Planning to Clear the Air

A collaborative Certified Public Manager project between SCDOT and SCDHEC
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I. Executive Summary

Transportation improvement projects are currently identified, developed, and funded through numerous organizations with different priorities, needs and different implementation plans. Currently, there is no overall master improvement goal or coordination effort in place for the State's infrastructure improvements. Because of the impending effects of the revised Air Quality regulations promulgated by the U.S. Environmental Protection Agency (EPA) in the non-attainment areas of the State, the SC Department of Transportation (SCDOT) and SC Department of Health and Environmental Control (SCDHEC) should work together to develop and implement a transportation management plan that is beneficial to public health and the environment.

The financial significance of these new EPA Air Quality regulations for South Carolina is that hundreds of millions of dollars annually of transportation funding could be in jeopardy. Close coordination and cooperation between two of the state's largest sister agencies will be essential in order to assure compliance with EPA's new regulatory requirements. Through the cooperative planning and implementation of a regional transportation plan, both missions of the agencies can be met and federal transportation funding can be preserved.

SCDOT and SCDHEC recognize the issues surrounding this problem and have recently signed a Memorandum of Agreement (MOA) stating that both agencies will focus their efforts to ensure that the State is protected from ozone related pollution and that federal money will still be available for upcoming projects. However, the current focus of this coordination is only on the major projects in the affected metropolitan areas of the state. The numerous smaller projects and projects just outside of and indirectly affecting the non-attainment areas are uncoordinated both

regionally and statewide. Establishment of an overall master plan will provide guidance and allow concerted improvement efforts with regards to the state's transportation infrastructure.

The good news is that SCDHEC and SCDOT have created an Air Quality Model using analytical data and trends that are predicting that the State of South Carolina will be in attainment for ozone in the future. This ozone reduction is expected to be credited to the cleaner fuels for automobiles and technological advances. If this prediction holds, being in attainment will allow the state to continue to receive federal transportation and mass transit funding in a similar manner as today. However, SCDOT and SCDHEC should continue their current efforts and commitments regarding air quality, with the assumption being made that areas of the state will still be designated as non-attainment.

Full implementation of the Smart Highways checklist for transportation planning would also assure that air quality goals are still being considered, even if the area is in attainment. This concept also reinforces the importance of understanding linkages between transportation and air quality planning. Since a large component of the ozone problem in the Upstate is attributable to the automotive emissions, the planning and implementation of congestion and capacity management type projects to avoid excessive delay may aid in reducing the automotive emissions. Additionally, by following the Smart Highways checklist, the areas would be prepared to address the regulatory requirements of Transportation Conformity if the EPA withdraws the current deferral of the non-attainment designation.

The underlying theme of this joint SCDOT and SCDHEC Certified Public Manager project is cooperation. The professional relationships that have been established between SCDHEC and SCDOT during the development of this CPM Project are key to building good partnering attitudes within two of the larger sister state agencies. Both agencies should consider

using these leadership and professional development programs as continuing opportunities to foster networking and team building. Cooperation and collaboration between SCDOT and SCDHEC will be critical in addressing the air quality issue for South Carolina.

II. The Issue

Transportation improvement projects are currently identified, developed, and funded through numerous organizations with different priorities, needs and different implementation plans. Currently, there is no overall master improvement goal or coordination effort in place for the State's infrastructure improvements. Because of the impending effects of the revised Air Quality regulations promulgated by the U.S. Environmental Protection Agency (EPA) in the non-attainment areas (see Figure 1 for a depiction of the areas not in compliance) of the State, the SC Department of Transportation (SCDOT) and SC Department of Health and Environmental Control (SCDHEC) should work together to develop and implement a transportation management plan that is beneficial to public health and the environment. Close coordination and cooperation between two of the state's largest sister agencies will be essential in order to assure compliance with EPA's new regulatory requirements.

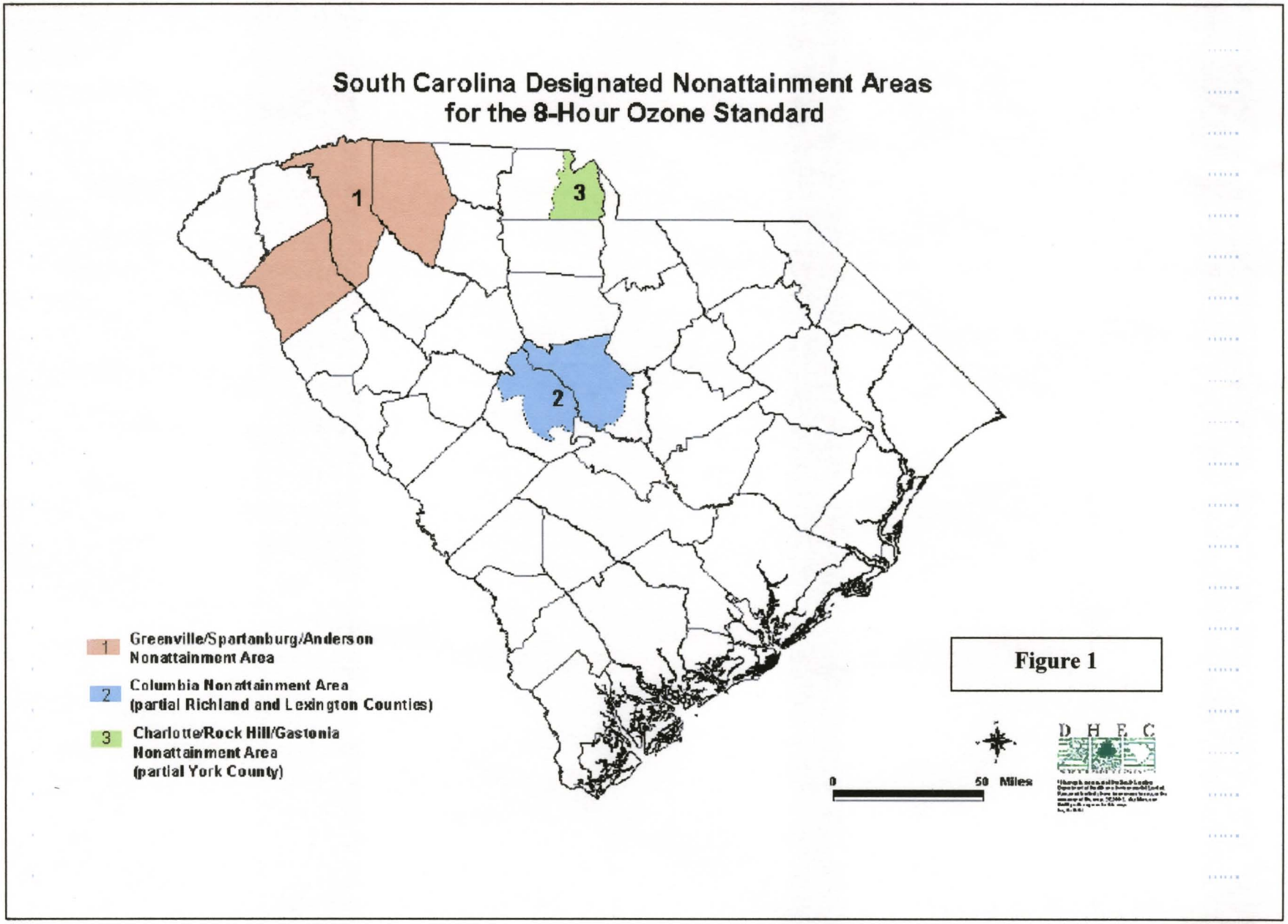


Figure 1

III. Why is this a problem?

The Clean Air Act Amendments require that states that have non-attainment areas for any criteria pollutant, establish a master plan for transportation. This plan should include any effects that transportation issues may have on the public health of the surrounding population and the effect of the environment. To help ensure that the process is taken into serious consideration, federal monies for new construction and building projects are tied to the organizations fulfilling their transportation conformity commitment.

The financial significance of these new EPA regulations for South Carolina is that hundreds of millions of dollars annually of transportation funding could be in jeopardy. South Carolina is heavily dependent on federal funding for its transportation improvements and any loss of federal funds will have a detrimental impact on the state's transportation infrastructure. For example, South Carolina expects to receive $ 688 Million in federal transportation funds for federal fiscal year 2005. This amount equates to 60% of SCDOT's estimated revenues available to the agency for transportation improvement and mass transit projects (see Appendix a).

SCDOT and SCDHEC recognize the issues surrounding this problem and have recently signed a Memorandum of Agreement (MOA) stating that both agencies will focus their efforts to ensure that the State is protected from ozone related pollution and that federal money will still be available for upcoming projects. However, the current focus of this coordination is only on the major projects in the affected metropolitan areas of the state identified in Figure 1. The numerous smaller projects and projects just outside of and indirectly affecting the non-attainment areas are uncoordinated both regionally and statewide.

SCDOT's mission is to provide a safe and efficient transportation system for the state of South Carolina. SCDOT is charged with the responsibility of systematic planning, construction, maintenance and operation of the state highway system and providing mass transit services. SCDOT is responsible for the fourth largest state maintained highway system in the United States. SCDHEC's mission is to promote and protect the health of the public and the environment. Specifically with regards to air quality, SCDHEC strives to conserve and enhance air resources in a manner that promotes quality of life. Through the cooperative planning and implementation of regional transportation plans, both missions of the agencies can be met and federal transportation funding can be preserved.

IV. Current Project Planning Process

The SCDOT has been designated by State Law as the transportation planning agency for the state of South Carolina with regards to federal transportation and mass transit funding. For the 2005 Federal Fiscal year, the SCDOT will be responsible for allocating, planning, managing and implementing over a billion dollars in federal and state transportation and mass transit funds (see Appendix a).

The SCDOT Commission has traditionally allocated certain levels of its federal funding to the MPO and Council of Government (COG) areas of the state (see Figure 2). In turn, these MPO and COG areas have boards established, mostly of elected officials, whereas the local board identifies and establishes priorities for transportation improvement projects. Typically, these transportation improvement projects are roadway widening projects throughout the MPO or COG area.

Metropolitan Planning Organizations (MPO) & Council of Governments (COG) Areas in South Carolina

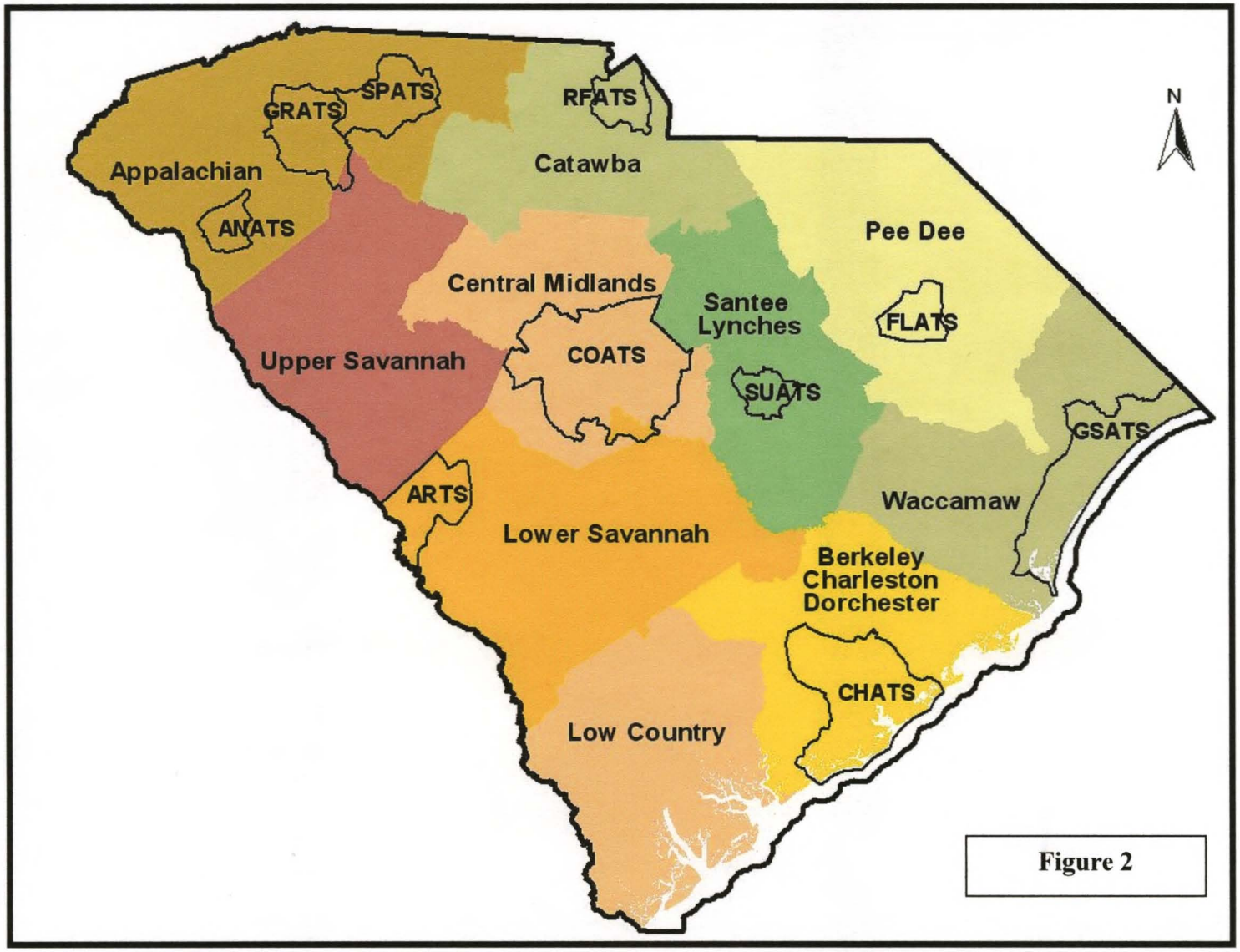


Figure 2

The MPO and COG areas have planning and technical staff that often work with SCDOT planning and technical staff on the development of immediate and long-range transportation improvement plans for the respective areas. This planning effort is usually focused on assuring that the plan is financially constrained and includes some form of ranking system. The project ranking system is normally established by the MPO or COG and can vary throughout the state. Generally, factors such as collision data, growth, level of service (see Appendix b) and traffic count volumes are used in the ranking system. It is rare that consideration of a statewide or fully inclusive regional plan come into play when MPO or COG projects are selected. It is expected that air quality will eventually begin to influence the project identification and ranking system once conformity analysis is required. This analysis will require that nearly all of the federal and state transportation projects within that geographic area are included in the MPO's conformity determination.

Of the federal transportation budget of SCDOT for FY 2005, approximately 7 % is designated for the MPO areas and another 7 % is designated for the COG areas of the state. After some other deductions, SCDOT has approximately 73% of the remaining federal funds to allocate and manage statewide. SCDOT then internally divides these non-MPO and non-COG budgeted amounts up into categories that are each managed separately within different divisions in the agency. Each division or department within SCDOT has its own set of criteria that it utilizes to determine the priority of its projects. There is no overall coordination or implementation plan between these various divisions.

Additionally, SCDOT receives state revenues from the state motor fuel tax. A portion of this state funding is also traditionally delegated to local groups called County Transportation Committees (CTC). Again, these groups establish a board to identify and establish priorities for

their transportation improvement projects with no overall coordination or planning efforts towards a regional or statewide plan. The balance of the available state funding that is discretionary is then used for operations, maintenance and for the required match for the federal funding (see Appendix a).

V. Who's on First ??

As indicated in the previous section, transportation projects in South Carolina are currently identified, developed and funded through numerous organizations, within and outside of the SCDOT. Typically, these various groups have different priorities, needs and implementation schedules for their transportation improvement projects. These groups can range from the larger MPO areas, to smaller County level (CTC) groups, to SCDOT internal departments such as safety and bridge divisions. Each group has its financially constrained list of projects important to them, have those projects prioritized and has funding aligned to accomplish them. Each group has its own interests and functions nearly completely independently of each other.

Individual projects are identified, planned and implemented independently of each other with little consideration given to the impact of the project and other projects regionally. As an example, on the following page is a map (Figure 3) showing the currently identified transportation improvement projects, by division or department, programmed for Anderson County. Because there is no overall coordination, planning or management of these projects or their implementation, the conditions are conducive to projects being implemented in a manner that may not be consistent with the SCDOT's vision for improved infrastructure in the state. Numerous projects in a small geographical area could be simultaneously under construction,

which could potentially result in a higher rate of delay or an increase the number of vehicle miles traveled on detours, thereby potentially increasing the NOx emissions.

Currently Identified Transportation Improvement Projects

Anderson County

Project	Improvement	Project Identifier
East / West Connector	New Location between US 176 and SC 81	MPO
S-143	Construct turn lanes North and South of SC 153	CTC
SC 8 / 81	Construct turn lanes at S-17	CTC
SC 24	Improvements at S-551 (Warner Road)	SCDOT Traffic Engineering
Brown Road	Bridge Improvement at Six and Twenty Creek	SCDOT Bridge
S-140	Bridge Improvement over 18 Mile Creek	SCDOT Bridge
US 29	Intersection Improvement at S-48	SCDOT Safety
SC 8 / SC 81 / SC 88	Intersection Improvement	SCDOT Safety
SC 28	Intersection Improvement at S-141	SCDOT Safety
SC 81	Widen to 3 lanes	SCDOT Safety
S-219	Intersection Improvement at S-281 / S-333	SCDOT Safety

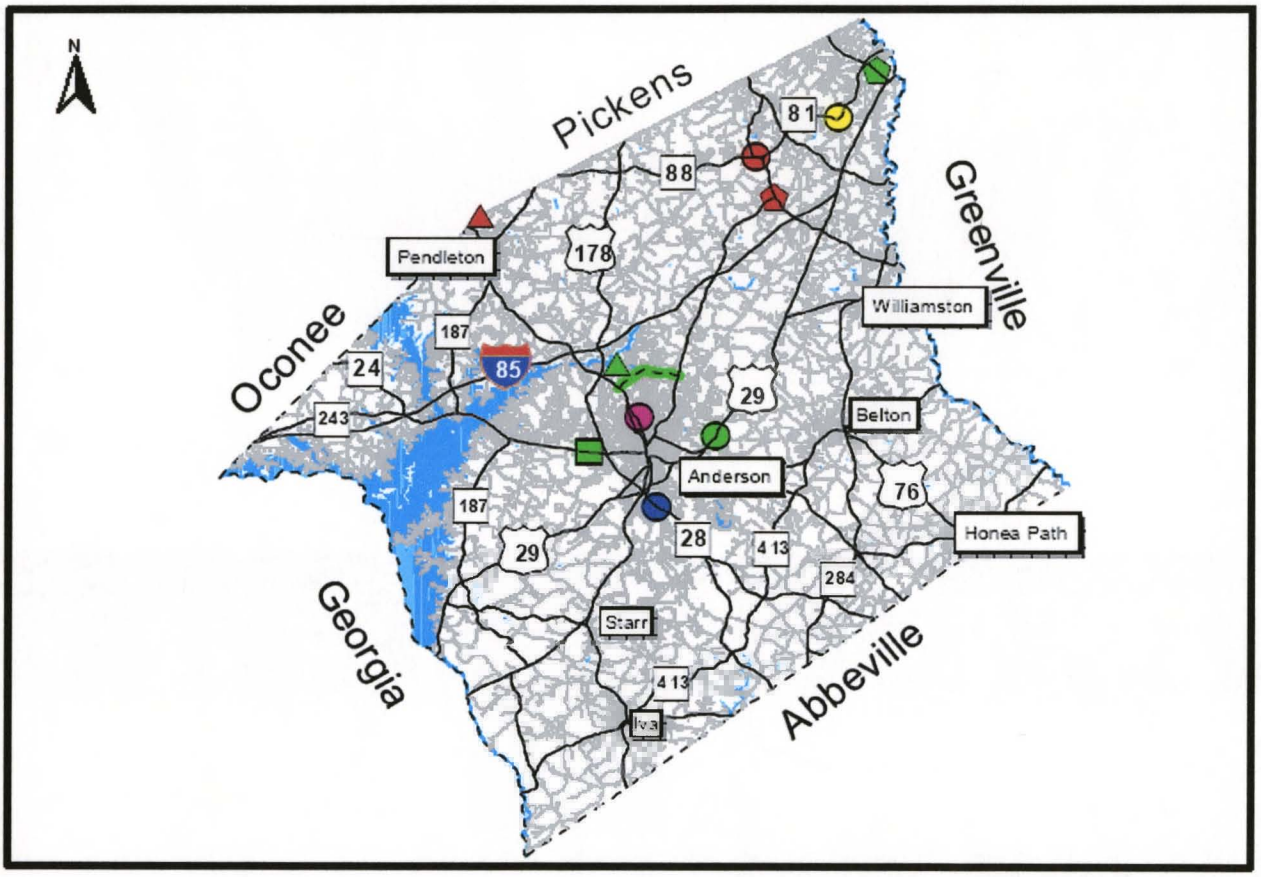


Figure 3

Since very little communication and coordination occurs between these various project-planning groups, the result is often complicated public relations. There have been several recent embarrassing situations where one group has a construction project underway on a route only to have another group starts construction activities on that same route. Even more difficult to explain to the motoring public is why construction work is beginning on a route posted and serving as a detour route for another project (essentially creating a detour for the detour).

It is also very difficult to locate information about a potential project as there are so many possible divisions or offices that could be responsible for developing and managing the project. The public, and even staff members and management within SCDOT, have a difficult time finding an answer the simple question "*Is there a project planned for road ABC* ?" In order for a staff member within SCDOT (who knows which departments needed to be contacted) to find the answer to this simple question, at least a half-dozen telephone calls or contacts need to be made. Regrettably, if a member of the public wants to find the answer to the same question, they could easily be passed from Department to Department. There have also been examples where the public has gotten conflicting information about a potential project from different offices within SCDOT. There is not a central place where someone, internal or external, can go to find out this information.

Improving this area could enhance SCDOT's customer service, one of the "Four Big Rocks" of the agency. The SCDOT's "Four Big Rocks" or strategic goals for the agency are:

1. Increase *Safety and Maintenance* on South Carolina's transportation system & within the agency.
2. Excel in *Customer Service*, internally & externally.
3. Use *Resources* wisely and efficiently.

4. Improve *Employee Development* for all employees.

These "Four Big Rocks" have been established to provide direction and goals to the various divisions and offices within the SCDOT as business is conducted daily at the agency. Customer Service is an area the SCDOT has made great strides in within the past decade. The agency has become more open and accessible to the public and has been through several internal re-organizations to align the departments and divisions to better fit the agency's mission.

However, SCDOT still has some room for growth in the customer service area with regards to project planning or coordination. As mentioned earlier, it is very difficult for anyone to find information about a particular potential project. Even more challenging is how the agency responds and reacts internally when a group (such as a MPO) requests a project status report by geographic region. The result is often reports, using different formats, being sent individually to the requestor to decipher.

VI. Impact of being Designated Non-attainment

The non-attainment designation could have a significant impact on the transportation planning process in South Carolina. Each Metropolitan Planning Organization (MPO) (see Figure 2) area of South Carolina, develops both a five-year Transportation Improvement Plan (TIP) and a twenty-year Long Range transportation Plan (LRP). If an area is designated as non-attainment, that region must analyze the emissions produced if the five-year and twenty-year transportation plans are implemented, document this analysis, and make a Conformity Determination. The purpose of the Conformity Determination is to establish whether the implementation of the TIP and LRP will have a detrimental impact to air quality and to ensure that is consistent with the Early Action State Implementation Plan (SIP) (see Appendix c) and adheres to the emissions budgets established by the SIP.

VII. The Clean Air Act and Amendments

Recent changes in the National Ambient Air Quality Standards as related to criteria pollutants, specifically ozone, have created an opportunity for two of the States largest Departments to work more closely together.

The Clean Air Act was passed on a federal level in 1970. It was amended in 1975 and 1977 on a minor level. The original Act was passed to establish what the pollutants of greatest concern were, what standard should be set, how do we measure the pollutants, and how do we address the problems.

The Clean Air Act Amendments of 1990 (CAAA) had the following as goals: reduce air emissions by 56 billion pounds per year, reduce ground level ozone and other criteria pollutants, reduce air toxics, and to protect the ozone layer. These acts are a driving force behind SCDHECs Air Quality program.

This started the framework for criteria pollutants. These pollutants are ozone, particulate matter, sulfur dioxides, nitrogen oxides, carbon monoxide, fluorides, and lead. The Environmental Pollution Agency is required by the CAAA to review the criteria pollutants every five (5) years. Every five years, the minimum level for compliance is determined. In 1997, the EPA reduced the mechanism and minimum level for ozone pollution.

Previously, the standard was based on an eight-hour average. The change implemented by EPA was to evaluate air quality on an hourly basis. By doing this, portions of the State of S.C. were brought into a "non-attainment" level. In April 2004, EPA designated three areas in South Carolina non-attainment for the 8-hour ozone standard (see Figure 1).

Two of those areas, Anderson-Greenville-Spartanburg (ANATS, GRATS & SPATS) and Columbia (COATS) (see Figure 1 and 2), had the effective date of their designation deferred as

long as they meet milestones agreed to in their 8-hour ozone Early Action Compact. As a result of this deferral, these two areas are not required to implement Transportation Conformity. Part of the CAAA of 1990 also established a transportation provision that calls on States to have transportation conformity and a planning process in order to ensure that air quality considerations are an integral part of transportation decisions.

VIII. What is Ozone ?

Ozone is a colorless, nearly odorless toxic gas. In the upper atmosphere (stratospheric), ozone protects us from the sun's damaging ultraviolet light, but at ground level, ozone is unhealthy. Ground-level ozone is formed by a reaction between volatile organic compounds (VOCs) and oxides of nitrogen when they are exposed to ultraviolet light (in sunlight). This reaction forms a three-atom molecule of oxygen. The normal oxygen molecule that sustains life has two atoms. The extra oxygen atom in ozone makes it highly reactive and a harmful air pollutant. Nitrogen oxides are pollutants that are emitted from combustion of petroleum-based engines. VOC's are found both naturally and manmade. See Table 1 for a breakdown of ozone causing sources in South Carolina.

Table 1 – Ozone Causing Sources in SC

NOx	
Component	Percent
Transportation	42%
Area Sources	21%
Industry	37%

VOC	
Component	Percent
Transportation	24%
Area Sources	18%
Industry	10%
Naturally Occurring	48%

The State is a VOC limited State. This means that essentially, for each part of VOC there is only a limited amount of NOx for it to react with. This plays a large part in making the decision on which parameter the state should try and reduce. Reductions of nitrogen oxides will limit the amount of compounds that can react to form ozone. This is directly related to combustion by-products, including vehicle emissions.

The EPA has set a National Ambient Air Quality Standard at 0.08 parts per million (166 micrograms of ozone per cubic meter of air). Ozone levels higher than this standard (the red line on Figure 4) can irritate and damage lung tissue, reduce our resistance to lung diseases, and aggravate existing lung diseases or asthma. Children and elderly people are most susceptible to the detrimental effects of ground-level ozone, but healthy adults who work or exercise outdoors also experience the unhealthy effects of ozone. Forests and agricultural plants, as well as ornamentals and yard plants, are damaged and made more susceptible to disease by ozone. Ozone also damages items made of rubber, plastics, or synthetic fabrics.

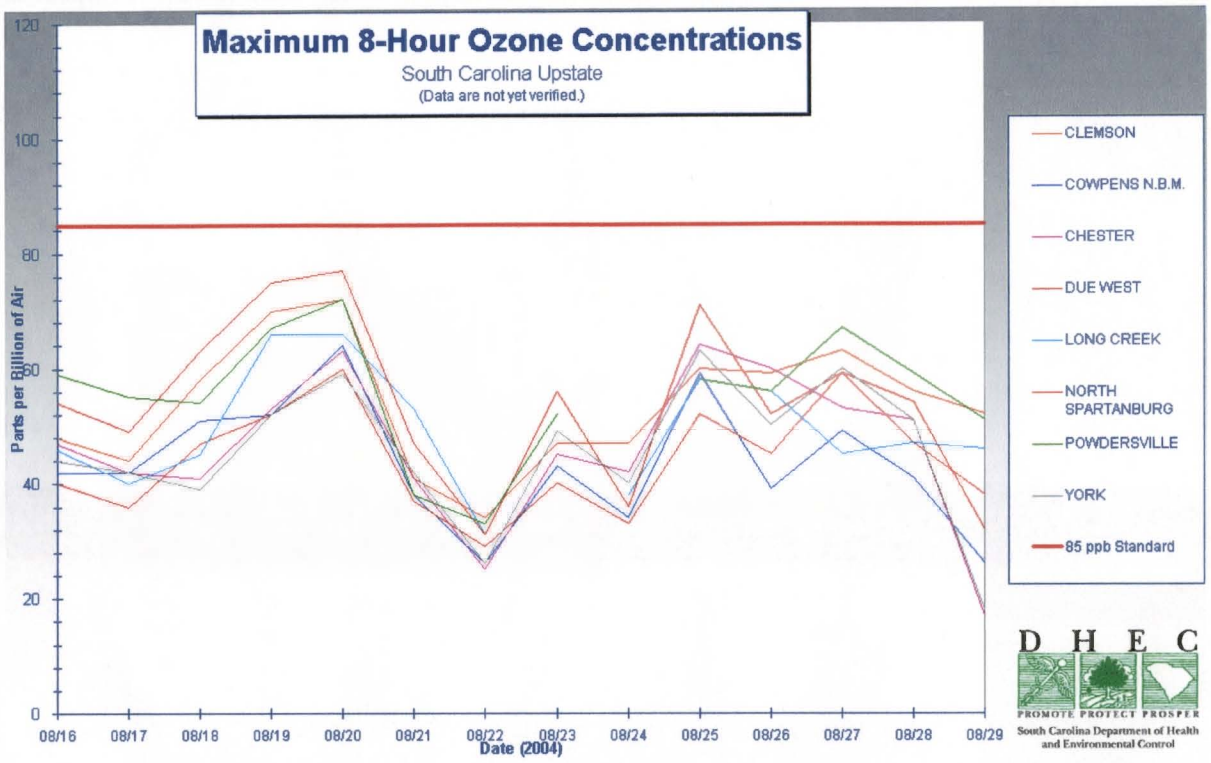


Figure 4

Currently the State has an Ambient Air Quality Monitoring Network in place to monitor criteria pollutants. This network has been established to ensure that the State of S.C. maintains an overall picture of the quality of air in the state. Rural and Urban areas are part of the sampling network (see Figure 5). Table 2 shows the current data available, and three-year trends, for the counties with air monitoring systems in South Carolina. The three-year average is the determining factor in assessing whether a county is in attainment for ozone.

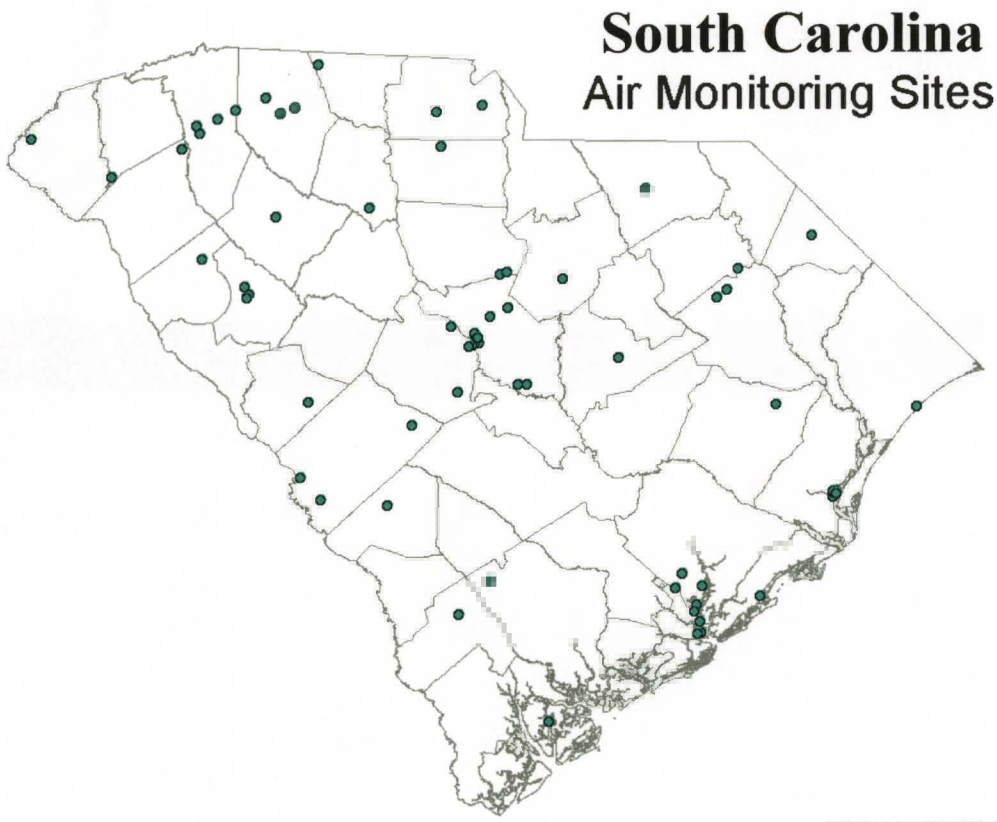


Figure 5

Table 2
County 8-Hour Ozone Levels

County	2000 4th 8-hr Average (ppm)	2001 4th 8-hr Average (ppm)	2002 4th 8-hr Average (ppm)	2003 4th 8-hr Average (ppm)	2004 4th 8-hr Average (ppm)	2000-2002 3 Year Average (ppm)	2001-2003 3 Year Average (ppm)	**2002-2004 Current 3 Year** Average (ppm)
Abbeville	0.085	0.082	0.088	0.077	0.074	0.085	0.082	0.079
Aiken	0.093	0.081	0.092	0.069	0.073	0.089	0.080	0.078
Aiken	0.075	0.079	0.089			0.081		
Anderson	0.084	0.088	0.093	0.078	0.075	0.089	0.086	0.082
Barnwell	0.090	0.074	0.086	0.073	0.072	0.083	0.077	0.077
Berkeley	0.080	0.071	0.074	0.070	0.073	0.075	0.071	0.072
Charleston	0.082	0.068	0.074	0.070	0.067	0.075	0.070	0.070
Charleston	0.076	0.068	0.074	0.074	0.066	0.072	0.072	0.071
Cherokee	0.088	0.080	0.093	0.079	0.068	0.087	0.084	0.080
Chester	0.078	0.083	0.093	0.078	0.069	0.084	0.084	0.080
Chesterfield			0.092	0.075	0.074		0.083	0.080
Colleton	0.080	0.076	0.085	0.069	0.070	0.081	0.076	0.074
Darlington	0.087	0.081	0.090	0.075	0.075	0.086	0.082	0.080
Edgefield	0.079	0.077	0.094	0.068	0.069	0.083	0.079	0.077
Oconee	0.082	0.078	0.094	0.079	0.075	0.084	0.083	0.082
Pickens	0.081	0.088	0.088	0.078	0.073	0.085	0.084	0.079
Richland	0.073	0.076	0.082	0.074	0.067	0.078	0.077	0.074
Richland	0.096	0.082	0.084	0.075	0.078	0.087	0.080	0.079
Richland			0.093	0.083	0.082	0.093	0.088	0.086
Spartanburg	0.089	0.090	0.093	0.079	0.080	0.090	0.087	0.084
Union	0.079	0.079	0.085	0.078	0.070	0.081	0.080	0.077
Williamsburg	0.077	0.067	0.077	0.069	0.068	0.073	0.071	0.071
York	0.076	0.080	0.096	0.076	0.069	0.084	0.084	0.080

0.080 to 0.084 = threshold (yellow)
0.085 or above = violation is triggered (red)

IX. Early Action Compact

Due to the potential significant impact the non-attainment designation could be for South Carolina, SCDHEC pursued options other than the non-attainment designation with the EPA. With approval from the EPA, SCDHEC entered into an Early Action Compact (EAC) (see Appendix c). The EAC had to be accepted on a countywide basis only. SCDHEC partnered with 45 of 46 counties (McCormick County being the exception) in developing county EAC's. These partnerships will allow areas that meet certain milestones, including monitoring data, to delay the required attainment of the 8-hour standard until December 31, 2007. The EAC does allow the areas to be labeled non-attainment but the prescriptive requirements associated with designation of non-attainment have been deferred as long as obligations defined by the EAC are met. This will allow the areas shown in Figure 1 to continue the development of their current transportation improvement programs without any significant impact until the end of 2007.

SCDHEC submitted to EPA the Early Action State Implementation Plan (SIP) at the end of 2004. The next steps with the Early Action Compact are that by April 1, 2005, the local/state control strategies must be implemented. EPA is then expected to take final action on the submitted SIP by September 30, 2005. The implemented strategies developed through the EAC process should lead the state into attainment of the ozone standard by December 31, 2007.

Without an Early Action Compact in South Carolina there could have been several consequences. Normally, a non-attainment area, designated by the EPA in April 2004, would have one year (until April 2005) to demonstrate conformity to the new ozone standard in their long-range transportation plan and five-year programs. If conformity is made within that time frame, projects can move forward. If conformity is not made, then projects will only be allowed to move forward with the phase of work already authorized, but no further. A project typically

has three phases: design, right of way acquisition and construction. So, projects that had not already entered the construction phase, would not be allowed to do so until the are was back in conformity.

X. Transportation Conformity

The success of the conformity process depends upon Federal, State and local transportation and air quality agencies working together. The conformity regulation requires that Federal, State and local agencies establish formal procedures to ensure interagency coordination on critical issues.

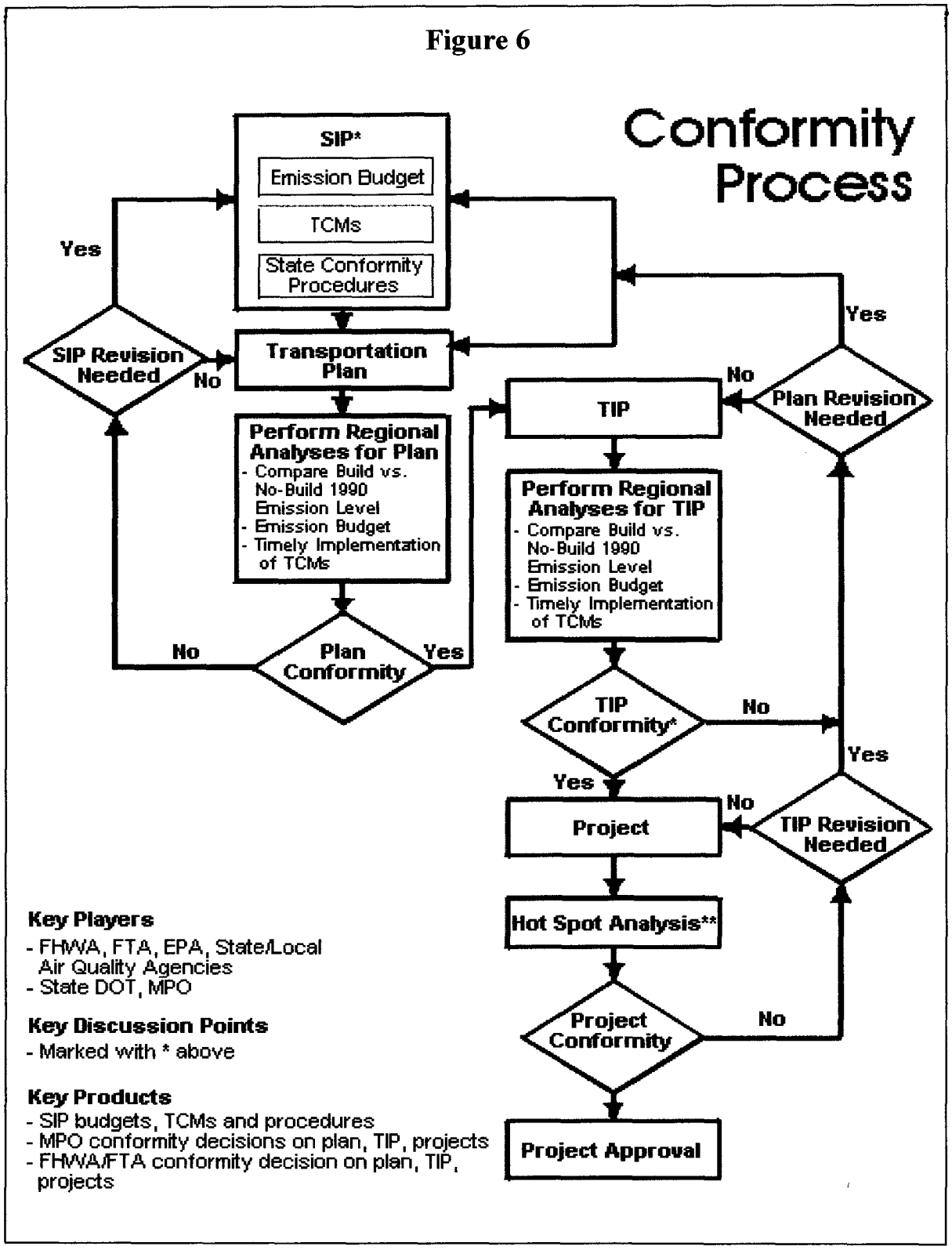
Transportation Conformity is a way to ensure that Federal funding and approval are given to those transportation activities that are consistent with air quality goals. It ensures that these transportation activities do not worsen air quality or interfere with the "purpose" of the SIP, which is to meet the U.S. Environmental Protection Agency (EPA) standards for air quality. Meeting these standards often requires emission reductions from mobile sources.
According to the CAA, transportation plans, programs, and projects cannot:

- Create new violations of the Federal air quality standards;
- Increase the frequency or severity of existing violations of the standards; or
- Delay attainment of the standards

The CAA requires that transportation plans, programs, and projects in non-attainment or maintenance areas that are funded or approved by the Federal Highway Administration (FHWA) or Federal Transit Agency (FTA) be in conformity with the SIPs through the process described

in the EPA's Transportation Conformity regulation. The conformity determination process is depicted in Figure 6.

Figure 6



A significant portion of federal funds may not be spent on most transportation projects until a Conforming Plan is developed. The only exception is the type of projects that do not add travel lanes or change the capacity of a roadway. Additionally, non-federal funds (state funds) may not be used for "Regionally Significant" projects unless they are from a Conforming Plan. If an area were determined to be nonconforming, it would result in the vast majority of the high profile transportation improvement projects for that region coming to a halt. This simple fact alone, generated a great deal of interest in the state to negotiate arrangements with the EPA in order to delay the financial consequences of non-attainment.

XI. Air Quality Modeling – Good News on the Horizon

The good news is that SCDHEC and SCDOT have created a model using current analytical data and trends that show the State of South Carolina will be in attainment for ozone in the future. This model can be used to help predict issues associated with Transportation Conformity in non-attainment areas. The model is a predictive tool that allows a proactive approach to develop multiple control scenarios and determine optimal selection of controls. The model uses the following as input tools: Meteorology, Biogenics, Point sources, Area sources, Mobile sources, Ozone model (UAMV), and Ozone monitoring data. The model is used to determine relative change in ozone and determine the ratio of future ozone levels to current levels (relative reduction factor).

Based on the operations of the model, it has been predicted that all areas will attain the new EPA standard in 2007 and remain in attainment in 2012 and 2017. However, the Anderson area is predicted to be very close to the standard in 2007. Additionally, the model predicts that all areas will show lower ozone levels in 2012 and 2017 with the exception of Cape Romain

(which is estimated to be out of compliance in 2017). The model also indicates that additional NOx reductions may have more benefit than VOC reductions.

There are several opportunities to reduce vehicle emissions. "Tier 2" emissions standards for new autos and light trucks are expected to reduce VOC and NOx emissions by 50 to 80 percent. Low sulfur fuels will enable automakers to improve emission control systems and help current emission controls work better. Land use changes could also help to reduce Vehicle Miles of Travel (VMT) by shortening trips and encouraging alternative modes of travel such as walking, bicycling, and transit.

XII. Smart Highways

While it is understood that Transportation Conformity is not required as a part of the SIP revision, through interagency meetings, air quality and transportation officials agree on the importance of considering air quality goals in transportation planning. As a result, the parties involved in the interagency meetings developed a Smart Highways checklist (see Appendix d) to be used in transportation planning. This checklist is intended to serve as an informational guideline to be used in reviewing Long Range Transportation Plans and Transportation Improvement Programs for adequacy of their documentation and will be used during long range transportation plan updates.

Implementation of this process will assist the deferred non-attainment areas (GRATS, ANATS, SPATS & COATS) in considering air quality goals in transportation planning. Also, in the event that deferral of the effective date of the non-attainment designation is withdrawn, these areas will be prepared to address the full regulatory requirements of Transportation Conformity. Additional benefits of the Smart Highway Checklist is that it is a mechanism for the MPO and SCDOT to capture information on all of the federally funded and regionally

significant projects within their geographic area for analysis. The Smart Highways Analysis is proposed by SCDOT and SCDHEC to be completed by Summer 2005.

XIII. Coordination between SCDOT and SCDHEC

Coordination on air quality analysis is currently been done on two levels in South Carolina. First, York County is the only area in SC that will require a full conformity finding. There is an alliance with all of the counties included in the Charlotte urbanized area (including York County) that are developing a consolidated long-range transportation plan. This alliance (SCDOT, RFATS, FHWA, EPA, and SCDHEC) is planning to complete the conformity finding by May 2005. SCDHEC's role in the alliance is to perform the mobile modeling, SCDOT's role is to perform the traffic modeling and plan development and finally RFATS role is to complete the written conformity report.

Anderson, Greenville, Spartanburg and Columbia are designated as non-attainment, but fall under the Early Action Compact (EAC). SCDHEC, in cooperation with SCDOT and other state and federal agencies and local governments in non-attainment areas, have developed a State Implementation Plan (SIP) to reduce air pollution and help these areas attain the new ozone standard. A complete conformity finding is not required on their long-range plans, but the "Smart Highway" process is proposed for these areas. Smart Highways is basically an abbreviated conformity analysis to show that air quality is considered in the planning process.

SCDOT and SCDHEC have frequently had opposing roles on issues and have often viewed each other as adversaries. This issue will provide the opportunity for a collaborative effort to protect the human and natural environment as well as enhance the transportation infrastructure of the state. There is currently one interagency committee that includes SCDOT,

MPOs, FHWA, EPA, and SCDHEC that meets on EAC and other air quality issues. There are opportunities for closer coordination and collaboration between the agencies through including each other and participating in standing committee meetings within each agency.

XIV. Conclusion and Recommendations

Because of the impending effect of the revised Air Quality regulations promulgated by EPA on the transportation projects in the non-attainment areas of the state, SCDOT and SCDHEC should work together to develop and implement a transportation infrastructure management plan that is beneficial to the human and natural environment. Federal money is directly tied into the issues of Air Quality and Transportation Issues. By working smarter, we can reduce the amount of pollution created from automobiles and reduce the possibility of restricting federal money for transportation issues.

Since a large component of the ozone problem in the Upstate is attributable to the automotive emissions, the planning and implementation of congestion and capacity management type projects to avoid excessive delay may aid in reducing the automotive emissions. Continued and enhanced interagency consultation is needed between SCDOT, SCDHEC, Federal Highway Administration (FHWA), Federal Transit Administration (FTA) and EPA.

Additionally, the establishment of an overall master plan will also provide guidance and allow concerted improvement efforts with regards to the state's transportation infrastructure. This overall master plan should include all of SCDOT's transportation improvement projects, not just the MPO and COG projects. SCDOT is staffed with competent and well-trained employees who have the ability to identify, plan and coordinate the infrastructure improvement needs of the state. Through the establishment of an overall master plan, the state's limited financial resources could be coordinated and managed in an enhanced manner. This enhanced coordination and

planning could also aid in solving the current "Who's on First?" dilemma the agency faces when questions are raised about a potential project.

The transportation master plan should also ensure that a comprehensive set of potential impacts, such as environmental protection and enhancement, energy conservation, and quality of life improvement are identified and considered prior to making investment decisions. This concept reinforces the importance of understanding the link between transportation and air quality planning.

SCDOT and SCDHEC are two large sister agencies within the state that seemingly have different roles and missions. However, at the end of the day, both SCDOT and SCDHEC are aiming to improve the quality of life of the citizens of the state of South Carolina. Cooperative and collaborative projects such as Air Quality analysis are just the tip of the iceberg of potential partnering projects between the two agencies. Water quality is the next item on the horizon for a major partnering opportunity between the two agencies.

SCDOT and SCDHEC should take advantage of every opportunity in state government to build professional relationships between staff members. The Certified Public Manager program, as well as other leadership programs within state government, has produced lasting friendships and cooperative professional relationships that can only benefit and aid both agencies in the future. The concept of SCDOT and SCDHEC partnering together on a CPM Project was surprising to many people, but is an example of the type of leadership and initiative that is needed to advance the missions of both agencies and protect the interests of the citizens of the state of South Carolina.

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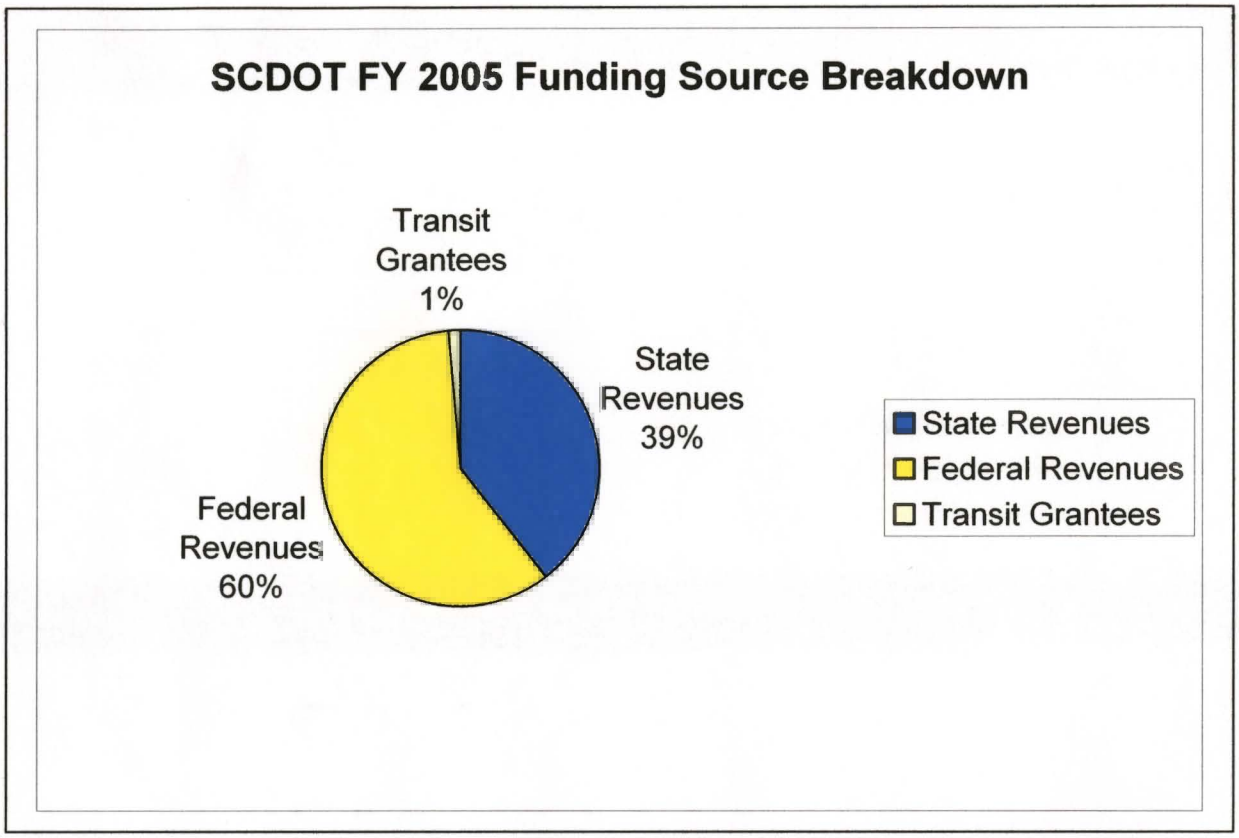
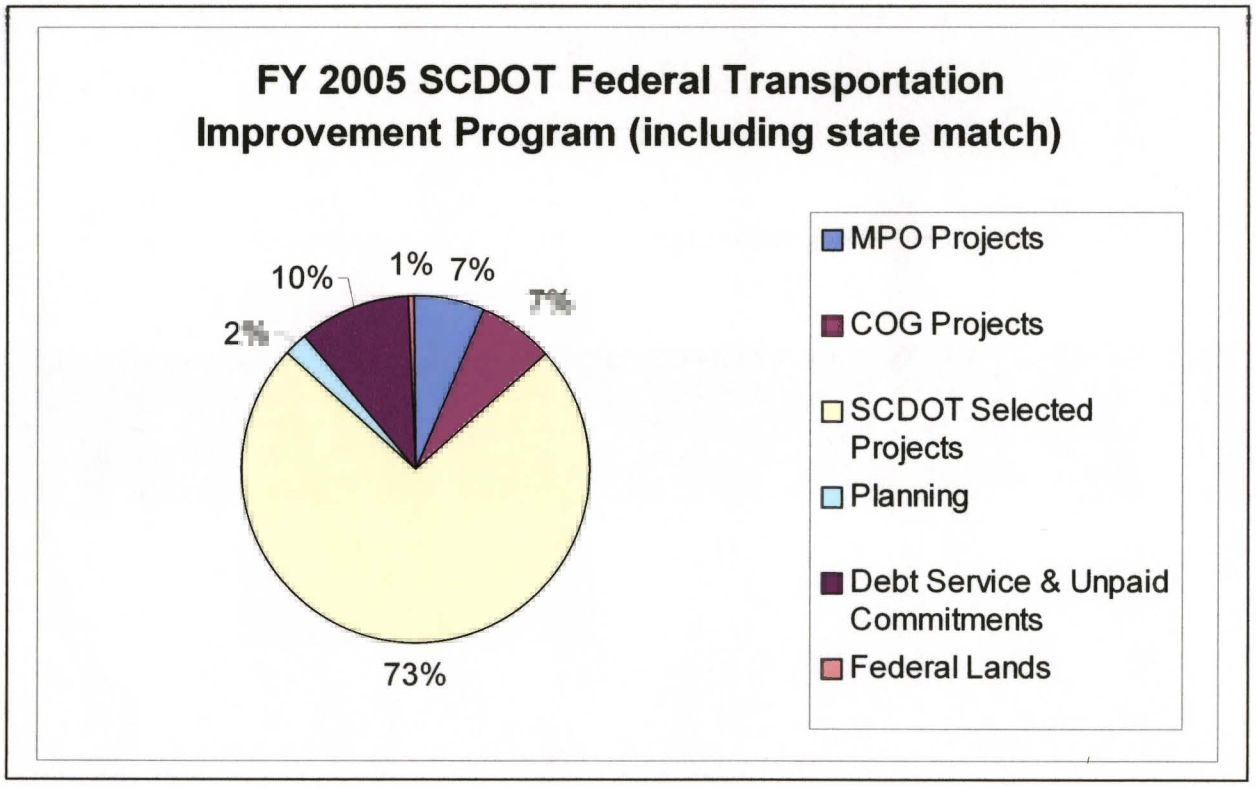
Appendix

Appendix a – SCDOT Revenues & Expenditures

SCDOT FY 2005 Estimated Revenues Federal & State Combined (in Millions)		
State Motor Fuel Tax (16 cents/gallon)	$	393.4
Interest	$	4.7
Toll Revenues	$	5.5
Misc. (permits, State Infrastructure Bank,etc)	$	47.4
Motor Vehicle Fees (20% allocation to SCDOT)	$	8.0
Carry Forward	$	4.5
Allocation from State General Fund	$	0.1
Transit Grantees	$	15.4
Federal Motor Fuel Tax (18 cents/gallon)	$	688.2
Total =	**$**	**1,167**

SCDOT FY 2005 Estimated Expenditures (in Millions)		
County Transp. Committee (CTC) Donor County Transfer	$	9.5
Transfer to State General Fund	$	4.9
Transfer to Department of Public Safety	$	1.0
Debt Service	$	11.8
Administration	$	34.0
Tolls	$	3.7
Engineering Administration	$	105.2
Land and Buildings	$	6.8
Maintenance	$	242.3
Construction	$	726.9
Mass Transit	$	21.2
Total =	**$**	**1,167**





Appendix b – Level of Service

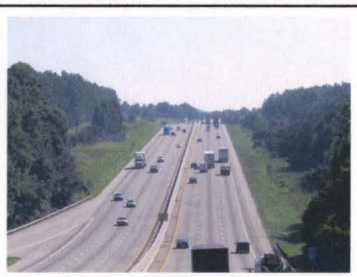
Level of Service (LOS) is a measurement used in transportation planning that describes the operating condition of a traffic stream. It is comprised of items such as speed, travel time, freedom to maneuver, traffic interruptions and comfort. It ranges from LOS A (free-flow) to LOS F (heavy congestion)

LOS A
Free flow, unaffected by other drivers.

LOS D
Unstable flow. High passing demand.

LOS B
Reasonably free flow, slightly affected by other drivers.

LOS E
Unstable flow at capacity of roadway.



LOS C
Constant flow below speed limit.

LOS F
Heavy congestion with poor travel time.

Appendix c – Early Action Compact State Implementation Plan (SIP)

c.1. Executive Summary

On July 19, 2002, the United States Environmental Protection Agency (EPA) endorsed a protocol for developing voluntary 8-hour ozone Early Action Compacts (EACs). EPA's stated purpose for the EAC process is to provide local areas with flexibility to control air emission from their sources and offer a means to achieve cleaner air sooner than the Clean Air Act requires. Only areas that are attaining the 1-hour ozone standard are eligible to participate in the EAC process. The compact requires these areas to attain the 8-hour ozone standard by December 31, 2007, a date that is sooner than would otherwise be required through the traditional nonattainment designation process.

The compacts include all necessary elements of a comprehensive air quality plan, but are tailored to local needs and driven by local decisions. As a result of an area's participation, the EAC process calls for EPA to recognize the area's commitment to early action by provisionally deferring the effective date of the nonattainment designation. The deferral of the effective date of the designation is contingent upon the participating area's meeting all terms and key milestones of the compact. Further, the process provides for "fail-safe" provisions for the area to revert to the traditional process if specific milestones are not met.

In December 2002, the South Carolina Department of Health and Environmental Control (SCDHEC) entered into compacts with EPA and local governments for the purpose of bringing cleaner air sooner to the citizens of South Carolina. Forty-five of forty-six counties signed compacts and they were grouped into the ten areas listed below:

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

Since that time, SCDHEC has been meeting with local governments, industry representatives, environmental groups, and other interested parties, to develop state-wide regulations and assist in the development of local ozone reduction strategies to fulfill the commitments under the compacts. In accordance with the EAC process, on March 31, 2004, SCDHEC submitted the final local early action plans to EPA. Based on this submittal and the EAC areas' continuing efforts, EPA published the first deferral of the effective date of the nonattainment designations on April 30, 2004. This final rule defers the effective date of nonattainment designations until September 30, 2005. In accordance with the compact requirements, SCDHEC has provided a final EAC SIP by December 31, 2004, consisting of local plans, all adopted control measures, and a demonstration that the areas will attain the 8-hour ozone standard by December 31, 2007.

c.2. Early Action Compact Requirements

The compacts that were signed by the SCDHEC, EPA, and local governments in December 2002, specify the requirements that must be met by participating EAC areas.

These requirements are as follows:

- Milestones and Reporting
- Emissions Inventories
- Modeling
- Control Strategies
- Maintenance for Growth
- Public Involvement

The SIP submittal provides detailed discussions and documentation to support how the State and local areas have met their commitments with respect to the compact requirements.

c.3. Modeling Results

One of the key requirements of the EAC process is that areas attain the 8-hour ozone standard by December 31, 2007, and beyond. For a monitoring site to pass the attainment test, the three-year average of the annual fourth highest 8-hour ozone concentration must not exceed 84 parts per billion (ppb). The three-year average is based on monitoring results for the years 2005, 2006, and 2007. Modeling indicates that the 2007 estimated design values for all sites are less than or equal to 84 ppb. Furthermore, the compacts require areas to address growth for five years beyond December 31, 2007, to ensure that the area remains in attainment. To demonstrate this, areas may use modeling analysis showing 8-hour ozone levels below the standard in 2012. SCDHEC conducted modeling analysis for, not only 2012, but also for 2017 and the results are that for 2012 and 2017 the estimated design values for all sites are less than or equal to 84 ppb.

c.4. Control Strategies

The modeling analysis described above demonstrates that all monitors in South Carolina will be attaining the 8-hour standard without the inclusion of measures beyond the national and regional programs already finalized. The Protocol for Early Action Compacts endorsed by EPA states that "after all Federal and State controls that have been or will be implemented by December 31, 2007, are accounted for in the modeling, the local area will identify additional local controls, as necessary, to demonstrate attainment of the 8-hour ozone standard on or before December 31, 2007." While additional control measures from local areas were not needed to attain the 8-hour ozone standard by December 31, 2007, the State and local areas continued to move forward to develop strategies to reduce emissions in South Carolina to demonstrate their commitment to the process.

The EAC process encourages state and local areas to design control strategies that best fit their specific needs. As part of this process SCDHEC began meeting in 2002 with local governments, industry representatives, environmental groups, and other state and federal agencies in an effort to develop state and local control strategies to reduce ozone precursors as part of the commitments under the compacts.

SCDHEC tackled these requirements from many different perspectives. First, SCDHEC met regularly with the local EAC areas to consult with them and provide them with assistance on developing the local plans. Second, SCDHEC formed stakeholder groups and conducted monthly meetings in an effort to develop state-wide regulations to achieve additional reductions in ozone precursors to support the EAC process. In addition, SCDHEC worked with several major NOx emission sources in critical areas to seek agreements for additional source specific NOx reductions. Also, in an effort to garner further support for the process from the state legislature and other state agencies, SCDHEC worked successfully to get a concurrent resolution passed endorsing the process. Finally, SCDHEC has conducted interagency meetings between air quality and transportation officials to develop a Smart Highways checklist to be used in transportation planning.

Most of the local measures described above are voluntary and will not be quantified, but will nonetheless have tangible benefits to air quality. For instance, with respect to the local measures, some of the strategies adopted as part of this process include anti-idling measures for county vehicles, hosting gas can exchange programs, and assigning an air quality contact for the county who is responsible for disseminating air quality information. While these measures are difficult to quantify, they will still have a positive impact on air quality and raising awareness about air quality issues. Also, most of these local areas have attained the 8-hour ozone standard but are still engaged in this process to ensure that their areas continue to support air quality improvement efforts.

Thus, SCDHEC is including all local plans to demonstrate their commitment to the process. The local measures demonstrate not only the commitment of the local areas but also the ownership that these areas are taking of this effort. They recognize the day-to-day activities that contribute to air quality. One such example of this is assigning an Air Quality Contact person in the County, responsible for disseminating the Ozone forecasts and related information on Ozone Action Days. Additionally, many counties have implemented carpooling programs and flex scheduling to coordinate with Ozone Action Days. Greenville County has committed to improving landscaping at all County facilities with the goal of improving the environment by minimizing turf areas and replacing them with shrubs, bed areas, and trees; enhance appearance; and reducing maintenance and associated costs. Greenville County, Georgetown County and Lexington County are implementing energy conservation measures to include sending reminders for employees to turn off lights and computers at the end of the day. Chester County has committed to plant 500 hardwood trees to help secure air quality and will also revise their purchasing policy to buy in bulk and reduce packaging. Georgetown County will develop a bike trail system in the county and will purchase electric cars for on site mobilizations. Sumter County will schedule maintenance activities to avoid peak time emissions during ozone alerts and has proposed changes to the current tree ordinance to protect existing trees in new developments. Many counties will consider the purchase of alternative fueled or more fuel-efficient vehicles when buying replacements. These are just a few of the behavioral changes being implemented in the counties that will provide air quality benefits now and in the future.

Among the key control strategies that were developed as part of the EAC process, were revisions to state-wide regulations for the purpose of providing additional reductions in ozone precursors. R.61-62.5 Standard 5.2, Control of Oxides of Nitrogen, and R.61-62.2, Prohibition of Open Burning, were published in the South Carolina State Register on June 25, 2004, and became effective upon publication . R.61-62.5, Standard 5.2, Control of Oxides of Nitrogen, is a newly-developed regulation that applies to new and existing stationary sources that emit or have the potential to emit NOx generated from fuel combustion. This regulation sets standards for new construction based on Best Available Control Technology (BACT) standards from the national RACT/BACT/LAER Clearinghouse.

For new sources, the regulation is primarily directed at smaller sources that fall below the Prevention of Significant Deterioration (PSD) thresholds and therefore would otherwise be exempt for NOx controls altogether. R.61-62.2, Prohibition of Open Burning, is an existing state regulation that has been revised as part of this process to seek additional NOx and VOC reductions. Specifically, the regulation was revised to clearly ban the burning of household trash statewide and therefore, in all local EAC areas. Prior to this revision, household trash was allowed to be burned when other disposal options were unavailable. Deleting this exemption removes any ambiguity in the regulation with respect to the burning household trash and will be helpful to SCDHEC with respect to the enforcement of this provision and will also help achieve addition reductions in ozone precursors. In addition, the exemption for the burning of construction waste was revised to allow only residential construction waste to be burned if certain provisions are met such as the requirement that only clean lumber be burned and only outside of the ozone season. Other construction waste that is not associated with the building and construction of one and two family dwellings is strictly prohibited.

While information pertaining to the amount of NOx and VOC reductions that are expected as a result of these regulations is provided in Attachment D, it is important to note that modeling indicates that all monitors will be attaining the 8-hour standard by 2007 even without these additional measures. However, the reductions from these regulations are quantifiable, permanent and will ensure that South Carolina obtains cleaner air sooner and helps ensure continued maintenance of the 8-hour ozone standard in the future. For example, R.61-62.5, Standard 5.2, became effective in June of 2004. Since that date, SCDHEC has permitted two 12.56mmBtu/hr boilers at the Oconee Memorial Hospital that were required to install low NOx burners as a result of this regulation. These are the types of smaller sources that would otherwise not be required to install NOx controls. Furthermore, SCDHEC has received and are in the process of permitting several additional applications from facilities that will be impacted by this regulation.

Another significant control strategy that was developed through this process is the voluntary commitments that SCDHEC has negotiated with several of the state's largest existing industrial sources to reduce and/or limit their NOx emissions. These negotiations were the direct result of the EAC process as are the NOx reductions that will result from them. These voluntary commitments are, in summary, SCE& G – Wateree in Richland County has agreed to take permit limits on two coal-fired boilers and International Paper in Richland County has agreed to take an annual allowable NOx emission reduction of 1000 tons, facilitywide. In addition, Duke Power in Anderson County has voluntarily agreed to install advanced low NOx burners on two coal-fired boilers. This is a $7 million investment by Duke Power that will result in approximately 850 tons of NOx reduced annually. Finally, as part of this process, Transcontinental Gas Pipeline Corporation (Transco) which operates the internal combustion engines at Station 140 in Spartanburg County, has agreed to begin early implementation of the NOx emission reductions required by Phase II of EPA's NOx SIP Call regulation.

In accordance with the federal requirements, Phase II is required to be fully implemented by 2007. As part of the EAC process, Transco has began engine overhauls and engine combustion modifications so that these NOx emission reductions can be fully implemented by December 2005, well ahead of the federal timeline.

SCDHEC believes that the sum of all these efforts will have a very real and positive impact on the health and environment of South Carolina. The EAC process has allowed the state of South Carolina to achieve reductions in ozone precursors from a variety of sources that otherwise would not have occurred and this was all done on a timeframe that was sooner than what would be required through the traditional non-attainment designation process. In addition, as a result of the local EAC plans and local efforts, awareness of air quality issues has been raised to a level that would not have been possible without the EAC process. People from around the state, who have never previously had any significant

exposure to air quality issues, have participated in the EAC process and helped make decisions about improving air quality. This is perhaps, above all else, the reason why the South Carolina Wildlife Federation chose to honor the "SCDHEC Early Action Compact SIP" with their 2005 South Carolina Wildlife Federation Air Conservation Award.

Appendix d - SMART HIGHWAYS Checklist

LONG RANGE TRANSPORTATION PLAN (LRTP) AND TRANSPORTATION IMPROVEMENT PROGRAMS (TIP) STATUS

_____ a. Document the date that the Metropolitan Planning Organization (MPO) officially adopted, accepted or approved the LRTP and/or TIP and completed an emissions estimate for the baseline year, attainment year, and LRTP horizon year.

_____ b. Document that the LRTP and/or TIP is financially constrained consistent with 23 CFR 450.

DEFERRED NONATTAINMENT DESIGNATION

_____ a. Document the classification for the deferred 8-hour ozone nonattainment area.

_____ b. Document that the early action compact milestones are being met.

TRANSPORTATION PLANNING AND PROCEDURE REQUIREMENTS

_____ a. Document the LRTP content and horizon years including:
- descriptions of the demographic and employment factors influencing expected transportation demand;
- descriptions of the transportation system; and
- descriptions of other transportation policies, requirements, services and activities including intermodal activities.

_____ b. Document the use of the latest planning assumptions, the source and the year of the assumptions including:
- current and future population, employment, travel, and congestion;
- changes in transit operating policies (including fares and service levels) and assumed transit ridership, if applicable; and
- assumptions for transit fares and road and bridge tolls, if applicable.

_____ c. Document the use of the latest emissions model approved by EPA, and any other air quality models used.

_____ d. Document fulfillment of public consultation requirements for the LRTP and TIP and that interagency consultation occurred.

REGIONAL EMISSIONS ANALYSIS

_____ a. Provide a table that shows the results of the emission analysis for the ozone precursors (i.e., volatile organic compounds and nitrogen oxides);

_____ b. Document all federal projects and all regionally significant non-federal projects are included in the regional emissions analysis;

_____ c. For each project, identify project type as air quality neutral or has an air quality impact, open to service date, and analysis year.

MODELING DOCUMENTATION

_____ a. Document the methodology used in the regional transportation-related emissions analysis.

_____ b. Document that the practice of the MPO to estimate vehicle miles traveled (VMT) is consistent with the practice being used to develop the VMT for the regional emissions analysis.

SPECIFIC CONSULTATION

_____ a. Document that the models and assumptions have been chosen through interagency consultation.

_____ b. Document the consultation on regional emission analysis and methodologies.

Appendix e – CPM Project Cooperation

The cooperation and coordination on this CPM Project is perhaps the greatest benefit of this research paper. The willingness of two staff members from separate, diverse state agencies to work together voluntarily is a testimony to the success of the certified public manager program for state government. The Certified Public Manager program was able to foster team building and educate the various candidates on various techniques for self and professional improvement. Because of the relationships established in the Certified Public Manager program, the concept to develop a joint CPM project between SCDOT and SCDHEC came naturally to the two candidates.

Summarized below is the general timeline and steps taken to complete this project:

- August 9 2004 – SCDOT submitted a research proposal regarding Air Quality & Transportation.
- August 9 2004 – Research proposals were discussed in CPM class. Following this class, the concept to develop a joint project materialized.
- August 24 2004 - Joint research proposal developed and submitted. Received Approval for project topic.
- August 2004 - Began data gathering and researching topic by each discipline:
    - SCDHEC gather info on air quality regulations and revisions
    - SCDOT gather info on projects, programs and funding
- Oct 14 2004 – Utilized the Project Session date to continue gathering data and discussing project.
- Nov 1 2004 – Telephone conference between the candidates to discuss progress and direction on the project. Continued data gathering and researching.
- Nov 2 & 3 2004 – utilized lunch periods from CPM class to discuss the project.
- Dec 1 2004 – Project Session - Met in person at SCDHEC's Aiken office to discuss project, review material and set path forward.
- Dec 1 2004 - Teleconference with CPM Project Coordinator regarding project scope and schedule.
- Dec 3 2004 - Met with CPM Project Coordinator
- Dec 10 2004 – Initial Drafts of each component shared with each other.

- Jan 7 2005 - Scheduled to meet at SCDOT Greenwood Office – this meeting was cancelled due to Graniteville train collision.
- Jan 19, 2005 - Final Drafts of each component shared with each other.
- Jan 23 2005 - Individual components merged into a single document.
- Week of Jan 24 2005 - Draft combined paper proofed and modified by each candidate via email and telephone.
- Jan 26 2005 - Executive Summary prepared and submitted to agency management for approval.
- Jan 28 –31, 2005 -Final touches (graphics and formatting) done on paper collaboratively.
- Feb 1 2005 - Final proof reading and printing of project paper.
- Feb 2005 - Received approval from each agency executive director to submit the joint CPM project.