

Greenwood Thoroughfare Plan

Needs Through the Year 2020



Prepared by the South Carolina Department of Transportation In
Cooperation With The Greenwood City/County Planning Department
And The Federal Highway Administration

July 2000

THOROUGHFARE PLAN
FOR
GREENWOOD COUNTY

Prepared by the South Carolina Department of Transportation
Statewide Planning / Preconstruction Division

In Cooperation with Greenwood City/County Planning Department
and the Federal Highway Administration

August 2000

Acknowledgements

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TABLE OF CONTENTS

Section 1. Introduction	
Purpose and Scope.....	1-1
Background.....	1-2
Transportation Planning Process.....	1-2
MPO Consideration.....	1-2
Section 2. Socioeconomic Trends	
Study Area Boundary.....	2-1
Socioeconomic Data.....	2-1
2020 Growth Allocation.....	2-5
Section 3. Existing Roadway System	
Road Inventory.....	3-1
Traffic Signal Inventory.....	3-1
Bridge Inventory.....	3-1
Pavement Conditions.....	3-2
Recent Improvements.....	3-2
Travel Patterns.....	3-3
Vehicle Miles of Travel.....	3-3
Growth Corridors.....	3-3
Traffic Accidents.....	3-5
Section 4. Transportation Model	
Modeling Process.....	4-1
Basic Data Inputs.....	4-1
Calibration and Validation.....	4-2
Trip Generation, Trip Distribution, Trip Assignment.....	4-2
Calibration Results.....	4-4
1997 Deficiencies.....	4-4
Forecasting Future Traffic.....	4-4
Existing Plus Committed Network.....	4-5
Travel Patterns for 2020.....	4-5
Future Deficiencies.....	4-6
Proposed Roadway Improvements.....	4-7
Evaluation of Alternative Networks.....	4-9
Measures of Effectiveness.....	4-13

Section 5. Environmental and Cultural Resources Considerations	
Social and Economic.....	5-1
Recreational and Scenic Resources.....	5-1
Historic and Archaeological.....	5-2
Threatened and Endangered Species.....	5-3
Hazardous and Solid Waste Sites and Facilities.....	5-4
Hydrology and Wetlands.....	5-4
Section 6. Plan Recommendations	
Financing.....	6-1
Alternative Financing.....	6-2
Project Cost Estimates.....	6-4
Project Ranking.....	6-4

APPENDICES

APPENDIX A:	Project Summary Sheets
APPENDIX B:	Project Ranking Form
APPENDIX C:	Table 1 – Summary of Projects from 1974 Transportation Study Table 2 – Greenwood School Enrollment Table 3 – Socioeconomic Data by Census Tract Table 4 – Major Road Improvements 1988-1998
APPENDIX D:	Table 1 – Distribution Rate Table Table 2 – Trip Generation Regression Equations Table 3 – V/C Ratios – Level of Service Table 4 – Comparison of Measures of Effectiveness
APPENDIX E:	Table 1 – Upper Savannah Project Acceleration Program Table 2 – COG/MPO Funding Comparison
APPENDIX F:	Project Cost Estimates

LIST OF FIGURES

1.1	Plan Development Process.....	1-1
2.1	Study Area	2-2
2.2	Development Trends.....	2-7
2.3	Population Density.....	2-8
2.4	Employment Density.....	2-9
2.5	Retail Density.....	2-10
3.1	Greenwood Centerline Miles.....	3-1
3.2	Census Mode Choice.....	3-3
3.3	1990-1997 Traffic Growth Trends.....	3-4
3.4	1998 Total Traffic Accident.....	3-6
3.5	1998 Traffic Accident Rate.....	3-7
4.1	E and C Network Level-of-Service.....	4-8
4.2	Greenwood Thoroughfare Plan.....	4-10
5.1	Minority Population by Census Block.....	5-6
5.2	Income by Census Block.....	5-7
5.3	Parks and Recreation.....	5-8
5.4	Historic Properties.....	5-9
5.5	Species of Concern.....	5-10
5.6	Waste Sites and Facilities.....	5-11
5.7	Flood Prone Areas.....	5-12
6.1	Construction Program Funding.....	6-1

LIST OF TABLES

2.1	Population Growth.....	2-3
2.2	Employment Growth.....	2-3
2.3	Employment by Sector.....	2-4
2.4	School Enrollment.....	2-5
2.5	Summary of Planning Data.....	2-5
3.1	Deficient Bridges.....	3-2
3.2	Obsolete Bridges.....	3-2
3.3	Substandard Pavement.....	3-2
3.4	Travel Patterns – 1990 Journey to Work.....	3-3
3.5	Population and VMT Growth.....	3-3
3.6	High AADT Locations.....	3-5
3.7	Accident locations by Road Segment.....	3-5
3.8	Accident Locations by Intersection.....	3-5
4.1	External Stations.....	4-3
4.2	Calibration Results.....	4-4
6.1	MPO Population and Funding.....	6-2
6.2	Project Sales Tax Revenues.....	6-3
6.3	Cost Estimates and Project Priority.....	6-4

Purpose and Scope: The Greenwood Transportation Plan is a twenty-year roadway plan that identifies potential improvements as a result of capacity deficiencies and local priorities. The Plan provides the technical analysis and planning basis for elected officials and community leaders to make informed decisions on future roadway investment.

In January of 1999, the Greenwood City/County Planning Department contacted the South Carolina Department of Transportation to develop a transportation plan and travel demand model for Greenwood County. The need for such a plan was recognized during the comprehensive planning process where the following specific transportation goals were identified under the community facilities element:

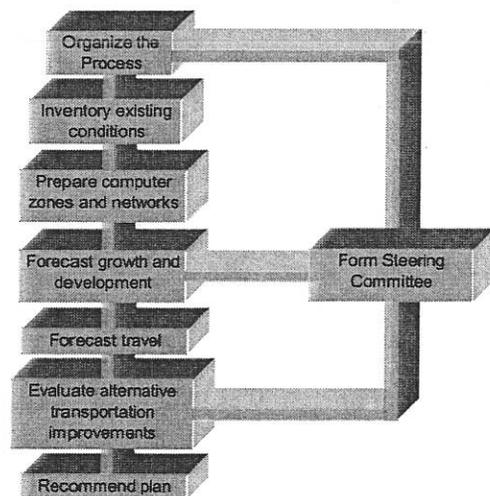
- Coordinate with local governments, the South Carolina Department of Transportation and the regional council of governments for current and future needs of the transportation system.
- Develop a county-wide, comprehensive transportation plan with a prioritization list of road upgrades and funding options for implementation.
- Target roadway improvements north of Highway 72 West and Highway 34 East.
- Provide east-west highway linkages south of the airport and in Uptown Greenwood.
- Identify the regional and local need to four-lane Highway 72 in Abbeville and Laurens Counties.

- Obtain accurate census counts in 2000 in order to become designated as a Metropolitan Planning Organization (MPO).

The Greenwood Thoroughfare Plan covers four components: the assessment of socioeconomic data and forecasts; a review of existing roadway conditions and travel patterns; the evaluation of future deficiencies and potential improvements; and finally, a review of environmental and social constraints, costs, and priorities. The Thoroughfare Plan focuses primarily on highway needs and is intended to be one element of a comprehensive transportation plan that addresses the needs of all transportation modes in the area.

The Greenwood Thoroughfare Plan was developed using a traditional transportation planning process that relied on input and guidance from a local steering committee.

**Figure 1.1
Greenwood Plan Development Process**



Background: In 1973, the South Carolina Department of Transportation developed the original transportation plan for Greenwood County. The original plan focused primarily on the road system within the immediate urbanized area and the city of Greenwood where the majority of population and employment base resided.

The 1973 plan used a travel demand model to assist in identifying future roadway needs. Based on future land use assumptions, a travel demand model is an effective tool used to identify potential deficiencies as a result of congestion and travel patterns. A travel demand model can also be used to test the effectiveness of improvements such as a road widening or new road alignment. A listing of the deficiencies identified in the original plan is included in Table 1, Appendix C.

As in most communities, over the last several decades Greenwood's population and employment growth has extended into the suburban areas of the county. As a result of this growth, internal travel patterns in Greenwood have changed since the 1970's. In addition, the success in employment growth has also made Greenwood an employment destination for the Upper Savannah Region.

Since the original plan was done, no major updates have occurred. As a result of growth and changes in development patterns, many of the recommendations and planning assumptions are no longer valid.

Transportation Planning Process: The current process for selecting and funding transportation improvements with federal dollars in Greenwood County

falls under the rural Council of Governments (COG) share program. Administered through the Upper Savannah Council of Governments, projects for the region are solicited and funded based on priority. Potential projects are identified based on input from the COG Board. Quantifiable data such as traffic counts and accident information are used to evaluate the need for improvements. A subjective analysis of a project's influence on economic development is also considered. Under this process, there is no technical mechanism to evaluate the impacts of future growth, or to test the effectiveness of planned improvements within the overall transportation system.

MPO Considerations: Based on the outcome of the 2000 Census, the Greenwood urbanized area may be designated as a Metropolitan Planning Organization. Under current federal transportation legislation, the Transportation Equity Act of the 21st Century (TEA-21) requires urbanized areas of 50,000 or more to initiate a continuing, comprehensive, and cooperative transportation planning process in order to receive federal aid for highway projects. The planning requirements for MPOs include the development of a 20-year, financially constrained plan that addresses specific planning requirements and is subject to a public involvement process.

In the event that Greenwood becomes an MPO, the Greenwood Thoroughfare Plan addresses many of the planning requirements specified in TEA-21. In addition, the update of the travel demand model for Greenwood County provides the area with the same modeling capabilities currently utilized by all 10 MPOs in South Carolina.

Socioeconomic Projections and Trends

Study Area Boundary: The first step in developing the travel demand model for the Greenwood area was defining the study area limits. In the original study, the project limits reflected the immediate urbanized area surrounding the city of Greenwood.

In defining the new study area, consideration was given to current development patterns, as well as projected growth areas. The goal in defining the study area was to capture the highest concentrations of population, employment, and retail activity within the county over next twenty years.

The new study limits include all of Greenwood County with the exception of the extreme southern portion of the county. The study area includes unincorporated areas of the county, as well as the city of Greenwood, the town of Hodges, Ninety-Six, and Ware Shoals. In general, the southern boundary follows Aull Mill Road, Enoree Church Road, McKenzie Road, McFerrin Road, and Greenwood Mills Farm Road. The new study area is approximately 273 square miles, or 60% of the total county area. Figure 2.1 illustrates the boundaries.

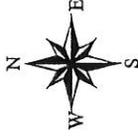
Although the southern portion of the county was not included in this study for the purpose of traffic modeling, the area is represented in the Upper Savannah Council of Governments Rural Travel Demand Model.

Socioeconomic Data: To reflect development patterns in Greenwood, special emphasis was placed on the compilation of population and other socioeconomic variables. For the complete study area, staff collected quantitative information regarding population, dwelling units, registered vehicles, employment, retail square footage, and school attendance. The socioeconomic data was collected from several sources, such as the Greenwood City/County Comprehensive Plan, 1990 Census Data, South Carolina Employment Security Commission, Greenwood Tax Assessor, Greenwood Chamber of Commerce, local school districts, Lander University and Piedmont Technical College.

The Greenwood travel demand model is based on a 1997 base year and a forecast year of 2020. The base year data is used in the calibration of the model. The model output for 1997 can be compared to actual traffic counts to determine the accuracy of the model and identify any areas that need refinement. When the model accurately estimates 1997 traffic, it is assumed that the 2020 model will produce reliable trip estimates.

The importance of socioeconomic data is reflected in the process of trip generation. The total number of trips estimated by the model is a direct function of the current and future land use characteristics of the area.

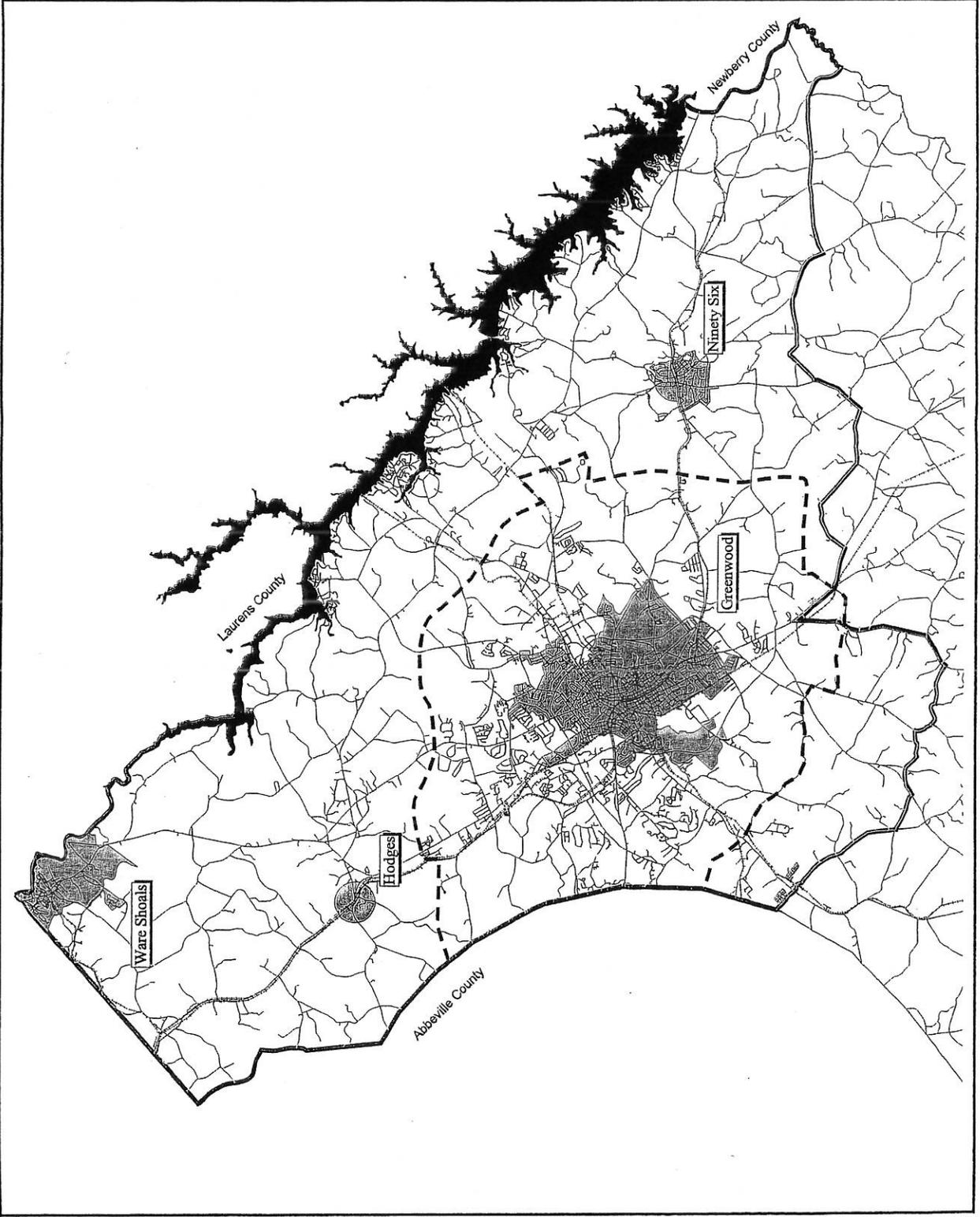
Figure 2.1
Greenwood Study Area
New Study Limits vs.
Original Study Limits



 Original Study Area
 Revised Study Area
 City Boundaries



Data Source: Census Tiger Data
 Produced by SCDOT Planning December 1999



Population

Greenwood County's population has continued to increase at a moderate rate over the last several decades. Table 2.1 reflects population growth from 1930 to 1990.

Table 2.1
POPULATION GROWTH
1930-1990

Year	Population	#Increase	%Increase
1930	36,078		
1940	40,083	4,005	11%
1950	41,628	1,545	4%
1960	44,346	2,718	7%
1970	49,686	5,340	12%
1980	57,847	8,161	16%
1990	59,567	1,720	3%

Source: US Census

Greenwood County, in comparison with other counties in South Carolina, has a relatively low population density. Pockets of more dense development are found within the urbanized area boundary as delineated within the City/County Comprehensive Plan and within the township boundaries. Present growth trends show increases in population within the southwestern and northwestern urban areas outside the city of Greenwood.

To establish a 1997 population total for the study area, the Greenwood Planning Department evaluated residential building permit activity to account for growth since the 1990 Census. After reviewing existing population densities, it was determined that the study area population represents 95% of the county total or 61,840.

Population Projections

The number of residents in Greenwood County by the year 2020 is projected to be 77,694, with a study area projection

of 73,809 (Greenwood Comprehensive Plan). The projected population for Greenwood County represents 34% of the total projected population for the six county region.

Employment and Retail

The total employment for Greenwood County in 1997 was 33,400 (South Carolina Employment Security Commission). The study area estimate is the same as the countywide total since less than 1% of the employment is located outside of the study area. Table 2.2 shows that employment for Greenwood County has continued to increase since the early 1990s, with the exception of 1995-1996. The decline in employment for this period can be attributed to losses in the construction and service sectors.

Table 2.2
EMPLOYMENT GROWTH
1993-1997

Year	Employees	# Increase	%Increase
1993	29,920		
1994	30,880	960	3.2%
1995	32,640	1,760	5.7%
1996	32,520	-120	-0.4%
1997	33,400	880	2.7%

Source: SC Employment Security Commission

In 1997, Greenwood County had 12,480 jobs or 37% of the total labor force in manufacturing. The high percentage of manufacturing positions can be attributed to such large employers as Greenwood Mills, Fuji, Solutia, Capsugel/Warner Lambert, Cutler-Hammer, and Kemet.

The manufacturing sector has had a strong presence in Greenwood County since the early 1900s, and continues to be the predominate employment sector for the area. This trend is somewhat counter to state and national trends that have seen significant shifts from

manufacturing to more service-related sectors. Table 2.3 presents the employment totals by work sector for Greenwood County.

Table 2.3
EMPLOYMENT BY SECTOR
1997

<i>Industry</i>	<i>Employees</i>	<i>Percent</i>
Manufacturing	12,480	37%
Construction	1,420	4%
Transp/Utilities	730	2%
Wholesale/Retail	6,930	21%
FIRE	720	2%
Services	5,200	16%
Government	5,920	18%
<i>Total</i>	33,400	100%

Source: SC Employment Security Commission

Employment Projections

Unlike population data that has a variety of sources for projections, 20-year forecasts for employment at the county level are typically not available. To establish a control total for employment in the year 2020, a ratio was used based on the relationship between employment and population totals for 1997. The 1997 employment/population ratio applied to the projected 2020 population yields a future employment estimate of 39,864.

Retail Square Footage

The retail component of trip generation has become an increasingly important aspect of travel as the share of non-work trips continues to increase.

The retail input for the Greenwood travel demand model is retail square footage. Retail square footage was chosen over retail sales data because sales data is generally more difficult to obtain. The total retail square footage in 1997 was 4,848,668 (Greenwood Tax Assessor). Although there is no trend information on retail square footage for Greenwood

County, assuming a strong correlation with retail sales, retail activity has grown at a 5% annual rate from 1990 to 1997 (S.C. Department of Revenue).

Retail Projections

The same methodology used to establish a control total for employment was also used to establish the control total for retail square footage. The 1997 retail square footage/population ratio was applied to the 2020 population projection to generate a future estimate of 5,787,117 retail square feet.

School Enrollment

Greenwood County is divided into three school districts. In 1997, the three districts operated 11 elementary schools, 5 middle schools, and 4 high schools. There are 3 private schools that offer K-12 programs.

Over the last ten years, Piedmont Technical College has continued to grow and has the fourth highest enrollment increase of the 16 technical schools in the state. The College has recently completed the construction of several new buildings and additions to the original campus. In the future, there are additional expansions planned for facilities and parking. The school offers training and educational programs that provide skilled labor to many of the local industries.

Lander University is a four-year public university located in the downtown area. The student population has consistently increased over the past ten years. Many of the students live in on-campus housing or other housing facilities and apartments located in the area. Future transportation issues for the campus include improved pedestrian and bicycle linkages to off-campus housing and

improving the current entrance to the campus off of Calhoun Street.

School Enrollment Projections

Each school district, along with Piedmont Technical College and Lander University maintains long-range facility plans. The enrollment projections from each facility's plan were extrapolated to the year 2020. Table 2.4 highlights high growth schools based on 2020 enrollment projections. A complete listing of school enrollment data is included in Table 2, Appendix C.

Table 2.4
GREENWOOD SCHOOL ENROLLMENT
SCHOOLS WITH 20% OR MORE GROWTH
IN ENROLLMENT

<i>Schools</i>	<i>1997 Enrollment</i>	<i>2020 Enrollment</i>	<i>Growth 97 to 20</i>	<i>Annual Growth</i>
Pinecrest Elementary	439	541	23%	1.0%
Springfield Elementary	400	550	38%	1.6%
Ninety Six Middle	304	409	35%	1.5%
Emerald High School	656	1,016	55%	2.4%
Greenwood High School	1,277	1,613	26%	1.1%
Ninety Six High School	400	565	41%	1.8%
Ware Shoals High School	527	644	22%	1.0%
Cambridge Academy	373	499	34%	1.5%
Piedmont Tech	3,415	4,090	20%	0.9%

Source: Greenwood School Districts 50,51,52; private academies; Piedmont Technical College; and Lander University.

2020 Growth Allocation: The following section presents the methodology used to allocate future population, employment and retail square footage to the year 2020. All of the projections used in Greenwood travel demand model are consistent with the type and density of development as defined by the Greenwood Comprehensive Plan. Table

2.5 shows the totals for each variable used in the Greenwood Transportation Model.

Table 2.5
SUMMARY OF PLANNING DATA

<i>Variables</i>	<i>1997</i>	<i>2020</i>
<i>Population</i>	61,840	73,809
<i>Dwelling Units</i>	25,410	30,328
<i>Employees</i>	33,400	39,864
<i>Vehicles</i>	49,072	58,570
<i>School Enrollment</i>	17,605	20,809
<i>Retail Sq. Ft.</i>	4,848,668	5,787,117

For the purposes of travel demand modeling, the study area was divided into 142 traffic analysis zones (TAZ). The basic zone structure from the original study was maintained, with the exception of zones that were split by census tracts. In those cases, minor adjustments were made to the zone boundaries. There are 24 additional zones compared to the 1970 study to account for the expanded study area.

Before 2020 projections were made by TAZ, control totals were established by census tract. Rather than allocating the projected growth of the entire study area to the individual TAZs, the allocation process worked from the census tract control totals to the zones within the tract. This simplified the overall process of allocating growth by TAZ.

Within each census tract, every TAZ was evaluated based on current densities, growth trends, future land use plans, land availability, and future water and sewer capacity. The projected growth was allocated to each TAZ based on all the factors considered until the census tract control total was reached. The socioeconomic projections by census tract are included in Table 3, Appendix C.

As noted previously, Greenwood County's recent growth has been

primarily in the unincorporated areas of the county. Over the next two decades, population growth is expected to continue in the unincorporated areas such as around Ware Shoals, the Lake Greenwood vicinity, and in the southwest area along the SC 10 corridor. Significant future residential developments such as Hunter's Creek Subdivision and Maxwell Springs Subdivision were also included in the growth projections. Figure 2.2 illustrates future development assumptions.

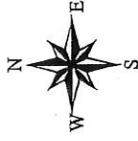
According to the US Census Bureau, urbanized areas are defined as having 1,000 people or more per square mile. Based on this threshold, the 2020 projections reflect additional urbanized areas along the SC 72 Bypass west of the Greenwood City limits. Figure 2.3 illustrates current and projected population densities.

Concentrations of employment growth are expected to continue along the SC 246 corridor with planned expansion at Fuji and Solutia. Industrial development potential was accounted for along Emerald Road and SC 225. Figure 2.4 illustrates current and projected employment growth.

Commercial development is projected to continue along US 25 Bypass with infill and redevelopment opportunities between US 221 and SC 254. The area west of US 25 along the bypass has seen the majority of recent large-scale retail development. Retailers such as Wal-Mart and Lowe's have located in the corridor and their presence has attracted additional retail development along with a large cinema theater. In 1997, the occupancy rate at the Greenwood Crosscreek Mall was approximately 50%. With future plans for renovation and recruitment of new retailers, an 85% occupancy rate was assumed for 2020.

Overall, the commercial corridors and location of retail uses in 1997 and 2020 are comparable. Figure 2.5 illustrates the current and future commercial activity.

Figure 2.2
Development Trends and Future Growth Considerations
Greenwood Study Area



Data Source: Census Tiger Data
 Produced by SCDOT Planning December 1999

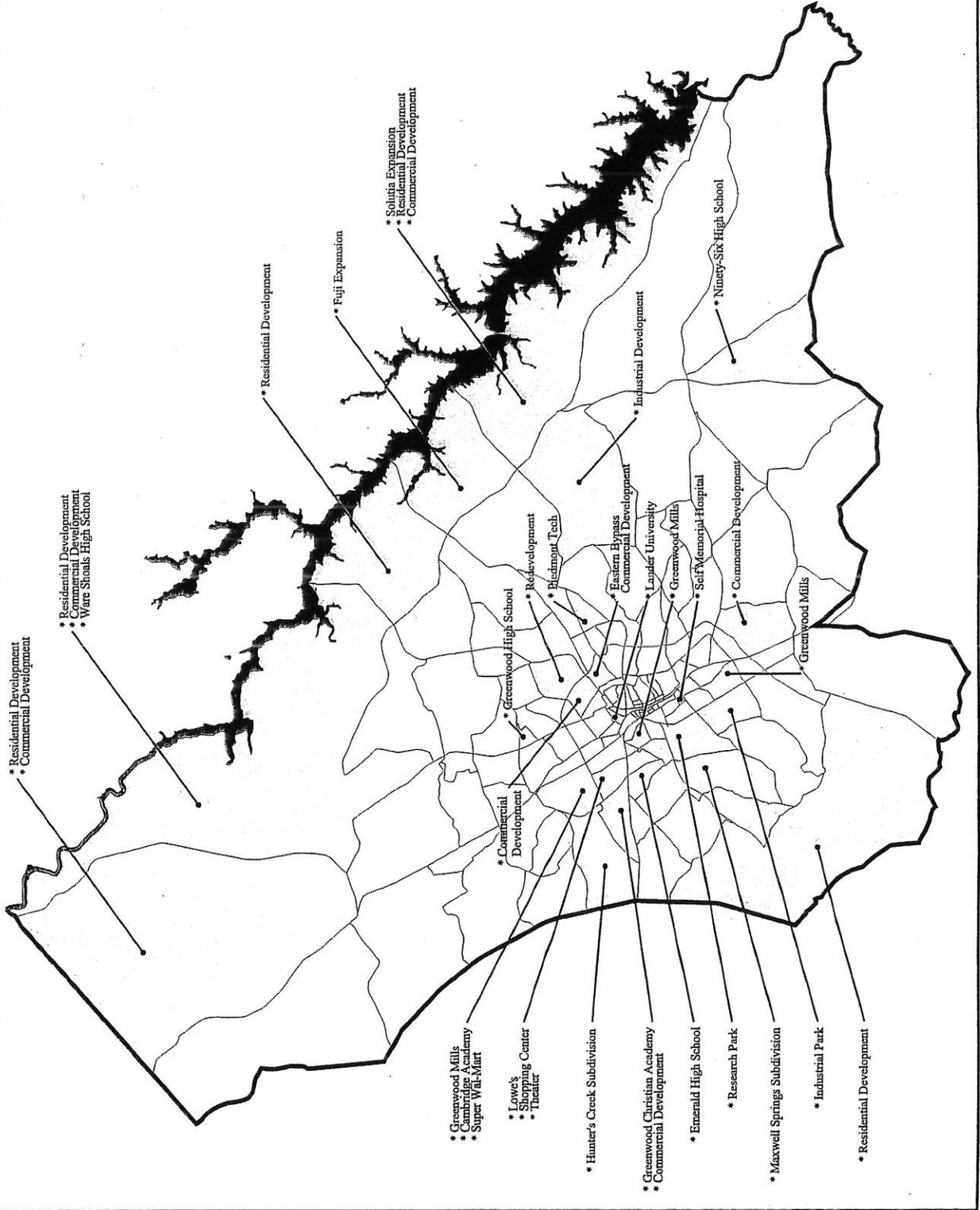
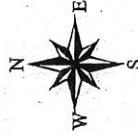


Figure 2.3
Population Density
by Traffic Analysis Zone
Persons Per Square Mile
Greenwood Study Area



Data Source: Census Tiger Data
 Produced by SCDOT Planning May 2000

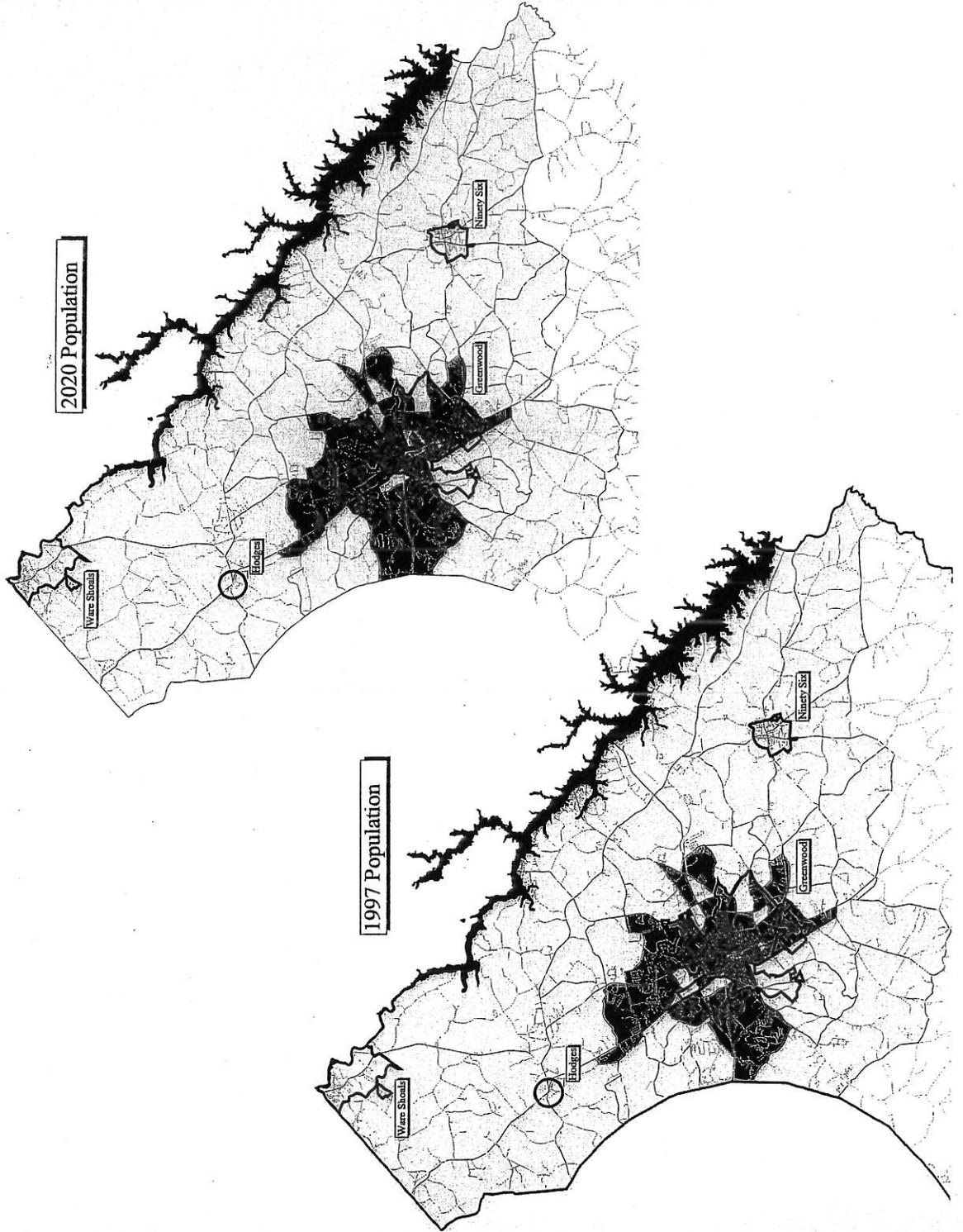
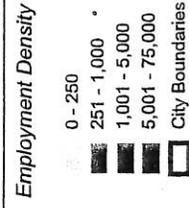
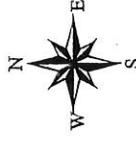


Figure 2.4
Employment Density
by Traffic Analysis Zone

Employment Per
Square Mile

Greenwood Study Area



Data Source: Census Tiger Data
 Produced by SCDOT Planning May 2000

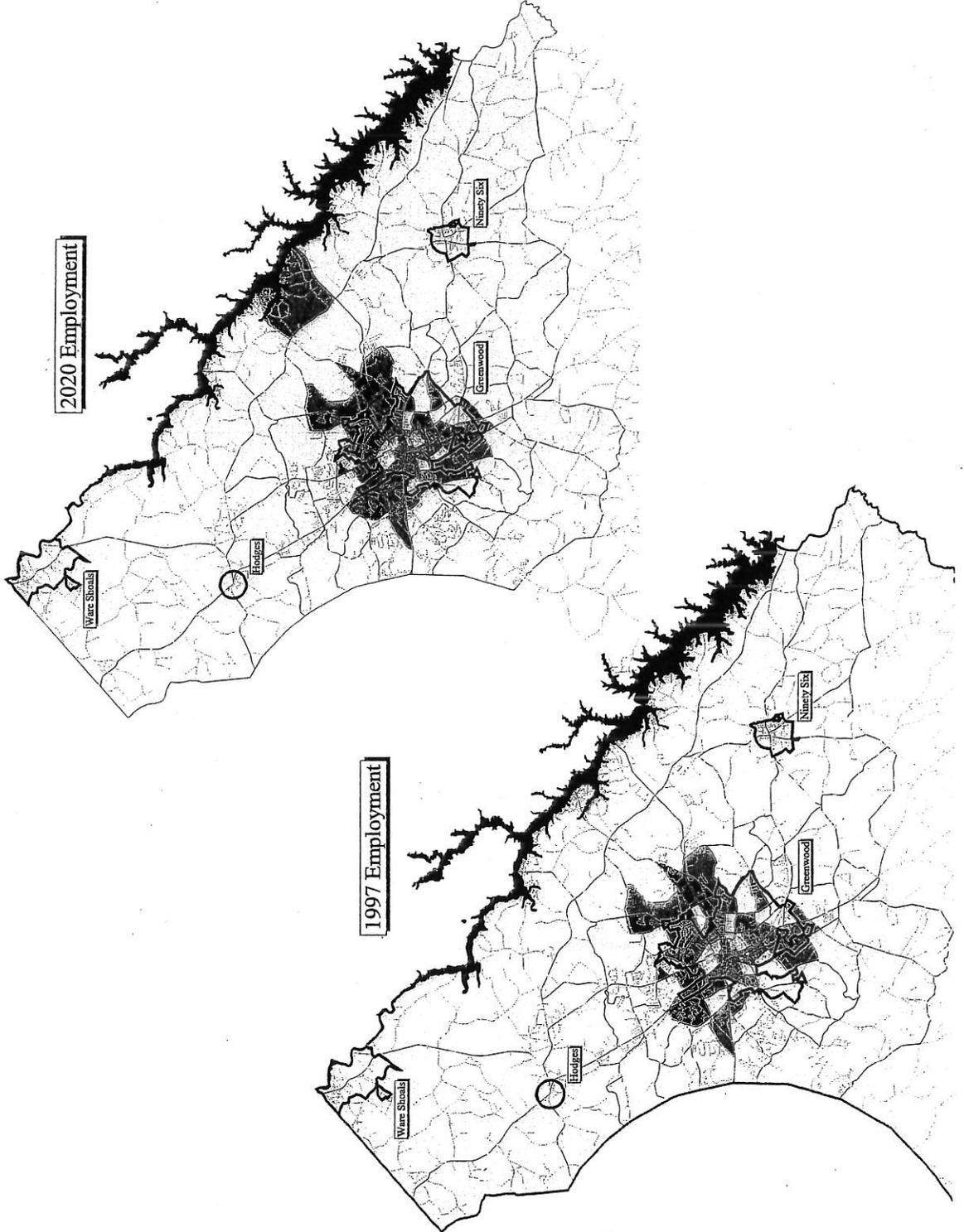
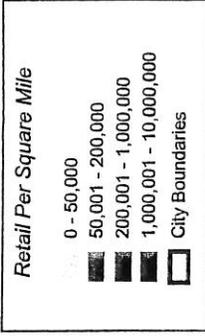


Figure 2.5
Retail Density
by Traffic Analysis Zone

Retail Square Feet
Per Square Mile
Greenwood Study Area



Data Source: Census Tiger Data
 Produced by SCDOT Planning May 2000

