANDERSON	29626	2000
ANDERSON	0200-0017	MOHAWK:BELTON-CLOSED	0	0	HIGHWAY 20	BELTON	29627	1997
ANDERSON	0200-0081	ZUPAN&SMITH:POWDERVILLE	0	0	RT 8 & HWY 81	POWDERSVILLE	29611	1998
ANDERSON	9900-0061	SLOAN CONSTRUCTION:#10-CLOSED	0	0	ROUTE 6, HAYES RD	ANDERSON	29624	1997
ANDERSON	0200-0057	TRANSMONTAIGNE:BELTON-PD	---	41	HIGHWAY 20 NORTH	BELTON	29627	1999
ANDERSON	0200-0052	MARATHON ASHLAND:BELTON	---	33	STATE RT 20	BELTON	29627	1999
ANDERSON	0200-0119	ROCKWELL AUTOMATION/DODGE	---	5	905 SC HWY 247	BELTON	29627	1999
ANDERSON	0200-0129	DARBY METALWORKS	---	2	110 SHIRLEYS STORE RAOD	ANDERSON	29621	2000
ANDERSON		TOTAL POINT SOURCES	4,162	1,309				
CHEROKEE	0600-0076	BROAD RIVER ENERGY LLC	294	1	SOUTH CAROLINA HIGHWAY 329	GAFFNEY	29340	2000
CHEROKEE	0600-0007	MILLIKEN:MAGNOLIA	244	134	SECONDARY ROAD #5 & I-85	BLACKSBURG	29702	1999
CHEROKEE	0600-0044	LINPAC PAPER	57	4	139 PRICE FARM RD	COWPENS	29330	1999
CHEROKEE	0600-0060	CHEROKEE COGENERATION	54	4	132 PEOPLES CREEK RD	GAFFNEY	29340	2001
CHEROKEE	0600-0009	TIMKEN CO,THE	28	1	100 TIMKEN RD	GAFFNEY	29340	1995
CHEROKEE	0600-0033	NESTLE FROZEN FOODS	26	0	2132 OLD GEORGIA HIGHWAY	GAFFNEY	29340	1995
CHEROKEE	0600-0065	SC PIPELINE:BLACKSBURG	23	0	SSR S-11-123	BLACKSBURG	29702	1999
CHEROKEE	0600-0030	NATIONAL TEXTILES:GAFFNEY-CLOSED	14	1	859 VICTORY TRAIL RD	GAFFNEY	29340	1997
CHEROKEE	0600-0005	BOREN CLAY PRODUCTS - BLACKSBURG PLT	11	1	550 YORK RD	BLACKSBURG	29702	1999
CHEROKEE	0600-0023	SPARTAN MILLS:CHEROKEE-CLOSED	9	84	418 CHANDLER DRIVE	GAFFNEY	29340	1999
CHEROKEE	9900-0301	VULCAN MATERIALS #275-CLOSED	4	4	HWY 29 & QUARRY RD	BLACKSBURG	29702	1999
CHEROKEE	0600-0039	INDUSTRIAL MINERALS	3	0	MINERAL DRIVE	KINGS CREEK	29719	1995
CHEROKEE	0600-0068	CORE MATERIALS CORP	3	10	24 COMMERCE DR	GAFFNEY	29340	1999
CHEROKEE	0600-0036	HAMRICK INDUSTRIES:PLANT 5	2	13	178 HYATT ST	GAFFNEY	29341	1995
CHEROKEE	0600-0014	SPRINGFIELD LLC:LIMESTONE	2	3	1206 CHEROKEE AVE	GAFFNEY	29340	1999
CHEROKEE	0600-0054	TNS MILLS:GAFFNEY	2	2	325 WILCOX AVE	GAFFNEY	29341	1999
CHEROKEE	0600-0004	HAMRICK MILLS:HAMRICK PLANT	1	1	2526 CHEROKEE AVE	GAFFNEY	29342	1997
CHEROKEE	0600-0062	HAMRICK MILLS:MUSGROVE	1	1	150 HAMRICK STREET	GAFFNEY	29342	1997

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CHEROKEE	0600-0055	IFCO ICS-SOUTH CAROLINA INC	1	55	CROSSING OF SC 5 & US 29	BLACKSBURG	29702	1995
CHEROKEE	0600-0040	MILLIKEN CHEMICAL:CYPRESS	0	32	SC HWY 5 & I-85	BLACKSBURG	29702	1999
CHEROKEE	0600-0016	ALCOA HOME EXTERIORS INC	---	145	100 CELLWOOD PLACE	GAFFNEY	29340	1999
CHEROKEE	0600-0052	SANDERS BROS METALS	---	5	1709 OLD GEORGIA HWY	GAFFNEY	29342	1995
CHEROKEE	0600-0049	FREIGHTLINER CUSTOM CHASSIS	---	1	552 HYATT ST	GAFFNEY	29341	2000
CHEROKEE		TOTAL POINT SOURCES	779	502				
GREENVILLE	1200-0039	MICHELIN:GREENVILLE	72	655	1401 ANTIOCH CHURCH ROAD	GREENVILLE	29605	1999
GREENVILLE	1200-0019	AMOCO POLYMERS:GREENVILLE	70	46	7139 AUGUSTA RD	PIEDMONT	29673	1997
GREENVILLE	1200-0245	BOB JONES UNIVERSITY	59	34	1700 WADE HAMPTON BOULEVARD	GREENVILLE	29614	1999
GREENVILLE	1200-0009	US FINISHING	55	135	3335 OLD BUNCOMBE RD	GREENVILLE	29609	2001
GREENVILLE	1200-0104	KEMET:MAULDIN	47	54	1224 OLD STAGE RD	SIMPSONVILLE	29681	1995
GREENVILLE	1200-0094	GE:GREENVILLE	47	22	300 GARLINGTON ROAD	GREENVILLE	29607	1999
GREENVILLE	1200-0026	MITSUBISHI POLYESTER FILM LLC	33	171	HOOD ROAD	GREER	29652	1997
GREENVILLE	1200-0013	CARAUSTAR:TAYLORS	33	1	873 ALEXANDER DRIVE	TAYLORS	29687	1995
GREENVILLE	1200-0017	JPS:SLATER	32	26	101 SLATER RD	SLATER	29683	1995
GREENVILLE	1200-0203	HITACHI ELECTRONIC	31	98	PARKINS MILL RD & MAULDIN RD	MAULDIN	29662	1999
GREENVILLE	1200-0029	MILLIKEN:GAYLEY MILL	27	40	HIGHWAY 288	MARIETTA	29661	1999
GREENVILLE	1200-0073	3M:FILM PLANT	24	55	1400 PERIMETER ROAD	GREENVILLE	29605	1999
GREENVILLE	1200-0024	CRYOVAC-SIMPSONVILLE (SEALED AIR CORP)	24	408	803 NORTH MAPLE STREET	SIMPSONVILLE	29681	1999
GREENVILLE	1200-0145	GREENVILLE HOSPITAL SYSTEM:ENERGY PLANT	14	1	701 GROVE ROAD	GREENVILLE	29605	1995
GREENVILLE	1200-0326	REXROTH:SOUTHCHASE COURT	14	1	8 SOUTHCHASE CT	FOUNTAIN INN	29644	1999
GREENVILLE	1200-0123	SPECIALTY SHEARING	11	0	ODOM CIRCLE	GREENVILLE	29602	1995
GREENVILLE	1200-0080	WILSON SPORTING GOODS-CLOSED	8	294	206 GEORGIA STREET	FOUNTAIN INN	29644	1999
GREENVILLE	1200-0035	PHARMACEUTICAL ASSOCIATES INC	8	6	OSAGE AND PERIMETER	ORA	29371	1995
GREENVILLE	1200-0015	JPSA ACQUISITION:MONAGHAN-CLOSED	8	3	11 SMYTHE ST	GREENVILLE	29611	1995
GREENVILLE	1200-0032	CYBERTECH GSP	8	22	1116 TANNER ROAD	TAYLORS	29687	1996
GREENVILLE	9900-0013	ASHMORE:#1	7	0	1880 S HWY 14	GREER	29651	1995
GREENVILLE	1200-0171	ETHOX CHEMICALS	7	1	1801 PERIMETER RD	GREENVILLE	29605	1999
GREENVILLE	1200-0111	CAROLINA CIRCUITS-CLOSED	5	53	200 FAIRFOREST WAY	GREENVILLE	29607	1999
GREENVILLE	1200-0127	NUTRICIA:GREENVILLE	4	66	1050 WOODRUFF ROAD	GREENVILLE	29607	1999
GREENVILLE	9900-0247	VULCAN MATERIALS GENCOR DRUM MIX PLANT	4	4	US HIGHWAY 25	BLACKSBURG	29702	

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GREENVILLE	1200-0196	DAN RIVER:WHITE HORSE	4	4	2721 WHITEHORSE RD	GREENVILLE	29611	1995
GREENVILLE	1200-0139	ST FRANCIS HOSPITAL	4	6	400 SUMTER STREET	GREENVILLE	29601	1995
GREENVILLE	1200-0100	DEERE,JOHN:GREER-CLOSED	4	23	BUNCOMBE ROAD	GREER	29651	1999
GREENVILLE	1200-0232	COLUMBIA FARMS:GREENVILLE	3	0	1354 RUTHERFORD RD	GREENVILLE	29608	1995
GREENVILLE	1200-0147	KEMET:FOUNTAIN INN	3	46	201 FAIRVIEW ST EXT	FOUNTAIN INN	29644	1998
GREENVILLE	1200-0016	DELTA MILLS:ESTES	3	6	750 ESTES DR	PIEDMONT	29673	1995
GREENVILLE	9900-0283	KING ASPHALT:# 3 - NEW	3	5	1189 OLD STAGE ROAD	SIMPSONVILLE	29681	2000
GREENVILLE	1200-0034	CROWN METRO:PLANT1	3	6	315 ECHELON RD	GREENVILLE	29606	1999
GREENVILLE	1200-0068	CPJ TECHNOLOGIES-CLOSED	3	45	200 TANNER DRIVE	TAYLORS	29687	1997
GREENVILLE	1200-0315	GESCHMAY CORP	3	2	525 OLD PIEDMONT HWY	GREENVILLE	29605	1997
GREENVILLE	1200-0028	MILLIKEN:JUDSON MILL	3	4	701 EASLEY BRIDGE RD	GREENVILLE	29611	1999
GREENVILLE	9900-0169	BLYTHE CONSTRUCTION:PLANT 4	2	0	BROWN RD & HWY 20	GREENVILLE	29615	1995
GREENVILLE	1200-0075	AIR PRODUCTS:PIEDMONT	2	4	410 OLD PELZER RD	PIEDMONT	29673	1995
GREENVILLE	1200-0337	TRANSFLO TERMINAL SVCS:GREENVILLE	2	0	WILLARD ST & BRAMLETT ST	GREENVILLE	29611	2000
GREENVILLE	1200-0217	GREENVILLE FINISHING	2	2	100 MILL STREET	GREENVILLE	29609	1995
GREENVILLE	1200-0247	REYNOLDS CHEMICAL:GREENVILLE	2	25	10 GATES STREET	GREENVILLE	29602	1999
GREENVILLE	1200-0149	LOCKHEED MARTIN AIRCRAFT CENTER	2	21	DONALDSON CENTER	GREENVILLE	29605	1999
GREENVILLE	1200-0060	MILLIKEN:ENTERPRISE PLANT	2	16	512 PUMPKINTOWN RD	MARIETTA	29661	1999
GREENVILLE	1200-0033	SCOTTS SIERRA:TRAVELERS REST	1	0	830 HWY 25 BYPASS	TRAVELERS REST	29690	1995
GREENVILLE	1200-0258	DELTA MILLS:FURMAN-CLOSED	1	0	710 NORTH WOODS DRIVE	GREENVILLE	29606	1995
GREENVILLE	1200-0121	NATIONAL ELECTRIC CARBON	1	41	251 FORRESTER DR	GREENVILLE	29607	1999
GREENVILLE	1200-0099	PARA-CHEM SOUTHERN INC	1	1	863 SOUTH MAIN STREET	SIMPSONVILLE	29681	1997
GREENVILLE	1200-0018	KEMET:GREENVILLE	1	23	2835 KEMET WAY	SIMPSONVILLE	29681	1995
GREENVILLE	9900-0362	PANAGAKOS ASPHALT PAVING	1	1	GREENCOVE DR	GREENVILLE	29616	2000
GREENVILLE	1200-0231	BELLSOUTH:GREENVILLE-COLLEGE ST	1	0	218 COLLEGE ST	GREENVILLE	29601	1999
GREENVILLE	1200-0311	STEVENS AVIATION:DONALDSON PARK	1	20	600 DELAWARE ST, DONALDSON RD	GREENVILLE	29605	2000
GREENVILLE	1200-0191	HOLLY OAK CHEMICAL	1	0	101 CASE ST	FOUNTAIN INN	29644	1995
GREENVILLE	1200-0346	AMERICAN WOODWORKS:GREENVILLE	1	7	8100 WHITE HORSE RD	GREENVILLE	29617	2000
GREENVILLE	1200-0163	SHERWIN WILLIAMS:FOUNTAIN INN	0	13	100 N WOODS DR	FOUNTAIN INN	29644	1999
GREENVILLE	9900-0158	ZUPAN&SMITH:SIMPSONVILLE	0	0	OLD STAGE ROAD	SIMPSONVILLE	29681	1999
GREENVILLE	1200-0067	COGNIS CORPORATION	0	7	2 GOLDEN STRIP DR	MAULDIN	29662	1995
GREENVILLE	1200-0181	ENGINEERED PRODUCTS:FURMAN HALL RD PLANT	0	77	500 FURMAN HALL RD	GREENVILLE	29609	1999

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Attachment 8-1
Upstate NO_X and VOC Point Sources

County	SC Air permit Number	Facility Name	NO_X (tpy)	VOC (tpy)	Street	City	ZIP	Inv. Year
GREENVILLE	1200-0277	EXCALIBUR TOOL:POINSETT	0	14	1434 POINSETT HIGHWAY	GREENVILLE	29609	1997
GREENVILLE	1200-0345	RMAX	0	10	1649 SOUTH BATESVILLE ROAD	GREER	29650	2000
GREENVILLE	1200-0207	KYOCERA MITA	0	0	1 MITA BOULEVARD	FOUNTAIN INN	29644	1998
GREENVILLE	1200-0179	SAINT GOBAIN ABRASIVES	0	0	100 WILHELM WINTER STREET	TRAVELERS REST	29690	1999
GREENVILLE	1200-0150	METROMONT:PARIS MOUNTAIN	0	0	510 OLD PARIS MOUNTAIN RD	GREENVILLE	29609	1999
GREENVILLE	1200-0317	GATEWAY MFG:PLANT #2 - GREENVILLE	0	27	5909 OLD BUNCOMBE ROAD	GREENVILLE	29602	2000
GREENVILLE	1200-0022	COLLINS & AIKMAN:TAYLORS-CLOSED	0	0	113 MILL STREET	TAYLORS	29687	1997
GREENVILLE	1200-0197	ENGINEERED PRODUCTS:PIEDMONT HWY-CLOSED	0	0	204 PIEDMONT HIGHWAY	GREENVILLE	29605	1999
GREENVILLE	1200-0200	METROMONT:ROPER MOUNTAIN ROAD	0	0	101 YOUNG COURT	GREENVILLE	29615	1999
GREENVILLE	1200-0237	FRANKLIN DYED YARNS-CLOSED	0	0	1 MCGARITY STREET	GREENVILLE	29602	1997
GREENVILLE	1200-0269	MESSER INDUSTRIES	0	20	208 SCHOOL ST	GREER	29651	1999
GREENVILLE	1200-0362	SC STEEL CORP	0	33	113 E WAREHOUSE COURT	TAYLORS	29687	2000
GREENVILLE	9900-0032	GREENVILLE SPARTANBURG ASPHALT-CLOSED	0	0	I-85 & HWY 14	GREER	29651	1997
GREENVILLE	9900-0053	SLOAN CONSTRUCTION:# 5-CLOSED	0	0	100 BROWN RD	GREENVILLE	29605	1997
GREENVILLE	9900-0056	SLOAN CONSTRUCTION:# 9-CLOSED	0	0	301 KELLER RD	TAYLORS	29687	1997
GREENVILLE	1200--0148	3M:TAPE PLANT	---	641	1450 PERIMETER ROAD	GREENVILLE	29605	1999
GREENVILLE	1200--0169	WASTEQUIP/LM:GREENVILLE-CLOSED	---	50	311 INDUSTRIAL DR	GREENVILLE	29607	1999
GREENVILLE	1200-0194	RUDCO PRODUCTS INC	---	18	1881 SUBER MILL RD	GREER	29652	1999
GREENVILLE	1200-0267	MARITEC CORP-CLOSED	---	8	202 BEECHTREE BLVD	GREENVILLE	29605	1995
GREENVILLE	1200-0260	PARTHENON MARBLE	---	7	P. DAVIS PK-106 INTERSTATE BLVD	GREENVILLE	29615	1997
GREENVILLE	1200-0252	WOVEN ELECTRONICS	---	5	1001 OLD STAGE ROAD	SIMPSONVILLE	29681	1997
GREENVILLE	1200--0126	ASHLAND CHEMICAL:GREENVILLE-CLOSED	---	2	100 DEVONSHIRE DR	GREENVILLE	29606	1995
GREENVILLE	1200-0107	NATIONAL CABINET LOCK	---	2	200 OLD MILL ROAD	MAULDIN	29662	1995
GREENVILLE	1200-0226	GREENVILLE NEWS	---	1	305 SOUTH MAIN	GREENVILLE	29616	1997
GREENVILLE	1200-0313	THERMO KINETICS	---	1	716 E FAIRFIELD RD	GREENVILLE	29606	1997
GREENVILLE	1200-0132	STANDARD MOTOR PRODUCTS INC	---	1	PELHAM ROAD & SMITH DRIVE	GREENVILLE	29615	1999
GREENVILLE	1200-0237	FRANKLIN DYED YARNS-CLOSED	---	0	1 MCGARITY STREET	GREENVILLE	29602	1997
GREENVILLE	1200-0281	EXCALIBUR TOOL:WASHINGTON-CLOSED	---	0	28 SOUTH WASHINGTON AVE	GREENVILLE	29609	1997
GREENVILLE	1200-0330	GREENVILLE CITY OF, LANDFILL-CLOSED	---	0	MAULDIN ROAD	GREENVILLE	29602	1997
GREENVILLE	1200-0331	ENOREE LANDFILL PH I-CLOSED	---	0	301 UNIVERSITY RIDGE	GREENVILLE	29601	1997
GREENVILLE	1200-0332	ENOREE LANDFILL PH II-CLOSED	---	0	301 UNIVERSTITY RIGE	GREENVILLE	29601	1997

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Upstate NO_X and VOC Point Sources

County	SC Air permit Number	Facility Name	NO_X (tpy)	VOC (tpy)	Street	City	ZIP	Inv. Year
GREENVILLE	9900-0099	TPS TECHNICAL:# 4-CLOSED	---	0	BLACKBERRY VALLEY LF	GREENVILLE	29600	1997
GREENVILLE		TOTAL POINT SOURCES	712	3,441				
OCONEE	1820-0048	WEST POINT STEVENS:CLEMSON	53	80	500 OLD CHERRY RD	CLEMSON	29631	1999
OCONEE	1820-0033	ENGELHARD:CHEMICAL CATALYSTS	23	5	554 ENGELHARD DRIVE	SENECA	29678	1999
OCONEE	1820-0006	WEST POINT STEVENS:SENECA-CLOSED	4	2	6TH & MAIN ST	SENECA	29678	1995
OCONEE	1820-0016	DUNLOP SLAZENGER MFG LLC	3	138	HIGHWAY 123,100 MAXFLI DRIVE	WESTMINSTER	29693	1999
OCONEE	1820-0018	SCHLUMBERGERSEMA UTILITIES	3	40	313 N HIGHWAY 11	WEST UNION	29696	1999
OCONEE	1820-0020	GREENFIELD INDUSTRIES	1	31	HIGHWAY 123 WEST	SENECA	29631	1995
OCONEE	1820-0041	DUKE ENERGY:OCONEE	1	7	HWY 130 & 183	SENECA	29678	1995
OCONEE	1820-0052	AEC SENECA-CLOSED	0	0	2313 BLUE RIDGE ROAD	SENECA	29325	1995
OCONEE	1820-0037	METROMONT:CLEMSON READY-MIX PLANT	0	0	640-A OLD CLEMSON HWY	SENECA	29678	1999
OCONEE	1820-0034	ZUPAN&SMITH:SENECA	0	0	HWY 123	SENECA	29678	1998
OCONEE	9900-0106	HUBBARD PAVING:5 FORKS ROAD	0	0	FIVE FORKS ROAD	WALHALLA	29691	
OCONEE	1820-0045	WYLDER FURNITURE MFG-CLOSED	---	3	220 BROCK RD	WESTMINSTER	29693	1995
OCONEE		TOTAL POINT SOURCES	88	306				
PICKENS	1880-0010	CLEMSON UNIVERSITY	80	1	KLUGH AVE	CLEMSON	29634	2001
PICKENS	1880-0007	BASF:CLEMSON	74	40	HIGHWAY 93	CENTRAL	29630	1999
PICKENS	1880-0005	LIBERTY DENIM LLC	16	14	101 MILLS AVENUE	LIBERTY	29657	1995
PICKENS	9900-0093	KING ASPHALT:# 3-CLOSED	10	3	OLD STAGE RD @ I-385	SIMPSONVILLE	29681	1997
PICKENS	1880-0051	EASLEY COMBINED UTILITIES:UTILITY STREET	7	0	150 UTILITY ST	EASLEY	29640	1998
PICKENS	9900-0098	SLOAN CONSTRUCTION:LIBERTY	6	0	HWY 93@VULCAN QUARRY	LIBERTY	29657	1996
PICKENS	1880-0043	MAYFAIR MILLS:GLENWOOD-CLOSED	5	10	306 HAGOOD ST	EASLEY	29640	1996
PICKENS	1880-0019	ALICE MANUFACTURING:ELLISON	4	2	1859 DACUSVILLE HWY	EASLEY	29640	1995
PICKENS	1880-0018	ALICE MANUFACTURING:ARIAL	4	2	212 RICE ROAD	EASLEY	29640	1995
PICKENS	1880-0020	ALICE MANUFACTURING:ELLJEAN	4	3	147 STORE RD	EASLEY	29640	1995
PICKENS	1880-0011	HOLLINGSWORTH SACO LOWELL	2	9	183 ROLLING HILLS CIRCLE	EASLEY	29640	1999
PICKENS	1880-0021	ALICE MANUFACTURING:FOSTER	2	2	1006 RICE RD	EASLEY	29640	1995
PICKENS	9900-0020	KING ASPHALT:# 2	2	1	HWY 93	LIBERTY	29657	1997
PICKENS	1880-0006	ONE WORLD INDUSTRIES:PICKENS	1	23	225 PUMPKINTOWN ROAD	PICKENS	29671	1999
PICKENS	1880-0052	MCKECHNIE:HIGHWAY 93 PLANT	1	42	SC HIGHWAY 93	EASLEY	29641	1999
PICKENS	1880-0040	FLEXIWALL:208 CAROLINA DRIVE	0	19	208 CAROLINA DR	LIBERTY	29657	1999

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PICKENS	1880-0001	CORNELL DUBILIER MARKETING	0	0	140 TECHNOLOGY PLACE	LIBERTY	29657	1997
PICKENS	1880-0044	MARK IV-CLOSED	---	0	SC HIGHWAY 93	EASLEY	29641	1997
PICKENS		TOTAL POINT SOURCES	218	171				
SPARTANBURG	2060-0179	TRANSCONTINENTAL GAS PIPE LINE	3,882	144	2201 MOORE-DUNCAN HIGHWAY	MOORE	29369	1999
SPARTANBURG	2060-0345	KOSA: ARTEVA SPECIALTIES	259	73	1551 SHA LANE	SPARTANBURG	29302	1997
SPARTANBURG	2060-0142	SPARTANBURG REGIONAL MEDICAL CENTER	33	2	101 E WOOD ST	SPARTANBURG	29303	1997
SPARTANBURG	2060-0221	PALMETTO LANDFILL & RECYCLING CTR	28	10	375 FREY CREEK ROAD	SPARTANBURG	29301	1999
SPARTANBURG	2060-0230	BMW MANUFACTURING CORP	28	58	1400 HWY 101 S	GREER	29651	1999
SPARTANBURG	2060-0065	MICHELIN:SPARTANBURG	24	537	1000 INTERNATIONAL DRIVE	SPARTANBURG	29304	1999
SPARTANBURG	2060-0018	SPRINGS INDUSTRIES:LYMAN	23	42	PACIFIC STREET	LYMAN	29365	1999
SPARTANBURG	2060-0071	KOHLER CO:PLASTICS PLANT	22	204	4000 SOUTH PINE STREET	SPARTANBURG	29302	1999
SPARTANBURG	2060-0029	BLACKMAN UHLER CHEMICAL	18	4	2155 W CROFT CIRCLE	SPARTANBURG	29302	1995
SPARTANBURG	9900-0323	SLOAN CONSTRUCTION:#14-CLOSED	10	9	ROUTE S-42-133 OFF SC RT 101	DUNCAN	29334	2000
SPARTANBURG	2060-0085	NATIONAL STARCH & CHEMICAL COMPANY	10	35	14351 HIGHWAY 221	ENOREE	29388	2001
SPARTANBURG	2060-0182	INTELICOAT TECHNOLOGIES	8	126	5670 BLACKSTOCK ROAD	SPARTANBURG	29303	1999
SPARTANBURG	2060-0075	EXOPACK LLC	8	171	345 CEDAR SPRINGS AVENUE	SPARTANBURG	29304	1999
SPARTANBURG	9900-0052	SLOAN CONSTRUCTION:# 2 CLOSED	8	2	350 VULCAN RD	PACOLET	29372	1998
SPARTANBURG	2060-0068	BASF:SPARTANBURG	8	1	HWY 295	SPARTANBURG	29302	1997
SPARTANBURG	2060-0055	BAYER CORP:WELLFORD	7	7	HWY 29 & I-85	WELLFORD	29385	1995
SPARTANBURG	2060-0026	AMERICAN FAST PRINT	7	73	I-85 AT BRYANT ROAD	SPARTANBURG	29301	1999
SPARTANBURG	2060-0001	MILLIKEN CHEMICAL:DEWEY	7	19	1440 CAMPTON RD	INMAN	29349	1999
SPARTANBURG	2060-0147	TIETEX INTERNATIONAL LTD	7	26	3010 N BLACKSTOCK RD	SPARTANBURG	29304	1995
SPARTANBURG	2060-0039	SAXON FIBERS LLC	6	39	11 FRONT STREET	SPARTANBURG	29301	1996
SPARTANBURG	9900-0091	SLOAN CONSTRUCTION:PACOLET	6	0	HWY 176	PACELOT	29372	1996
SPARTANBURG	2060-0019	REEVES BROTHERS:FAIRFOREST	6	50	798 REEVES ST	SPARTANBURG	29301	1999
SPARTANBURG	2060-0233	MAYFAIR MILLS:BAILY-CLOSED	5	4	101 WEST CLEVELAND ST	ARCADIA	29320	1997
SPARTANBURG	2060-0041	INMAN MILLS:INMAN PLANT-CLOSED	5	1	300 PARK RD	INMAN	29349	1995
SPARTANBURG	9900-0152	ASPHALT CONTRACTORS LLC	5	0	HALF MOON ROAD	LYMAN	29365	1995
SPARTANBURG	2060-0077	CROWN CORK&SEAL:SPARTANBURG	5	152	930 BEAUMONT AVENUE	SPARTANBURG	29303	1999
SPARTANBURG	9900-0115	SLOAN CONSTRUCTION:LYMAN	5	0	248 PLEMMONS ROAD	DUNCAN	29334	1996
SPARTANBURG	2060-0022	MILLIKEN:RESEARCH	4	0	920 MILLIKEN RD	SPARTANBURG	29304	1999

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SPARTANBURG	2060-0025	ISG RESOURCES INC	4	0	520 CALICO DRIVE	PACOLET	29372	1995
SPARTANBURG	2060-0271	INMAN MILLS:RAMEY PLANT	4	2	HWY. 221	ENOREE	29335	1995
SPARTANBURG	2060-0176	SPARTAN MILLS:SPARTAN-CLOSED	4	2	436 HOWARD ST	SPARTANBURG	29301	1995
SPARTANBURG	9900-0090	F & R ASPHALT:PLANT #1	3	0	BALLENGER RD	INMAN	29365	1995
SPARTANBURG	2060-0262	REEVES BROTHERS:SPARTANBURG	3	0	US29 SOUTH	SPARTANBURG	29304	1997
SPARTANBURG	2060-0121	MARY BLACK MEMORIAL HOSPITAL	3	0	1700 SKYLYN DR	SPARTANBURG	29304	1995
SPARTANBURG	2060-0042	INMAN MILLS:SAYBROOK	3	1	1 FIRST ST	INMAN	29349	1995
SPARTANBURG	2060-0035	GOODYEAR:SPARTANBURG	3	155	SIMUEL RD & I-85	SPARTANBURG	29301	2001
SPARTANBURG	2060-0249	CISA INDUSTRIES-CLOSED	2	0	1720 EAST MAIN STREET	DUNCAN	29334	1995
SPARTANBURG	2060-0186	PROGRESS LIGHTING-CLOSED	2	24	HWY 29 E	COWPENS	29330	1995
SPARTANBURG	2060-0012	MOHAWK:LANDRUM	2	2	300 LANDRUM MILLS RD	LANDRUM	29356	1995
SPARTANBURG	2060-0134	TRANSMONTAIGNE:SPARTANBURG-SE	2	33	680 DELMAR RD	SPARTANBURG	29302	1996
SPARTANBURG	2060-0064	ROEBUCK DISPOSAL LLC:CLOSED	2	3	301 RAILROAD ST	ROEBUCK	29376	1997
SPARTANBURG	2060-0180	STERIS-ISOMEDIX SERVICES	2	3	2072 SOUTHPORT RD	SPARTANBURG	29306	2000
SPARTANBURG	2060-0007	SPARTANBURG AUTOMOTIVE PRODUCTS	1	0	1290 NEW CUT ROAD	SPARTANBURG	29303	2000
SPARTANBURG	2060-0348	SPARTANBURG STAINLESS PRODUCTS	1	1	121 BROADCAST DR	SPARTANBURG	29303	2000
SPARTANBURG	2060-0028	MOUNT VERNON MILLS:ARKWRIGHT	1	0	ARKWRIGHT PLT-405 NORTH ST	SPARTANBURG	29306	1999
SPARTANBURG	2060-0175	HOKE INC	1	0	899 SIMUEL RD	SPARTANBURG	29305	2000
SPARTANBURG	2060-0119	BOMMER INDUSTRIES:LANDRUM	1	6	HWY 176 S	LANDRUM	29356	1995
SPARTANBURG	2060-0181	PALMETTO VERMICULITE	1	0	HWY 221 S OF WOODRUFF	WOODRUFF	29388	1998
SPARTANBURG	9900-0352	KING ASPHALT:# 4 - NEW	1	2	599 LAWSON CREEK DRIVE	SPARTANBURG	29303	2000
SPARTANBURG	2060-0079	TNS MILLS:SPARTANBURG	1	1	400 TNS RD	SPARTANBURG	29303	1999
SPARTANBURG	9900-0016	KING ASPHALT:# 4 - CLOSED	1	2	599 LAWSON CREEK DRIVE	SPARTANBURG	29303	1997
SPARTANBURG	2060-0017	INMAN MILLS:RIVERDALE-CLOSED	1	0	GRAHAM STREET	ENOREE	29335	1996
SPARTANBURG	2060-0086	PHELPS DODGE	1	0	1570 COMPTON ROAD	INMAN	29349	1997
SPARTANBURG	9900-0023	ASPHALT ASSOCIATES	1	0	546 SPRINGFIELD RD	SPARTANBURG	29303	1997
SPARTANBURG	2060-0070	MEMC ELECTRONIC MATERIALS	1	0	7601 HIGHWAY 221 SOUTH	MOORE	29369	2000
SPARTANBURG	2060-0299	APPALACHIAN ENGINEERED HARDWOOD FLOORING	0	0	200 PRISON ROAD	ENOREE	29335	2000
SPARTANBURG	2060-0128	SPARTANBURG HOSPITAL RESTORATION CARE	0	0	389 SERPENTINE DR	SPARTANBURG	29304	1998
SPARTANBURG	2060-0288	MILLIKEN:COTTON BLOSSOM-PLANT	0	1	295 BROADCAST DR	SPARTANBURG	29304	1999
SPARTANBURG	2060-0081	DONNELLEY,RR & SONS	0	137	300 JONES ROAD	SPARTANBURG	29307	1999
SPARTANBURG	2060-0061	MACK MOLDING CO	0	63	10769 ASHVILLE HWY(HWY 176)	INMAN	29349	1995

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SPARTANBURG	2060-0108	PIEDMONT DIELECTRICS	0	3	HWY 221@HARRIS BR RD	WOODRUFF	29388	1995
SPARTANBURG	2060-0051	EASTMAN CHEMICAL COMPANY	0	0	200 RAILROAD ST	ROEBUCK	29376	1995
SPARTANBURG	2060-0084	LEIGH FIBERS INC	0	0	1101 SYPHRIT	WELLFORD	29385	2000
SPARTANBURG	9900-0282	PIEDMONT CONCRETE:DUNCAN	0	0	103 OLD DOMINION DR	DUNCAN	29353	2000
SPARTANBURG	2060-0038	METROMONT:SPARTANBURG I-85	0	0	475 SIMUEL RD	SPARTANBURG	29303	1995
SPARTANBURG	2060-0047	ARROW AUTOMOTIVE IND-CLOSED	0	0	801 BEAUMONT AVE EXT	SPARTANBURG	29303	1997
SPARTANBURG	2060-0087	JACKSON MILLS:CLOSED	0	0	RAILROAD ST	WELLFORD	29385	1997
SPARTANBURG	2060-0088	COOPER STANDARD AUTOMOTIVE	0	2	355 UPPER VALLEY ROAD	SPARTANBURG	29304	1997
SPARTANBURG	2060-0151	SPARTAN MILLS:STARTEX CLOSED	0	0	23 N MAIN ST	STARTEX	29377	1997
SPARTANBURG	2060-0167	SEW EURODRIVE	0	0	1275 SPARTANBURG HWY	LYMAN	29365	1997
SPARTANBURG	2060-0173	SPARTAN MILLS:MONTGOMERY-CLOSED	0	0	707 MONTGOMERY DR	CHESNEE	29323	1997
SPARTANBURG	2060-0208	MILLIKEN:NEW PROSPECT-CLOSED	0	0	10400 HIGHWAY 9	CAMPOBELLO	29322	1997
SPARTANBURG	2060-0280	REEVES BROTHERS:CHESNEE-CLOSED	0	0	604 SOUTH ALABAMA STREET	CHESNEE	29323	1997
SPARTANBURG	2060-0344	JOHNS MANVILLE	0	0	995 MT PLEASANT ROAD	SPARTANBURG	29307	1997
SPARTANBURG	9900-0166	METROMONT:HWY 101	0	0	1401 HWY 101 SOUTH	GREER	29651	1999
SPARTANBURG	2060-0097	MOTIVA ENTERPRISES LLC	---	47	UNION STREET, CAMP CROFT	SPARTANBURG	29304	1995
SPARTANBURG	2060-0215	DOT PACKAGING-PRINTPAK	---	30	195 ABBOTT LANE	SPARTANBURG	29304	1999
SPARTANBURG	2060-0101	CITGO:SPARTANBURG	---	27	OLD UNION RD	SPARTANBURG	29304	1995
SPARTANBURG	2060-0098	TRANSMONTAIGNE:SPARTANBURG-PD	---	26	OLD UNION ROAD	SPARTANBURG	29304	1995
SPARTANBURG	2060-0056	PHILLIPS PIPELINE:SPARTANBURG	---	25	200 NEBO STREET	SPARTANBURG	29301	2000
SPARTANBURG	2060-0096	CONOCOPHILLIPS COMPANY	---	13	2430 S PINE STREET EXT	SPARTANBURG	29302	1995
SPARTANBURG	2060-0094	CROWN CENTRAL PETROLEUM	---	13	400 DELMAR ROAD	SPARTANBURG	29302	1995
SPARTANBURG	2060-0183	MICHELIN:DUNCAN	---	10	STATE ROAD 290@I-95	DUNCAN	29334	1995
SPARTANBURG	2060-0199	COLOR CONVERTING IND	---	8	150 BELCHER RD	INMAN	29349	1995
SPARTANBURG	2060-0107	INA USA CORP:PLANT IV	---	0	1298 NEW CUT ROAD	SPARTANBURG	29304	1997
SPARTANBURG	2060-0333	CAMP CROFT LANDFILL-CLOSED	---	0	P O BOX 1633	SPARTANBURG	29072	1997
SPARTANBURG		TOTAL POINT SOURCES	4,496	2,431				
UPSTATE		TOTAL POINT SOURCES	31,365	24,480				

Source: SCDHEC Emission Inventory – July 11, 2003

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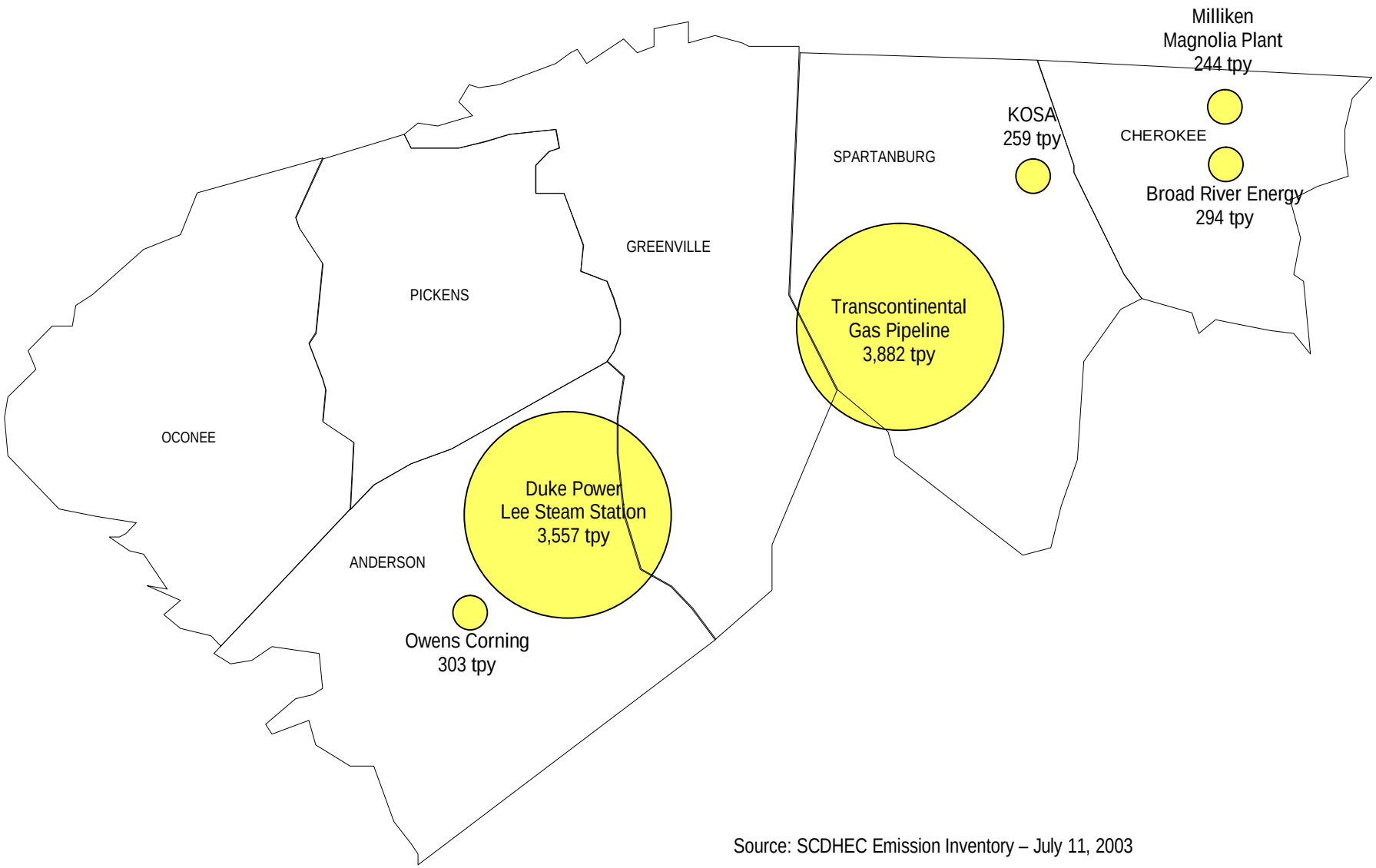
Attachment 8-2
Upstate Major NO_X Point Sources
(greater than 100 tons per year)



Source: SCDHEC Emission Inventory – July 11, 2003

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Attachment 8-3
Upstate NO_X Emissions Distribution (tpy)

COUNTY	POINT[a]	AREA[a]	NON-ROAD[a] MOBILE	ON-ROAD[a] MOBILE	NATURAL[b]	TOTAL
Anderson	4,162	910	866	6,975	,237	13,150
Cherokee	779	284	816	2,674	93	4,646
Greenville	712	2,044	3,085	10,538	165	16,544
Oconee	88	437	687	2,482	152	3,846
Pickens	218	656	814	3,405	117	5,210
Spartanburg	4,496	1,381	2,299	11,550	206	19,932
TOTAL	10,455	5,712	8,567	37,624	970	63,328
PERCENT	17%	9%	14%	59%	2%	N/A

Attachment 8-3
Upstate VOC Emissions Distribution (tpy)

COUNTY	POINT[a]	AREA[a]	NON-ROAD[a] MOBILE	ON-ROAD[a] MOBILE	NATURAL[b]	TOTAL
Anderson	1,309	9,429	857	4,315	10,770	26,682
Cherokee	502	2,514	174	1,412	6,304	10,905
Greenville	3,441	17,975	3,318	8,172	14,562	47,466
Oconee	306	4,340	855	1,477	13,968	20,945
Pickens	171	5,872	954	2,192	11,172	20,361
Spartanburg	2,431	15,671	1,206	7,212	11,883	38,407
TOTAL	8,160	55,801	7,364	24,780	68,659	164,766
PERCENT	5%	34%	4%	15%	42%	N/A

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Attachment 8-3

Upstate "Ozone Precursor" (NO_X + VOC) Emissions Distribution (tpy)

COUNTY	POINT[a]	AREA[a]	NON-ROAD[a] MOBILE	ON-ROAD[a] MOBILE	NATURAL[b]	TOTAL
Anderson	5,467	10,339	1,723	11,290	11,007	39,826
Cherokee	1,281	2,798	990	4,086	6,397	15.552
Greenville	4,153	20,019	6,403	18,710	14,727	64,006
Oconee	394	4,777	1,542	3,959	14,120	24,791
Pickens	389	6,528	1,768	5,597	11,289	25,571
Spartanburg	6,927	17,052	3,505	18,762	12,089	58,335
TOTAL	18,615	61,513	15,931	62,404	69,629	228,091
PERCENT	8%	27%	7%	27%	31%	N/A

[a] July 11, 2003 SCDHEC emission inventory.
[b] January 2003 SCDHEC emission inventory.

Attachment 8-4
South Carolina Coal Use by Sector

Year	Utility	Industrial	Residential and Commercial	TOTAL
1980	7,927,000	1,842,000	211,000	9,980,000
1981	8,679,000	2,074,000	105,000	10,858,000
1982	8,581,000	2,292,000	117,000	10,990,000
1983	6,989,000	2,200,000	172,000	9,361,000
1984	7,428,000	2,226,000	115,000	9,769,000
1985	7,888,000	2,525,000	66,000	10,479,000
1986	7,777,000	2,465,000	219,000	10,461,000
1987	9,019,000	2,502,000	120,000	11,641,000
1988	9,210,000	2,602,000	126,000	11,938,000
1989	9,472,000	2,491,000	17,000	11,980,000
1990	8,228,000	2,310,000	6,000	10,544,000
1991	9,218,000	2,212,000	22,000	11,452,000
1992	9,078,000	2,177,000	31,000	11,286,000
1993	10,410,000	2,395,000	109,000	12,914,000
1994	10,597,000	2,334,000	61,000	12,992,000
1995	10,074,000	2,188,000	17,000	12,279,000
1996	11,833,000	2,000,000	19,000	13,852,000
1997	12,096,000	2,014,000	1,000	14,111,000
1998	12,664,000	1,962,000	23,000	14,649,000
1999	13,666,000	1,863,000	237,000	15,766,000
2000	15,034,000	1,912,000	0	16,946,000
2001	14,382,000	2,038,000	0	16,421,000
2002	not available	1,923,000	0	incomplete

1980 - 2000 data from "2001 South Carolina Energy Use Profile" - South Carolina Energy Office.
2001 data from "Annual Coal Report 2001" - Energy Information Administration - DOE/EIA-0584 (2001).
2002 data from "Quarterly Coal Report, October - December 2002" - DOE/EIA-0121 (2002/04Q).

Attachment 8-4
Upstate Coal Use by Sector

Source Category	County	Annual tons of coal
Utility[a]	Anderson	505,000
Industrial[b] (Non-Residential)	Cherokee	45,000
	Anderson	20,000
	Pickens	20,000
	Upstate Total	85,000
Residential[b]	Upstate Total	1,030

[a] 2000 data from "2001 South Carolina Energy Use Profile" - South Carolina Energy Office.
[b] information provided by Upstate coal dealers.

Attachment 8-4
Comparison of South Carolina and Upstate Coal Use

Source	Utility[a]	Industrial[b]	Residential[c]	TOTAL
South Carolina	15,034,000	1,923,000	237,000	17,194,000
Upstate	505,000	85,000	1,030	591,030
Upstate Percent	3%	4%	<1%	3%

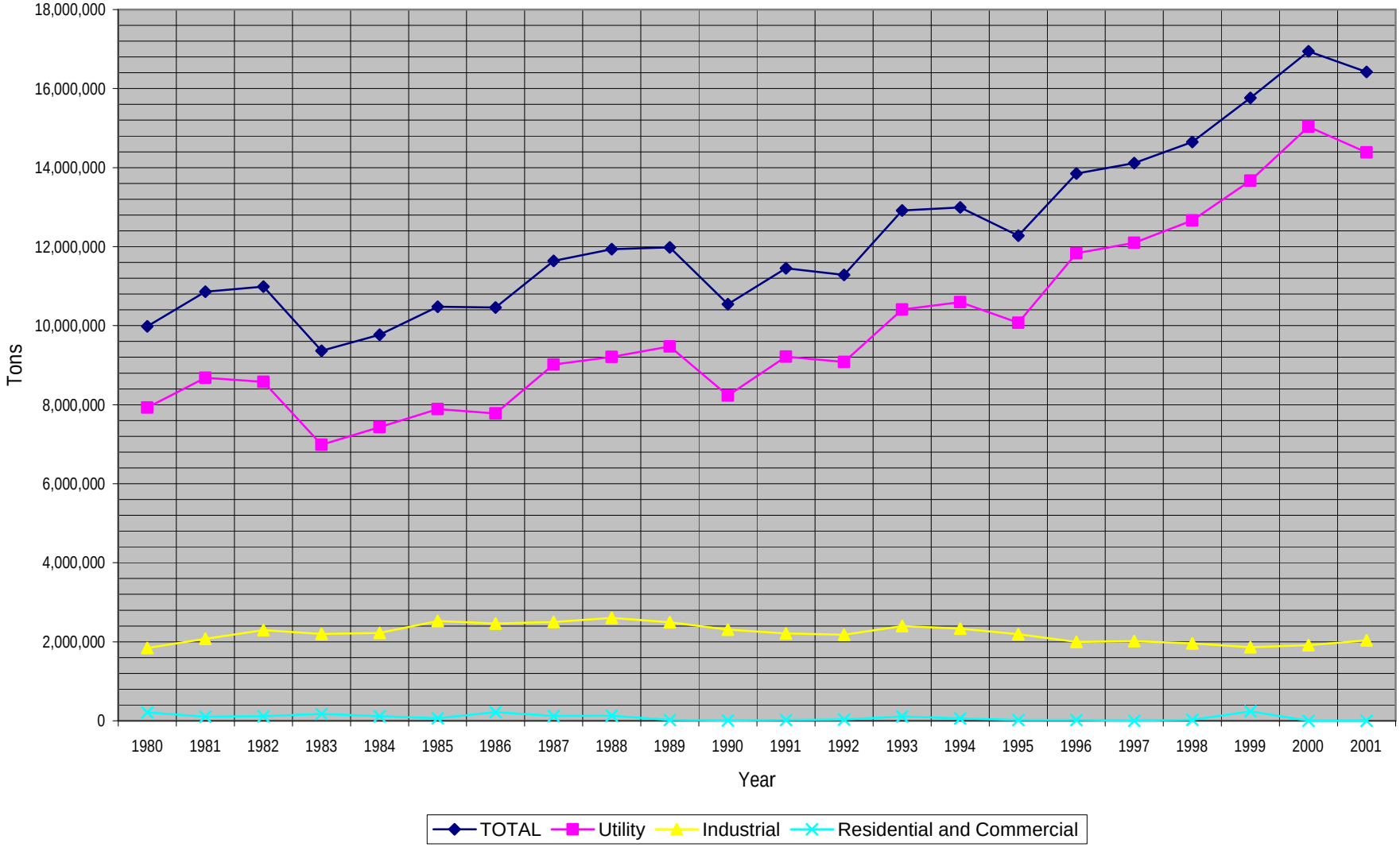
[a] comparison for 2000 (most recent common year available).
[b] comparison for 2002 (most recent year).
[c] comparison for 1999 (last year none-zero data reported).

Attachment 8-4
Comparison of Duke Power Coal Use

State	Plant	Annual tons of coal[a]
North Carolina	Allen	1,907,000
	Buck	680,000
	Cliffside	1,472,000
	Dan River	314,000
	Marshall	4,943,000
	Riverbend	824,000
	Belews Creek	4,444,000
South Carolina	Lee	505,000
Duke Power Total		15,089,000
South Carolina Percent		3%

[a] data from "Cost and Quality of Fuels for Electric Utility Plants 2000 Tables" - DOE/EIA-0191(00).

Attachment 8-4
Coal Use in South Carolina



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Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
9. Support SCDHEC in evaluating and seeking reductions from major sources based on modeling. Priority A	• Coordinate with Duke Power to determine what NOx reductions are planned for the Lee Steam Plant. • Coordinate with the Williams Company to determine what NOx reductions are planned for the Transco Pipeline. • Support NOx reduction strategies in the State Implementation Plan. • Develop an Early Reduction Program with incentives for industrial facility (Tier Two Type emission NOx sources)	2,000-4,000 tpy NOx from SIP Call Potential 500-1000 tpy NOx (Tier Two)	2005	Area: Countywide. Agency: local governments, Chambers of Commerce, utilities, business and industry.

Findings

a. Transco Pipeline/Williams Company and Lee Steam Plant are scheduled under the NOx SIP Call to reduce emission. Accelerated installation of equipment ahead of SIP Call schedule is doubtful given, replacement equipment availability is project dependent and capital spending planning is difficult to change at this point in the process. However in the longer time frame we will see significant reductions. New emission inventories have reduced the current emission of the Transco Pipeline by 44%.
b. Top Sources Greater than 100 tpy NOx
   i. Transco present inventory of NOx 3,882 tpy.
   ii. Duke Power Lee Steam Station present inventory of NOx 3,557 tpy.
   iii. Owens Corning in Anderson present inventory of NOx 303 tpy.
   iv. Broad River Energy NOx of 294 tpy.
   v. Kosa Spartanburg present inventory of NOx of 259 tpy.
   vi. Milliken Magnolia Plant present inventory of NOx 244 tpy.
c. Primary energy source for electricity in the upstate is nuclear, minimizing the amount of NOx generated by the electric utilities.
d. 98,000 tons of NOx is generated in South Carolina from primary energy sources of electricity, with only less than 10% being generated in the Upstate (less than 8,000 tpy NOx) due to the predominate use of nuclear and hydroelectric electrical energy sources (Duke Powers Oconee Plant and Bad Creek Hydro Plant in Oconee county)
e. Work on an Early Reduction Plan need to be evaluated.
f. Support DHEC modeling efforts to evaluate impact of VOCs sources.

Advantages

a. Decrease NOx point source emissions of NOx.
b. Uses of Hydroelectric and Nuclear power give the upstate and advantage in reduced NOx from power production.

Disadvantages

a. Point sources can only contribute a small amount of overall NOX reduction and we need to model these finding to determine if impact to upstate significant and the cost are practicable economically.

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Cost of implementation
Cost per Ton: Cost of implementation is not currently known.

Potential Revenue Sources

Conclusion
This strategy should be included in the early action plan until we can determine the impact of this strategy on the Ozone Model and determine the cost/benefit.

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Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
10. Develop a program to offer to purchase or repair smoking vehicles (known as cash for clunkers). Priority A	• Use funds generated from a license plate sales, registration fees, or license plate tax program to buy or repair high emitting vehicles from individuals. • Purchase such vehicles from non-profit groups such as the Kidney Foundation, Goodwill, Salvation Army when they have been donated as charitable gifts. • Consider accelerated vehicle retirement (scrappage) programs to encourage vehicle owners to voluntarily retire their vehicles sooner than they would have otherwise.		2005	Area: countywide. Agency: local governments.

Findings

a. In Greenville County on-road mobile sources account for 64% (10,538 tpy) of the NOx emissions and 21% (9,491 tpy) of the VOC emissions
b. 2% of the vehicles (super-high emitters) result in 28% of the automobile/light trucks VOC emissions (some type of similar relationship with NOx); 10% of the vehicles (high emitters) result in 45% of the automobile/light trucks VOC emissions
c. Several voluntary pilot buyback programs for high emission vehicles have been implemented (CA, CO, DE, IL)
d. Typical vehicle buy back programs paid from $500 to $1,000 per vehicle
e. Repairs cost ranged up to $500 per vehicle repaired
f. Vehicles are typically identified by the following methods: model year; emission waivers (inspection & maintenance program); a smoking vehicle hotline; and remote sensors
g. Some scrappage/repair programs used private funds (emissions trading type program) for buybacks
h. Eligibility should be linked to duration of a vehicle's registration in program area (prevent import of cars from other areas for scrappage)
i. Some scrappage programs do not let persons with assets above certain threshold participate
j. Implementing this program have created some controversy: (1) auto repair industry may oppose retiring these vehicles because it reduces the supply of parts for older vehicles and decrease the demand for repairs; and (2) lack of understanding from car collectors on cars' eligibility and the voluntary nature of the program.
k. Some programs offer to pay owners of these vehicles for repairs so that the vehicle complies with emissions standards. This would be difficult to implement as South Carolina does not have an inspection program.
l. EPA reviews the proposed "cash for clunker" program if states include this program in the SIP.
m. If the programs assumes that the oldest vehicles are the highest polluters, some would argue that a well maintained car may not necessarily be a high polluter
n. A study concluded that (http://www.ncseonline.org/NLE/CRSreports/Air/air-25.cfm):
    i. Accelerated Vehicle Retirement (AVR) programs "are potentially more effective in states with large metropolitan areas where automobile exhaust contributes significantly to air pollution and in states with heavy industry where there is a demand for pollution credits earned from funding a program" and

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ii. The future of AVR programs will depend on whether private industry will seek to sponsor such programs to earn pollution credits and whether less controversial or more cost-effective options are available to states to achieve or maintain federal air quality standards.

Advantages

a. Cost effective way of reducing VOCs.
b. Local repairs of automobiles enhances local economy.
c. Repair of vehicles increases chances scraped vehicle will not be replaced with another high polluting vehicle.
d. With repairs, a well tuned vehicle can produce 10 to 15 times less pollution.

Disadvantages

a. Buying back a high emission vehicle for $500 to $1,000 is no guarantee that participant will buy a cleaner burning car.
b. Finding hard data concerning the success of the vehicle buyback program for high emission vehicles is difficult.
c. Retiring old vehicles could reduce the supply of car for those who cannot afford to purchase more expensive vehicles.

Cost of implementation

a. California – $3,000 to $4,000/ton (VOCs & NOx).
b. Colorado – $11,438/ton VOCs.
c. Delaware – $4,000/ton VOCs.
d. Illinois – $7,600/ton VOCs and $47,200/ton NOx.

Potential Revenue Sources

a. Use funds generated from a license plate sales, registration fees, or license plate tax program to buy or repair high emitting vehicles from individuals.
b. Sponsorship from local companies: this may allow companies to earn pollution credits for contributing funding to a program to purchase eligible vehicles.

Conclusion

A high emission vehicle buyback or repair program appears to be cost effective for VOC emissions, but is less clear for NOx emissions. It is hard to quantify the success rate of the program in the various states the program has been implemented, but the program seems to make intuitive sense. This type of program will become increasingly more important as the new vehicle pollution control systems increase the gap between the new vehicle's emissions and the "smoking" vehicle's emissions. I recommend funding the high emission vehicle buyback or repair program as a pilot program with a set yearly target for the number of vehicles that will be either repaired or scraped. A follow-up study on this pilot program would need to be implemented to determine the impact on emissions (ozone) for the upstate.

Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
11. Ban open burning of on-site commercial clearing debris during ozone season (April to October). Priority A	• Use SCDHEC model to determine the most effective method to ban open burning. • Discuss modeling results with all local governments to consider adoption.		2004	Area: countywide. Agency: SCDHEC and local governments.

Findings

a. South Carolina Department of Environmental Control:
   i. SCHEC is leading statewide efforts on studying the effects of open burning. Some of the changes to existing regulations being studied include:
      - Only allowing fire training at approved facilities as determined by the State Fire Marshall's Office and DHEC.
      - Ban open burning of household waste.
      - Ban open burning of construction waste.
   ii. Ban on open burning of construction debris as a result of land clearing is not being considered.
   iii. Based on 1999 data from EPA, open burning of land clearing debris produce the following amounts of NOx annually:
      - South Carolina: 2,200 tons/year;
      - Anderson County: 71 tons/year;
      - Greenville County: 378 tons/year. Greenville County is the highest in South Carolina; and
      - Spartanburg County: 118 tons/year.
      - The second and third highest NOx emitting counties are Charleston and Richland, respectively.
   iv. SCDHEC can model this strategy if it is proposed that the ban on open burning is year round.
   v. Approximately 1,900 tons/year of Particulate Matter[1] are emitted as a result of open burning of land clearing debris from the three county area.

b. Anderson County: Sections 34-1 (a) through (d) of Anderson Code regulates open burning as follows:
   (a) *Declaration of policy; purpose and intent.* To achieve the greatest public benefit from restriction of open burning during drought conditions, the county council adopts the following regulations and restrictions on open burning within the unincorporated area of the county.
   (b) *Definitions.* As used in this section [the following phrase shall have the meaning ascribed to it, except where the context clearly indicates a different meaning:]
   Open burning means the burning of any substance outside of a building enclosed by walls and a roof. This excludes incinerators which are governed by regulations of the department of health and environmental control.
   Imposition of ban. Immediately upon the declaration by the county forest ranger (forestry commission), publicly disseminated throughout the county by use of news media, of a fire state of emergency due to drought conditions or other conditions which create fire hazards to the

[1] Source: http://www.scdhec.net/eqc/baq/html/factsheets/pm25.html) -- "Particulate Matter 2.5 (PM 2.5) is the term used for solid or liquid particles found in the air. PM2.5 refers to particles with a diameter of 2.5 microns (one-millionth of a meter) or less. In comparison, human hair has a diameter of seventy microns. PM2.5, also referred to as "fine particulate", comes from a wide variety of stationary, mobile, and natural sources. For example, power production, cement manufacturing, combustion, fireplaces, diesel trucks, and forest fires are all sources of particulate emissions. Concerns for human health from PM2.5 exposure are effects on breathing and the respiratory system. Because of its extremely small size, PM2.5 penetrates the most sensitive parts of the respiratory tract. Children, the elderly, and those with cardiovascular or chronic lung diseases such as emphysema or asthma are especially sensitive to particulate matter pollution. The Environmental Protection Agency (EPA) established a new particulate matter standard in July, 1997, to provide more stringent standards for fine particles in the air. Nineteen air monitoring sites are currently being established across the State to measure the concentration of PM2.5 in the air."

unincorporated area of the county, there shall exist and come into being a prohibition, or ban, on open burning of any substance within the unincorporated area of the county, subject only to any exceptions or rules established by state or federal law. Such ban will continue in effect until lifted or amended by order of the county forest ranger (forestry commission), publicly disseminated through the county news media, declaring the end of such ban or the modification of such ban.

(c) *Penalties for violations.* Any person violating any provision of this section shall be guilty of a misdemeanor and, upon conviction, shall be punished in accordance with section 1-7.

c. Greenville County: Sections 15-6 (b) through (j) of the Greenville County Code of Laws regulates outdoor burning within residential areas as follows:

(b) *Prohibition*: It shall be unlawful for any person to kindle or maintain any open burning or authorize any such fire to be kindled or maintained within a platted residential subdivision or zoned area, with the exception of the R-S, Residential Suburban Zoning District, in Greenville County or within two hundred (200) feet of a platted residential subdivision or applicable zoned area in Greenville County, except as provided below:

(1) The burning must be located not less than fifty (50) feet from any structure and adequate provision is made to prevent the fire from spreading within fifty (50) feet of any structure; and

(2) The burning must be constantly attended by a competent person until such fire is extinguished. Such person shall have a garden hose connected to a water supply, or other fire extinguishing equipment readily available for use. Proper notification shall be given to the state forester or his duly authorized representative or other persons designated by the state forester. The notice shall contain all information required by the state forester or his representative. The burning must be conducted in accordance with all applicable laws and regulations including, but not limited to, DHEC Air Quality Regulations 61-62.2 and 61-62.4 and state statute § 48-335-10, et seq.; and

(3) All burnings must be extinguished by 3:00 p.m. and no burnings shall be permitted between 3:00 p.m. one day and 9:00 a.m. of the following day with the exception of fires in connection with the preparation of food for immediate consumption, or campfires and fires used solely for recreational purposes, ceremonial occasions, or human warmth and those fires where the time parameters are already regulated by Department of Environmental Control Regulation 61-62-2.

(c) *Authority to prohibit permitted burnings.* The official charged with the administration and enforcement of this section may prohibit open burning that is otherwise authorized by this section when atmospheric conditions, local circumstances or other conditions exist that, in the sole determination of such official, would make such fires hazardous.

(d) *County roads and drainage rights-of-way.* Open burning shall be prohibited on all Greenville County roads and drainage rights-of-way or within an area that may cause damage to any Greenville County road or drainage right-of-way.

(e) *Inapplicability.* The provisions of this section do not apply to the following:

1. Vegetative debris burning related to forestry, wildlife, and agricultural burns authorized by the South Carolina Forestry Commission.
2. Any burning in connection with the preparation of food for immediate consumption, or campfires and fires used solely for recreational purposes, ceremonial occasions, or human warmth, so long, as such burnings are performed in a safe manner.
3. Fires set for the purposes of training public fire-fighting personnel when authorized by the appropriate governmental entity, and fires set by a private industry as a part of an organized program of drills for the training of fire-fighting personnel. These will be exempt only if the drills are solely for the purposes of fire-fighting training and the duration of the burning, is held to the minimum required for such purposes. Prior approval is required only for sites which are not established training sites.

(f) *Hazardous or toxic materials.* The burning of hazardous or toxic materials shall not be permitted under any circumstances.

(g) *Liability.* Any burning authorized by the provisions of this ordinance shall not relieve the individual responsible for such burning from any civil or criminal liabilities which may occur as a result of such burning.

(h) *Conflicts.* In the event any conflict may arise between the provisions of this ordinance and any state law, the provisions of state law shall prevail and be controlling.

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(i) *Penalties.* Any person, firm, corporation or agent, who shall violate the provisions of this section shall be guilty of a misdemeanor and shall be punished within the jurisdictional limits of magistrate's court. Each such person, finn, corporation or agent shall be deemed guilty of a separate offense for each and every day or portion thereof during which any violation of any of the provisions of this ordinance is committed, or continued.

(j) *Administration and enforcement.* The provisions of this ordinance shall be administered and enforced by the fire chief, or his/her designated representative, in whose area the burning occurs. In the event such burning occurs in an area that is not the responsibility of any fire chief, then, in such event, the provisions of this ordinance shall be administered and enforced by the Greenville County fire official.

d. Spartanburg County: Spartanburg does not regulate open burning.

Advantages

a. Implementing a ban on open burning year round is more beneficial than implementing it only during ozone season because it would allow to reduce harmful emissions from particulate matter year round, which would have a greater impact on improving air quality. Statistical data indicates that Greenville County emissions from particulate matter total 1,285 tons/year; Anderson County total 243 tons/year; and Spartanburg County total 404 tons/year.

Disadvantages

a. Ban on open burning of debris as a result land clearing may not be popular in the construction industry. However, this might be overcome by creating an intense educational campaign to create consciousness of the problems that this practice creates on the quality of the air we breathe. A concerted effort should be conducted where local governments implement this type of ban and partnerships are established, supported by the federal and/or state governments and environmental groups, to encourage mulching the debris on site and distributing the mulch to individuals who want it either at cost or free of charge.

Cost of implementation

Cost per Ton

Potential Revenue Sources

Conclusion

Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
12. Create incentives for the purchase of high efficiency and low emissions vehicles. Priority A	• Offer tax credits for vehicles with high efficiency gas consumption or low emissions. • Offer tax credits for low mileage vehicles instead of high mileage vehicles.		2005	Area: Statewide. Agency: State and county governments.

Findings

a. Federal Tax Incentives:

i. Clean-fuel vehicles (http://www.irs.gov/newsroom/article/0,,id=107766,00.html; http://www.fueleconomy.gov/feg/tax_hybrid.shtml): Individuals who are the original owners of a qualifying clean fuel or hybrid (gasoline/electric) vehicle may be eligible to claim a one-time tax deduction of up to $2,000 on the federal income tax in the year the vehicle is first used. The tax deduction is taken as an adjustment to income. Hybrid vehicles do not have to be owned or used by businesses to qualify for the deduction. There are three Toyotas (the 2001, 2002 and 2003 Prius models) and four Hondas (the 2000, 2001 and 2002 Insight and the 2003 Civic Hybrid) that qualify for this tax deduction. This incentive is scheduled to phase out in 2004-06 as follows:

Purchase Year:	1992-03	2004	2005	2006
Maximum Deduction per Vehicle:	$2,000	$1,500	$1,000	$500

Clean fuel vehicles include natural gas, liquefied natural gas (LNG), liquefied petroleum gas (LPG), hydrogen, electricity (e.g., some gasoline/electric hybrids), and any other fuel that is at least 85% alcohol or ether (e.g., E85).

Other requirements: individuals must purchase the vehicle new and for their own use, not for resale; must be driven mostly in the United States; the vehicles must meet all federal and state emissions requirements; and government agencies, tax exempt organizations, and foreign entities are not eligible.

ii. Electric vehicles (http://www.fueleconomy.gov/feg/tax_afv.shtml#ev; Form 8834: Qualified Electric Vehicle Credit): Individuals purchasing new electric vehicles may be eligible for a one-time federal income tax credit of 10% o the vehicle cost up to $4,000 per vehicle. Individual who purchased electric vehicles prior to 2002 can claim the credit by filing an amended tax return for the tax year when the vehicle was purchased. This incentive is scheduled to phase out in 2004-2006 as follows:

Purchase Year:	1992-03	2004	2005	2006
Credit (% of Cost)	10.0%	7.5%	5.0%	2.5%
Maximum Deduction per Vehicle:	$4,000	3,000	$2,000	$1,000

Other requirements: individuals must purchase the vehicle new and for their own use, not for resale; vehicle must be driven mostly in the United States; the vehicle must meet all federal and state emissions requirements; government agencies, tax exempt organizations, and foreign entities not eligible. If any of these conditions change within three (3) years of purchase, individuals may have to return some of the money saved by the deduction.

b. State of South Carolina (http://www.ccities.doe.gov/vbg/progs/laws2.cgi):

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i. South Carolina does not currently offer any incentives for alternative fuel vehicles (AFVs) or hybrid electric vehicles (HEVs). For more information, please contact Wendy Bell of the Catawba Regional Council of Governments (COG) at (803) 327-9041, or via email at wbell@catawbacog.org or LeAnn Herren of the University of South Carolina Industrial Ecology Program at (803) 777-9061, or via email at herren@environ.sc.edu.
ii. Whenever practical and economically feasible, all state agencies operating AFVs are required to use alternative fuels in those vehicles. Private businesses are encouraged to increase the use of alternative fuels in the state. (Reference Executive Order 2001-35).
iii. The state Liquefied Petroleum Gas (LPG) Board has been re-established and the number of members has increased to seven. The Board's powers and duties include ensuring that the laws of South Carolina affecting LPG are executed faithfully, instituting proceedings for violations of laws relevant to LPG, and promulgating and enforcing regulations relating to LPG and LPG equipment. (Reference South Carolina Code of Laws §40-82).

c. Incentives offered by other states:
i. State of Georgia (http://www.ccities.doe.gov/vbg/progs/laws2.cgi):
The Alternative Fuel Vehicle Incremental Cost Incentive Program offers grants to local governments and businesses to assist the introduction and expansion of alternative fuels into fleet operations. Georgia offers the following incentives:

- a $5,000 tax credit for the purchase or lease of a zero emission vehicle (ZEV) and a $2,500 tax credit for the purchase or lease of a vehicle that meets or exceeds the U.S. Environmental Protection Agency's (EPA) low emission vehicle (LEV) standard;
- a $2,500 tax credit for converting a conventional vehicle to operate solely on an alternative fuel; and
- a $2,500 tax credit to businesses for the purchase or lease of an electric charger.

Funded through Congestion Mitigation and Air Quality (CMAQ) funds, the Alternative Fuel Vehicle Incremental Cost Incentive Program is available to local businesses, governments, and authorities throughout the 13-county Metropolitan Atlanta area. The program provides an incentive for fleets to purchase alternative fuel vehicles (AFVs) by offering funding to offset the incremental cost difference of AFVs from comparable gasoline- or diesel-powered vehicles. Applicants must have a demonstrated commitment to use alternative fuels and all vehicles must operate full-time on the alternative fuel. There is a 20% matched dollar requirement for each project, as well as a 6% administrative fee. For more information, please contact Julia Miller at (404) 656-7972 or via email at jkmiller@gefa.org.

Georgia offers an income tax credit of $5,000 for the purchase or lease of a ZEV. ZEVs include, but are not limited to, battery-only electric vehicles (EVs) and hydrogen fuel cell vehicles. For more information contact James Udi of the Georgia Environmental Protection Division at (404) 363-7046, or via email at james_udi@dnr.state.ga.us. (Reference Georgia Code Sec. 48-7-40.16)

Georgia offers a $2,500 tax credit towards the purchase, lease, or conversion of a vehicle that operates solely on an alternative fuel and is LEV certified (or better) by EPA. The owners of vehicles that undergo conversion to an Energy Policy Act (EPAct) defined alternative fuel and can meet the EPA certification of LEV or better may also receive the credit. The credit is worth $2,500 for the purchase of a new AFV or up to $2,500 for the cost of a certified conversion. The credit cannot exceed the taxpayer's income tax liability, but any portion of the credit not used in the year the AFV is purchased or converted can be carried over for up to five additional years. For more information, please contact the Georgia Environmental Protection Division at (404) 363-7028. (Reference Georgia Code Sec. 48-7-40.16)

There is a $2,500 tax credit to any business enterprise for the purchase or lease of each electric charger that is located in Georgia. For more information, please contact the Georgia Environmental Protection Division at (404) 363-7028. (Reference Georgia Code Sec. 48-7-40.16)

AFVs displaying the proper alternative fuel license plate are allowed to use high occupancy vehicle lanes, regardless of the number of passengers. (Reference Georgia Code Sec. 32-9-4).

An excise tax is imposed at the rate of $0.075 per gallon on distributors who sell or use motor fuel within Georgia. Motor fuels which are not commonly sold or measured by the gallon, and are used in any motor vehicles on Georgia's public highways, may be taxed according to their gasoline gallon equivalent. Propane and special fuels sold in bulk to a licensed consumer distributor are exempt from this tax. (Reference Georgia Code Sec. 48-9-3)

ii. State of Colorado (http://www.revenue.state.co.us/fyi/html/income09.html):
The Colorado Department of Revenue provides the following tax credits based on incremental costs, emission certification level of HEVs and tax year:

Toyota Prius	
2002	$3,929
2003	$3,070

Honda Insight		
2002		$3,375
2003	(automatic)	$3,120
2003	(manual)	$2,603

Honda Civic Hybrid	
2003	$1,815

In addition, tax credit is available for AFVs as follows (the amount of the credit allowed is equal to the percentage of the following):

- The difference between the actual cost incurred by such person during the tax year in purchasing a motor vehicle that uses an alternative fuel and the cost of the same motor vehicle that uses a traditional fuel or, if the same vehicle is not available, then the cost of the most similar vehicle, taking into account the model, make, engine size, and options, that uses a traditional fuel;
- The difference between the actual cost incurred by such person during the tax year in replacing an existing power source in a motor vehicle that uses a traditional fuel with a power source that uses an alternative fuel and the cost of replacing the existing power source in the motor vehicle with the same type of power source that uses a traditional fuel; or
- The actual cost incurred by such person during the tax year in converting the motor vehicle to a fuel system that uses an alternative fuel.

The percentage of the difference in actual cost incurred or the percentage of the actual cost incurred that may be claimed as a credit is as follows:

Certification Level	Tax years commencing on or after July 1, 1998 but prior to July 1, 2006:	Tax years commencing on or after on or after July 1, 2006 but prior to July 1, 2009:	Tax years commencing on or after on or after July 1, 2009 but prior to July 1, 2011:
Low-emitting vehicle	50%	25%	0%
Ultra-low-emitting vehicle or inherently low-emitting vehicle	75%	50%	25%
Zero-emitting vehicle	85%	75%	50%

iii. State of Kentucky (http://www.ccities.doe.gov/vbg/progs/laws2.cgi):

- Organizations or individuals located in non-attainment areas are eligible for Congestion Mitigation and Air Quality Improvement Program vehicle rebates of $2,000 per dedicated light or medium-duty alternative fuel vehicle (AFV) and $4,000 per dedicated heavy-duty AFV. There is a limit of five vehicles per fleet per calendar year. Rebates are also available for hybrid electric vehicles operating within a fleet. For more information, please contact Melissa Howell at (502) 452-9152, or via email at kcfc@aol.com.
- The transportation, distribution, or delivery of natural gas used as a motor vehicle fuel is exempt from regulation by the Kentucky Public Service Commission, as is the sale of natural gas to a compressed natural gas (CNG) fuel station, retailer, or end-user. (Reference Kentucky Revised Statues (KRS) 278.508).

- Liquefied petroleum gas (LPG) is exempt from excise tax when it is used to propel motor vehicles on the public highways, given that these vehicles are equipped with carburetion systems approved by the Natural Resources and Environmental Protection Cabinet. (Reference KRS 234.321)

iv. State of California (http://www.ccities.doe.gov/vbg/progs/laws2.cgi):

- The California Energy Commission (CEC) and participating Original Equipment Manufacturers (OEMs), have implemented the Efficient Vehicle Incentive Program. Participating OEMs offer incentives to consumers and fleet operators (first-come-first-served) when they purchase or lease vehicles The Honda HEV is eligible for as much as $1,000; dedicated natural gas vehicles for as much as $3,000. Vehicles must be purchased or leased between February 8, 2002 and March 1, 2004. Fleets covered by the Energy Policy Act of 1992 (EPAct) are not eligible. Eight models are currently eligible for these incentives: up to $1,000 for the Honda hybrid-electric vehicle (HEV), and up to $3,000 for dedicated natural gas vehicles including the Ford Crown Victoria, Ford F-150 pick-up, Ford compressed natural gas (CNG) vans, and the Honda Civic GX.
- The San Joaquin Valley Unified Air Pollution Control District offers the Light-Duty and Medium-Duty Vehicle Incentive Program. The program provides incentives for new on-road OEM AFVs (including HEVs, EVs and dedicated CNG and LPG vehicles) with GVWRs to 14,000 lbs. Applications must be completed and approved before the vehicle is purchased.
- Originally funded with $18 million appropriated in the Fiscal Year (FY) 2000 state budget and an additional $10 million appropriated the FY 2001 state budget, the Statewide Zero Emission Vehicle Incentive Program (also known as ZIP I and ZIP II) is designed to encourage the purchase and lease of zero emission vehicles (ZEVs) in California. The program is administered by CARB in conjunction with the State Energy Resources Conservation and Development Commission and distributes grants worth 90% of the incremental cost above $1,000 of an eligible new zero emission light-duty car or truck. A maximum of $9,000 per vehicle is available through December 31, 2002 on a first-come-first-served basis. A maximum of $5,000 per vehicle is available through June 30, 2004 on a first-come-first-served basis. These grants are available to individuals, public agencies, nonprofit organizations, and private businesses.
- The Carl Moyer Memorial Air Standards Attainment Program consists of the Advanced Technology Development Program (ATDP) and the Fuel Infrastructure Demonstration Program (FIDP). The ATDP is administered by CARB and the CEC and is designed to assist companies with new advanced technologies that lower heavy-duty and off-road vehicle emissions. These technologies must have the potential for commercialization within five years and provide significant emission reductions. Once commercialized, these technologies will be eligible for Carl Moyer incentives.

v. New York (http://www.ccities.doe.gov/vbg/progs/laws2.cgi):

- The Alternative-Fuel (Clean-Fuel) Vehicle Tax Incentive Program offers tax credits and a tax exemption for people who purchase AFVs, HEVs and/or install clean-fuel vehicle refueling equipment.
- EVs are eligible for a tax credit worth 50% of the incremental cost, up to a maximum of $5,000 per vehicle. All dedicated EVs qualify for this credit.
- Qualified HEVs are eligible for a tax credit of up to $2,000. To qualify, the vehicle must draw propulsion energy from both an internal combustion engine (or heat engine that uses combustible fuel) and an energy storage device; and must employ a regenerative braking system that recovers waste energy to charge such energy storage device. Current production models such as the Toyota Prius and Honda Insight qualify.
- Compressed natural gas (CNG), liquefied petroleum gas (LPG), methanol, ethanol, and hydrogen-powered vehicles are eligible for a tax credit worth 60% of the incremental cost. The maximum value for vehicles weighing less than 14,000 lbs. Gross Vehicle Weight (GVW) is $5,000. The maximum value for vehicles with a GVW over 14,000 lbs. is $10,000.
- The installation cost of clean-fuel vehicle refueling equipment (including EV recharging stations) is eligible for a tax credit worth up to 50% of the project cost. There is no limit on this incentive.
- The incremental cost of clean-fuel vehicles and the project costs of developing refueling infrastructure are exempt from New York State sales tax. This exemption expires February 1, 2004.

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Description of Measure: Offer tax credits for vehicles with high efficiency gas consumption or low emissions.

Suggested Measure: Fee/Tax Credit

When there is a sale/transfer of a vehicle, the new owner would either pay a variable fee or be eligible for a rebate in the form of a tax credit on SC income tax. The less efficient the vehicle is, the greater the fee paid. For high efficiency, low emission vehicles the new owner would be eligible for a rebate. The amounts proposed here are for discussion, but conceptually, the amounts should offset each other so there is no net tax increase or decrease. Since there are fees paid now on vehicle transfer as well as SC income tax structure, there is no new governmental bureaucracy required to implement this concept.

Proposed Incentive Structure

The following would apply to automobiles, SUVs, and light duty trucks:

Highway Miles per Gallon	Fee/Tax Credit
0-10	$2,000 fee
11-20	$1,500 fee
21-30	$500 fee
31-40	$1,000 Tax Credit
40 and over	$3,000 Tax Credit
Zero emission vehicles	$4,000 Tax Credit

The "Highway Miles Per Gallon" would be the average as determined by the federal testing. As the national "Highway Miles per Gallon" average increases, the targets for incentives would be increased proportionally. For example, if the national average in 2003 is 25 mpg and increases by 10% in 2004, the target "Highway Miles Per Gallon" for fees would be raised by 10%. The following would apply to heavy duty and commercial on-road vehicles:

Type of truck- Medium (Miles per Gallon)	Fee/Tax Credit	Type of truck- Heavy (Highway Miles per Gallon)	Fee/Tax Credit
0-7	FEE	0-4	FEE
8-11	No Fee	5-8	No Fee
12+	Tax Credit	9+	Tax Credit

A medium truck has a GVWR of 8,500- 15,000 lbs. A heavy truck has a GVWR of over 15,000 lbs

Advantages

a. Tax incentives for purchasing new vehicles persuade individuals to purchase HEVs and clean fuel vehicles. The domino effect would be that the more vehicles of this type individuals are willing to purchase:
   i. The less dependence on imported oil the USA would be in the future;
   ii. The less pollution to the environment by reducing global warming (less greenhouse emissions);
   iii. The more savings individuals would realize by refueling less often, especially when gasoline prices are high, and by taking advantage of the federal income tax deduction or federal tax credits (scheduled to phase out in 2006).
b. This plan does not create new governmental structures to implement plan.

Disadvantages

a. The cost of purchasing up front may be high for a brand new vehicle; however, currently, this is offset by the incentives that the federal income tax laws offers. In addition, the cost could be further offset by the proposed incentives from the SC income taxes.

b. The implementation of incentives may find some resistance from tax policy makers, if the incentive plan is not well designed and explained.

Cost of implementation
Cost per Ton: If we define the cost per ton of NOx reductions as the cost for the government of South Carolina, this proposal is specifically designed so that there is NO COST.

Potential Revenue Sources
The potential revenue sources to provide the tax credits would be the fee that would be paid on purchases of low efficient vehicles.

Conclusion
a. The health risk and cost imposed on people, especially children, seniors, and people suffering from respiratory illnesses, by individuals or organizations who decide to purchase low efficient vehicles far exceeds the private individual cost that would be paid by these individuals and organizations as proposed in this measure. Many states in the country have the funding structure and laws in place to provide tax incentives to individuals and organizations that purchase high efficient or low emissions vehicles.

b. The State would create the "South Carolina Ground Level Ozone Abating Fund," which would be credited with the monies received from the fees paid by individuals or organizations purchasing low efficient vehicles. In turn, this Fund would pay for tax credits claimed through the income tax. South Carolina would join the states that have already taken on these initiatives and could provide the tax incentives as described in this description of the measure under consideration.

Description of Measure: Eliminate property tax-reduction for high-mileage vehicles.
This measure would shift the savings to a program that either:
a. Rewards owners of very low-mileage vehicles.
b. Creates a fund for greenways and sidewalks, or
c. Creates a fund to repair or replace clunkers, retrofit vehicles with new catalytic converters, retrofit school buses or purchase of new school buses.

Findings:
a. South Carolina currently has a provision to reduce property taxes on high-mileage vehicles. The assumption is that high-mileage automobiles have a lower-than-average market value, so the State agrees to reduce property tax assessments on those cars. The owner must simply submit a request in writing every year the mileage exceeds a certain threshold. This leaves low- to average-mileage vehicles to carry a higher tax burden when in actuality, they are having less of an impact on roadways and air quality. Reduced value qualification is done through an appeal process (it is not automatically provided).
b. Greenville County reported that there were 20,595 vehicle accounts that received mileage reductions in 2002 for a total amount of $32,795.21.

Advantages:
a. This program would create an incentive for driving less instead of driving more. Each of the programs suggested has advantages.
   i. Reducing property taxes for very low-mileage drivers is equitable because they place a very limited burden on roadways and have little impact on air quality. Many of the drivers who fall into this category are seniors on limited incomes, and would benefit from a tax reduction.
   ii. A fund for greenways or sidewalks is in keeping with our goal to provide alternatives to automobile use. A number of counties are already considering implementing greenway plans – this would be one source of funding for local greenway plans.
   iii. A fund to repair or replace "clunkers" would help eliminate some of the most high emitting and serious offenders.

Disadvantages:

a. High-mileage drivers would not like abolishing the tax reduction. An educational component would be necessary to illustrate the additional burden they place on roadways and the increased impact they have on air quality.

Cost of Implementation:

a. This should be a break-even program as the high mileage vehicles would pay taxes at the normal tax rate and the low mileage vehicles would receive the tax reduction that high mileage vehicles were entitled to before.

Potential Revenue Source:

See "Suggested Measure" above.

Conclusion:

In reality, high-mileage vehicles place more demand on transportation infrastructure and create more emissions than their lower-mileage counterparts. In effect, their owners are being rewarded for creating these additional burdens. At the same time, very low-mileage vehicles that have less impact on air quality are being taxed at a higher level. This program would reward the lower-mileage drivers only. Tax rates would remain the same for average- and high-mileage vehicles. It is equitable and sensible.

Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
13. Develop air quality best management practices (BMPs) for construction sites. Priority A	• Develop a generic list of BMPs. • Develop management practices for construction debris. • Develop management practices for emissions from construction vehicles. • Develop management practices for traffic controls during construction.		2004	Area: countywide. Agency: local governments.

Findings
To be developed before December 2003.

Advantages

Disadvantages

Cost of implementation
Cost per Ton

Potential Revenue Sources

Conclusion

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Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
14. Use land-use and transportation planning to improve air quality. Priority A	• Include air quality measures as a part of the land-use and transportation planning process.		2004	Area: countywide. Agency: local governments.

Note: Many of the Suggested Measures at the end of this section parallel recommendations in the Quality of Life Task Force Report commissioned by Governor Mark Sanford and presented in February, 2003.[2] In their May 2003 letter to James Joy at SCDHEC, the Southeastern Environmental Law Center endorsed a number of the recommendations from Governor Sanford's report and recommended that they be incorporated into South Carolina's Early Action Plan.

Findings

a. There is a well-established linkage between land use and transportation
   i. The way land is developed and how residences, jobs, shopping, recreation, and other destinations are situated within an area have an impact on the length and number of auto trips that people must take, which in turns affects pollution;[3]
   ii. In South Carolina, 80 per cent of NOx emissions are the result of fuel combustion by industry (37 per cent) and transportation (42 per cent);[4]
   iii. Air pollution emissions from cars are a function of how many trips people make using these vehicles, how far they have to drive, and the types of vehicles they drive;[5]
   iv. Since 1970, the number of cars and trucks in the U.S. has more than quadrupled, but population has not quite doubled;[6]
   v. The average annual mileage driven by Americans in 1997 was almost twice as high as it was in 1970;[7]
   vi. South Carolina's population increased 18 per cent from 1988 to 2000, but the number of miles driven by South Carolinians increased approximately 43 per cent (SCDOT graph attached);
   vii. Conclusion: Even though automobiles have been getting cleaner, the number of vehicles on the road and the frequency and length of trips have been increasing;[8]
   viii. Sprawl requires driving further[9]
   ix. In South Carolina, 58 per cent of all trips under one-half mile are made by car, and only 2.3 per cent of all commutes are made on foot[10]
   x. South Carolina ranks second to last among all states in the percentage of federal transportation dollars invested in pedestrian and bicycle safety. The state currently spends 2/10 of one per cent (0.2%) of its transportation dollars on pedestrian and bicycle projects. This equates to 22 cents per person annually statewide. However, in the Greenville-Spartanburg-Anderson MSA, that amount was 2 cents per person. The national average is 87 cents per person.[11]

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[2] The report can be read in its entirety at http://masc.sc/qualityoflife.pdf
[3] *EPA Guidance: Improving Air Quality Through Land Use Activities*. EPA420-R-01-001, January 2001. http://www.epa.gov/otaq/transp/trancont/r01001.pdf
[2] *Healthy People Living in Healthy Communities.* SCDHEC, 2002.
[3] *EPA Guidance: Improving Air Quality Through Land Use Activities*. EPA420-R-01-001, January 2001. http://www.epa.gov/otaq/transp/trancont/r01001.pdf
[6] Ibid.
[7] Ibid.
[8] Ibid.
[9] *Healthy People Living in Healthy Communities*, SCDHEC, 2002.
[10] "Walking in South Carolina." Surface Transportation Policy Project, 2003. http://www.transact.org/library/reports_pdfs/pedpoll/SC.pdf
[11] *Mean Streets 2002*. Surface Transportation Policy Project. http://www.transact.org/report.asp?id=202

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xi. Interconnected streets with shorter blocks, few cul-de-sacs, and that connect developments allow greater accessibility and a broader choice of routes for drivers, pedestrians and cyclists. The Greenville-Spartanburg MSA ranks fifth worst in the country in the level of interconnectedness of its street network.[12]

b. Zoning is limited in the Upstate counties:
   i. Anderson County – 20 per cent zoned,
   ii. Greenville County – 60 per cent zoned, and
   iii. Spartanburg County – no zoning in unincorporated areas
c. Per capita guideshare is currently $29.41 in South Carolina
d. South Carolina's annual average per capita spending for public transit is $3.29[13]
e. Sunlight and temperatures exacerbate ozone production.
   i. Urban areas – often dominated by asphalt, concrete, and other non-reflective paving and roofing materials – contain little natural vegetation to shade buildings, block solar radiation, and cool the air.[14] Replacing mature trees with concrete, asphalt and buildings raises temperatures and can lower humidity in urban areas (and speed ozone production);[15]
   ii. Trees help reduce ambient air temperature through the cooling effects of evapotranspiration;[16]
   iii. Using shade trees in parking lot construction, in combination with reflective pavement, makes them cool by reducing VOC emissions from car fuel tanks and NOx emissions from start ups;[17]
   iv. Trees contribute to ozone formation by emitting volatile organic compounds (VOC) in the presence of NO_X (largely from automobile exhaust); they also "scrub" ozone from city air. Because these VOC emissions—which generally constitute less than 10 percent of total VOC emissions in urban areas (Nowak, 1991)—are temperature-dependent, increased urban tree cover is believed to lower overall VOC and therefore reduce ozone formation (Cardelino and Chameides, 1990). Nowak (1994) found that Chicago's urban forest was removing 2,000 t O_3 yr^- from that city's atmosphere;[18]
   v. Because trees naturally emit VOCs, low VOC emitting trees (e.g., ash and maple) could be planted to maximize air quality benefits.[19]
   vi. Approximately 16 per cent of hydrocarbon emissions from automobiles comes from evaporative emissions that occur during daytime heating of fuel delivery systems of parked vehicles;[20]
   vii. Shading in parking lots has been shown to reduce fuel tank temperatures by 3.6ºF to 7.2ºF;[21]
   viii. Current county ordinances on landscaping and tree plantings.
      - Anderson County Ordinance 97-002 establishes that "the developer shall make every effort to preserve as many trees as possible and remove only those trees necessary for the development of the lot. This stipulation shall not be on a subjective basis for the withholding of approval."

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[12] *Measuring Sprawl and Its Impacts,* Smart Growth America. October, 2002.
[13] Ibid.
[14] *NASA's Heat Hunters: Combating effects of the Urban Heat Island at the Global Hydrology and Climate Center,.* September 2000. National Aeronautics and Space Administration. FS-2000-09-167-MFSC. http://www1.msfc.nasa.gov/NEWSROOM/background/facts/heathunters.pdf
[15] *Healthy People Living in Healthy Communities*, SCDHEC, 2002.
[16] *EPA Report: Heat Island Effect*. http://yosemite.epa.gov/oar/globalwarming.nsf/content/ActionsLocalHeatIslandEffect.html
[17] Ibid.
[18] *Land Use, Land Use Change, and Forestry, 1998.* International Panel on Climate Change, http://www.grida.no/climate/ipcc/land_use/index.htm
[19] *EPA Report: Urban Heat Island Effect*. http://yosemite.epa.gov/oar/globalwarming.nsf/content/ActionsLocalHeatIslandEffect.html
[20] McPherson and Simpson, *Reducing Air Pollution through Urban Forestry,* 1999 http://cufr.ucdavis.edu/products/11/cufr_73.pdf
[21] McPherson, et al. *Actualizing Microclimate and Air Quality Benefits with Parking Lot Shade Ordinances,* 1999. http://cufr.ucdavis.edu/products/11/cufr_69.pdf

- Greenville County's Ordinance 3631 requires that new off-street parking lots with sixty (60) or more spaces provide one (1) tree for every fifteen (15) parking spaces; and
- Spartanburg County's Ordinance 099-015 (Unified Land Management Ordinance) establishes landscaping (The purpose of landscaping is to improve the appearance of vehicular use areas and development abutting public rights-of-way; to protect, preserve, and promote the aesthetic appeal, scenic beauty, character and value of land in the County; to promote public health and safety through the reduction of noise pollution, storm water run off, air pollution, visual pollution, and artificial light glare), and open common space plantings The purpose of this section is to ensure adequate open space for high density residential development; to integrate recreation, landscaping, greenery and/or natural areas into such projects; to promote the health and safety of residents of such projects; and to compensate for the loss of open space inherent in single-family residential projects.

ix. A recent study estimated available VOC reductions due to a 50 per cent canopy of shade in parking lots was in the range of 1.5 – 2 per cent of the light duty auto and truck countywide on-road emissions;[22]

f. USEPA and SCDHEC have published reports emphasizing the connection between land use and transportation - both are referenced above
   i. *EPA Guidance: Improving Air Quality Through Land Use Activities*. EPA420-R-01-001, January 2001. http://www.epa.gov/otaq/transp/trancont/r01001.pdf
   ii. *Healthy People Living in Healthy Communities*, SCDHEC, 2002

g. Governor Mark Sanford commissioned a report on Quality of Life that makes a number of recommendations related to land use and transportation issues. Some of the more pertinent ones follow: (The report can be read in its entirety at http://masc.sc/qualityoflife.pdf)
   i. Fact-based decision-making: major projects should conform to adopted plans, developed by local authorities, to keep politics from guiding infrastructure decision-making.
   ii. Public entities should plan where they build and only build where they plan.
   iii. Coordination among school boards and local governments to plan school sites and avoid conflicts.
   iv. Local governments coordinate with other local authorities to designate priority investment areas which will receive funding preferences
   v. Highway system maintenance should take precedence over new roads
   vi. Removal legal impediments to traditional neighborhood designs and provide incentives for the construction and revitalization of traditional neighborhoods.
   vii. Integrate transportation planning with land use planning so public transit can make a comprehensive contribution to economic development and mobility.
   viii. Evaluate public transportation opportunities, including intra-regional and inter-regional systems.
   ix. Work with Community Builders, Main Street programs, and other non-governmental organizations to encourage downtown renewal and revitalization projects.

h. Many remedies are inexpensive and easy to implement.

MEASURABLE GOALS:

a. Reduce *annual increase* in per capita VMTs by 10 percent.
b. Increase Upstate spending on pedestrian facilities to meet South Carolina's annual spending average of 22 cents per person by 2005, and ultimately increase the state's average to meet the national average of 87 cents per person.
c. Increase pedestrian/bicycle accessways by 20 per cent by 2025.
d. Increase portion of transportation funding dedicated to transit projects to 6 per cent by 2010.

[22] *Final Parking Lot Shading, 2001.* Clean Air Counts, Chicago. http://www.cleanaircounts.org/resource%20package/A%20Book/paving/finaltreeshade.doc

e. Reduce evaporative VOC emissions by 20 per cent by 2025.

SUGGESTED MEASURES:

a. Encourage development of higher density, mixed-use, pedestrian- and transit-oriented developments.
b. Provide incentives for renewal and revitalization projects in areas where infrastructure already exists.
c. Allow for increased density in residential, retail and employment districts in central areas and near transit.
d. Encourage pedestrian and bicycle travel by increasing sidewalk and bikepath networks.
e. Coordinate major infrastructure projects with local land use plans.[23]
f. Enact local ordinances and incentives that encourage this type of development (following examples are from *EPA Guidance: Improving Air Quality Through Land Use Activities*. EPA420-R-01-001, January 2001):
    i. Infill development: encouraging pedestrian and transit travel by locating new development in already developed areas, so that activities are closer together;
    ii. Mixed-use development: development that increases complementary land uses such as housing retail, office, services, and public facilities within walking distance of each other;
    iii. Neo-traditional design/pedestrian-oriented development: creating a set of land development and urban design elements with the purpose of creating pedestrian oriented neighborhoods;
    iv. Brownfield development: remediation and redevelopment of underutilized or abandoned lands, usually in already developed areas, that have been contaminated during previous use;
    v. Developing concentrated activity centers: encouraging pedestrian and transit travel by creating "nodes" of high density mixed development that can be more easily linked by a transit network;
    vi. Strengthening downtowns: encouraging pedestrian and transit travel by making central business districts concentrated activity centers which can be the focal point for a regional transit system;
    vii. Jobs/housing balance: reducing the disparity between the number of residences and the number of employment opportunities available within a sub-region by directing employment developments to areas with housing, and vice versa;
    viii. Transit-oriented development: encouraging transit travel by developing moderate- to high-density housing, shopping, and employment centers along a regional transit system, with pedestrian access.
g. Focus state infrastructure funding in areas where growth is desired. This would ensure that the state will not facilitate development in areas where it is not desired by local governments.
h. Encourage retention of healthy tree canopy, especially in urban areas, to reduce ambient air temperatures – thus reducing VOC emission through evaporation.
    i. Enact local ordinances that set minimum standards for tree retention or planting in new developments.
    ii. Provide incentives for surpassing the minimum standards.
i. Adopt recommendations pertinent to land use transportation issues from Governor Sanford's Quality of Life Task Force Report.

Advantages

a. Could reduce overall VOC emissions from automobiles by reducing VMTs (fewer and shorter trips)

[23] Pending legislation will require "a priority investment element which establishes, through coordination with all adjacent and other relevant jurisdictions and agencies, suitable areas where development and community facilities must be directed and to where state and federal funding for all growth-related projects and community facilities must be targeted." http://www.lpitr.state.sc.us/sess115_2003-2004/bills/4354.htm

b. Could reduce ambient air temperatures, thus reducing production of ozone
c. Could reduce automotive fuel tank temperatures, thus resulting in less VOC emissions through evaporation
d. Could reduce health care costs due to healthier lifestyles
e. Could result in increased walking and/or biking opportunities, which could in turn improve the communities' overall health. (South Carolina's obesity rate is among the highest in the country, with 23 per cent of the population considered obese.)

Disadvantages
a. Could result in higher development costs
b. Limited success in an area with little or no zoning controls
c. Would require local commitment to policy changes

Cost of implementation
Cost per Ton

Potential Revenue Sources

Conclusion
a. With effective land use controls and/or zoning in the area, this strategy could prove very effective, with minimal government cost, in reducing emissions leading to the production of ozone.
b. With increased pedestrian, bike, and transit facilities, citizens would begin to have transportation choices and reduce dependency on automobiles as a sole method of movement.

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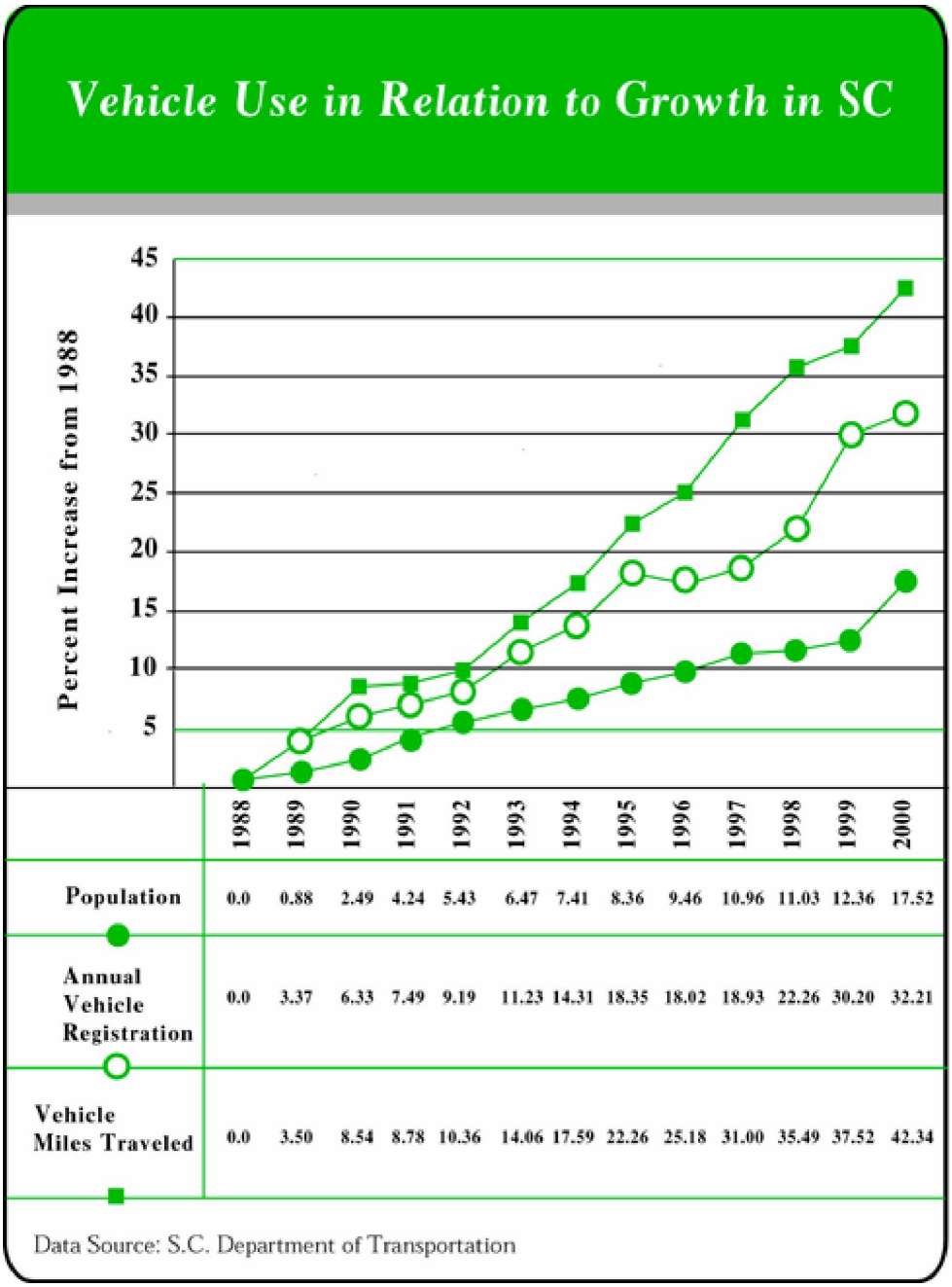

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Population	0.0	0.88	2.49	4.24	5.43	6.47	7.41	8.36	9.46	10.96	11.03	12.36	17.52
Annual Vehicle Registration	0.0	3.37	6.33	7.49	9.19	11.23	14.31	18.35	18.02	18.93	22.26	30.20	32.21
Vehicle Miles Traveled	0.0	3.50	8.54	8.78	10.36	14.06	17.59	22.26	25.18	31.00	35.49	37.52	42.34

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Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
15. Implement a program to encourage use of green power. Priority A	• Capture emissions from landfills to produce green power, e.g., BMW is utilizing Palmetto Landfill emissions to produce energy for its plant. • Implement a Purchase Green Power program when available. Green power is electricity generated by renewable resources like solar, wind, and even decomposing garbage in selected landfills. These resources are replenished naturally and minimize harm to the environment.		2004	Area: countywide. Agency: local governments.

Findings

a. Methane (CH_4) is a greenhouse gas that creates explosion hazards if left uncontrolled. CH_4 is also the main component of natural gas and it can be a valuable source of energy. (Source: http://www.highlandpower.com/../growth.html)
b. "Methane is 21 times more potent a greenhouse gas than carbon dioxide (CO_2). Though emitted in much smaller quantities, methane is the second most important greenhouse gas after carbon dioxide. Over the last two centuries, methane concentrations in the atmosphere have more than doubled, largely due to human-related, or anthropogenic, activities. Coal mines release methane, as do other human activities like landfills, natural gas production and transportation systems, and livestock operations." (http://www.epa.gov/outreach/cmop/faqs.htm#7)
c. Flaring is less costly than green power unless tax incentives or disincentives are used.
d. Tax incentives are generally required a partner from private industry.
e. The Energy Bill in the U.S. Congress may provide necessary tax incentives for green power for landfills
f. The amount of methane (CH4) that is emitted from Upstate landfills should be examined. CH4 is a Volatile organic compound and is an ozone precursor. The emission rate of CH4 from a Greenville County landfill is being determined to calculate the cost per ton and amount of methane release into the local air shed.
g. The amount of carbon monoxide (CO) from flaring at sites in the Upstate should be examined. CO is an ozone precursor.
h. Emissions credits for climate change may be able to fund some of the costs for reducing methane emissions. The cost of an emission credits for a ton of carbon dioxide reduction is approximately $20 per ton. Over dollars values can be determined when CH4 is converted to carbon dioxide (CO2) and water (H20). Methane conversion to CO2 should provide a positive return on conversion rate because CH4 contributes to global warming about 100 more that CO2.
i. A possible scenario for an emissions reduction program could be to first flare until tax credits or emissions credits are sold, then change over from flaring to the production of green power.
j. Landfill methane has been widely study by USEPA and the State
k. Smaller landfills have received less attention than larger landfills
l. Typically, for every cubic feet per minute (CFM) of gas removed from a landfill, .021 lb. of methane is extracted. The gas mixture is typically a 50/50 mix of methane (CH4) and carbon dioxide (CO2). At a draw rate of 150 cfm, 251 lbs. of methane can be removed per hour for energy. This DOES NOT IMPLY THAT THE LANDFILL WOULD OTHERWISE EMIT 251 PER HOUR.
m. Depending upon the type of electricity generator used the amount of NOx produced from a landfill can be high.
n. The size of the landfill and the ability to draw methane at a reasonable rate of cfm determines the feasibility of a project.

o. Two landfill gas to energy projects are underway in the three counties. One is in Spartanburg County providing energy to BMW and the other is in Anderson County, being pursued by Santee Cooper.
p. The State contact for gas to energy projects from landfill gases is Sonny Dubose in Columbia.
q. The USEPA site for information on landfill gas to energy projects is located at www.epa.gov/lmop
r. High-tech start-ups can use methane to produce hydrogen at landfills that are less productive for electricity. The hydrogen could be used for research into Fuel Cells at the proposed Automotive Research Park or Fuel Cell Research Center at USC.
s. At lower methane-producing site, the gas can be bottled for fleet vehicles.
t. Greenville County is currently exploring additional options such gas collections systems and production of energy, which would be implemented when Enoree Landfill closes in 2006.
u. During the August 14, 2003 power outage affecting parts of the Midwest, Northeast, and Canada several federal, state and local government officials interviewed mentioned that the current energy distribution system is obsolete and in need of modernization. They also mentioned that there should be diversification in the way power is generated to include biomass, solar, greenpower, etc. (Source: CNN, August 14, 2003 television interviews.)

Advantages
a. Reduces methane emissions into the atmosphere.
b. Reduces emissions of gases that cause climate change or global warming. Methane is 21 times as strong for retaining heat compared to carbon dioxide.
c. Energy can be produced locally.
d. In some projects, the energy production can be profitable.
e. Usually landfill methane is a long-term energy source; about 20 years.

Disadvantages

Cost of implementation
Cost per Ton: Awaiting information from USEPA

Potential Revenue Sources
a. Private investment and Federal Grants.

Conclusion
A strategy worth pursuing due to the potential for energy and reduction in methane emissions.

Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
16. Promote route efficiency for delivery vehicles, trash collection etc. Priority A	• Encourage business to consolidate distribution and collection routes to improve efficiency and reduce emissions from their fleets. • Maximize route efficiency for public services such as garbage collection, delivery vehicles, and other vehicle trips to reduce fuel usage.		2004	Area: countywide. Agency: Chambers of Commerce

Findings

a. Identify and establish a Clean Air Partnership between, local business, municipalities, counties, and the state and local government agencies that do service locally with fleets.
b. This could include everyone from school buses to Fed Ex, to US Post Office, to Garbage and Recycling Collection.
c. Develop and implement an educational and marketing plan on what the emissions impact and savings could be on these fleets should everyone work to maximize efficiency and then sell it to the participants.

Advantages

a. Getting everyone to work together and educate on them on the problem and possible solutions.
b. Reduction in fuel emissions.

Disadvantages

a. Convincing some that there may be more benefit in the long run to adopting a strategic plan on this rather than solely considering the bottom line profit margin of their business and making small sacrifices to help the situation.
b. Convincing everyone to come to the table.

Cost of implementation

Cost per Ton

Potential Revenue Sources

None

Conclusion

Getting business and agency fleets to operate using an “environmentally friendly” mentality while understanding their need to turn a profit and continue providing quality service.

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Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
17. Establish a clean air partnership with business and industry. Priority A	• Encourage and coordinate alternate work schedules such as staggered work hours for business, industry and local governments. • Establish park and ride lots serving perimeter counties along major corridors. • Make the public aware of the park-and-ride concept: media could assist in publicizing which programs are available. • Encourage carpooling/vanpooling as an option where employees living in the same area agree to ride to work together rather than to drive their individual vehicles to work. • Consider parking facility controls that can include employers offering a tax-free transit/vanpool benefits and which limit the amount of parking and encourage carpooling, mass transit, etc. • Encourage telecommuting. • Adopt a Bus Program. • Develop funding to be used for matching grants fund for several EAP Strategies. • Develop a core competency and assisting the Upstate EAP group in writing grant proposal	Significant in the area of grants and local non-local tax funds generation.	2004	Area: countywide. Agency: local governments, local business, and Chambers of Commerce.

Findings

a. Establish a clean air partnership with business and industry
b. Example from Tennessee Valley Authority (TVA):
   i. In the fall of 1998, PPI, EPRI (the Electric Power Research Institute), the U.S. Department of Energy, and the National Park Service formed a partnership to develop a complementary, wilderness-oriented Supersite project in east Tennessee. Its purpose is to focus on fine-particle air-quality issues in the Great Smoky Mountains National Park. Improved knowledge of the composition of these particles is necessary before strategies mitigating their impacts can be developed.
   ii. Furthering its long-standing commitment to environmental stewardship, TVA—in cooperation with national, regional, state, and local regulatory and research groups—actively seeks science-based answers to emerging air quality issues.
   iii. Benefits:
      - TVA is part of the air pollution solution, not simply part of the problem. Because TVA fossil plants add to the presence of fine particles in and downwind of the Valley, the agency contributes toward understanding and resolving the associated public health issues. The fine-particle monitoring network is part of this contribution.

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- The Great Smoky Mountains National Park is one of the most environmentally sensitive and ecologically diverse ecosystems in the world. TVA helps understand the contribution of its emissions to this environmentally and economically important natural resource through its Supersite program.
- The information collected through both projects allows TVA to better develop appropriate, science-based, cost-effective environmental control strategies for the future.

c. Example from Santa Barbara, CA.

i. Clean Technologies for Clean Air Building Partnerships

Since 1988, ITG has been dedicated to building relationships with local businesses and equipment manufacturers, specializing in leveraging funding with creative project partnerships. For every dollar of original funding, ITG has secured up to five dollars from other project participants. For example, the Clean Air Express Dual-Fuel Bus Project ITG partners included:

- City of Lompoc
- Federal Transit Authority
- California Energy Commission
- National Renewable Energy Laboratory
- Southern California Gas Co.
- Caterpillar, Inc.
- Power Systems Associates
- EcoTrans.

These sources provided more than $1.5 million to fund the project.

d. Example from New York City.

i. New Queens Clean Air Project will award $2 Million to Community Groups for Local Clean Air and Energy Efficiency Initiatives:

- New York, NY (July 15, 2003) -- Addressing the need to advance community-oriented air pollution reduction and energy efficiency goals in northwest Queens neighborhoods, a new partnership of New York Power Authority (NYPA), Natural Resources Defense Council (NRDC), New York Public Interest Research Group (NYPIRG), New York State Department of Environmental Conservation (NYSDEC), Queens Borough President's Office (Queens BP) and Northeast States Clean Air Foundation (NESCAF) today announced a Request For Proposals (RFP) that will provide $2 million in funding to establish clean air projects benefiting the local community.
- Called the Queens Clean Air Project (QCAP), the new venture will work in tandem with local community groups to achieve quantifiable emissions reductions and energy efficiency savings to improve air quality and public health in northwest Queens. NYPA will provide the $2 million in initial funding that is expected to be significantly leveraged through public-private partnerships.
- Ken Colburn, executive director of NESCAF and Clean Air Communities stated, "Through creative partnerships, leveraged funding and technical assistance, Clean Air Communities has a track record of achieving measurable emissions reductions and energy savings in neighborhoods that need it most. We are thrilled to work with our partners to bring this proven formula to benefit the residents of Queens and hope that other entities will follow NYPA's lead in recognizing the true value of CAC's programs."…….
- QCAP seeks to help build coalitions and improve communications among diverse stakeholders concerned with renewable and alternative energy and air quality issues. With this in mind, QCAP is forming an Advisory Group, initially including tenant and civic associations, community board members, and local officials in Queens, to provide ongoing guidance and input regarding the program's advancement of clean air and energy goals

Advantages

a. Leverage the Upstate EAP.
b. Provide new and innovative fund sources.

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c. Critical part of the private public coalition.
d. Excellent tool getting participation and for communication, education on EAP topics.

Disadvantages

Cost of implementation
Cost per Ton

Potential Revenue Sources

Conclusion
This strategy should be included in the early action plan and grants and partnerships need to be aggressively explored to help fund all strategies of the EAP and off-set costs.

Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
18. Establish an active public awareness campaign. Priority A	• Develop an editorial board to discuss air quality issues and development of a relationship with media. o Use alert messages year round, not only during ozone season. o Utilize public service announcements, newspapers, weather channels, and other media outlets to notify citizens of high ozone days. o Utilize TV Channels to issue high ozone alerts using the crawl bar at bottom of TV screens. • Encourage health organizations to sponsor ozone alerts in media. • Enhance ozone awareness (Outreach - Communication): assign a local agency to develop and implement a program to educate and motivate individuals to take actions to minimize ozone pollution. Includes a focused distribution of educational materials, dissemination of SCDHEC ground-level ozone forecast, increased media alerts to specific audiences, and includes action oriented components (i.e. ridesharing, telecommuting, etc.). • Develop a campaign to encourage things such as refueling vehicles during evenings, not topping off tanks when refueling, using lawnmowers during evenings instead of during high ozone hours, using of electric lawn mowers. • Develop a license plate program to generate revenue to implement the public awareness campaign. • Develop awareness program on tax savings for purchasing high efficiency vehicles.		2004	Area: countywide. Agency: local governments, local media, health organizations, and Chambers of Commerce.

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Findings

a. USEPA and SCDHEC have developed educational resources that can be enhanced and tailored to meet local needs for presentations, seminars, and websites: www.epa.gov/airnow/resource.html, www.scdhec.net/baq/
b. Local website on Upstate Early Action Compact and Plan also available: www.upstatecleanair.org/
c. Excellent website from State of Illinois "Partners for Clean Air" : www.cleantheair.org/
d. Others:
    i. North Carolina Dept. of Environmental and Natural Resources: www.daq.state.nc.us/
    ii. Virginia Department of Environmental Quality: www.deq.state.va.us/
    iii. New Jersey Department of Environmental Protection: www.state.nj.us/dep/airmon/
    iv. National Safety Council Environmental Health Center: www.nsc.org/ehc/airqual.htm
    v. EPA Australia: www.epa.nsw.gov.au/air/index.htm
    vi. Environment Canada: www.msc.ec.gc.ca/aq_smog/index_e.cfm
    vii. Ministry of the Environment Ontario: www.airqualityontario.com/
    viii. American Lung Association: www.lungusa.org/air/
    ix. Atlanta Chamber of Commerce: www.metroatlantachamber.com/macoc/initiatives/air_new.shtml
e. January 1997, the Envision Utah Public/Private Partnership was formed to guide the development of a broadly and publicly supported Quality Growth Strategy - a vision to protect Utah's environment, economic strength, and quality of life for generations to come. Air quality was first on the list of six goals the project addresses. One of the first steps during the project has been to engage decision-makers, elected officials, community leaders, and the public in a public awareness campaign to share information about the project. Only when these stakeholders understood the issues could the process to improve existing conditions and plan for the future begin to move forward. http://www.envisionutah.org
f. CA Air Resources Board's outreach campaign http://www.arb.ca.gov/msprog/zevprog/2001rule/outreach.pdf
g. CA Air Resources Board's Incentive Program http://www.arb.ca.gov/msprog/zevprog/zip/zipguidelines.pdf

Advantages

a. Issues related to environmental protection have only recently begun to find their way into the public psyche, and often an extensive public awareness campaign precedes any meaningful change in behavior or policy. For example, the "Anti-Litter" campaigns have led to a greater understanding of the impacts of litter on the environment, both from a health (e.g., water quality) and aesthetic perspective. A public awareness campaign targeting air quality can have the same results.
b. Can reach almost everyone through television, radio, Internet, group presentations, newsletters, and conferences.

Disadvantages

a. It is difficult to quantify the impact of a public education campaign.
b. Some people would not be reached.
c. Potential cost could be a deterrent.

Cost of implementation

Cost per Ton: Unknown.

Potential Revenue Sources:

a. In-kind donations (e.g., media outlets, PR firms, corporate partners, health and related agencies, active living advocates) can significantly reduce costs.
b. All appropriate public and private funding sources including grants can be used.

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c. License plate program and other fees may be potential revenue sources.

Conclusion

Recommended components:

a. Education campaign with quantified economic impacts for target audiences:
   i. Elected officials, policymakers, community leaders.
   ii. Air quality committee members.
   iii. Transportation and land use planners, officials.
   iv. Owners of registered vehicles.
   v. General public.

   Emphasize incentive: do not want non-attainment status
b. DHEC's Spare the Air campaign.
c. Website
   i. Each region, with links to DHEC and EPA information and with up-to-date local information
d. PSAs on specific, short topics, (Title: "On the Air"), for example:
   i. Best time to refuel.
   ii. Topping off tank.
   iii. Leave ½ hour earlier or later to avoid congestion.
   iv. Combine errands into fewer trips.
   v. Advantages of using public transit.
   vi. Advantages of creating development policies that encourage transit use and/or non-motorized transportation (sidewalk development, transit-oriented development, multi-use development, proposed state law for neighborhood schools).
   vii. Highlight programs that encourage non-motorized transportation (ex. Safe Routes to School, enhancement program).
   viii. Factoids, e.g., What is smog?, Rate of respiratory illnesses (Spartanburg number one in South Carolina)
   ix. Emphasis on those PSAs associated with an action or behavior change.

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Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
19. Assist in the development of voluntary facility audits to promote energy efficiency. Priority A	• Encourage Chambers of Commerce to form a coalition to conduct voluntary site visits to help local business and industry find ways to improve energy efficiency. • Utilize State Energy Office to promote energy efficiency in public buildings.		2004	Agency: Chambers of Commerce and local business.

Findings
To be developed before December 2003.

Advantages

Disadvantages

Cost of implementation
Cost per Ton

Potential Revenue Sources

Conclusion

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Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
20. Promote research in energy efficiency at local universities, industries, energy companies, federal government, and other institutions that improve air quality. Priority A	• Establish programs to research energy efficiencies at local universities, e.g., Institute for Energy Studies at Clemson University. • Encourage business and industry to utilize the research from these programs to make the best decision concerning the purchase or upgrade of furnaces and boilers. • Encourage fuel cell and other hydrogen based research.		2005	/agency: local universities.

Findings

§ The South Carolina Institute for Energy Studies (SCIES) based at Clemson University is a state-chartered research and development organization established in 1981. Its objectives are to promote energy research and development in and for the state; to transfer energy technology developed by others to South Carolina applications; to contribute to national energy issues in areas of excellence; and to promote statewide energy-education activities. (Source: http://www.clemson.edu/scies/AboutSCIES.htm)

SCIES focus its activities on applications oriented projects with "short term payout" and research is directed to support applications. Examples of projects or programs include:

- o Advanced Gas Turbine Systems Research focused on "developing more efficient, less polluting, electric generation plants;
- o Energy Systems Laboratory (ESL) provides "hands-on" education and research opportunities in advance energy systems, energy management and energy efficiencies. The ESL conducts yearly continuing education workshops to educate the workforce on updates and changes developed overtime to meet current challenges. The ESL also provides industry avenues to tap Clemson University diverse research expertise to solve their problems, e.g., ESL can test and monitor equipment and products for energy efficiency through the Clemson Facilities Department;
- o Solid Waste Technology Program demonstrates and assists in the development of technologies that effectively recycle, recover and reuse municipal solid waste reducing dependency on landfills;
- o Pulsed Atmospheric Fluidized Bed Combustion is a demonstration of 50,000 lb/hr steam generating, hybrid coal combustor producing steam fro the Clemson University Campus;
- o Plasma Arc Ferrochromium Smelter;
- o Manufactured Housing designed to develop an understanding of why energy consumption in these home is high and varies widely.

§ BMW, Michelin, Savannah River site, and the University of South Carolina currently have major research efforts on hydrogen alternatives. This will likely be a focus of the new Clemson Automobile Research Park.

Advantages

§ University research and transfer or sharing of knowledge and technology advances could lead to reduction in NOx emissions. Examples of these projects include (Source: SCIES literature):

- o Pennsylvania State University's project *The Effects of Fuel Distribution, Velocity Distribution, and Fuel Composition on Static and Dynamic Instabilities and NOx Emissions in Lean Premixed Combustors.*

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- Advanced Gas Turbine Systems (combustion research): the University of California at Berkeley developed a fiber-optic probe for measuring fuel-air mixedness to determine the level of premixing which relates to NOx emissions reduction; Purdue University developed an infrared sensor for accurate combustor temperature measurements, which are useful to industry in monitoring emissions as opposed to measuring temperatures downstream of the combustor and correlations emissions. These developments could lead to improve environmental performance, with nitrogen oxide emissions under half today's utility turbine averages.
- Clean Coal Combustion project at SCIES: Pulsed Atmospheric Fluidized Bed Combustor (a combination of a bubbling fluidized bed coal combustor and a pulse combustor) allow the use of high sulfur coal, performing extremely well environmentally with particularly low NOx and SOx emissions; these combustors, however, require coarse coal with no fines.
- Premixer/Catalytic Combustor Program at SCIES: this represents a potentially significant technology development in ultra low-NOx gas turbine technology. The goal is to develop and demonstrate an optimal, low pressure drop premixer capable of delivering highly mixed reactants to the inlet plane of a catalytic combustor under high-pressure ratio conditions.

Disadvantages
§

Cost of implementation
Cost per Ton

Potential Revenue Sources

Conclusion
The Staff Advisory Committee has established a relationship with the SCIES, which will be more fully developed in the next few months. The intent is to coordinate with SCIES in the following ways:

§ the staff of the SCIES will become members of the Air Quality Staff Advisory Committee and will serve in an advisory role concerning research of new technology on energy efficiency and NOx reduction;
§ utilize SCIES' relationships with other colleges and universities to bring in experts in developing new technologies pertaining to the air quality efforts;
§ conduct workshops and programs for utilities, industry, government, and businesses to educate them on ways to save energy and reduce NOx emissions;
§ develop relationships between SCIES and industrial recruiters such as Spartanburg Development Corporation, Greenville Area Development Corporation, and Upstate Alliance, and Anderson County Office of Economic Development to advise potential industries of the availability of SCIES' advance technology research on reducing stationary source emissions.

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Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
21. Use of alternate fuels. Priority B	• Direct local Planning Commissions to identify areas where alternative fuels will be best suited. • Encourage the use of alternate fuels; • Assist with establishing alternative fuel infrastructure for private sector clean fuel fleets. Fuels other than gasoline and diesel that are used to power on-road vehicles. Examples of alternate fuels include bio-diesel, electricity, ethanol, hydrogen, liquefied petroleum gas, methanol, and natural gas. • Assist with establishing alternative fuels for public fleets. Fuels other than gasoline and diesel that are used to power on-road vehicles. Examples of alternate fuels include bio-diesel, electricity, ethanol, hydrogen, liquefied petroleum gas, methanol, and natural gas. • Encourage a clean-fuel fleet program for centrally fueled fleets of more than 10 vehicles		Ongoing	Area: Countywide. Agency: local businesses and local governments.

Findings

a. Current studies have shown that California be wrong regarding the cost of ethanol as an oxygenated fuel. Currently ethanol studies have shown that ethanol will save over 6.6 cent per gallon of gasoline under the current market forces and prices.
b. Ethanol was found to reduce ozone in California by the U.S. Federal Court. The Court upheld the USEPA's decisions to use ethanol as an oxygenate, but remanded the decision to the USEPA to consider the effects on particulate emissions. The Renewal Fuels Association does not believe that ethanol will have an adverse effect on particulate manner.
c. Current studies have show that there is an adequate supply of ethanol and reasonable cost associated with the transport of ethanol.
d. Government Agencies in Columbia, SC are planning to demonstrate the use of ethanol in fleet vehicles.
e. A could generate about 80 million dollars in revenue.
f. A 40-million gallon annual production facility for ethanol typically is over a $ 50 million dollar investment and creates over 1000 jobs based upon investment dollars by typical chamber of commerce ratios.
g. The production of ethanol is expected to double with passage of an energy bill by U.S. Congress and to replace MTBE, a water-poisoning oxygenative fuel. Oxygenative fuels are mandated by USEPA to reduce ground-level ozone.
h. Ethanol/fuel mixes have determined to reduce carbon monoxide (CO) and ground-level ozone from the reduction of carbon monoxide.
i. Ethanol Plants in South Carolina have the potential to sell to two large markets; Charlotte and Atlanta.
j. Biodiesel also reduces emissions of ozone-causing emissions, thus improves are quality.
k. Ethanol and Biodiesel plants would support the Governor's economic plan which focuses on agriculture.
l. Current modern ethanol plants produce twice the energy that they consume.

Priority A: those strategies that should be implemented in the short term. Priority B: those strategies that should be implemented in the long term.
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m. Future, high-tech ethanol plants could produce three times the energy that they consume. A High-tech ethanol start-up is looking to locate in South Carolina.

Advantages
a. Ethanol could provide for economic growth.
b. Ethanol and Biodiesel could reduce ground level ozone.

Disadvantages
a.

Cost of implementation
Cost per Ton: Not figured yet.

Potential Revenue Sources
a. Private investment and Federal Grants.
b. State grants from the Energy Office for E-85 for local governments fleets.

Conclusion
Ethanol and Biodiesel production facilities are worth pursuing as a long-term strategy for the State.

Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
22. Evaluate the use of High Occupancy Vehicle (HOV) lanes using existing lanes. Priority B	• Evaluate use of HOV on three (3) lane interstate highways; • Show the advantages of designating HOVs; • Pass laws establishing regulations on HOVs lanes such as the threshold in the number of passengers (perhaps two) in the vehicle using HOVs lanes and time of day for the lane to be designated as HOV (rush hour). • Pass laws authorizing issuance of tickets for violations of HOVs lanes regulations, i.e., one-passenger vehicles using HOV lanes on designated hours.		2005	Area: Interstate limited access highways. Agency: SCDOT and SCDHEC.

Findings

a. Theoretically, HOV lanes would force motorists to car pool which would result in fewer vehicles on the road, and less congestion and emissions.
b. HOV lanes are controversial. While the FHA and some local entities (California) support their use, many local governments and residents question their effectiveness in reducing congestion.
c. If an HOV lanes is built, the FHA will not allow its removal for single occupied vehicles use unless it is reimbursed federal funds used for its construction. This cost is often extreme for local governments.
d. Without adding more lanes on I-85, the third lane would have to be used for an HOV lane. With a 2015 projected volume of 124,000 vehicles per day (vpd), a two lane interstate capacity of approximately 65,000 vpd, and with 35% truck use, the removal of the third lane for limited use would result in greater congestion and consequent emissions.

Advantages

a. None, unless new lanes are added.

Disadvantages

a. With one less lane available for future use, a HOV lane on I-85 would lead to greater congestion, and shorter gaps between vehicles and more, high speed and fatal accidents.
b. The cost of two new lanes on I-85 would cost approximately $8 to $12 million a mile.
c. Once constructed they would have to remain HOV lanes unless the federal government was reimbursed.

Cost of implementation

Cost per Ton

Potential Revenue Sources: FHWA, SCDOT.

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Conclusion

a. HOV lanes work best where an interstate or a limited access arterial lead directly to major employment centers, usually within a central business district (CBD). With the exception of I-385 leading to the Greenville CBD, Upstate interstates (especially I-85) generally link the cities of Anderson, Greenville, and Spartanburg via peripheral routes, not conducive to the addition of HOV lanes. In addition, inter-county work trends do not show major volumes that would support car-pooled trips.

b. Making the third lane of I-85 an HOV lane would severely increase congestion, emissions, and future accidents. The addition of new lanes would be cost prohibitive, and would not be allowed to revert to a single occupancy vehicle (SOV) status without reimbursement to the federal government.

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Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
23. Modify speed limits for optimum fuel efficiency. Priority B	• Direct SCDHEC and SCDOT to take the lead role. • Direct Planning Commissions to assist SCDHEC in modeling.		2005 or 2006	Area: Interstate highways. Agency: State Legislature and SCDOT.

Findings

a. A 1997 EPA study found that vehicles operating below 65 mph significantly emit fewer emissions than those traveling over that speed.
b. A newer 2002 EPA study, however, found that this appeared to be mistaken. In the new study, EPA found that there were no significant increases in emissions for vehicles traveling higher speeds when those vehicles weighed less than 10,000 pounds. However, vehicles weighing greater than 10,000 pounds do significantly emit more emissions.
c. Speed limits on the urban sections of I-85 are already posted at 60 to 65 mph.

Advantages

a. A lower and enforced speed limit for all vehicles would lessen emissions because higher weight vehicles would have fewer emissions.
b. A lost cost strategy in monetary terms.

Disadvantages

a. Politically unpopular.
b. Freight carriers would argue that they would be at an economic disadvantage since many of their runs are time-dependent.
c. Given that I-85 already has lower posted speeds, this strategy would not appear to be as cost-effective as others.

Cost of implementation

Cost per Ton

Potential Revenue Sources: SCDOT.

Conclusion

Specific analysis and modeling on the I-85 corridor should be performed to weigh the specific and quantitative benefits emanating from this strategy. Based on the new EPA study, the reduction of speed limits may not have as great an impact as previously thought. On the other hand, given the high truck volumes (35%) on I-85, such a strategy—if enforced—could conceivably have some benefit. A wider study is needed.

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Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
24. Develop process for evaluating and minimizing impact of major projects such as shopping centers, schools, and subdivisions. Priority B	• Study impact of post construction traffic flow. • Study impact of construction activities.		2004	Area: countywide. Agency: local governments.

Findings

a. Increasing traffic congestion causes a number of problems: crashes, economic costs due to delays, air pollution and loss of economic vitality. As one roadway becomes congested, others may experience problems as motorists use routes not Intended for through traffic.
b. Traffic Impact Analysis
c. A traffic impact analysis is a specialized study which assesses the effects that a particular development's traffic will have on the surrounding transportation network. A traffic impact study will vary in range and complexity depending on the type and size of the proposed development.
d. Can be implemented through land use regulations (i.e. Zoning, Subdivision Regulations, Performance Standards, Planned Developments)
e. One of the key triggers for identifying when an impact study should be required is "trip generation." The trip generation of a proposed development is basically the number of inbound and outbound vehicle trips that are expected to be generated by the development during an average day or during a peak hour. The process of using thresholds is as follows; estimate the trip generation, compare that generation to accepted thresholds, and then determine the type if any) of traffic study needed.

Advantages

a. Forecast the traffic impacts created by new development based on accepted practices, not perception,
b. Determine improvements needed to accommodate new development,
c. Assist communities in land use decisions and road agencies in the driveway permit process,
d. More efficiently allocate limited funds,
e. Meet federal requirements for managing congestion,
f. Relate land use decisions with traffic conditions, evaluate the number and location of access points, evaluate alternatives,
g. Update traffic data,
h. Provide input for metropolitan transportation planning efforts, and
i. Identify problems which could affect a developer's decision on pursuing a proposed project.

Disadvantages

a. Longer permitting time for developers.
b. Higher cost to developers.

Cost of implementation

Cost per Ton

Potential Revenue Sources

a. One key issue in evaluating traffic impacts and associated improvements is "Can we require the developer to fund improvements to the roadway?" While some states use impact fees and other techniques to "exact" funding for roadway improvements from the developer, improvements in other states are typically funded by the road agency.
b. Developer pays for Impact Analysis as part of Permitting Process.
c. Impact Fees for roadway improvements.

Conclusion

A process for evaluating and minimizing the impact of major projects such as shopping centers, schools and sub-divisions is essential not only for Air Quality purposed but for sound land use planning as well. The Advantages of a Traffic Impact Analysis program greatly out weigh the disadvantages. However, in South Carolina this will be seen as yet another regulation that impedes economic growth. It must be sold to the law makers as a sound planning practice that in the long run will improve economic development rather than hinder it. In some communities it will be feasible to implement such a program as early as 2004. However, other communities will take much longer. Anderson County is in the beginning stages of studying such a program.

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Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
25. Community Schools to reduce vehicle miles traveled and encourage biking and walking for students and parents by encouraging smaller community-based schools that are integrated into neighborhoods Priority B	• Eliminate minimum acreage requirements for school sites. • Cap student populations per facilities. • Require coordination among school boards and local governments to plan school sites and avoid conflicts with local planning goals. • Favor restoration and construction of community-based small schools over new construction of remote mega schools.			Area: countywide. Agency: local governments, planning commissions, and school boards.

Findings

a. Large, remote schools increase the need for automobile and bus transportation and reduce the ability for students, parents and teachers to walk or bike to school.[24, 25]
b. One of the main driving forces behind locating schools in remote areas is state-mandated minimum acreage requirement for school sites. South Carolina's regulation required one acre for each 100 students in addition to a base number of acres depending on the type of school (Elementary 10, Middle 20, High 30). For example, an 800 student middle school would require a minimum of 28 acres.[26]
c. Another is the tendency for school districts to build schools with large populations (e.g., Greenville County prototype elementary school accommodates 1,000 students), which are located in geographic centers of attendance areas but often in remote areas or along industrial or commercial thoroughfares (e.g., Dorman High School on I-26 in Spartanburg County) that are not convenient to existing residential neighborhoods.
d. Many states favor renovation and rehabilitation of older, neighborhood schools over building new ones. For example, the Vermont Sate Board of Education has adopted a policy that encourages using existing structures and gives preference for funding to renovations over new school development, and Maine actively promotes renovating or expanding schools in existing locations.

Advantages

Disadvantages

Cost of implementation

Cost per Ton

[24] *Why Johnny Can't Walk to School,* Beaumont, Constance E. with Elizabeth G. Pianca. National Trust for Historic Preservation, November 2000. http://www.nationaltrust.org/issues/schoolsRpt.pdf

[25] *Dollars and Sense: The Cost Effectiveness of Small Schools.* Lawrence, et al. Knowledge Works Foundation, 2002. http://www.kwfdn.org/ProgramAreas/Facilities/dollars_sense.pdf

[26] South Carolina passed legislation that was signed into law July 16, 2003 that eliminated the minimum acreage requirements to allow local districts more flexibility in siting new schools. This was one of Governor Sanford's and the SELC's recommendations.

Potential Revenue Sources

Conclusion

Suggested Measures (from Governor Mark Sanford's Quality of Life Task Force Report and repeated in Southern Environmental Law Center recommendations)[27]:

1. Place caps on student populations to encourage the construction of smaller, neighborhood schools.
2. Require coordination among school boards and local governments to plan school sites and avoid conflicts.[28]
3. Favor restoration and construction of community-based schools over new construction of remote mega schools.

[27] The elimination of minimum acreage requirements was another recommendation in both reports. Since legislation was passed in 2003 in support of that recommendation, it is not repeated here. See report at http://masc.sc/qualityoflife.pdf

[28] A bill has been proposed in the SC Legislature that, if passed, will require "a priority investment element which establishes, through coordination with all adjacent and other releveant jurisdictions and agencies, suitable areas where development and community facilities must be directed and to where state and federal funding for all growth-related projects and community facilities must be targeted." http://www.lpitr.state.sc.us/sess115_2003-2004/bills/4354.htm

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These are the Draft Plans of Emission Reduction Strategies for the Appalachian Region submitted for the December 10, 2003 Early Action Compact Milestone.

Early Action Compact Milestone - December 2003

List of Emission Reduction Strategies Under Consideration

Oconee County

According to the latest 8-hour ozone monitoring data, Oconee County should remain attainment for the 8-hour ozone standard. However, in an effort to assist other areas in South Carolina and in the interest of public health and the environment, in December 2002, Oconee County agreed to participate in the 8-hour ozone early action process. Therefore, based on stakeholder consultation and taking into consideration resource and political constraints, the following emission reduction strategies remain under consideration. Oconee County will continue to evaluate the air quality within the county and may implement one or more of the following measures under consideration.

Measure under consideration	Detailed description of measure	Current assessment of emission reductions	Proposed date for implementation	Geographic area and/or local government
Ozone Action Coordinator	Designation of county staff person to coordinate education efforts and dissemination of ozone related information	N/A	July 2003	Countywide
Ozone Reduction Meetings	Coordination of meetings with municipalities, stakeholder groups, the public, and other entities	N/A	2004	Countywide
Lower Emissions in County Fleet	Utilize Capital Improvement Plan to initiate annual review of vehicle and equipment fleet. Upgrade and replace older, less-fuel efficient vehicles and equipment as budget allows; replace improperly operating catalytic converters.	N/A	2003	County Government
Energy-efficient Buildings	Utilize Capital Improvement Plan to initiate annual review of needed upgrades to county-owned buildings and facilities. Resulting construction and maintenance projects to result in highest level of energy-efficiency practical for the structures.	N/A	2003	County Government
Reduce Speeding on Highways	County shall support efforts by County Sheriff to emphasize speed and traffic control (this may or may not include expansion of Traffic Control Division of Sheriff's Department)	N/A	2004	Countywide
Greenspace Regulations	Amend Land Development and Subdivision Regulations to require minimum areas of greenspace and trees in all new county-approved subdivisions	N/A	2004	Countywide
Ozone Reduction in Comprehensive Plan	Include emission reduction efforts as a major goal in the updated Comprehensive Plan	N/A	2004	Countywide
Intergovernmental Cooperation	Encourage and assist municipalities in taking an active role in countywide emission reduction efforts. This may include supporting efforts by municipalities to develop and expand mass transportation facilities	N/A	2004	Countywide

Pickens County Early Action Compact Milestone - December 2003

Based on stakeholder consultation and taking into consideration resource and political constraints, the following control measures under consideration can be reasonably implemented. It is anticipated these measures under consideration will assist <insert county name> in achieving and/or maintaining the 8-hour ozone standard by 2007 and beyond.

Measure under consideration	Detailed description of measure	Current assessment of emission reductions	Proposed date for implementation	Geographic area and/or local government
Public Relations	No action will be taken on any Public Relations development until the DRAFT EAC is evaluated by SCHEC/EPA.	None	Originally, 7/2003. Delayed to 7/2004.	County wide program implemented by County administration
Ozone Adv Comm	County adding: 1) Mass Transit Assessment -- US Hwy 123, 2) School Busing Assessment as additions to County's DRAFT EAP. Other committee action pending DHEC review of DRAFT Local EAP.	None	Originally 3/2003. Completed on schedule, and ongoing.	County wide program implemented by County administration
Heavy Diesel Retrofits/Alternative Fuel for County Fleet	County is developing inventory of heavy diesels. Ongoing study of tech's and synergy with other options. Heavy diesel retrofitting lowered in priority due to cost, poor NOx reduction. Alternative fuel B10 or B20 appears to be a valid option until ULSD availability.	None	Originally, 4/2004. Currently, 4/2004.	County-owned vehicle pool administered by County administration
Catalytic Convertor County Fleet	Evaluating fleet emissions maintenance. Develop SOP if needed to meet mfgr's recommendations.	None	Originally, 4/2004. Currently, 4/2004.	County-owned vehicle pool administered by County administration
Landfill Methane	Methane extraction system under construction at Easley Landfill. Flaring to begin in January, 2004.	None	Originally, 4/2004. Currently, 1/2004.	Municipal Landfill owned/operated by County administration.
Park & Ride	Park & Ride Program discussed with Pickens County Economic Development Director and private stakeholders. Coordination with development of Mass Transit program.	None	Originally, 4/2004. Delayed to 4/2005.	County wide program implemented by County administration
Contract Specs	Will develop SOP for combusion engine purchases and for contract services received from operators of mobile sources.	None	Originally, 7/2003. Delayed until 1/2004.	County-owned equipment pool administered by County administration
Carpooling	No Action at this time.	None	Orignally, 8/2004. Currently, 8/2004.	County wide program implemented by County administration
No-Idling Policy	"No-Idling" Policy developed for Pickens County in September, 2003	None	Originally, 4/2004. Completed, 9/2003.	County-owned vehicle pool administered by County administration
Property Tax Rules	No Action at this time. Requested information from Assessor on property tax rule amendments.	None	Originally, 1/2005. Currently, 1/2005.	County wide program implemented by County administration
CATS Ridership/ Route Dvlpmt (Added 12/2003)	Assessment for County participation in expansion of CATS routes along US Hwy 123. Participation requires finding sources and support from local business, cities, and SCDOT.	None	Originally, 4/2004. Expanded scope and rescheduled to 8/2005.	County wide program implemented by County administration
School Bus Program (Added 12/2003)	County to offer assistance to School District to improve Bus ridership, school parking permits, special restrictions for air quality, May-June emphasis, Traffic control	None	8/2004 or 2005	County administration to assist County School District in County-wide program

Based on stakeholder consultation and taking into consideration resource and political constraints, the following control measures are under consideration pending modeling that demonstrates compliance in 2007 by SCDHEC. It is anticipated these measures under consideration will assist Cherokee County , South Carolina, in achieving and/or maintaining the 8-hour ozone standard by 2007.

Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
1. Support SCDHEC statewide efforts to reduce ozone levels. Priority A	• Develop stakeholder group to support and participate in modeling efforts. • Develop stakeholder group to participate in development of regulations (NOx – BACT (Best Available Control Technology Economically Achievable), restrict open burning).	Equivalent to removing 359,500 cars from the road or 7190 tons of VOC	Ongoing	Area: Countywide. Agency: SCDHEC, local governments.

Findings

a. The NOx Control Regulation will directly affect most combustion sources:
   i. NOx control regulations require technology that meets "BACT limits found in the BACT/BACT/LAER Clearinghouse" for all new or modified sources of NOx. DHEC Response to Comments, "Boilers" (July 16, 2003).
   ii. Low NOx burners ("LNB") or the equivalent are required technology for existing sources replacing burners, and new construction must meet NOx Guidelines. NOx Control Regulations, Sections III-IV.
   iii. DHEC "cannot to date predict with any accuracy what additional reductions [in NOx levels]" will be achieved from the NOx Control Regulation, if any, for the Upstate in excess of current strategies. DHEC Response to Comments, S.C. Chamber of Commerce, Response to No. 8.
   iv. DHEC modeling shows attainment without the NOx Control Regulation by 2010. Id.
   v. Technology upgrades and tune-up requirements will incur capital and operations/maintenance costs. A cost/benefit analysis is not complete on the regulations, but costs are believed to be outweighed by costs of non-attainment. Id.

b. VOC Best Available Control Technology ("BACT") regulations are proposed for any new source construction permit where the net VOC emissions increase is 100 TPY since July 1, 1979:
   i. The "actual emissions" definition is revised to be more stringent than Federal standards by limiting the analysis to "the average rate, in tons per year, at which the unit actually emitted [VOC] during a two-year period which preceeded the particular date and which is representative of normal source operations." Draft R.61-62.5, Standard No. 5.1, Section I.A.3 (April 28, 2000).
   ii. VOC BACT will be triggered by "new construction" when the "net VOC emissions increase exceeds 100 tons per year" since July 1, 1979. Id. at Section II.B.
   iii. DHEC has not conducted modeling on the affects of the more stringent BACT for VOCs on ozone levels in the Upstate.

Advantages

a. NOx Control Regulations:

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   i. Modeling the affect on ozone attainment by the NOx Control Regulation will give certainty to the cost benefit analysis, the anticipated affects on a designation of non-attainment, and implementation of the EAC plans in the Upstate.
   ii. Revisions to the NOx Control Regulation for technology requirements may preclude industrial development and expansion in Upstate.
   iii. If modeling demonstrates ozone reductions, the state-wide regulation would reduce costs of non-attainment for the Upstate.

b. VOC BACT Control Regulations:
   i. The proposal substantially increases the number of sources subject to BACT controls for VOCs, and VOCs are a precursor to ozone.
   ii. If modeling demonstrates ozone reductions, the state-wide regulation would reduce costs of non-attainment for the Upstate.

Disadvantages

a. NOx Control Regulations:
   i. The EAC plan, in part, is being pursued to avoid costly limits on industrial growth like BACT technology requirements, so the NOx Control Regulation undermines that objective. The need for the EAC is diminished as a result.
   ii. BACT technology for replacements and combustion burners as required could prove costly and deter industrial development in Upstate.
   iii. The NOx reduction from a state-wide NOx Control Regulation are not modeled and are unknown.

b. VOC BACT Control Regulations:
   i. The costs of BACT to local industry may be significant, including deterrence to industrial development and expansion in the Upstate.
   ii. The applicability of BACT-like standards to sources less than 250 TPY was a primary rationale for undertaking the EAC process to avoid non-attainment; adopting the regulation in the Upstate jeopardizes the rationale.
   iii. The regulation changes presume the most recent two years are representative of pollutant loadings for the plant; allowing comparison to any two consecutive years over the past ten years would more accurately represent normal industry operations.
   iv. Modeling, to date, does not demonstrate reduction in VOCs under the BACT Regulation and will have an affect on ozone levels in the Upstate.

Recommendation

a. Further evaluate statewide NOx Control Regulations until modeling demonstrates a reduction in ozone levels in the Upstate will result.
b. Further evaluate statewide VOC BACT Control Regulations until modeling demonstrates a reduction in ozone levels in the Upstate will result.

Cost of implementation

Cost/benefit analysis underway

Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
5 Use of alternate fuels. Priority B	• Encourage the use of alternate fuels; • Encourage a clean-fuel fleet program for centrally fueled fleets of more than 10 vehicles		Ongoing	Area: Countywide. Agency: local businesses and local governments.

Findings

a. Current studies have shown that California may be wrong regarding the cost of ethanol as an oxygenated fuel. Currently ethanol studies have shown that ethanol will save over 6.6 cent per gallon of gasoline under the current market forces and prices.
b. Ethanol was found to reduce ozone in California by the U.S. Federal Court. The Court upheld the USEPA's decisions to use ethanol as an oxygenate, but remanded the decision to the USEPA to consider the effects on particulate emissions. The Renewal Fuels Association does not believe that ethanol will have an adverse effect on particulate manner.
c. Current studies have show that there is an adequate supply of ethanol and reasonable cost associated with the transport of ethanol.
d. Government Agencies in Columbia, SC are planning to demonstrate the use of ethanol in fleet vehicles.
e. A could generate about 80 million dollars in revenue.
f. A 40-million gallon annual production facility for ethanol typically is over a $ 50 million dollar investment and creates over 1000 jobs based upon investment dollars by typical chamber of commerce ratios.
g. The production of ethanol is expected to double with passage of an energy bill by U.S. Congress and to replace MTBE, a water-poisoning oxygenative fuel. Oxygenative fuels are mandated by USEPA to reduce ground-level ozone.
h. Ethanol/fuel mixes have determined to reduce carbon monoxide (CO) and ground-level ozone from the reduction of carbon monoxide.
i. Ethanol Plants in South Carolina have the potential to sell to two large markets; Charlotte and Atlanta.
j. Biodiesel also reduces emissions of ozone-causing emissions, thus improves are quality.
k. Ethanol and Biodiesel plants would support the Governor's economic plan which focuses on agriculture.
l. Current modern ethanol plants produce twice the energy that they consume.
m. Future, high-tech ethanol plants could produce three times the energy that they consume. A High-tech ethanol start-up is looking to locate in South Carolina.

Advantages

a. Ethanol could provide for economic growth.
b. Ethanol and Biodiesel could reduce ground level ozone.

Disadvantages

a.

Cost of implementation

Cost per Ton: Not figured yet.

Potential Revenue Sources

Priority A: those strategies that should be implemented in the short term. **Priority B**: those strategies that should be implemented in the long term.

a. Private investment and Federal Grants.
b. State grants from the Energy Office for E-85 for local governments fleets.

Conclusion

Ethanol and Biodiesel production facilities are worth pursuing as a long-term strategy for the State.

Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
6. Use of hybrid vehicles. Priority A	• Encourage people, public and private organizations to purchase hybrid vehicles as they replace vehicles/fleet • Encourage that 10% of public agencies fleet have hybrid vehicles (use of hybrid vehicles does not require changes in infrastructure for dispensing fuel). • Encourage public agencies to require purchasing hybrid electric vehicles (HEVs) through the State vehicle contract.		Local governments as soon as practical.	Area: countywide. Agency: local governments.

Findings

a. The use of conventional cars impose external costs on society, i.e., environmental pollution, health problems attributed to air pollution, greenhouse gases, changes in climate, dependence on imported oil, and cost of securing oil supplies. These external costs are usually borne by governments; therefore, there is justification for governments to pay the incremental cost of purchasing HEVs for their fleets. Not only will governments help with relieving society from the external costs imposed by conventional cars, but they will also help in building up the demand of HEVs. This would allow manufacturers to reduce their costs to the point where HEVs become attractive at the retail level. (http://www.gvsc.ca/hybrid.html#today)

b. Hybrid vehicles use two or more sources of power. Currently, these vehicles use electricity generated from batteries and mechanical power generated by an internal combustion engine.

c. Hybrid electric vehicles produce low emissions and more miles per gallon.

d. HEVs never have to be plugged in to recharge the batteries since they recharge as the vehicles operate.

e. The federal government provides tax incentives to individuals who purchase new clean fuel vehicles or HEVs

f. Federal and private funding sources for R&D: the federal government, through the Department of Energy, has partner with automobile manufacturers to share the cost of developing a comprehensive HEV research and development program.

g. Manufacturers are also addressing off-highway applications with the production of hybrid trucks, trams and shuttle buses. (http://www.evi-usa.com/aboutus.htm)

h. Toyota (Prius) and Honda (Insight and the Civic Hybrid) have produced hybrid vehicles.

i. Ford introduced its concept environmentally friendly SUV in April 2003. The Ford Escape Hybrid will be available to consumers in late summer 2004 and identified fleet customers later in 2003. (http://www.fordvehicles.com/escapehybrid/frameset.asp; http://www.hybridcars.com/default.htm).

j. Ford also announced that the new 2006 Ford Futura mid-size car will be its next hybrid vehicle and it is planning to launch it in 2005.

k. General Motors (http://www.ott.doe.gov/hev/gmaccomp.html) plans to launch several new HEV models between model years 2004 and 2007 as follows:
   a. 2004: The Chevrolet Silverado and GMC Sierra. These will be available first to fleets; in fall 2004 they will be available to the public.
   b. 2005: The Saturn Vue will carry a Super Ultra Low Emissions Vehicle rating.
   c. 2006: The Chevrolet Equinox SUV.
   d. 2007: The Chevrolet Tahoe and the GMC Yukon SUVs. This same year GM will offer the hybrid system used on the Equinox on the Chevrolet Malibu sedan.

l. DaimlerChrysler (http://www.ott.doe.gov/hev/dcaccomp.html) plans to release the hybrid Dodge Ram pickup in 2005 and the Mercedes S-class in 2006.

m. Also Mitsubishi, Nissan, Fiat, Renault, and Subaru are developing their own HEVs. (http://www.ott.doe.gov/hev/faqs_ans1.html)

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n. It is unclear if the majority of consumers are aware of the existence of the new technology and benefits that HEVs offer, i.e., improved air quality, health and financial incentives. Manufacturers and local dealers should establish a more aggressive marketing campaign describing these benefits to create consumer awareness of their availability locally.
o. Motorists traveled more than 2.8 trillion miles in 2002 in the country. (http://money.cnn.com/2003/07/18/pf/autos/bc.autos.deaths.reut)
p. There are 22 million SUVs on U.S. roads. This is approximately 10 percent of the total number of vehicles. (http://money.cnn.com/ 2003/07/18/pf/autos/bc.autos. deaths.reut)
q. State and local governments around the country are purchasing HEVs for their fleets. For example, SCDHEC purchased a Toyota Prius and a Honda Insight; King County, WA purchased twenty (20) Toyota Prius cars at a total cost of $375,000. (http://www.metrokc.gov/procure/ green/bul66.htm#1)
r. National initiative to assist state and local governments purchase low-emission, energy-efficient fleet vehicles: this national purchasing alliance will allow local and state agencies to pool their purchasing power. By doing it, agencies will obtain fuel-saving hybrid vehicles with favorable contract provisions. The leading agency will be King County, Washington. King County and the project sponsors will develop the national solicitation for hybrid vehicles over the next few months. U.S. Communities, the National Association of Counties (NACo), and the Center for a New American Dream sponsor this program. State, county, city, school, and regional government entities will be able to join the solicitation once it is complete. The solicitation will be available for bidding in late 2003 or early 2004. Other national founding co-sponsors include: the National Institute of Governmental Purchasing (NIGP), National League of Cities (NLC), the U.S. Conference of Mayors (USCM) and the Association of School Business Officials International (ASBO). No fees will be charged to public agencies to access and use these contracts. (http://www.afdc.nrel.gov/whatsnew.shtml)

Advantages

a. Improve air quality by producing less pollution. HEVs emissions meet the Ultra Low Emission Vehicle (ULEV) regulations that exists today (the strictest are the zero emission vehicles – ZEVs) (http://www.gvsc.ca/hybrid.html).
b. Reduce global warming by cutting greenhouse emissions.
c. Save money by taking advantage of the one-time federal income tax deduction or federal tax credits when purchasing a brand new vehicle and by refueling less often as HEVs travel up to 700 miles between fill-ups.
d. Save fuel consumption and reduce exhaust emissions, e.g., when the vehicle is idle, the engine in hybrid vehicles turns "OFF" and turns "ON" when is accelerated. Fuel economy is about twice that of conventional cars (http://www.gvsc.ca/hybrid.html)
e. Use of electric outlets to recharge battery is not needed, e.g., hybrid vehicles do not need to be plugged in to an electric outlet to recharge batteries.
f. Reduce reliance on imported oil.
g. Improve mileage per gallon.
h. There is no need to develop new infrastructure to refuel HEVs as they currently use gasoline for the internal combustion engines.

Disadvantages

a. The incremental cost of HEVs is about US $6,000 more than comparable conventional vehicles (http://www.gvsc.ca/hybrid.html). The cost of purchasing HEVs up front may be high for a new vehicle; however, this is somehow offset by the tax incentives that the federal income tax and some States offer (see strategy #12).
b. HEVs may not be available on time locally for mass retail purchases to meet the new air quality standards established by EPA by 2007. This, however, maybe reversed by the national initiative to assist state and local governments to purchase HEVs led by King County, WA, which would increase the demand of HEVs provided there is enough participation from these agencies.
c. Sometimes owners must deal with inherited mechanical problems that new technologies create until manufacturers acquire sufficient knowledge to fix those problems before new HEVs leave manufacturing plants. This is more a nuisance for the owner than a cost, as manufacturers provide warranties that cover the repairs.

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d. It would be hard to change consumers' minds to purchase HEVs in mass, as conventional vehicles have been available in the market for the past several decades.

Cost of implementation

Cost per Ton: to be determined later.

Potential Revenue Sources

a. Grants from USEPA to local governments:
   i. In 2001, King County, WA received a grant from EPA as part of a new national transportation partnership program to purchase hybrid vehicles for its fleet.
   ii. King County received a grant to purchase hybrid cars for the local Flexcar program, a county-supported car-sharing program. "Carsharing is similar to car rental; the main differences are that an individual can use the carsharing vehicle for as short a time period as one hour, and that the cars are located in the communities rather than at a central car rental location." (http://www.commuterpage.com/carshare.htm)
   iii. It is unclear whether EPA is currently providing grants to local governments to purchase HEVs.

Conclusion

The expanded use of HEVs would definitely improve the air quality in the Upstate. To create consumer awareness, manufacturers and, especially, local dealers should establish a more aggressive marketing campaign describing the benefits that purchasing and driving HEVs provide financially and to the environment. The Air Quality Steering or Staff Advisory Committees should meet with local car dealers to discuss topics such as the availability of HEVs in the Upstate, how dealers perceive the outlook of the demand of HEVs in the area, etc.

Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
11. Promote route efficiency for delivery vehicles, trash collection etc. Priority A	• Encourage business to consolidate distribution and collection routes to improve efficiency and reduce emissions from their fleets. • Maximize route efficiency for public services such as garbage collection, delivery vehicles, and other vehicle trips to reduce fuel usage.		2004	Area: countywide. Agency: Chambers of Commerce

Findings

a. Identify and establish a Clean Air Partnership between, local business, municipalities, counties, and the state and local government agencies that do service locally with fleets.
b. This could include everyone from school buses to Fed Ex, to US Post Office, to Garbage and Recycling Collection.
c. Develop and implement an educational and marketing plan on what the emissions impact and savings could be on these fleets should everyone work to maximize efficiency and then sell it to the participants.

Advantages

a. Getting everyone to work together and educate on them on the problem and possible solutions.
b. Reduction in fuel emissions.

Disadvantages

a. Convincing some that there may be more benefit in the long run to adopting a strategic plan on this rather than solely considering the bottom line profit margin of their business and making small sacrifices to help the situation.
b. Convincing everyone to come to the table.

Cost of Implementation

Cost per Ton

Potential Revenue Sources

None

Conclusion

Getting business and agency fleets to operate using an "environmentally friendly" mentality while understanding their need to turn a profit and continue providing quality service.

Priority A: those strategies that should be implemented in the short term. **Priority B**: those strategies that should be implemented in the long term.

Measure under Consideration	Detailed description of measure	Current assessment of emission reductions	Proposed Date for Implementation	Geographic Area and/or Local Government
12 Establish an active public awareness campaign. Priority A	• Develop an editorial board to discuss air quality issues and development of a relationship with media. ○ Use alert messages year round, not only during ozone season. ○ Utilize public service announcements, newspapers, weather channels, and other media outlets to notify citizens of high ozone days. ○ Utilize TV Channels to issue high ozone alerts using the crawl bar at bottom of TV screens. • Encourage health organizations to sponsor ozone alerts in media. • Enhance ozone awareness (Outreach - Communication): assign a local agency to develop and implement a program to educate and motivate individuals to take actions to minimize ozone pollution. Includes a focused distribution of educational materials, dissemination of SCDHEC ground-level ozone forecast, increased media alerts to specific audiences, and includes action oriented components (i.e. ridesharing, telecommuting, etc.). • Develop a campaign to encourage things such as refueling vehicles during evenings, not topping off tanks when refueling, using lawnmowers during evenings instead of during high ozone hours, using of electric lawn mowers. • Develop a license plate program to generate revenue to implement the public awareness campaign. • Develop awareness program on tax savings for purchasing high efficiency vehicles.		2004	Area: countywide. Agency: local governments, local media, health organizations, and Chambers of Commerce.

Priority A: those strategies that should be implemented in the short term. **Priority B**: those strategies that should be implemented in the long term.

Findings

a. USEPA and SCDHEC have developed educational resources that can be enhanced and tailored to meet local needs for presentations, seminars, and websites: www.epa.gov/airnow/resource.html, www.scdhec.net/baq/
b. Local website on Upstate Early Action Compact and Plan also available: www.upstatecleanair.org/
c. Excellent website from State of Illinois "Partners for Clean Air" : www.cleantheair.org/
d. Others:
   i. North Carolina Dept. of Environmental and Natural Resources: www.daq.state.nc.us/
   ii. Virginia Department of Environmental Quality: www.deq.state.va.us/
   iii. New Jersey Department of Environmental Protection: www.state.nj.us/dep/airmon/
   iv. National Safety Council Environmental Health Center: www.nsc.org/ehc/airqual.htm
   v. EPA Australia: www.epa.nsw.gov.au/air/index.htm
   vi. Environment Canada: www.msc.ec.gc.ca/aq_smog/index_e.cfm
   vii. Ministry of the Environment Ontario: www.airqualityontario.com/
   viii. American Lung Association: www.lungusa.org/air/
   ix. Atlanta Chamber of Commerce: www.metroatlantachamber.com/macoc/initiatives/air_new.shtml
e. January 1997, the Envision Utah Public/Private Partnership was formed to guide the development of a broadly and publicly supported Quality Growth Strategy - a vision to protect Utah's environment, economic strength, and quality of life for generations to come. Air quality was first on the list of six goals the project addresses. One of the first steps during the project has been to engage decision-makers, elected officials, community leaders, and the public in a public awareness campaign to share information about the project. Only when these stakeholders understood the issues could the process to improve existing conditions and plan for the future begin to move forward. http://www.envisionutah.org
f. CA Air Resources Board's outreach campaign http://www.arb.ca.gov/msprog/zevprog/2001rule/outreach.pdf
g. CA Air Resources Board's Incentive Program http://www.arb.ca.gov/msprog/zevprog/zip/zipguidelines.pdf

Advantages

a. Issues related to environmental protection have only recently begun to find their way into the public psyche, and often an extensive public awareness campaign precedes any meaningful change in behavior or policy. For example, the "Anti-Litter" campaigns have led to a greater understanding of the impacts of litter on the environment, both from a health (e.g., water quality) and aesthetic perspective. A public awareness campaign targeting air quality can have the same results.
b. Can reach almost everyone through television, radio, Internet, group presentations, newsletters, and conferences.

Disadvantages

a. It is difficult to quantify the impact of a public education campaign.
b. Some people would not be reached.
c. Potential cost could be a deterrent.

Cost of implementation

Cost per Ton: Unknown.

Potential Revenue Sources:

a. In-kind donations (e.g., media outlets, PR firms, corporate partners, health and related agencies, active living advocates) can significantly reduce costs.
b. All appropriate public and private funding sources including grants can be used.

Priority A: those strategies that should be implemented in the short term. **Priority B**: those strategies that should be implemented in the long term.

c. License plate program and other fees may be potential revenue sources.

Conclusion

Recommended components:

a. Education campaign with quantified economic impacts for target audiences:
   i. Elected officials, policymakers, community leaders.
   ii. Air quality committee members.
   iii. Transportation and land use planners, officials.
   iv. Owners of registered vehicles.
   v. General public.

   Emphasize incentive: do not want non-attainment status

b. DHEC's Spare the Air campaign.

c. Website
   i. Each region, with links to DHEC and EPA information and with up-to-date local information

d. PSAs on specific, short topics, (Title: "On the Air"), for example:
   i. Best time to refuel.
   ii. Topping off tank.
   iii. Leave ½ hour earlier or later to avoid congestion.
   iv. Combine errands into fewer trips.
   v. Advantages of using public transit.
   vi. Advantages of creating development policies that encourage transit use and/or non-motorized transportation (sidewalk development, transit-oriented development, multi-use development, proposed state law for neighborhood schools).
   vii. Highlight programs that encourage non-motorized transportation (ex. Safe Routes to School, enhancement program).
   viii. Factoids, e.g., What is smog?, Rate of respiratory illnesses (Spartanburg number one in South Carolina)
   ix. Emphasis on those PSAs associated with an action or behavior change.

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