South Carolina
Department of Transportation

U.S. Department
of Transportation

Federal Highway Administration

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The Center for Community Growth and Change

SUMMARY REPORT

Report No. FHWA–SC–04–02
April 2004

South Carolina
Department of Transportation
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Meeting Air Quality Conformity Standards Through Alternative Scenarios in the Transportation Modeling Process

The goal of the SC Intermodal Transportation Plan is to maintain conformity with National Ambient Air Quality Standards (NAAQS). Air Quality is one measure of the high quality of life South Carolinians enjoy and expect. Currently, the state of South Carolina is faced with the dilemma of maintaining its air quality while accommodating increasing population growth. The lowering of several National Ambient Air Quality Standards exacerbates this issue. Presently, there are several metropolitan areas in this state that are threatened with non-attainment to NAAQS on one or more criteria pollutants. While South Carolina will not lose Federal money if areas are unable to demonstrate conformity with the attainment standards, areas that cannot demonstrate conformity will be restricted in the types of transportation projects that can proceed until a conformity designation is made.

The South Carolina Department of Transportation has made highway safety a top priority in its current strategic plan. Yet, since 1997, the state's collision rates and fatality rates have begun to rise. According to the SC Intermodal Transportation Plan, "some of this increase may be attributable to continuing rapid growth in vehicle miles traveled, which is causing more routes to operate under more congested conditions for longer periods of the day. Residential growth in the rural fringes around metropolitan areas may also play a role, as this growth puts more traffic on the types of roads which produce the highest fatality rates."[1]

From 1990-1999, traffic density in South Carolina increased by 45 percent. Population growth explains about half of the increase.[2] The other half of the increase was related to growth in vehicle miles of travel per person. Per capita travel is increasing in part due to low-density urban growth patterns and increases in long-distance commuting. This decentralized land use requires drivers to travel further between destinations and propels the increase in vehicle miles traveled. The more miles traveled, the more pollutants are exhausted into the air, thereby threatening air quality in our state.

The South Carolina Department of Health and Environmental Control Bureau of Air Quality has been working with South Carolina counties to sign an Early Action Compact that will, in effect, bring about a pro-active response to dealing with air quality. The Early Action Compact (EAC) will bring the non-attainment areas back to attainment by 2007 rather than 2010. However, the areas will still be designated according to their effective date of non-attainment designation. Attainment designation requirements will be deferred as long as all EAC terms and

[1] Ibid. Page 2-9.
[2] South Carolina Department of Transportation, August 21, 2001, DRAFT South Carolina Intermodal Transportation Plan, page 2-6.

milestones are met by the areas in non-attainment. Forty-five of South Carolina's forty-six counties have signed the compact. During the summer of 2003, SCDHEC submitted a draft of the strategies counties are proposing to deal with air quality issues. The state Early Action Plan was due by August 31, 2003. If any of EPA's deadlines are not met, non-attainment designation will proceed as originally scheduled.

Part of the Early Action Compact will be to introduce strategies for reducing air pollutants from mobile sources. The purpose of the research project was to introduce and test a new GIS-based transportation modeling software and to use that software to explore alternative strategies for reducing vehicle miles traveled and thereby improve air quality. During the course of this research, the Center for Community Growth and Change has:

- Acquired a new GIS-based transportation modeling software, TransCAD,
- Converted the Spartanburg County Transportation Model from TRANPLAN to TransCAD and compared the output for accuracy, ease of use and the clarity of the reported results,
- Developed eight alternative transit and land use density scenarios,
- Modeled the alternative scenarios, and
- Tested the output of the model under the various scenarios to determine the effects of the different alternatives on the number of vehicle miles traveled (VMT) in the MPO and the resultant Air Quality impacts.

The research demonstrates that as the land use density increases, vehicle miles of travel decrease. If transit is introduced, VMT further declines. As VMT decreased, air quality improved because fewer pollutants were emitted. However, the changes to VMT and air quality were somewhat marginal. In part this is a function of the reality that about 80 percent of the development expected in 2025 exists now, and this development is dispersed in population centers around the county. Filling in additional density within these centers does not eliminate the travel between dispersed population centers. As a result of these constraints, increased density and transit usage levels in our most aggressive scenario could not bring Spartanburg's air quality back into compliance because all scenarios involved an increase in VMT over year 2000 levels. However, EPA Mobile 6 model did not account for the possible emission reductions due to cleaner burning vehicles and low sulfur fuel. It specified the fuel sulfur content at 30 ppm. Fortunately, increased density and transit use did reduce VMT and improve air quality over less dense and lower transit usage scenarios.

This research is in response to a demonstrated need by the SCDOT to produce modeling outputs that are understandable to elected officials and the public. It is also in response to the need for demonstrating the potential effects of alternative mass transit uses and development patterns on future infrastructure needs and on air quality. Overall, the research showed that as density increased, vehicle miles travels (VMT) decreased, with a corresponding decrease in pollutant emission. The research and the new software will allow the SCDOT to be responsive to municipalities by providing likely transportation and air quality outcomes of locally adopted land use plans and by demonstrating the effects of different mass transit scenarios on road usage and air quality in specific areas.