

**LAND USE AND SOCIO-ECONOMIC  
DATA AND PROJECTIONS  
FOR THE GREATER CHARLOTTE REGION**

**DRAFT FOR REVIEW**

Submitted by  
UNC Charlotte Urban Institute



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## EXECUTIVE SUMMARY

### Background, Objectives and Process

The Greater Charlotte region consists of an eleven county area in North and South Carolina. Transportation planning in this region is a cooperative effort between three Metropolitan Planning Organizations (MPOs) in North Carolina, one MPO in South Carolina, two Rural Planning Organizations (RPOs) in North Carolina and two state Departments of Transportation. The Metrolina Regional Travel Demand Model is a cooperative effort between these regional transportation planning partners to develop a travel demand model that encompasses the Greater Charlotte region. This model will serve as a tool for projecting future travel demand for use in transportation planning activities across the region. These activities include the following:

- The development of Federally-mandated long range transportation plans within the MPOs;
- The demonstration of conformity to the National Ambient Air Quality Standards (NAAQS) established by the Environmental Protection Agency (EPA) for the non-attainment area within the region; and
- The development of comprehensive transportation plans for the jurisdictions within the RPOs; and
- The planning and design of projects within the region that are included in the Metropolitan and State Transportation Improvement Programs (MTIP and STIP).

An oversight committee consisting of representatives from each of the partnering agencies is guiding the development of the regional model. A primary responsibility of this committee is overseeing the forecasting of land use and socioeconomic variables needed for application of the regional model in future years. The Land Use and Socioeconomic Data Sub-Committee of the model Oversight Committee was established to develop the projected population, household and employment data that comprises these land use and socioeconomic data.

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The objectives of the Land Use and Socioeconomic Data Sub-Committee were to provide land use and socioeconomic base year (2000) and planning horizon years (2010, 2020 and 2030) data for the region. Thomas R. Hammer, Ph.D. and UNC Charlotte were hired as consultants to assist the Sub-Committee. Dr. Hammer prepared regional and county-level data projections using “demand side” or “top-down” approaches. UNC Charlotte acted as a technical advisor to the Partners as they developed their local “supply side” or “bottom-up” approaches. Through an iterative process that included **comparing** the “top-down” and “bottom-up” results, the Partners developed the final set of projections for use in the regional travel demand model.

### Data, Methodology, and Results

Data were collected for base year (2000) at the Traffic Analysis Zone (TAZ) level for population, households, persons in households, persons in group quarters, employment, commercial vehicles, school enrollments, land use and development type.

Population-related data for the base year were obtained from the 2000 U.S. Census. The population data were used in projecting horizon year figures and in the regional travel demand model as a direct input.

Employment data were obtained from a variety of sources to establish current year (2002) inventories at the regional or county level and at the TAZ level. The employment data were verified by telephone interview for large employers and were subsequently aggregated to and reported by 8 categories. The employment data were used in projecting horizon year figures and in the regional travel demand model as a direct input.

The Partners collected current year commercial vehicle by contacting large employers in industries (such as retail, manufacturing, wholesale, and transportation, communications, and utilities) that typically have large commercial fleets. Employers were asked to identify each location at which they maintain vehicles, and to report them in three size/weight categories. The Partners contacted schools, colleges, and universities to collect school enrollment data. The schools were asked to report enrolled students in three grade level categories.

The Partners also collected current year land use data, to help guide them in the population and employment projections process.

Once the base year inventory was complete, the projections for the 2010, 2020, and 2030 horizon years were developed both through Dr. Hammer's regional, top-down approach and the local bottom-up approaches of the Partners. Dr. Hammer prepared regional and county-level projections for population, households and employment using methods that draw upon national projections and models that use data collected from other urban areas. The variables projected by the Partners for the horizon years included:

- Total Population
- Households
- Persons in Households
- Persons in Group Quarters
- Employment, in each of 8 categories

The Partners' locally derived population, household and employment projections took into account information such as vacant and re-developable land, local land use policies, employment, and local expert judgment. Dr. Hammer's projections were then used as a guide for the Partners' more detailed TAZ-level projections.

Using an iterative approach, the Partners collectively reviewed the base year inventory and the projections for the entire region and refined them as needed to ensure their reasonableness, both in terms of their relation to the overall regional level projections and in terms of the spatial distributions within and across jurisdictional boundaries. The projections presented by the Partners were formally approved by each MPO and RPO for their respective jurisdictions.

For a more extensive discussion of the data and methods, please see Section II of this report. Section III contains the resulting base year and projection data, aggregated to the following geographic areas: the Region; the Non-Attainment and Attainment Areas; area MPOs and RPOs; and the individual counties.

- The Region refers to the model area: eight counties in North and South Carolina (Cabarrus, Gaston, Lincoln, Mecklenburg, Rowan, Stanly, Union (NC), and York) plus the eastern part of Cleveland County, the southern section of Iredell County, and the panhandle portion of Lancaster County, SC.
- The non-attainment area includes all or portions of eight counties in North and South Carolina (Cabarrus, Gaston, Iredell, Lincoln, Mecklenburg, Rowan, Union and York).
- The MPO and RPO data are presented for four Metropolitan Planning Organization (MPO) areas, two Rural Planning Organization (RPO) areas and portions of two counties that are not included in either an MPO or RPO.
- Data for each of the region's eight counties (Cabarrus, Gaston, Lincoln, Mecklenburg, Rowan, Stanly, Union, and York), as well as portions of Cleveland, Iredell, and Lancaster Counties, are also included.

TAZ level base year inventory data and projections for population, employment, and school enrollment are available, upon request, from the Charlotte Department of Transportation.

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*Notes:*

- 1) *For base year inventory and projections at the Traffic Analysis Zone level, please refer to the CD, “Land Use and Socio-Economic Data and Projections for the Charlotte Region, 2004”, available on request from the Charlotte Department of Transportation.*
- 2) *For projections developed at the regional level for comparison to initial County subarea projections, please refer to separate report, “Demographic and Economic Forecasts for the Charlotte Region”, by Thomas R. Hammer, Ph.D., December 8, 2003, available on request from the Charlotte Department of Transportation.*

**IV. Appendices**

- A. Supplementary Methodology Materials
- B. Maps by Model Traffic Analysis Zone
- C. Employment Categories

## **I. INTRODUCTION**

This report documents the objectives, methodologies, and resulting population and employment projections that were used as input to the Metrolina Regional Travel Demand Model. The projection process was developed and implemented by the Land Use and Socio-Economic Data Sub-Committee of the Metrolina Regional Travel Demand Model project, over the period from January 2003 through November 2004.

This introductory section provides the background and context to the project, defines the project's objectives, identifies the organizations that partnered to conduct the project, and outlines the project's process. The methods used and the resulting projections are detailed in subsequent sections of the report.

### **A. Background**

The Greater Charlotte region consists of an eleven county area in North and South Carolina. Transportation planning in this region is a cooperative effort between three Metropolitan Planning Organizations (MPOs) in North Carolina, one MPO in South Carolina, two Rural Planning Organizations (RPOs) in North Carolina and two state Departments of Transportation. The Metrolina Regional Travel Demand Model is a cooperative effort between these regional transportation planning partners to develop a travel demand model that encompasses the Greater Charlotte region. This model will serve as a tool for projecting future travel demand for use in transportation planning activities across the region. These activities include the following:

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- The development of comprehensive transportation plans for the jurisdictions within the RPOs; and
- The planning and design of projects within the region that are included in the Metropolitan and State Transportation Improvement Programs (MTIP and STIP).

An oversight committee consisting of representatives from each of the partnering agencies is guiding the development of the regional model. A primary responsibility of this committee is overseeing the forecasting of land use and socioeconomic variables needed for application of the regional model in future years. The Land Use and Socioeconomic Data Sub-Committee of the model Oversight Committee was established to develop the projected population, household and employment data that comprises these land use and socioeconomic data.

### **B. Objectives**

The objectives of the Land Use & Socio-Economic Data Sub-Committee were to:

## Land Use & Socio-Economic Data and Projections

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- Provide land use and socio-economic data for the base year (2000) and projections for each of the planning horizon years (2010, 2020, and 2030);
- Provide the base year and horizon year data at the TAZ level for:
  - Population (number of persons), including persons in households versus persons in group quarters;
  - Households (number of);
  - Employment (number of jobs) in eight categories;
  - School enrollments (number of students) in three grade level groups from kindergarten through college and post-graduate work;
  - Commercial vehicles (number of vehicles) by three size/weight categories;
- Ensure that the data are consistent, reliable, and credible across all TAZs in the region.

### C. Partners

The four MPOs and two RPOs are collectively referred to as the project's "Partners". They include:

- Cabarrus-Rowan Metropolitan Planning Organization
- Gaston Urban Area Metropolitan Planning Organization
- Mecklenburg-Union Metropolitan Planning Organization
- Rock Hill – Fort Mill Area Transportation Study
- Lake Norman Rural Planning Organization
- Rocky River Rural Planning Organization

### D. Process

The Sub-Committee established an 18-month work plan and schedule for meeting its objectives. This schedule was later extended, with all final endorsements obtained by November, 2004. The work plan consisted of these major components:

- Collect and develop base year inventory data (January – June, 2003)
- Develop first round of population, household, and employment projections (July – October, 2003)
- Iteratively refine population, household, and employment projections (November, 2003 – April, 2004)
- Obtain official MPO/RPO endorsement of final population, household, and employment projections (May – June, 2004)

While each Partner was responsible for preparing data for the portion of the study area under its jurisdiction, the Partners collectively assumed responsibility for developing a common methodology, for documenting any differences from the common methodology (as for example, when an alternate data source had to be used), and for reviewing each others' results for cross-boundary consistency and reasonableness. The Sub-Committee held regular meetings typically two hours on a monthly basis, to review progress, raise and discuss issues, and to refine the work plan as needed. The Sub-Committee also held periodic "Milestone Workshops", typically of four to six hours, to focus on critical portions of the work plan, such as methodology development or review of preliminary results.

To assist the Sub-Committee in its work, the Executive Committee of the Regional Travel Demand Model hired two consultants:

- Thomas R. Hammer, Ph.D.
- UNC Charlotte

Dr. Hammer's role was to prepare regional and county-level projections of population, households, and employment using national data and economic models. These "top-down" projections were used as a guide and check for the Partners' more detailed TAZ-level projections, referred to as the "bottom-up" projections.

UNC Charlotte's role, described as the "Regional Land Use Technical Advisor", was to assist the Partners in developing the common methodology, document the project through this report, provide technical assistance to individual Partners as requested, and facilitate the Partners' collective work through the regularly scheduled Sub-Committee meetings and periodic "Milestone Workshops".

### METHODOLOGY

This section of the report documents the methods used to develop the base year inventory data and the projections of population and employment. Results are detailed in the next section of the report.

#### A. Overview

Discussion of the methodology falls into two basic parts: base year inventory, and projections. The base year inventory data were used in calculating projections. Results were obtained at the TAZ level based on various source data ranging from sub-TAZ-level to national-, regional-, or county-level data.

##### 1. Base Year Inventory

The base year established for the process was 2000. The data compiled for the base year inventory included:

- Total population, households, persons in households, and persons in group quarters.
- Employment, reported in eight categories.
- Commercial vehicles, reported in three categories by size and weight.
- School enrollments, reported in three grade level categories from kindergarten through college or university.
- Land use, reported in sixteen categories.
- Development type, reported in four categories for intensity and type of development.

The data needed for the base year inventory fell into three groups that required three different approaches to collection and compilation: population-related, employment-related, and “other” (commercial vehicles, school enrollments and land use.)

Population Data. Data from the 2000 U.S. Census were used to establish base year inventories for the population-related variables. The base year population data were used in projecting horizon year figures and in the Model as a direct input.

Employment Data. As described below, a variety of sources were used to establish current year (2002) inventories for employment, which were reconciled with each other to arrive at a common set of employment data used both at the regional or county level and the TAZ level. Finally, since the employment data were collected for the current year, scaling factors were applied to both regional- or county-level and TAZ-level numbers to approximate employment for the base year of 2000. All employment data were reported in eight categories of SIC codes, reflecting different levels of traffic generation by category. The employment data were used in projecting horizon year figures and in the Model as a direct input.

In collecting current year employment data at the TAZ level, the Partners used sources that provide data by employer including employer location, telephone and SIC code (Standard Industrial Classification code). The Partners verified the employment data for large employers (generally, 100 or more employees reported), and then geocoded the employer addresses to assign them to TAZs. Dr. Hammer used national sources that provided data by SIC code for 2001 at the state and county level, which he adjusted to 2002 using proprietary data from InfoUSA. Scaling factors were applied to the employment data collected by the Partners, by SIC code, to produce employment numbers at the TAZ level that aggregated more closely to the county-level numbers used by Dr. Hammer.

Other Data. Current year commercial vehicle and school enrollments data were collected by the Partners by contacting large employers in industries (such as retail, manufacturing, wholesale, and transportation, communications, and utilities) that typically have large commercial fleets. Employers were asked to identify each location at which they maintain vehicles, and to report them in three size/weight categories. The Partners contacted schools, colleges, and universities to collect school enrollment data. The schools were asked to report enrolled students in three grade level categories. These data, while used in the travel demand model, were not used in the population or employment projections, and so were not scaled to the base year as part of this process.

In addition to the other base year inventory data, land use data were collected by the Partners for the current year, to help guide them in the population and employment projections process. Partners used various data sources, including tax parcel files and land cover files from satellite imagery, to report acres of land in each of sixteen land use categories by TAZ.

### 2. **Population and Employment Projections**

The horizon years established for the population and employment projections were 2010, 2020, and 2030. The variables projected for those horizon years included:

- Total Population
- Households
- Persons in Households
- Persons in Group Quarters
- Employment, in 8 categories

Both a regional (“top-down”) and a TAZ-level (“bottom-up”) method were used to develop the population and employment projections. The regional projections were used as a guide and “reasonableness” check for the initial TAZ-level projections, which after refinement, resulted in the final projections reported in the Results section of this report.

The “top-down” method employed by Dr. Hammer, described below in the “Regional Methodology Overview” section, used national economic data and demographic data to create regional and county-level population and employment projections.

The “bottom-up” method used by the Partners and described below in the “Population and Households Projections” and “Employment Projections” sections, relied on TAZ-level calculations and used the top-down county-level projections as a factor in refining the TAZ-level calculations.

The Partners’ TAZ-level population and household calculations took into account available vacant and re-developable land, local land use policies, and local expert judgment as to rates, spatial location, and likelihood of development occurring. The Partners translated those calculations into estimates of future households and population.

The Partners’ TAZ-level employment calculations used the top-down county-level projections to estimate basic (“non-population-serving”) employment in each of the eight SIC code categories. Expert panels assisted in allocating additional basic employment to TAZs. Using the employment-to-population ratios of the county-level projections, and the TAZ-level population projections, the additional projected non-basic (“population-serving”) employment was calculated for each TAZ.

### **B. Regional Methodology Overview**

This section provides a brief overview of the method used to develop the Regional level population and employment projections. For a detailed description of that process, please refer to Dr. Hammer's report, "Demographic and Economic Forecasts for the Charlotte Region" (prepared for Charlotte Department of Transportation, December 8, 2003).

The Regional Methodology includes data compiled or projected at four geographic levels:

- National
- Regional (the territory centering on Charlotte, larger than the present MSA)
- Counties (15 counties, plus a portion of Catawba County, NC)
- Districts (sub-county areas, drawn on Census block group lines)

Both demographic and employment data were compiled for the year 2002, which were then used to forecast those data at eleven-year intervals through 2035. Interpolation using third-degree polynomial equations provided projections for the three horizon years 2010, 2020, and 2030.

The sections below describe the Regional level methods employed for the base year inventory, the national and regional projections, and the county and district projections, respectively.

#### **1. Base Year Inventory**

The Census Bureau's 2002 intercensal population estimates for counties were used to guide extrapolation of more detailed demographic data from the 1990 and 2000 censuses.

Industry-specific employment figures for 2001 from the federal data system were updated to 2002 using proprietary 2002 employer data from InfoUSA.

#### **2. National and Regional Projections**

National employment was projected first, and used to develop regional employment projections. Regional population was then forecast, using projected regional employment as a factor (national population projections, used as a factor in the national employment projections, are taken from the Census' long-term population projections).

The national employment forecast is based on the ten-year forecast of employment produced every two years by the Bureau of Labor Statistics and the Census Bureau's long-term population projections by age and sex. It provides industry-specific employment figures for 2010, 2020, and 2030. The key assumption is that national employment in 2030 will be constrained by the size of the working-age population. This allows forecasting a 2030 national employment total, based on projected labor participation rates for each age-sex group in the long-term population projections. The BLS' industry-specific ten-year employment forecast is then extrapolated to 2030 and adjusted to fit the population-constrained 2030 national employment total. The 2020 employment projections are interpolated from the 2010 and 2030 projections.

Regional employment forecasts were derived from the national forecasts by extrapolating historical trends in the ratios of regional basic (non-population-serving) employment to national total employment (from 1969 to the base year 2002), for each of 42 industry-specific categories. The resulting forecast of regional basic employment was then used to forecast regional population-serving (non-basic) employment, based on regional ratios of basic to non-basic employment in each industry category. The key assumption in this methodology is

that historic relationships between regional economic drivers and national industries will remain stable.

Regional demographic, or population, projections were then derived from the regional employment projections. The methodology uses cohort-survival projection methods and applies labor force participation rates to the results to evaluate the “fit” with the established employment projections. The cohort-survival techniques project future birth, death, and net migration rates, the latter of which are adjusted to produce a labor force equal to the projected employment.

### 3. County and District Projections

County and district (sub-county) projections were derived from the regional projections, using an allocation model. The model consists of 35 empirically calibrated equations, three of which allocate households (at high, middle and upper income levels), and the remainder of which allocate employment (for different industry groups). Population projection allocations were derived from the household projection allocations. Forty-six districts were also defined for the region, to allow sub-County allocations. These districts were defined as aggregations of census block groups within each county, with the requirement that each district be larger than 50 square miles and contain more than 25,000 in population.

The equations were developed via multiple regression analysis of data from 227 counties in over 30 metropolitan regions around the country. To predict the county or district allocations from the regional projection of any one of the 35 variables, the independent or predictor variables included magnitudes of change from 1980 to 1990, conditions at 1990, and contemporaneous change from 1990 to 2000 in other variables. Proximity measures and measures of available land were included to capture both “the attractive force of existing activity and the dispersive force of land scarcity”<sup>1</sup>.

The models rely on functions of distance, land area, and density, in addition to earlier time period values of the dependent, or target, variables. Not included were factors such as natural land characteristics, land use controls, and availability of infrastructure, that tend to influence the supply of land suitable for development. This means the models emphasize predictors of development demand over predictors of development supply. Recognition of this aspect of the models was a key element in the decision to use both the “top-down” and “bottom-up” approaches to developing the final TAZ-level projections.

The original intent of producing the county and district projections was to provide spatially-specific comparisons with the results achieved through the bottom-up, or supply-side, methodology. However, since TAZs do not necessarily aggregate to census block group boundaries, a direct comparison at the district level was not possible. These comparisons were made at the county level, and the district level top-down projections were used as a guide in evaluating relative patterns of growth in TAZs within each county. Details of the methodology for these comparisons and refinements of the TAZ-level projections in response to the top-down projections are provided in the sections of this report that follow.

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<sup>1</sup> Hammer, Thomas R., Ph.D., “Demographic and Economic Forecasts for the Charlotte Region”, December 8, 2003, report prepared for the City of Charlotte Department of Transportation

### **C. Base Year Inventory**

This section describes the “bottom-up” approach to establishing base year inventory data. The general approach is described, as well as any Partners’ approaches which differed from the agreed-upon methodologies.

#### **1. General County Subarea Approach**

The base year for all projections was 2000. All base year data were either collected at the TAZ level, or aggregated to the TAZ level from smaller geographical units. All data items were stored in a GIS environment, as attributes of a TAZ polygon boundary file.

The Partners followed a general, agreed-upon methodology for compiling the base year inventories in their own jurisdictions. Each Partner provided Base Year Inventory data for its jurisdiction, in a specified uniform format, for compilation by the RLUTA into a single regional Base Year Inventory GIS data set. Anomalies encountered by each Partner in data availability, reliability, and consequent variations to the general methodology are documented under “Subarea-Specific Approaches”.

Following compilation of the base year inventories, each Partner reviewed and assessed the data for its own jurisdiction, looking for outliers, unusual or unexpected patterns, or other anomalies. The RLUTA team followed up on the Partners’ observations with additional review.

Please see Appendix A for a detailed set of steps used by the Partners to produce the base year inventory information. The following is a list of that information collected by the Partners at the TAZ level.

- Population
  - Population in Households
  - Population in Group Quarters
- Households
- Employment (by 8 categories)
  - Manufacturing, Industry, Wholesale, Transportation, Communications, and Utilities
  - Retail
  - Highway Retail
  - Low Traffic Services
  - High Traffic Services
  - Office/Government
  - Banking
  - Schools, Colleges, and Universities
- Commercial vehicles
- Student enrollments
  - K-8
  - 9-12
  - College / University
- Land use
- Development Type of area

- County Subarea name<sup>2</sup>
- Primary Census Tract (2000)
- Primary Census Place Code
- Number of Census Places
- Place Code of Primary ETJ
- Number of Census Tracts

### 2. Subarea-Specific Approaches

The following section describes any approaches taken by the Partners which differed from the agreed-upon general methodology.

#### Cabarrus- Rowan MPO

Following the submittal of the first land use layer, it was determined that some of the residential parcels should have been classified as vacant. The Partner submitted a revised version of the land use inventory.

#### Gaston Urban Area MPO

In conjunction with national databases for employment, the Gaston MPO also purchased the mailing labels to all employment locations. The MPO noticed that there were a number of employment locations not included in the data by cross referencing employer address and locations through the Gaston County Cross Reference Directory and local knowledge of employer locations. The MPO sent out a survey to all employment locations to verify their address, employment numbers and vehicle numbers. The MPO also collected major employer closings from the Gaston County Economic Development Corporation to note losses in employment locations.

The Gaston MPO conducted their commercial vehicle survey before the regional approach was designed, and categorized some information differently. The Gaston MPO split the vehicles into three categories: autos and pickups, taxis, and trucks and buses. For the industrial businesses, the Gaston MPO used best judgment to determine how many heavy trucks (semi-trucks) were located on site. Staff used the employment SIC Code number from the geo-coded data to determine the likelihood of the employer housing light trucks and heavy trucks. These categories were then re-categorized to match those of the regional approach.

The school enrollment was collected in August 2002 from a survey done by the Gaston Gazette. The Gaston Gazette received all of the private, charter and public school enrollments for Elementary, Middle and High School students for the 2002 school year.

Staff did not union within each TAZ the individual land use classifications; staff created a program in ArcINFO to calculate each land use classification's total acreage and input the acreage into the Base Year Inventory database.

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<sup>2</sup> The Partners submitted proposed boundaries for subareas within their counties, which were then revised by RLUTA. Subareas are aggregations of census TAZs within a single county into a smaller unit of geography representing similar planning influences. Base year data and projections were made available at the subarea level, which provided some additional confidence when allocating totals to the census TAZ level. Subareas also served as the boundaries between Partner jurisdictions in some cases. Northwest Gaston County and southern and eastern portions of Union County were split between two partners (GUAMPO and CCOG splitting Gaston, and CCOG and MUMPO splitting Union).

### Mecklenburg-Union MPO

MUMPO generally followed the county subarea approach. Specific details are documented in *Mecklenburg-Union Metropolitan Planning Organization Population Projections and Employment Allocations 2000-2030*, prepared by the Center for Applied GIS, UNC Charlotte.

### York County: Rock Hill-Fort Mill Area Transportation Study

York County determined whether a parcel was “developed” for any land use classification by evaluating the assessed value for any built structure on the parcel. If building value was equal to \$0 or there was no utility found on the parcel, it was classified as vacant. Residential land uses were limited only to those parcels classified as such in the database that had a maximum of two acres per unit.

### Centralina: NC non-MPO areas

No county or subarea specific approaches were used.

### Lancaster County: SC non-MPO areas

The Catawba Regional Council of Governments (CRCOG) staff worked with the Lancaster County Joint Planning Commission and their Highway 521 Corridor Study Team to review existing development patterns and discuss development trends affecting development in the Indian-land portion of Lancaster County.

Parcel-based digital land use data are not available for Lancaster County. A ‘windshield survey’ was conducted by Catawba Regional Council of Governments in 1998. It was decided that growth in the Panhandle area between 1998 and 2000 (the base year) would not produce a significant enough effect to warrant compiling the 2000 data.

### **3. Deriving Final Base Year Inventory Data**

Additional attempts were made to create the most reliable county and TAZ-level employment information. Since the original databases used during phone verification by the Partners (see Appendix A) were known to contain discrepancies in education and government employment, the 2002 county totals were factored to totals provided by Dr. Thomas Hammer, which were based on national databases (BEA and BLS). These factors were applied to the individual employer record, and then aggregated based on TAZ and employment category. Following this adjustment, the 2002 TAZ level data were factored to a number estimating year 2000 totals, for the purposes of modeling and data analysis.

## **D. Population and Household Projections**

Bottom-up population and household projections were completed first, and then used to help guide the bottom-up employment projections. This section discusses the general approaches used as well as any Partner approaches which differed from the agreed-upon methodology.

### **1. General County Subarea Approach**

Total population and number of households per TAZ were projected for the horizon years (2010, 2020, and 2030) by each Partner. The general approach, as developed by the Land Use Sub-Committee, was designed to allow each Partner’s staff and carefully selected teams of local planning and community professionals (“expert panel”) to provide professional judgment on projection output.

For both population and employment projections, the Partners organized an expert panel. In the case of population projections, the Partners typically identified residents and leaders in the county who were involved in planning, land development, real estate, or governing. In

most cases, there was some representation from the planning organizations and elected officials. The Partners invited this small group, per county, to meet one to three times during the development of the population projections, to firstly consider land development factors. The panels were also asked to provide input as to where and how much residential development was likely to occur over the next 25 years. Where it was not possible to complete both steps in a single meeting, multiple meetings were held.

The next phase of the population projection methodology was to define residential Development Potential Areas (DPAs) throughout each county subarea. Staff, and in some cases Expert Panel members, identified Land Development Factors (LDFs) for residential development (such as water availability and transportation improvements). Values and weights were assigned to the LDFs, relative to their expected impacts on local residential development. A composite map showing combined scores for areas of overlap, or Building and Land Opportunity Blocks (BLOBs), was created, and scores were attributed to each TAZ accordingly. Finally, similarly ranked TAZs were, where feasible, grouped into Development Potential Areas (DPAs), for review by expert panel.

Concurrently, staff converted their base year land use codes to a uniform “developable” coding system, used to estimate maximum acres (per TAZ) available for residential development or redevelopment. Vacant and undeveloped lands were designated as either developable, redevelopable, or undevelopable for future use. Partners designated redevelopable status to parcels using a minimal density threshold. This threshold was determined using local redevelopment trends. Developable or redevelopable lands were then reclassified for either residential, non-residential, or mixed-use development. Residential acres were then used to produce a number of households (MHH) allowed per local zoning or land use policies, and maximum population (MPOP), based on average household sizes, per TAZ.

Staff then reviewed the findings. Data were compared at the county level to other population and housing projections, building permit histories, and across TAZ boundaries for reasonableness. Partners refined the projections as needed, and submitted their data to RLUTA, in both shapefile and spreadsheet format. Documentation was provided to record any variation from the general methodology used by the Partners, during the population projection process. Please see Appendix A for a detailed set of operational instructions used by the Partners to produce the population projections.

### **2. Subarea-Specific Approaches**

The following section describes those approaches taken by the Partners which were distinctly different than the agreed-upon general methodology.

#### Cabarrus- Rowan MPO

Cabarrus Rowan MPO staff prepared a series of maps of likely DPAs for their counties, before approaching their expert panels. The panels were asked to react to rather than to create expectations for types and intensity of residential growth.

The Partner did not calculate acres consumed by future residential development, beyond developable/redevelopable statistics in 2000. Therefore, the Partner was not able to calculate the maximum residential acres available for 2010 and 2020 development, as a part of projecting 2020 and 2030 numbers of households, respectively.

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Cabarrus Rowan MPO initially submitted population projections for Cabarrus County that represented a reallocation of the totals given by the Water and Sewer Authority for Cabarrus County (WASACC). After further consideration of building permit trends and RLUTA team evaluation, the Partner resubmitted a more conservative set of population projections in March 2004.

The Partner initially submitted population projections for Rowan County that resembled the projections created for the Rowan-Salisbury School System. RLUTA asked the Partner to review Rowan County building permit data. More conservative estimates were created for Rowan County and submitted in May 2004.

### Gaston Urban Area MPO

The Gaston MPO chose not to assign values to the LDFs, but rather had the expert panels define BLOBs according to local judgment. When calculating approximate population densities and the zoning classification did not permit that of a proposed development density in a location, the Partner applied the higher density to the DPA.

### Mecklenburg-Union MPO

The MUMPO team did not use DPA scales of geography in expert panel discussions, due to the number of anticipated DPAs likely to be identified. Experts were asked to give more input on the LDFs and relative weights, and computer-derived values for consumed acreage, household densities, and persons per household.

### York County: Rock Hill-Fort Mill Area Transportation Study

The Partner prepared maps using pre-determined values and weights applied to select land development factors. RFATS asked their expert panel to evaluate the factors and weighting. The Partner proposed that 25% of the developable acreage be set aside for infrastructure, but the panel decided that only 18% of the land would be used for infrastructure and a maximum of 60% would be dedicated toward built development. This shift increased the expectations for population growth compared to the projections initially suggested by staff.

Zones of growth were designated, beginning within and adjacent to existing urbanized areas. The highest scored zones received the largest share (60%) of its potential growth in the first horizon year, 30% of its potential growth in the second horizon, and the remaining portion in the final horizon. The lower the cumulative score, the more delay a DPA would experience in receiving its largest share of potential population growth. All TAZs within a DPA received equal consideration for household per acre and population per household densities.

### Centralina: NC non-MPO areas

Centralina COG staff requested that each planner and/or manager within their counties appoint persons to serve on the expert panel, for each county.

The Partner did not calculate the maximum number of households and population for each TAZ, since the majority of Centralina's jurisdiction is rural, and it was deemed that there was little risk of land development beyond that which could be supported. Also, not all calculated BLOBs and DPAs were mapped, since expert panel members were able to suggest locations for future development for more specific areas, due to the rural nature of the area and their experience there.

### Lancaster County: SC non-MPO areas

The general county subarea approach was followed. The Catawba COG relied partly on existing projections and land use plans for the Lancaster panhandle.

### **3. Comparing Regional and County Subarea Results**

Following the completion of the first round of population projections, site visits were scheduled between RLUTA team members and the Partners. The Partners were asked to explain their decisions related to a number of factors, including growth rates, land development factors, and density expectations. RLUTA offered comparisons of the rates of growth forecasted to those historically experienced within the given county, and offered recommendations for revisions to the county projections, for discussion purposes and to guide planners' judgment.

A Partner Milestone Meeting was scheduled for April 16, 2004 to review and discuss the outcome of revised, first round population projections. Maps of population density and population growth per TAZ, and approximate land consumption information per TAZ were created. Because not all Partners submitted information on land availability and demand for base year and future years, some of the future land use information was estimated for the purposes of the review. Approximate densities and growth rates mapped for all horizons allowed the Partners to evaluate their results relative to their neighbors, thereby providing another "reasonableness" test.

Building permit data were collected for each county, to compare with population projection growth rates. It was generally found that building permit data demonstrated strong growth in the region, but there was speculation that vacancy rates in both apartment rentals and single family dwellings would have countered this. Where building permit data did not support the rates of growth anticipated by the Partner, RLUTA recommended more modest projections.

Subsequent rounds of site visits were planned with each Partner, where necessary, to arrive at consensus for population growth at the regional, county, and subarea levels.

## **E. Employment Projections**

The population and household projections were used as an input to the employment projection methodology described below. This section covers the general approaches used, as well as any Partners' approaches which differed from the agreed upon methodologies.

### **1. General County Subarea Approach**

Employment was projected at the TAZ level, for each of the horizon years, for the eight employment categories (defined in the Base Year data discussion), and for total employment. As with the population projection methodology, the Land Use Sub-Committee developed a general method for the Partners to follow when creating employment projections. Unlike the population projections, however, county employment totals were not created using an entirely bottom-up approach, as described below.

Very little information is available in the region to allow comparison with other employment projections, methods, and control totals. Chambers of commerce and economic development commissions have made estimates, but none at a sub-County level or beyond a 5-10 year horizon. The Land Use Sub-Committee considered it unlikely that expert panel input and land availability would be enough information to provide bottom-up projections at the TAZ and county levels. Therefore, Dr. Thomas Hammer's employment projections were used as an initial point of reference, for creating numbers appropriate to local expert expectations.

The approach used reflects the assumption that employment and population relate differently at a national, a regional, and a local level, i.e. while national population characteristics can drive national employment, regional population growth generally follows regional employment growth, and local population shifts can result in local employment shifts. Dr. Hammer produced total employment projections for counties and districts, which were based, in part, on national level demographic characteristics. Based on the assumptions above, the Land Use Sub-Committee adjusted employment totals to reflect the locally-derived, bottom-up population projections. RLUTA developed a formula by which non-basic, “population-chasing” employment (PCE) could be calculated at the county level using Dr. Hammer’s employment-to-population ratios and the Partners’ population projections. (See Appendix A for a description of Supplementary Methodology Materials). This number was added to the basic, “non-population chasing” portion of Dr. Hammer’s original employment projection to arrive at new county-level totals.

The new total employment was then redistributed to the eight employment categories. This redistribution was based partly on information from an earlier Hammer report, which projected employment per 18 SIC code groups per county. RLUTA re-grouped these into the 8 categories used for the regional methodology. The Land Use Sub-Committee also applied percentages to a more detailed set of 42 SIC code-groups, which described the estimated share of that employment type which exists to serve the local residential population.

The totals per the eight employment categories were then allocated to the TAZs, using a method similar to that used for the population projections. An expert panel was assembled to discuss employment demand factors, prospective locations for future employment, and the magnitude and type of this employment.

Employment projection expert panels were similar to that of the population projection expert panels for each county. Leaders in the field of economic development and recruitment, such as Economic Development Commissions and Chambers of Commerce, as well as major employers, and local planners and governing officials were among the types of professions represented on employment expert panels in each county. It was also common for a county to have representation from their local TCC or TAC boards on the employment expert panels. As with the population projection process, there were, in some instances, multiple rounds of expert employment discussions.

Other than MUMPO, the Partners did not map total acreage consumed by non-residential uses through 2030, since the planning areas were mostly rural and it was deemed that there was little risk of land becoming unavailable for future employment growth.

Please see Appendix A for a detailed set of operational instructions used by the Partners to produce the employment projections.

## **2. Subarea Specific Approaches**

The following section describes only those approaches taken by the Partners which were distinctly different than the agreed-upon Regional Methodologies.

### Cabarrus- Rowan MPO

The Partner did not allocate employment projections as divided into population-chasing and nonpopulation-chasing employment. However, the expert panel did consider mapped population growth when assigning types of employment using professional judgment.

The expert panel provided general expectations for where employment growth is likely to occur by 2020 and 2030, but could not provide any information as to the types of employment.

When the agreed-upon methodology formulas were applied to Dr. Hammer's original projections, to calculate employment per the eight categories, the result was an overall loss of banking jobs over the 30-year horizon in Rowan County. Cabarrus Rowan MPO responded by providing an alternative set of totals, based on local bank expectations.

After the Consultant's county-level employment projections were developed, Cabarrus County lost over 3,800 jobs when Pillowtex closed. To account for the net effect of this on the employment projections, the Pillowtex lost jobs were deducted from each projected horizon year, and then the extent to which the revised projections would then understate or overstate total employment was evaluated:

1. Would other current employers choose not to expand their employment, or reduce their employment in reaction to the Pillowtex closing? (i.e., in addition to any changes in employment already accounted for in the projections)
2. Would prospective new employers choose not to relocate to Cabarrus County in reaction to the Pillowtex closing? (again, in addition to any decisions not to relocate there already accounted for in the projections, such as in response to general economic downturns)
3. Would some current employers find competitive advantage in Pillowtex's closing and take the opportunity to expand their employment?
4. Would some prospective new employers who otherwise would not have relocated to Cabarrus County find new reasons to select Cabarrus County for relocation in the wake of the Pillowtex closing?

In the judgment of the planners, the first three factors listed above are of negligible magnitude, and the first two will tend to cancel out the third. The fourth factor, however, is expected to produce non-negligible amounts of additional jobs beyond those already accounted for in the projections, for these reasons:

- Recruitment efforts will almost certainly be significantly increased specifically to "make up for" the Pillowtex loss. While the success of those efforts can't be predicted, and 100% success rate is not realistic, the end result of more employers contacted and recruited should be more employers relocating to Cabarrus County than would otherwise have occurred in the absence of increased recruitment efforts.
- Negotiations are already underway for purchase and re-development of the main Pillowtex plant site. While it could be argued jobs at the re-developed site represent a shifting of jobs already projected from elsewhere in the County, there is a significant possibility that the re-development potential will in fact secure an employer who otherwise would have located elsewhere.
- The County's supply of industrial workers seeking employment has significantly increased. While the labor market might not have previously been characterized as "tight", this loss certainly makes it less tight.

The planners then evaluated the likely magnitude of the effect of the fourth factor over the 30-year period of the projections. Some experts have said they expect the effect to be close to 100% of the 3,800 jobs probably regained, while others have said they expect it to be less

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than 50%. In the absence of any specific way to determine which estimate is more likely to be proven true, the planners settled at an estimated 66% of the 3800 plus jobs.

The next step was to distribute the 66% of the 3800 plus jobs over the three horizon years. Given the negotiations currently underway for re-development of the Pillowtex site, the planners expect that the bulk of the new jobs are likely to be realized before 2010, with the remainder spread out relatively evenly over the subsequent two decades. Thus, the planners estimate that 50% of the regained jobs should be added to the revised 2010 projections, and 25% each to the revised 2020 and 2030 projections.

Finally, the likely types and locations of the regained jobs were considered. The planners added all of the jobs in the TAZs where the bulk of the original manufacturing loss occurred. 50% of those jobs are projected to return in the form of retail, and 50% as office, according to the phased distribution described previously.

### Gaston Urban Area MPO

The Partner did not provide employment projections divided into population-chasing and nonpopulation-chasing employment. However, the expert panel did consider mapped population density when assigning types of employment using professional judgment.

### Mecklenburg-Union MPO

MUMPO generally followed the county subarea approach. Specific details are documented in *Mecklenburg-Union Metropolitan Planning Organization Population Projections and Employment Allocations 2000-2030*, prepared by the Center for Applied GIS, UNC Charlotte.

### York County: Rock Hill-Fort Mill Area Transportation Study

The Partner did not provide employment projections divided into population-chasing and nonpopulation-chasing employment. York County planners and the expert panel defined EPAs according to the projected industrial/commercial growth areas, as identified in the York County Comprehensive Plan and the Rock Hill Urban Area Plan.

### Centralina: NC non-MPO areas

The Partner did not provide allocated employment projections divided into population-chasing and nonpopulation-chasing employment. However, the expert panel did consider mapped population growth areas when assigning the more “fixed-location” types of employment.

When the agreed-upon methodology formulas were applied to Dr. Hammer’s original projections, to calculate employment per the eight categories, the result was an overall loss of banking jobs over the 30-year horizon in Gaston, Cleveland and Union. Centralina responded by providing an alternative set of totals, based on local bank expectations. The Partner also increased the number of jobs provided by RLUTA for Iredell County in categories related to the recently announced Lowe’s headquarter location to Iredell County.

### Lancaster County: SC non-MPO areas

The Partner did not provide employment projections divided into population-chasing and nonpopulation-chasing employment.

### 3. Comparing Regional and County Subarea Results

As already documented earlier in this report, there were several points at which the general methods and results were assessed for reasonableness and consistency. Among these was a review of the Regional Projection methods. A number of economic development experts in the region were contacted to respond to the approach designed by the Land Use Sub-Committee for determining employment projections. Specifically, these experts were asked to respond to Dr. Hammer's December 2003 report, and to offer their professional opinion regarding employment to population ratios in the region. Most experts replied that Dr. Hammer's methodology was sound. Few responded directly to those questions related to the relationship between employment and population.

RLUTA also researched other employment projections created for the region, from a number of sources, to determine whether the designed approach was credible. The states' Employment Security Commission produces estimates each year for number employed by both their place of work and place of residence, per county. The 1999-2003 numbers were used to estimate alternatives for future employment growth rates, which were then compared to the Partners' and Hammer's original growth expectations.

ESC data for the region suggested that the Partners' expectations for future employment growth were too ambitious, at least within the first horizon. Most of the Partners, based on further review, agreed to reduce their 2010 totals to approximately two-thirds of Dr. Hammer's original expectations for the first horizon. The amount of employment subtracted from Hammer's first decade 2000-2010 incremental growth projection was added back in the second two decades in equal shares. This was done either by the Partners performing locally-specific reallocation of the county totals, or by the RLUTA team proportionately applying the new county totals to the TAZs, as based on previous projections.

At an August 2004 Milestone meeting, the Partners were again asked to review the resulting county total changes, keeping in mind the earlier judgments of their expert panels and TCC/TAC members. In some cases, slight modifications were made to the totals and sent to RLUTA. Additionally, some Partners had modified their population projections, which affected their population-chasing employment totals. RLUTA made these adjustments to each county's previous control totals, and then the Partners made the necessary adjustments at the TAZ and employment category levels, to meet the new totals.

In some cases, the student enrollment projections modeled by RLUTA through 2030 did not match with the Partners' education employment projections. Either the computer model showed instances where there was education employment but no student enrollment present in the same TAZ, or there was student enrollment projected, but no employment education. Consequently, Partners were asked to either provide an explanation or an alternative set of education employment projections for those instances.

There were only a few projected losses in employment across horizon years, either per employment category or total, by TAZ. The first was in Cabarrus County, accounting for losses in manufacturing employment following the closure of several large mills. The other case was in Gaston County, where a school closing was confirmed, reflected in a loss of education jobs in that specific TAZ.

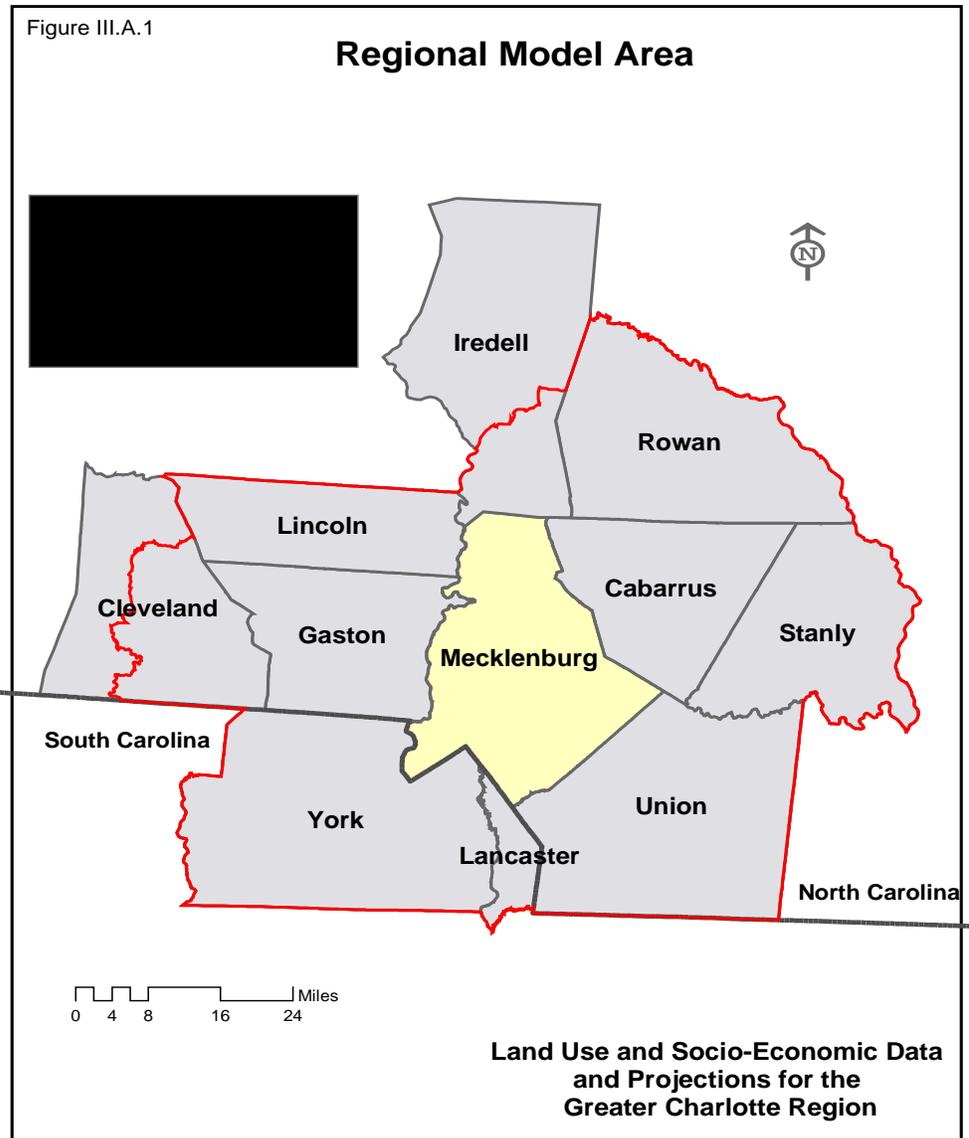
In summary, the method described in this report included several checks on the method and the reasonableness of the resulting projections. The iterative approach to developing projections and comparing them for consistency and reasonableness was intended to ensure that the Partners' projections, developed using the general method plus local planners' judgment, would result in a cohesive set of regional projections for use in the Regional Travel Demand Model.

### III. RESULTS

This section of the report presents Base Year Inventory data, Population and Household Projections, and Employment Projections. The data are presented first for the entire region, and then by various subcategories. The subcategories include Air Quality Non-Attainment Area, Planning Organization, and County. Data at the Traffic Analysis Zone (TAZ) level are not presented in the report, but are contained in the CD accompanying it. Please note that Model TAZs are not necessarily identical with Census TAZs, since, in some cases, model TAZs were re-aggregations of census data to reflect area-specific needs for smaller or larger units of measurement.

#### A. Regional Totals

As shown in Figure III.A.1, the region includes eight counties in North and South Carolina (Cabarrus, Gaston, Lincoln, Mecklenburg, Rowan, Stanly, Union (NC), and York) plus the eastern part of Cleveland County, the southern section of Iredell County and the panhandle portion of Lancaster County, SC.



**1. Base Year Inventories (2000)**

Table III.A.1 below shows regional totals for all population, household, and employment data items collected as part of the base year inventory. For each data item, the first column in the table gives the data item description; the second column gives the data item name as it is found in the data file on the CD accompanying this report; and, the third column gives the regional total for that data item.

<b>Table III.A.1 Regional Totals: Base Year Inventory</b>		
<b>Data Item Description</b>	<b>Data Item Name</b>	<b>Regional Total*</b>
Total Population as of 2000 Census (SF 1, Table P-1)	TOT_POP	1,683,668
Total No. of Households as of 2000 Census (SF 1, Table P-15)	HH	646,204
Persons in Households (SF-1, P-16)	POP_HHS	1,648,061
Persons in Group Quarters (SF-1, P-37)	POP_GRP	35,607
Employees in Manufacturing, Industry, Wholesale, Transportation, Communications & Utilities	MIWTCU	339,852
Employees in Retail Trade	RTL	95,809
Employees in Highway Retail	HWY	52,830
Employees in Low Traffic Services	LOSVC	111,013
Employees in High Traffic Services	HISVC	127,972
Employees in Office/Government	OFFGOV	83,046
Employees in Banking	BANK	34,514
Employees in Schools, Colleges, Universities	EDUC	56,778

\*Regional totals include only the model area: eight counties in North and South Carolina (Cabarrus, Gaston, Lincoln, Mecklenburg, Rowan, Stanly, Union (NC), and York) plus the eastern part of Cleveland County, the southern section of Iredell County and the panhandle portion of Lancaster County, SC.

Employment data reported here are for the base year (2000), as factored or calculated from the 2002-2003 employment data collected by the Partners. The unfactored 2002-2003 employment data are available at the TAZ level on the CD accompanying this report.

Supplementary data collected for the base year inventory process are reported on the CD available upon request from Charlotte DOT, at the TAZ level, and include data items on school enrollments, commercial vehicles, and land use.

2. Population & Household Projections

Figures III.A.2.a-d chart the projected regional population and household data. The regional population is expected to

Figure III.A.2.a Total Population

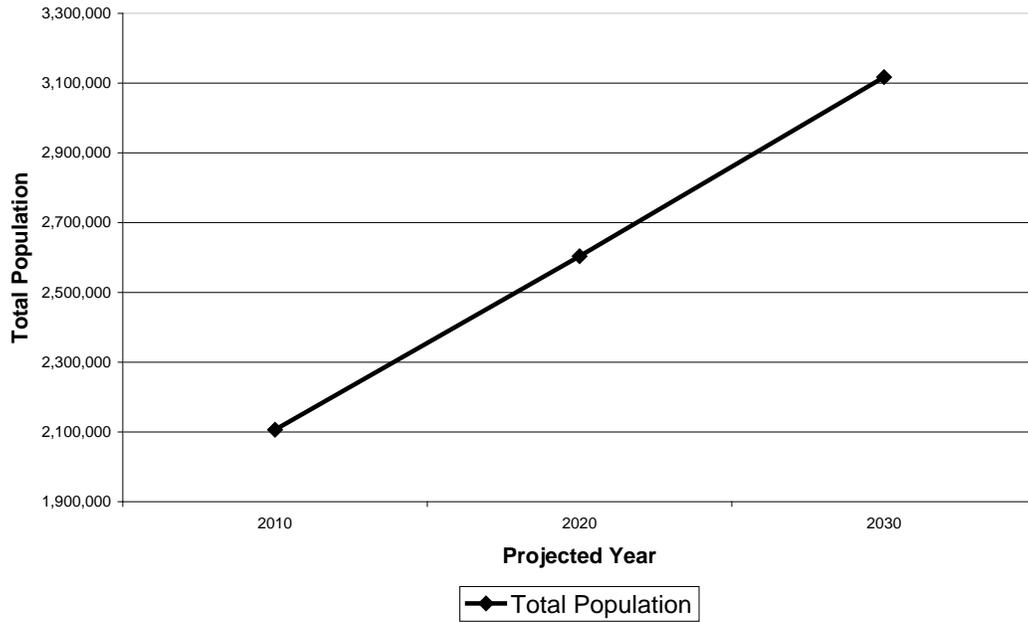
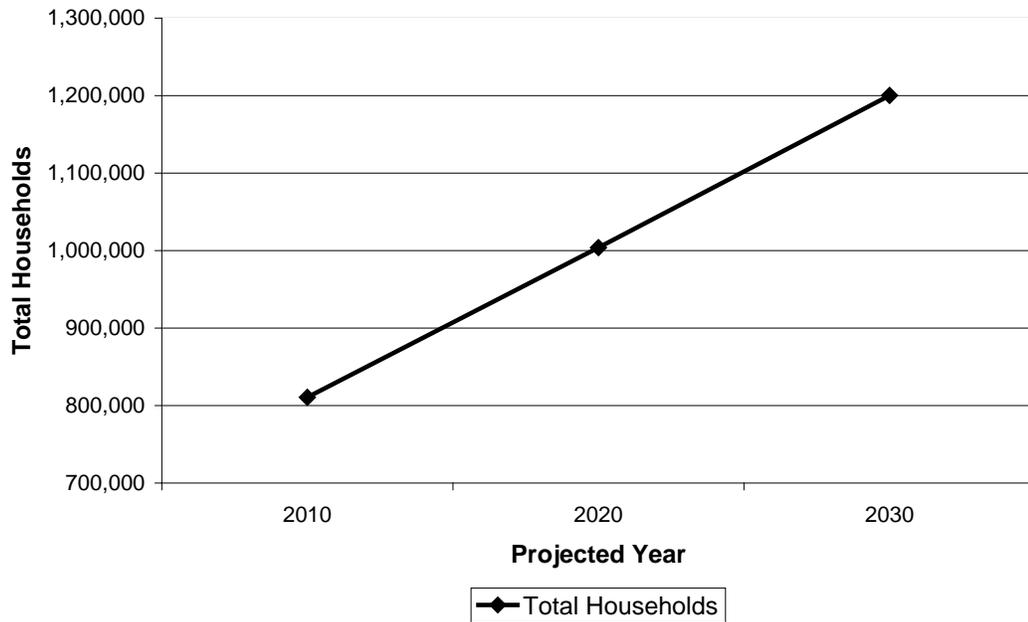
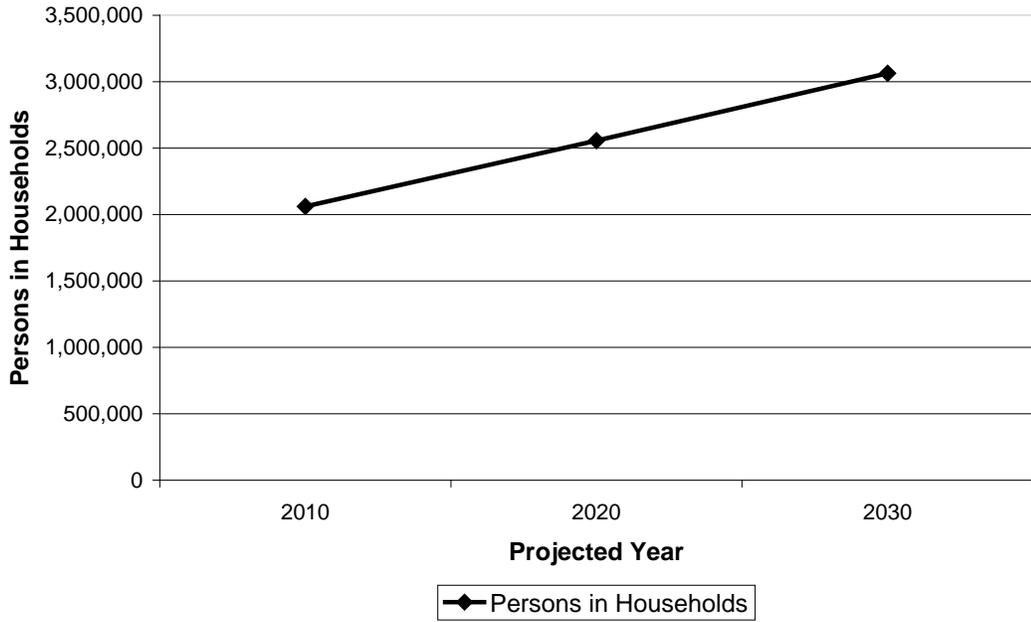


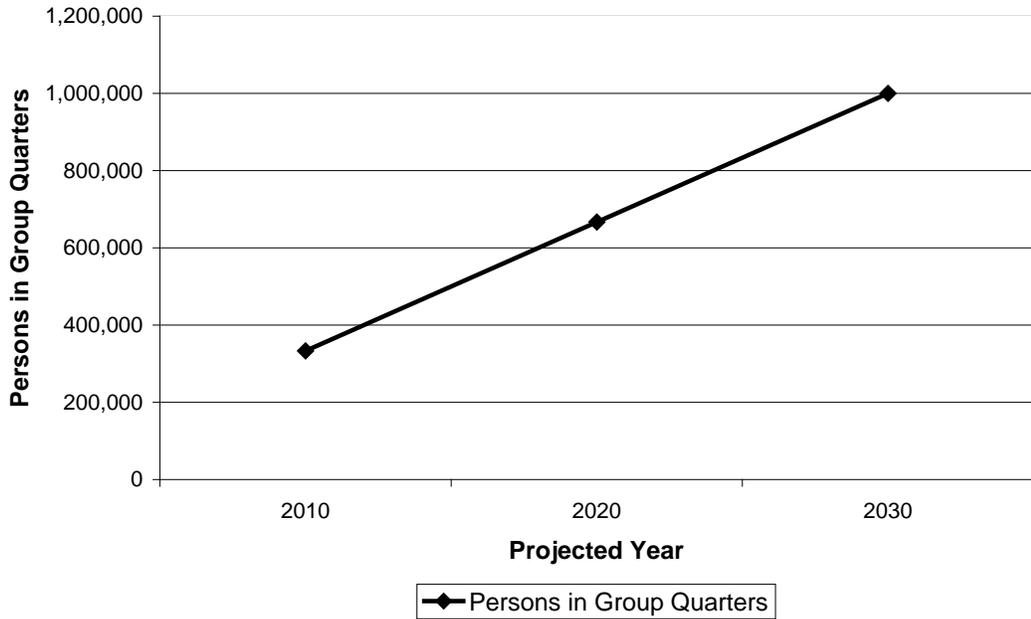
Figure III.A.2.b Total Households



**Figure III.A.2.c Persons in Households**



**Figure III.A.2.d Persons in Group Quarters**



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Table III.A.2.a below shows regional totals for all population and household projected for the three horizon years.

Table III.A.2.b below shows incremental and percent change in population for each decade and for the thirty-year period 2000 to 2030.

	<b>2000</b>	<b>2010</b>	<b>2020</b>	<b>2030</b>
Population	1,683,668	2,106,216	2,603,825	3,117,160
Households	646,204	810,769	1,003,850	1,200,352
Persons in Households	1,648,061	2,060,968	2,556,891	3,064,053
Persons in Group Quarters	35,607	45,248	46,934	53,107

	<b>2000 to 2010</b>		<b>2010 to 2020</b>		<b>2020 to 2030</b>		<b>2000 to 2030</b>	
	Change	%	Change	%	Change	%	Change	%
	Change	Change	Change	Change	Change	Change	Change	Change
Population	422,548	25.1%	497,609	23.6%	513,335	19.7%	1,433,492	85.1%
Households	164,565	25.5%	193,081	23.8%	196,502	19.6%	554,148	85.8%
Persons in Households	412,907	25.1%	495,923	24.1%	507,162	19.8%	1,415,992	85.9%
Persons in Group Quarters	9,641	27.1%	1,686	3.7%	6,173	13.2%	17,500	49.1%

**3. Employment Projections: 10-yr incremental Projections from 2010 to 2030**

Figure III.A.3 charts the regional employment totals for the base year and the three horizon years.

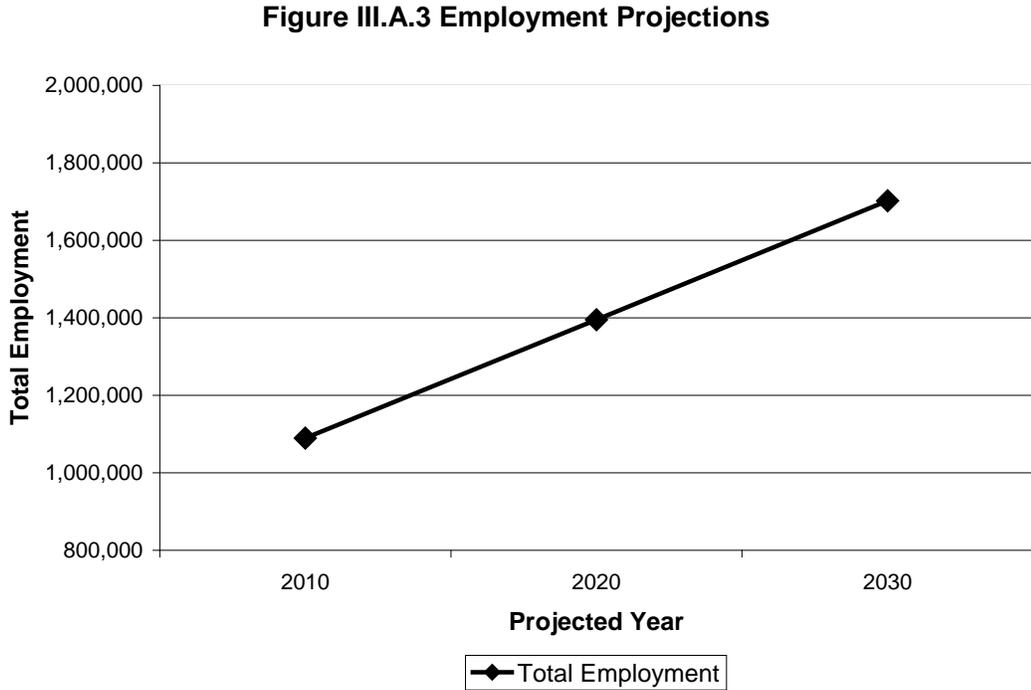


Table III.A.3.a below shows regional totals for all employment categories projected for the three horizon years.

Table III.A.3.b shows incremental and percent change in employment categories for each of the three decades and for the thirty-year period 2000 to 2030. These are the eight categories of employment used in the base year inventory and defined by SIC codes.

Land Use & Socio-Economic Data and Projections

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**Table III.A.3.a Projected Regional Employment, by Category, 2000-2030.**

<b>Employees in:</b>	<b>2000</b>	<b>2010</b>	<b>2020</b>	<b>2030</b>
Mfg, Ind, Wholesale, Trans, Comm, Utilities	339,852	381,751	462,564	537,735
Retail	95,809	117,747	148,032	172,946
Highway Retail	52,830	65,387	86,899	106,491
Low Traffic Services	111,013	149,711	213,878	287,533
High Traffic Services	127,972	163,202	216,096	271,628
Office/Gov't	83,046	99,216	125,271	150,497
Banking	34,514	41,958	55,199	69,674
Schools, Colleges, Universities	56,778	70,580	87,012	105,768
<b>Total</b>	<b>901,814</b>	<b>1,089,552</b>	<b>1,394,951</b>	<b>1,702,272</b>

**Table III.A.3.b Projected Regional Employment Change, by Category, 2000-2030.**

<b>Employees in:</b>	<b>2000 to 2010</b>		<b>2010 to 2020</b>		<b>2020 to 2030</b>		<b>2000 to 2030</b>	
	Change	% Change						
Mfg, Ind, Wholesale, Trans, Comm, Utilities	41,899	12.3%	80,813	21.2%	75,171	16.3%	197,883	58.2%
Retail	21,938	22.9%	30,285	25.7%	24,914	16.8%	77,137	80.5%
Highway Retail	12,557	23.8%	21,512	32.9%	19,592	22.5%	53,661	101.6%
Low Traffic Services	38,698	34.9%	64,167	42.9%	73,655	34.4%	176,520	159.0%
High Traffic Services	35,230	27.5%	52,894	32.4%	55,532	25.7%	143,656	112.3%
Office/Gov't	16,170	19.5%	26,055	26.3%	25,226	20.1%	67,451	81.2%
Banking	7,444	21.6%	13,241	31.6%	14,475	26.2%	35,160	101.9%
Schools, Colleges, Universities	13,802	24.3%	16,432	23.3%	18,756	21.6%	48,990	86.3%
<b>Total</b>	<b>187,738</b>	<b>20.8%</b>	<b>305,399</b>	<b>28.0%</b>	<b>307,321</b>	<b>22.0%</b>	<b>800,458</b>	<b>88.8%</b>

**B. Air Quality Non-Attainment Area Totals**

The Charlotte non-attainment area, as designated by the USEPA, includes all of Lincoln, Gaston, Mecklenburg, Union, Cabarrus, and Rowan Counties and the southern township of Iredell County in North Carolina, as well as the portion of York County, South Carolina designated as the Rock Hill–Fort Mill Area Transportation Study. Figure III.B.1 highlights the non-attainment area in blue and highlights the remaining portion of the modeled region, hereafter referred to as the attainment area, in white. Tables III.B.1 through III.B.3b summarize the region’s population, households, and employment by attainment and non-attainment area.



Land Use & Socio-Economic Data and Projections

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<b>Table III.B.1 Air Quality Attainment and Non-Attainment Area Base Year (2000) Population and Household Inventory</b>				
	<b>2000</b>			
<b>Air Quality Area</b>	<b>Population</b>	<b>Households</b>	<b>Persons in Households</b>	<b>Persons in Group Quarters</b>
Attainment Area	189,634	71,774	185,851	3,783
Non-Attainment Area	1,494,034	574,430	1,462,210	31,824
<b>Region Total</b>	<b>1,683,668</b>	<b>646,204</b>	<b>1,648,061</b>	<b>35,607</b>

<b>Table III.B.2 Air Quality Attainment and Non-Attainment Area Population and Household Projections, 2000 - 2030.</b>								
<b>Air Quality Area</b>	<b>2000</b>		<b>2010</b>		<b>2020</b>		<b>2030</b>	
	<b>Population</b>	<b>Households</b>	<b>Population</b>	<b>Households</b>	<b>Population</b>	<b>Households</b>	<b>Population</b>	<b>Households</b>
	Attainment Area	189,634	71,774	222,722	86,215	270,687	104,987	325,813
Non-Attainment Area	1,494,034	574,430	1,883,494	724,554	2,333,138	898,863	2,791,347	1,073,972
<b>Region Total</b>	<b>1,683,668</b>	<b>646,204</b>	<b>2,106,216</b>	<b>810,769</b>	<b>2,603,825</b>	<b>1,003,850</b>	<b>3,117,160</b>	<b>1,200,352</b>

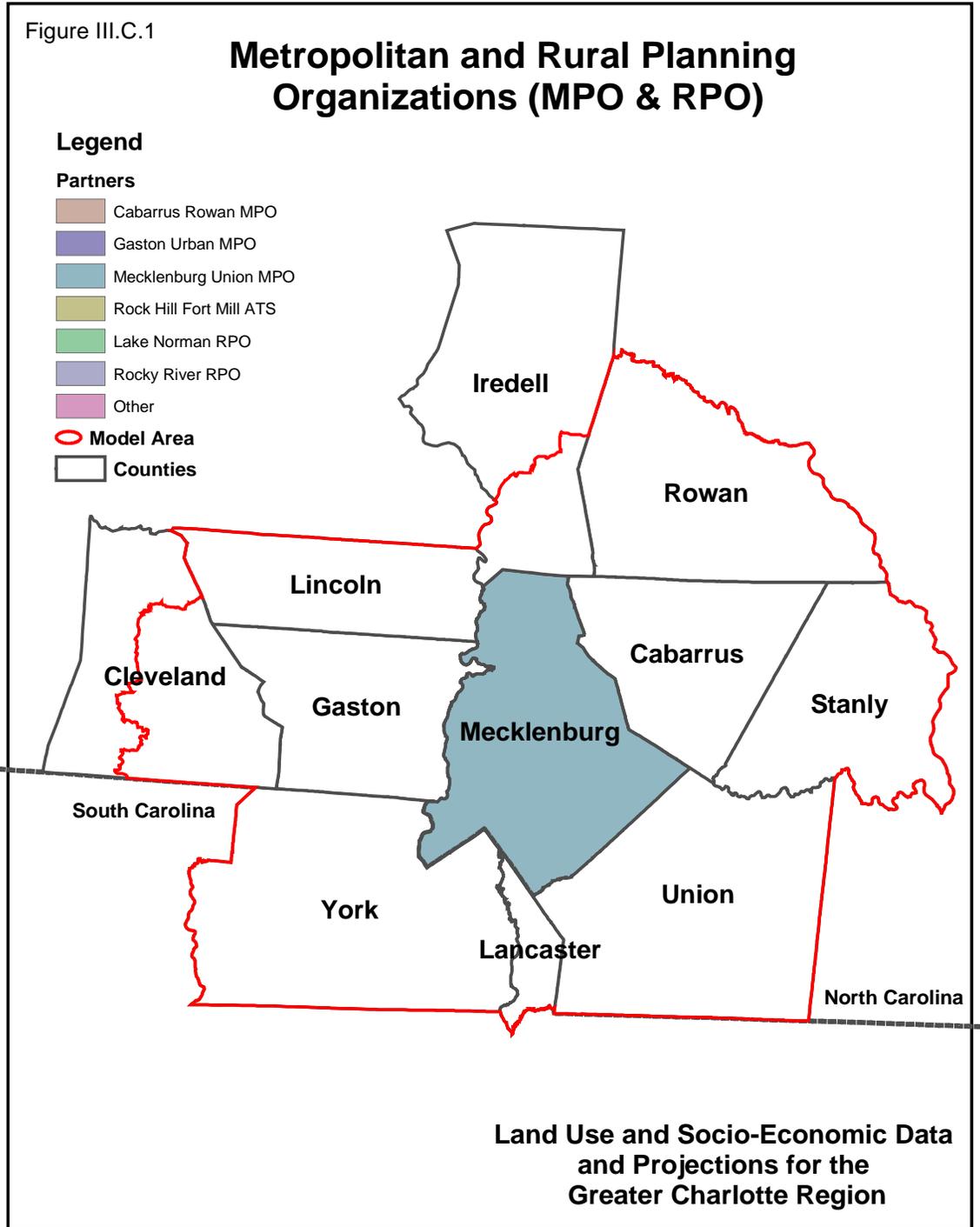
<b>Table III.B.3a Air Quality Non-Attainment Area Employment Projections, 2000 – 2030.</b>				
	<b>Non-Attainment</b>			
<b>Employees in:</b>	<b>2000</b>	<b>2010</b>	<b>2020</b>	<b>2030</b>
Mfg, Ind, Wholesale, Trans, Comm, Utilities	312,158	351,249	427,347	498,134
Retail	88,241	109,057	137,095	160,822
Highway Retail	49,142	61,000	81,418	100,102
Low Traffic Services	108,260	145,704	207,358	278,758
High Traffic Services	119,502	153,394	203,676	256,969
Office/Gov't	76,418	91,378	115,432	139,173
Banking	33,824	41,076	54,094	68,401
Schools, Colleges, Universities	48,651	60,774	74,916	91,194
<b>Total</b>	<b>836,196</b>	<b>1,013,632</b>	<b>1,301,336</b>	<b>1,593,553</b>

Land Use & Socio-Economic Data and Projections

<b>Table III.B.3b Air Quality Attainment Area Employment Projections, 2000 – 2030.</b>				
	<b>Attainment</b>			
<b>Employees in:</b>	<b>2000</b>	<b>2010</b>	<b>2020</b>	<b>2030</b>
Mfg, Ind, Wholesale, Trans, Comm, Utilities	27,694	30,502	35,217	39,601
Retail	7,568	8,690	10,937	12,124
Highway Retail	3,688	4,387	5,481	6,389
Low Traffic Services	2,753	4,007	6,520	8,775
High Traffic Services	8,470	9,808	12,420	14,659
Office/Gov't	6,628	7,838	9,839	11,324
Banking	690	882	1,105	1,273
Schools, Colleges, Universities	8,127	9,806	12,096	14,574
<b>Total</b>	<b>65,618</b>	<b>75,920</b>	<b>93,615</b>	<b>108,719</b>

**C. Metropolitan and Rural Planning Organizations Totals**

The modeled region includes four Metropolitan Planning Organizations (MPOs), two Rural Planning Organizations (RPOs), and portions of two counties that are not included in either an MPO or RPO. Figure III.C.1 highlights each MPO and RPO. Tables III.C.1 through III.C.3d summarize the region's population, households, and employment by MPO and RPO.



**Table III.C.1 MPO and RPO Population and Households, Base Year Inventory (2000.)**

<b>Planning Organization</b>	<b>Population</b>	<b>Households</b>	<b>Persons in Households</b>	<b>Persons in Group Quarters</b>
Cabarrus-Rowan MPO	261,403	99,459	254,538	6,865
Gaston Urban Area MPO	166,957	64,924	164,162	2,795
Mecklenburg-Union MPO	794,519	307,845	777,548	16,971
Rock Hill – Fort Mill ATS	119,505	44,876	115,986	3,519
Lake Norman RPO	206,404	79,089	203,540	2,864
Rocky River RPO	82,712	31,184	80,817	1,895
Other	52,168	18,827	51,470	698
<b>Region Total</b>	<b>1,683,668</b>	<b>646,204</b>	<b>1,648,061</b>	<b>35,607</b>

Land Use & Socio-Economic Data and Projections

<b>Planning Organization</b>	<b>2000</b>		<b>2010</b>		<b>2020</b>		<b>2030</b>	
	<b>Population</b>	<b>Households</b>	<b>Population</b>	<b>Households</b>	<b>Population</b>	<b>Households</b>	<b>Population</b>	<b>Households</b>
	Cabarrus-Rowan MPO	261,403	99,459	330,261	125,025	409,220	154,919	499,098
Gaston Urban Area MPO	166,957	64,924	191,903	75,324	225,214	88,626	262,399	103,141
Mecklenburg-Union MPO	794,519	307,845	1,015,303	391,911	1,265,409	489,723	1,513,805	585,176
Rock Hill – Fort Mill ATS	119,505	44,876	156,937	60,206	197,408	75,640	225,054	86,046
Lake Norman RPO	206,404	79,089	249,148	96,811	303,803	118,005	369,805	143,449
Rocky River RPO	82,712	31,184	93,441	35,652	109,685	41,878	132,680	50,578
Other	52,168	18,827	69,223	25,840	93,086	35,059	114,319	43,242
<b>Region Total</b>	<b>1,683,668</b>	<b>646,204</b>	<b>2,106,216</b>	<b>810,769</b>	<b>2,603,825</b>	<b>1,003,850</b>	<b>3,117,160</b>	<b>1,200,352</b>

Land Use & Socio-Economic Data and Projections

<b>Table III.C.3a MPO and RPO Employment, by Category, 2000.</b>									
	<b>Employees In:</b>								
	<b>Mfg, Ind, Wholesale, Trans, Comm, Utilities</b>	<b>Retail</b>	<b>Highway Retail</b>	<b>Low Traffic Services</b>	<b>High Traffic Services</b>	<b>Office/Gov't</b>	<b>Banking</b>	<b>Schools, Colleges, Universities</b>	<b>TOTAL</b>
<b>Planning Organization</b>									
Cabarrus-Rowan MPO	43,982	15,374	6,560	6,145	17,728	9,589	926	7,302	107,606
Gaston Urban Area MPO	27,906	8,613	4,531	4,286	9,777	5,201	674	4,503	65,491
Mecklenburg-Union MPO	201,132	52,220	30,643	88,605	79,679	55,638	31,408	29,558	568,883
Rock Hill – Fort Mill ATS	18,308	6,532	4,312	5,920	6,681	2,904	359	3,791	48,807
Lake Norman RPO	30,551	9,022	4,465	4,534	10,539	5,359	799	6,185	71,634
Rocky River RPO	11,341	2,668	1,549	900	2,976	1,888	253	2,583	24,158
Other	6,632	1,380	590	623	592	2,467	95	2,856	15,235
<b>Region Total</b>	<b>339,852</b>	<b>95,809</b>	<b>52,830</b>	<b>111,013</b>	<b>127,972</b>	<b>83,046</b>	<b>34,514</b>	<b>56,778</b>	<b>901,814</b>

Land Use & Socio-Economic Data and Projections

<b>Table III.C.3b MPO and RPO Employment Projections, by category, 2010.</b>									
<b>Planning Organization</b>	<b>Employees In:</b>								
	<b>Mfg, Ind, Wholesale, Trans, Comm, Utilities</b>	<b>Retail</b>	<b>Highway Retail</b>	<b>Low Traffic Services</b>	<b>High Traffic Services</b>	<b>Office/Gov't</b>	<b>Banking</b>	<b>Schools, Colleges, Universities</b>	<b>TOTAL</b>
Cabarrus-Rowan MPO	49,390	19,197	8,226	10,237	22,317	12,381	1,287	9,552	132,587
Gaston Urban Area MPO	28,476	9,498	4,989	4,972	10,657	5,501	754	5,296	70,143
Mecklenburg-Union MPO	227,218	64,267	37,940	116,845	101,103	63,138	37,617	35,370	683,498
Rock Hill – Fort Mill ATS	21,255	7,328	4,708	7,817	9,307	3,608	632	3,992	58,647
Lake Norman RPO	35,449	12,552	6,979	7,343	15,288	9,201	1,168	9,463	97,443
Rocky River RPO	11,983	3,305	1,832	1,278	3,658	2,218	313	3,835	28,422
Other	7,980	1,600	713	1,219	872	3,169	187	3,072	18,812
<b>Region Total</b>	<b>381,751</b>	<b>117,747</b>	<b>65,387</b>	<b>149,711</b>	<b>163,202</b>	<b>99,216</b>	<b>41,958</b>	<b>70,580</b>	<b>1,089,552</b>

Land Use & Socio-Economic Data and Projections

<b>Table III.C.3c MPO and RPO Employment Projections, by Category, 2020.</b>									
<b>Planning Organization</b>	<b>Employees In:</b>								
	<b>Mfg, Ind, Wholesale, Trans, Comm, Utilities</b>	<b>Retail</b>	<b>Highway Retail</b>	<b>Low Traffic Services</b>	<b>High Traffic Services</b>	<b>Office/Gov't</b>	<b>Banking</b>	<b>Schools, Colleges, Universities</b>	<b>TOTAL</b>
Cabarrus-Rowan MPO	63,623	24,442	12,245	17,664	30,701	15,809	1,982	11,788	178,254
Gaston Urban Area MPO	29,952	11,307	5,894	7,261	12,933	6,411	1,055	5,964	80,777
Mecklenburg-Union MPO	273,983	78,909	49,625	160,690	131,901	77,039	48,939	44,765	865,851
Rock Hill – Fort Mill ATS	28,466	9,910	6,060	11,856	13,043	4,800	921	4,335	79,391
Lake Norman RPO	42,444	16,580	9,640	12,456	21,120	14,111	1,621	10,741	128,713
Rocky River RPO	13,589	4,662	2,521	2,372	5,206	2,955	414	6,054	37,773
Other	10,507	2,222	914	1,579	1,192	4,146	267	3,365	24,192
<b>Region Total</b>	<b>462,564</b>	<b>148,032</b>	<b>86,899</b>	<b>213,878</b>	<b>216,096</b>	<b>125,271</b>	<b>55,199</b>	<b>87,012</b>	<b>1,394,951</b>

Land Use & Socio-Economic Data and Projections

<b>Table III.C.3d MPO and RPO Employment Projections, by Category, 2030.</b>									
<b>Planning Organization</b>	<b>Employees In:</b>								
	<b>Mfg, Ind, Wholesale, Trans, Comm, Utilities</b>	<b>Retail</b>	<b>Highway Retail</b>	<b>Low Traffic Services</b>	<b>High Traffic Services</b>	<b>Office/Gov't</b>	<b>Banking</b>	<b>Schools, Colleges, Universities</b>	<b>TOTAL</b>
Cabarrus-Rowan MPO	75,200	29,823	15,393	26,009	37,844	20,683	2,736	14,042	221,730
Gaston Urban Area MPO	31,250	12,795	6,825	9,635	15,005	7,343	1,367	6,602	90,822
Mecklenburg-Union MPO	322,927	91,631	61,645	209,453	166,881	92,224	61,679	54,358	1,060,798
Rock Hill – Fort Mill ATS	31,229	10,362	6,426	18,909	16,660	5,401	944	6,303	96,234
Lake Norman RPO	48,946	19,995	11,688	17,175	26,734	16,321	2,058	12,441	155,358
Rocky River RPO	16,177	5,985	3,514	4,214	6,996	3,833	604	7,201	48,524
Other	12,006	2,355	1,000	2,138	1,508	4,692	286	4,821	28,806
<b>Region Total</b>	<b>537,735</b>	<b>172,946</b>	<b>106,491</b>	<b>287,533</b>	<b>271,628</b>	<b>150,497</b>	<b>69,674</b>	<b>105,768</b>	<b>1,702,272</b>

### **D. Totals by County**

This section of the report contains data for the region's eight counties in North and South Carolina (Cabarrus, Gaston, Lincoln, Mecklenburg, Rowan, Stanly, Union (NC), and York) plus the eastern part of Cleveland County, the southern section of Iredell County and the panhandle portion of Lancaster County, SC). Please note that data for Cleveland, Iredell and Lancaster is for the portion of the county in the model area only and does not represent totals for the entire county.

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<b>Table III.D.1.a County Population and Household Base Year Inventory (2000).</b>				
<b>County</b>	<b>Population</b>	<b>Households</b>	<b>Persons in Households</b>	<b>Persons in Group Quarters</b>
Cabarrus	131,063	49,519	128,894	2,169
Cleveland*	73,877	28,701	72,580	1,297
Gaston	190,365	73,936	187,274	3,091
Iredell*	45,377	17,345	44,997	380
Lancaster*	7,059	2,652	7,049	10
Lincoln	63,742	24,031	62,851	891
Mecklenburg	695,454	273,416	680,042	15,412
Rowan	130,340	49,940	125,644	4,696
Stanly	58,100	22,223	56,312	1,788
Union (NC)	123,677	43,390	122,011	1,666
York	164,614	61,051	160,407	4,207
<b>Region Total</b>	<b>1,683,668</b>	<b>646,204</b>	<b>1,648,061</b>	<b>35,607</b>

\*Model area includes the eastern part of Cleveland County, the southern section of Iredell County and the panhandle portion of Lancaster County (SC).

Land Use & Socio-Economic Data and Projections

<b>Table III.D.1.b County Employment, by Category, Base Year Inventory (2000).</b>									
	<b>Employees In:</b>								
<b>County</b>	<b>Mfg, Ind, Wholesale, Trans, Comm, Utilities</b>	<b>Retail</b>	<b>Highway Retail</b>	<b>Low Traffic Services</b>	<b>High Traffic Services</b>	<b>Office/Gov't</b>	<b>Banking</b>	<b>Schools, Colleges, Universities</b>	<b>TOTAL</b>
Cabarrus	23,251	8,652	4,098	3,358	8,742	6,227	440	3,222	57,990
Cleveland*	12,068	3,771	1,721	1,351	5,036	2,537	377	3,619	30,480
Gaston	29,815	9,146	4,839	4,610	10,392	5,447	756	4,845	69,850
Iredell*	6,225	2,736	1,586	1,125	2,976	887	145	913	16,593
Lancaster*	1,715	21	7	273	60	141	0	165	2,382
Lincoln	10,349	1,982	1,030	1,734	1,912	1,689	195	1,311	20,202
Mecklenburg	180,883	47,904	28,410	86,275	75,743	52,679	31,158	26,620	529,672
Rowan	20,731	6,722	2,462	2,787	8,986	3,362	486	4,080	49,616
Stanly	8,143	2,384	1,377	763	2,818	1,624	218	1,652	18,979
Union (NC)	23,447	4,600	2,405	2,467	4,094	3,223	285	3,869	44,390
York	23,225	7,891	4,895	6,270	7,213	5,230	454	6,482	61,660
<b>Region Total</b>	<b>339,852</b>	<b>95,809</b>	<b>52,830</b>	<b>111,013</b>	<b>127,972</b>	<b>83,046</b>	<b>34,514</b>	<b>56,778</b>	<b>901,814</b>

\*Model area includes the eastern part of Cleveland County, the southern section of Iredell County and the panhandle portion of Lancaster County (SC).

## Land Use & Socio-Economic Data and Projections

Tables III.D.2.a-b below show totals by county for projected population and household data for each horizon year.

Tables III.D.2.c-d show projected change in population and household data for each decade and for the 30-year increment 2000 to 2030, by county.

### a. Projected County Population and Households

<b>Table III.D.2.a Projected County Population and Households, 2000 – 2030.</b>								
<b>County</b>	<b>2000</b>		<b>2010</b>		<b>2020</b>		<b>2030</b>	
	<b>Pop.</b>	<b>Households</b>	<b>Pop.</b>	<b>Households</b>	<b>Pop.</b>	<b>Households</b>	<b>Pop.</b>	<b>Households</b>
	Cabarrus	131,063	49,519	177,748	66,664	231,036	86,458	289,238
Cleveland*	73,877	28,701	80,470	31,684	90,120	35,511	103,571	40,762
Gaston	190,365	73,936	216,603	85,045	251,884	99,126	292,063	114,804
Iredell*	45,377	17,345	63,769	24,875	85,083	33,193	110,172	42,961
Lancaster*	7,059	2,652	13,722	5,487	19,197	7,676	24,206	9,680
Lincoln	63,742	24,031	80,209	30,531	101,930	38,801	126,398	48,063
Mecklenburg	695,454	273,416	867,451	340,142	1,059,519	417,084	1,227,928	483,878
Rowan	130,340	49,940	152,513	58,361	178,184	68,461	209,860	80,715
Stanly	58,100	22,223	64,609	25,402	75,205	29,622	91,180	35,836
Union (NC)	123,677	43,390	176,684	62,019	240,370	84,895	327,377	116,040
York	164,614	61,051	212,438	80,559	271,297	103,023	315,167	119,608
<b>Region Total</b>	1,683,668	646,204	2,106,216	810,769	2,603,825	1,003,850	3,117,160	1,200,352

\*Model area includes the eastern part of Cleveland County, the southern section of Iredell County and the panhandle portion of Lancaster County (SC).

Land Use & Socio-Economic Data and Projections

**b. Projected County Persons in Households and Persons in Group Quarter, 2000 - 2030**

<b>Table III.D.2.b County Totals: Projected Persons in Households &amp; Persons in Group Quarters, 2000 – 2030.</b>								
<b>County</b>	<b>2000</b>		<b>2010</b>		<b>2020</b>		<b>2030</b>	
	<b>Persons in Households</b>	<b>Persons in Group Quarters</b>	<b>Persons in Households</b>	<b>Persons in Group Quarters</b>	<b>Persons in Households</b>	<b>Persons in Group Quarters</b>	<b>Persons in Households</b>	<b>Persons in Group Quarters</b>
	Cabarrus	128,894	2,169	174,926	2,822	228,105	2,931	285,888
Cleveland*	72,580	1,297	78,880	1,590	88,543	1,577	101,831	1,740
Gaston	187,274	3,091	212,490	4,113	247,698	4,186	287,381	4,682
Iredell*	44,997	380	63,302	467	84,592	491	109,603	569
Lancaster*	7,049	10	13,707	15	19,182	15	24,189	17
Lincoln	62,851	891	79,106	1,103	100,770	1,160	125,041	1,357
Mecklenburg	680,042	15,412	847,149	20,302	1,038,033	21,486	1,203,409	24,519
Rowan	125,644	4,696	147,143	5,370	172,951	5,233	204,046	5,814
Stanly	56,312	1,788	62,505	2,104	73,144	2,061	88,875	2,305
Union (NC)	122,011	1,666	174,606	2,078	238,063	2,307	324,677	2,700
York	160,407	4,207	207,154	5,284	265,810	5,487	309,113	6,054
<b>Region Total</b>	<b>1,648,061</b>	<b>35,607</b>	<b>2,060,968</b>	<b>45,248</b>	<b>2,556,891</b>	<b>46,934</b>	<b>3,064,053</b>	<b>53,107</b>

\*Model area includes the eastern part of Cleveland County, the southern section of Iredell County and the panhandle portion of Lancaster County (SC).

Land Use & Socio-Economic Data and Projections

c. Projected County Projected Population Change, 2000 -2030

Table III.D.2.c Projected County Population Change, 2000 – 2030.

County	2000 to 2010		2010 to 2020		2020 to 2030		2000 to 2030	
	Change	% Change						
	Cabarrus	46,685	35.6%	53,288	30.0%	58,202	25.2%	158,175
Cleveland*	6,593	8.9%	9,650	12.0%	13,451	14.9%	29,694	40.2%
Gaston	26,238	13.8%	35,281	16.3%	40,179	16.0%	101,698	53.4%
Iredell*	18,392	40.5%	21,314	33.4%	25,089	29.5%	64,795	142.8%
Lancaster*	6,663	94.4%	5,475	39.9%	5,009	26.1%	17,147	242.9%
Lincoln	16,467	25.8%	21,721	27.1%	24,468	24.0%	62,656	98.3%
Mecklenburg	171,997	24.7%	192,068	22.1%	168,409	15.9%	532,474	76.6%
Rowan	22,173	17.0%	25,671	16.8%	31,676	17.8%	79,520	61.0%
Stanly	6,509	11.2%	10,596	16.4%	15,975	21.2%	33,080	56.9%
Union (NC)	53,007	42.9%	63,686	36.0%	87,007	36.2%	203,700	164.7%
York	47,824	29.1%	58,859	27.7%	43,870	16.2%	150,553	91.5%
<b>Region Total</b>	422,548	25.1%	497,609	23.6%	513,335	19.7%	1,433,492	85.1%

\*Model area includes the eastern part of Cleveland County, the southern section of Iredell County and the panhandle portion of Lancaster County (SC).

Land Use & Socio-Economic Data and Projections

**d. Projected County Household Change, 2000 - 2030**

<b>County</b>	<b>2000 to 2010</b>		<b>2010 to 2020</b>		<b>2020 to 2030</b>		<b>2000 to 2030</b>	
	Change	% Change						
	Cabarrus	17,145	34.6%	19,794	29.7%	21,547	24.9%	58,486
Cleveland*	2,983	10.4%	3,827	12.1%	5,251	14.8%	12,061	42.0%
Gaston	11,109	15.0%	14,081	16.6%	15,678	15.8%	40,868	55.3%
Iredell*	7,530	43.4%	8,318	33.4%	9,768	29.4%	25,616	147.7%
Lancaster*	2,835	106.9%	2,189	39.9%	2,004	26.1%	7,028	265.0%
Lincoln	6,500	27.0%	8,270	27.1%	9,262	23.9%	24,032	100.0%
Mecklenburg	66,726	24.4%	76,942	22.6%	66,794	16.0%	210,462	77.0%
Rowan	8,421	16.9%	10,100	17.3%	12,254	17.9%	30,775	61.6%
Stanly	3,179	14.3%	4,220	16.6%	6,214	21.0%	13,613	61.3%
Union (NC)	18,629	42.9%	22,876	36.9%	31,145	36.7%	72,650	167.4%
York	19,508	32.0%	22,464	27.9%	16,585	16.1%	58,557	95.9%
<b>Region Total</b>	164,565	25.5%	193,081	23.8%	196,502	19.6%	554,148	85.8%

\*Model area includes the eastern part of Cleveland County, the southern section of Iredell County and the panhandle portion of Lancaster County (SC).

Land Use & Socio-Economic Data and Projections

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**2. Projected County Employment: 2010 to 2030**

Tables III.D.3.a-c on the following pages show county-level projected employment for the three horizon years. Tables III.D.3.d-g show change in employment at each ten-year increment, and for the 30-year period 2000 to 2030, by county.

**a. Projected County Employment, by Category, 2010**

<b>Table III.D.3.a Projected County Employment, by Category, 2010.</b>									
<b>Employees In:</b>									
<b>County</b>	<b>Mfg, Ind, Wholesale, Trans, Comm, Utilities</b>	<b>Retail</b>	<b>Highway Retail</b>	<b>Low Traffic Services</b>	<b>High Traffic Services</b>	<b>Office/Gov't</b>	<b>Banking</b>	<b>Schools, Colleges, Universities</b>	<b>TOTAL</b>
Cabarrus	26,269	11,908	5,438	6,055	12,241	8,472	751	4,307	75,441
Cleveland*	12,657	4,003	1,890	1,535	5,261	2,737	402	4,185	32,670
Gaston	30,503	10,078	5,349	5,488	11,304	5,791	853	5,697	75,063
Iredell*	8,573	5,104	3,180	2,813	6,440	4,149	372	2,381	33,012
Lancaster*	2,264	74	76	760	134	272	20	238	3,838
Lincoln	12,192	2,865	1,549	2,479	2,940	2,025	295	2,496	26,841
Mecklenburg	201,091	57,960	34,286	112,491	94,897	58,863	37,158	31,063	627,809
Rowan	23,121	7,289	2,788	4,182	10,076	3,909	536	5,245	57,146
Stanly	8,682	2,958	1,601	1,133	3,457	1,924	274	2,429	22,458
Union (NC)	29,428	6,654	3,885	4,499	6,407	4,569	498	5,713	61,653
York	26,971	8,854	5,345	8,276	10,045	6,505	799	6,826	73,621
<b>Region Total</b>	<b>381,751</b>	<b>117,747</b>	<b>65,387</b>	<b>149,711</b>	<b>163,202</b>	<b>99,216</b>	<b>41,958</b>	<b>70,580</b>	<b>1,089,552</b>

\*Model area includes the eastern part of Cleveland County, the southern section of Iredell County and the panhandle portion of Lancaster County (SC).

Land Use & Socio-Economic Data and Projections

**b. Projected County Employment, 2020**

<b>Table III.D.3.b Projected County Employment, by Category, 2020.</b>									
<b>Employees In:</b>									
<b>County</b>	<b>Mfg, Ind, Wholesale, Trans, Comm, Utilities</b>	<b>Retail</b>	<b>Highway Retail</b>	<b>Low Traffic Services</b>	<b>High Traffic Services</b>	<b>Office/Gov't</b>	<b>Banking</b>	<b>Schools, Colleges, Universities</b>	<b>TOTAL</b>
Cabarrus	35,136	16,418	7,933	11,075	18,160	11,513	1,380	5,963	107,578
Cleveland*	13,509	4,608	2,233	2,712	6,158	3,184	453	4,313	37,170
Gaston	32,068	11,974	6,312	7,891	13,651	6,746	1,167	6,405	86,214
Iredell*	11,963	6,988	4,505	5,000	9,266	7,901	596	3,061	49,280
Lancaster*	2,853	157	94	884	157	292	23	284	4,744
Lincoln	14,856	4,317	2,484	4,114	4,978	2,691	460	2,926	36,826
Mecklenburg	239,353	69,168	43,697	152,179	121,063	70,505	48,079	38,284	782,328
Rowan	28,487	8,024	4,312	6,589	12,541	4,296	602	5,825	70,676
Stanly	9,565	3,831	1,957	1,906	4,550	2,471	336	4,158	28,774
Union (NC)	38,654	10,572	6,492	8,977	11,494	7,018	938	8,377	92,522
York	36,120	11,975	6,880	12,551	14,078	8,654	1,165	7,416	98,839
<b>Region Total</b>	<b>462,564</b>	<b>148,032</b>	<b>86,899</b>	<b>213,878</b>	<b>216,096</b>	<b>125,271</b>	<b>55,199</b>	<b>87,012</b>	<b>1,394,951</b>

\*Model area includes the eastern part of Cleveland County, the southern section of Iredell County and the panhandle portion of Lancaster County (SC).

Land Use & Socio-Economic Data and Projections

c. Projected County Employment, 2030

<b>Table III.D.3.c Projected County Employment, by Category, 2030.</b>									
<b>Employees In:</b>									
<b>County</b>	<b>Mfg, Ind, Wholesale, Trans, Comm, Utilities</b>	<b>Retail</b>	<b>Highway Retail</b>	<b>Low Traffic Services</b>	<b>High Traffic Services</b>	<b>Office/Gov't</b>	<b>Banking</b>	<b>Schools, Colleges, Universities</b>	<b>TOTAL</b>
Cabarrus	43,058	20,685	9,992	16,963	23,383	15,720	2,046	7,545	139,392
Cleveland*	14,005	5,065	2,501	3,085	6,756	3,516	476	4,558	39,962
Gaston	33,459	13,550	7,300	10,356	15,797	7,721	1,495	7,075	96,753
Iredell*	15,630	8,327	5,192	7,490	11,613	8,934	810	3,833	61,829
Lancaster*	3,607	196	130	1,026	186	355	35	344	5,879
Lincoln	17,102	5,848	3,520	5,879	7,573	3,493	644	3,577	47,636
Mecklenburg	280,139	78,593	53,812	195,457	150,830	83,368	60,338	45,754	948,291
Rowan	32,142	9,138	5,401	9,046	14,461	4,963	690	6,497	82,338
Stanly	10,793	4,331	2,407	2,953	5,478	3,061	439	4,775	34,237
Union (NC)	48,172	14,692	8,940	15,257	17,569	9,628	1,506	11,030	126,794
York	39,628	12,521	7,296	20,021	17,982	9,738	1,195	10,780	119,161
<b>Region Total</b>	<b>537,735</b>	<b>172,946</b>	<b>106,491</b>	<b>287,533</b>	<b>271,628</b>	<b>150,497</b>	<b>69,674</b>	<b>105,768</b>	<b>1,702,272</b>

\*Model area includes the eastern part of Cleveland County, the southern section of Iredell County and the panhandle portion of Lancaster County (SC).

Land Use & Socio-Economic Data and Projections

**d. Projected County Employment Change, by Category, 2000 to 2010**

**Table III.D.3.d Projected County Employment Change, by Category, 2000 - 2010.**

Employees In:																		
County	Mfg, Ind, Wholesale, Trans, Comm, Utilities		Retail		Highway Retail		Low Traffic Services		High Traffic Services		Office/Gov't		Banking		Schools, Colleges, Universities		TOTAL	
	Change	% Change	Change	% Change	Change	% Change	Change	% Change	Change	% Change	Change	% Change	Change	% Change	Change	% Change	Change	% Change
Cabarrus	3,018	13.0%	3,256	37.6%	1,340	32.7%	2,697	80.3%	3,499	40.0%	2,245	36.1%	311	70.7%	1,085	33.7%	17,451	30.1%
Cleveland*	589	4.9%	232	6.2%	169	9.8%	184	13.6%	225	4.5%	200	7.9%	25	6.6%	566	15.6%	2,190	7.2%
Gaston	688	2.3%	932	10.2%	510	10.5%	878	19.0%	912	8.8%	344	6.3%	97	12.8%	852	17.6%	5,213	7.5%
Iredell*	2,348	37.7%	2,368	86.5%	1,594	100.5%	1,688	150.0%	3,464	116.4%	3,262	367.8%	227	156.6%	1,468	160.8%	16,419	99.0%
Lancaster*	549	32.0%	53	252.4%	69	985.7%	487	178.4%	74	123.3%	131	92.9%	20	**	73	44.2%	1,456	61.1%
Lincoln	1,843	17.8%	883	44.6%	519	50.4%	745	43.0%	1,028	53.8%	336	19.9%	100	51.3%	1,185	90.4%	6,639	32.9%
Mecklenburg	20,208	11.2%	10,056	21.0%	5,876	20.7%	26,216	30.4%	19,154	25.3%	6,184	11.7%	6,000	19.3%	4,443	16.7%	98,137	18.5%
Rowan	2,390	11.5%	567	8.4%	326	13.2%	1,395	50.1%	1,090	12.1%	547	16.3%	50	10.3%	1,165	28.6%	7,530	15.2%
Stanly	539	6.6%	574	24.1%	224	16.3%	370	48.5%	639	22.7%	300	18.5%	56	25.7%	777	47.0%	3,479	18.3%
Union (NC)	5,981	25.5%	2,054	44.7%	1,480	61.5%	2,032	82.4%	2,313	56.5%	1,346	41.8%	213	74.7%	1,844	47.7%	17,263	38.9%
York	3,746	16.1%	963	12.2%	450	9.2%	2,006	32.0%	2,832	39.3%	1,275	24.4%	345	76.0%	344	5.3%	11,961	19.4%
<b>Region Total</b>	<b>41,899</b>	<b>12.3%</b>	<b>21,938</b>	<b>22.9%</b>	<b>12,557</b>	<b>23.8%</b>	<b>38,698</b>	<b>34.9%</b>	<b>35,230</b>	<b>27.5%</b>	<b>16,170</b>	<b>19.5%</b>	<b>7,444</b>	<b>21.6%</b>	<b>13,802</b>	<b>24.3%</b>	<b>187,738</b>	<b>20.8%</b>

\*Model area includes the eastern part of Cleveland County, the southern section of Iredell County and the panhandle portion of Lancaster County (SC).

\*\*In 2000, Lancaster had a zero in banking employment resulting in a division by zero for percent change from 2000 to 2010.

Land Use & Socio-Economic Data and Projections

e. Projected County Employment Change, by Category, 2010 to 2020

Table III.D.3.e Projected County Employment Change, by Category, 2010 - 2020.																		
Employees In:																		
County	Mfg, Ind, Wholesale, Trans, Comm, Utilities		Retail		Highway Retail		Low Traffic Services		High Traffic Services		Office/Gov't		Banking		Schools, Colleges, Universities		TOTAL	
	Change	% Change	Change	% Change	Change	% Change	Change	% Change	Change	% Change	Change	% Change	Change	% Change	Change	% Change	Change	% Change
Cabarrus	8,867	33.8%	4,510	37.9%	2,495	45.9%	5,020	82.9%	5,919	82.9%	3,041	35.9%	629	83.8%	1,656	38.4%	32,137	42.6%
Cleveland*	852	6.7%	605	15.1%	343	18.1%	1,177	76.7%	897	76.7%	447	16.3%	51	12.7%	128	3.1%	4,500	13.8%
Gaston	1,565	5.1%	1,896	18.8%	963	18.0%	2,403	43.8%	2,347	43.8%	955	16.5%	314	36.8%	708	12.4%	11,151	14.9%
Iredell*	3,390	39.5%	1,884	36.9%	1,325	41.7%	2,187	77.7%	2,826	77.7%	3,752	90.4%	224	60.2%	680	28.6%	16,268	49.3%
Lancaster*	589	26.0%	83	112.2%	18	23.7%	124	16.3%	23	16.3%	20	7.4%	3	15.0%	46	19.3%	906	23.6%
Lincoln	2,664	21.9%	1,452	50.7%	935	60.4%	1,635	66.0%	2,038	66.0%	666	32.9%	165	55.9%	430	17.2%	9,985	37.2%
Mecklenburg	38,262	19.0%	11,208	19.3%	9,411	27.4%	39,688	35.3%	26,166	35.3%	11,642	19.8%	10,921	29.4%	7,221	23.2%	154,519	24.6%
Rowan	5,366	23.2%	735	10.1%	1,524	54.7%	2,407	57.6%	2,465	57.6%	387	9.9%	66	12.3%	580	11.1%	13,530	23.7%
Stanly	883	10.2%	873	29.5%	356	22.2%	773	68.2%	1,093	68.2%	547	28.4%	62	22.6%	1,729	71.2%	6,316	28.1%
Union (NC)	9,226	31.4%	3,918	58.9%	2,607	67.1%	4,478	99.5%	5,087	99.5%	2,449	53.6%	440	88.4%	2,664	46.6%	30,869	50.1%
York	9,149	33.9%	3,121	35.2%	1,535	28.7%	4,275	51.7%	4,033	51.7%	2,149	33.0%	366	45.8%	590	8.6%	25,218	34.3%
<b>Region Total</b>	<b>80,813</b>	<b>21.2%</b>	<b>30,285</b>	<b>25.7%</b>	<b>21,512</b>	<b>32.9%</b>	<b>64,167</b>	<b>42.9%</b>	<b>52,894</b>	<b>42.9%</b>	<b>26,055</b>	<b>26.3%</b>	<b>13,241</b>	<b>31.6%</b>	<b>16,432</b>	<b>23.3%</b>	<b>305,399</b>	<b>28.0%</b>

\*Model area includes the eastern part of Cleveland County, the southern section of Iredell County and the panhandle portion of Lancaster County (SC).

Land Use & Socio-Economic Data and Projections

**f. Projected County Employment Change, by Category, 2020 to 2030**

**Table III.D.3.f Projected County Employment Change, by Category, 2020 – 2030.**

Employees In:																		
County	Mfg, Ind, Wholesale, Trans, Comm, Utilities		Retail		Highway Retail		Low Traffic Services		High Traffic Services		Office/Gov't		Banking		Schools, Colleges, Universities		TOTAL	
	Change	% Change	Change	% Change	Change	% Change	Change	% Change	Change	% Change	Change	% Change	Change	% Change	Change	% Change	Change	% Change
Cabarrus	7,922	22.5%	4,267	26.0%	2,059	26.0%	5,888	53.2%	5,223	28.8%	4,207	36.5%	666	48.3%	1,582	26.5%	31,814	29.6%
Cleveland*	496	3.7%	457	9.9%	268	12.0%	373	13.8%	598	9.7%	332	10.4%	23	5.1%	245	5.7%	2,792	7.5%
Gaston	1,391	4.3%	1,576	13.2%	988	15.7%	2,465	31.2%	2,146	15.7%	975	14.5%	328	28.1%	670	10.5%	10,539	12.2%
Iredell*	3,667	30.7%	1,339	19.2%	687	15.2%	2,490	49.8%	2,347	25.3%	1,033	13.1%	214	35.9%	772	25.2%	12,549	25.5%
Lancaster*	754	26.4%	39	24.8%	36	38.3%	142	16.1%	29	18.5%	63	21.6%	12	52.2%	60	21.1%	1,135	23.9%
Lincoln	2,246	15.1%	1,531	35.5%	1,036	41.7%	1,765	42.9%	2,595	52.1%	802	29.8%	184	40.0%	651	22.2%	10,810	29.4%
Mecklenburg	40,786	17.0%	9,425	13.6%	10,115	23.1%	43,278	28.4%	29,767	24.6%	12,863	18.2%	12,259	25.5%	7,470	19.5%	165,963	21.2%
Rowan	3,655	12.8%	1,114	13.9%	1,089	25.3%	2,457	37.3%	1,920	15.3%	667	15.5%	88	14.6%	672	11.5%	11,662	16.5%
Stanly	1,228	12.8%	500	13.1%	450	23.0%	1,047	54.9%	928	20.4%	590	23.9%	103	30.7%	617	14.8%	5,463	19.0%
Union (NC)	9,518	24.6%	4,120	39.0%	2,448	37.7%	6,280	70.0%	6,075	52.9%	2,610	37.2%	568	60.6%	2,653	31.7%	34,272	37.0%
York	3,508	9.7%	546	4.6%	416	6.0%	7,470	59.5%	3,904	27.7%	1,084	12.5%	30	2.6%	3,364	45.4%	20,322	20.6%
<b>Region Total</b>	<b>75,171</b>	<b>16.3%</b>	<b>24,914</b>	<b>16.8%</b>	<b>19,592</b>	<b>22.5%</b>	<b>73,655</b>	<b>34.4%</b>	<b>55,532</b>	<b>25.7%</b>	<b>25,226</b>	<b>20.1%</b>	<b>14,475</b>	<b>26.2%</b>	<b>18,756</b>	<b>21.6%</b>	<b>307,321</b>	<b>22.0%</b>

\*Model area includes the eastern part of Cleveland County, the southern section of Iredell County and the panhandle portion of Lancaster County (SC).

Land Use & Socio-Economic Data and Projections

**g. Projected County Employment Change, by Category, 2000 to 2030**

<b>Table III.D.3.g Projected County Employment Change, by Category, 2000 – 2030.</b>																		
<b>Employees In:</b>																		
<b>County</b>	<b>Mfg, Ind, Wholesale, Trans, Comm, Utilities</b>		<b>Retail</b>		<b>Highway Retail</b>		<b>Low Traffic Services</b>		<b>High Traffic Services</b>		<b>Office/Gov't</b>		<b>Banking</b>		<b>Schools, Colleges, Universities</b>		<b>TOTAL</b>	
	Change	% Change	Change	% Change	Change	% Change	Change	% Change	Change	% Change	Change	% Change	Change	% Change	Change	% Change	Change	% Change
Cabarrus	19,807	85.2%	12,033	139.1%	5,894	143.8%	13,605	405.2%	14,641	167.5%	9,493	152.4%	1,606	365.0%	4,323	134.2%	81,402	140.4%
Cleveland*	1,937	16.1%	1,294	34.3%	780	45.3%	1,734	128.3%	1,720	34.2%	979	38.6%	99	26.3%	939	25.9%	9,482	31.1%
Gaston	3,644	12.2%	4,404	48.2%	2,461	50.9%	5,746	124.6%	5,405	52.0%	2,274	41.7%	739	97.8%	2,230	46.0%	26,903	38.5%
Iredell*	9,405	151.1%	5,591	204.3%	3,606	227.4%	6,365	565.8%	8,637	290.2%	8,047	907.2%	665	458.6%	2,920	319.8%	45,236	272.6%
Lancaster*	1,892	110.3%	175	833.3%	123	1757.1%	753	275.8%	126	210.0%	214	151.8%	35	**	179	108.5%	3,497	146.8%
Lincoln	6,753	65.3%	3,866	195.1%	2,490	241.7%	4,145	239.0%	5,661	296.1%	1,804	106.8%	449	230.3%	2,266	172.8%	27,434	135.8%
Mecklenburg	99,256	54.9%	30,689	64.1%	25,402	89.4%	109,182	126.6%	75,087	99.1%	30,689	58.3%	29,180	93.7%	19,134	71.9%	418,619	79.0%
Rowan	11,411	55.0%	2,416	35.9%	2,939	119.4%	6,259	224.6%	5,475	60.9%	1,601	47.6%	204	42.0%	2,417	59.2%	32,722	66.0%
Stanly	2,650	32.5%	1,947	81.7%	1,030	74.8%	2,190	287.0%	2,660	94.4%	1,437	88.5%	221	101.4%	3,123	189.0%	15,258	80.4%
Union (NC)	24,725	105.5%	10,092	219.4%	6,535	271.7%	12,790	518.4%	13,475	329.1%	6,405	198.7%	1,221	428.4%	7,161	185.1%	82,404	185.6%
York	16,403	70.6%	4,630	58.7%	2,401	49.1%	13,751	219.3%	10,769	149.3%	4,508	86.2%	741	163.2%	4,298	66.3%	57,501	93.3%
<b>Region Total</b>	<b>197,883</b>	<b>58.2%</b>	<b>77,137</b>	<b>80.5%</b>	<b>53,661</b>	<b>101.6%</b>	<b>176,520</b>	<b>159.0%</b>	<b>143,656</b>	<b>112.3%</b>	<b>67,451</b>	<b>81.2%</b>	<b>35,160</b>	<b>101.9%</b>	<b>48,990</b>	<b>86.3%</b>	<b>800,458</b>	<b>88.8%</b>

\*Model area includes the eastern part of Cleveland County, the southern section of Iredell County and the panhandle portion of Lancaster County (SC).

\*\*In 2000, Lancaster had a zero in banking employment resulting in a division by zero for percent change from 2000 to 2030.



**Appendix A**  
**Supplementary Methodology Materials**

### **Base Year Inventory**

The general methodology for compiling the base year inventories is detailed in this section of the project report, by base year inventory data item.

#### Population, Households

Data from the Decennial Census 2000 at the Census block level was used for population- and household-related items, and was then aggregated to the TAZ level. The CTPP providing TAZ-level population and household figures was not released at the time this data was needed. Specified population and household data items were extracted from the Census Summary File 1 as one record per Census block. Since Census block boundaries do not cross TAZ boundaries (i.e., Census blocks always are completely contained within a TAZ), aggregating block data to the TAZ level was readily accomplished by using GIS to create block-to-TAZ look-up tables and appending the appropriate TAZ identifier to each block-level record, then summing by TAZ identifier. The results were then joined by TAZ identifier to the TAZ polygon boundary file.

#### Employment

*Employment compilation, review and verification:* Employment data was compiled from files purchased from Dun & Bradstreet (7 or more employees, as of 2003) and InfoUSA (all employers as of 2002), and provided by state and local sources such as State Employment Commissions (as of 2003) and chambers of commerce (typically, as of 2002). Purchased and supplied employment data was combined and reviewed for:

- duplication of employers, with contradictory employment figures,
- omissions of known employers in each jurisdiction,
- inaccurate employer location addresses,
- inaccurate distribution of employees for employers with multiple locations, and
- inaccurate or missing SIC code assignment.

Employment data was then verified through surveys of employers with 100 or more employees in MPO areas and surveys of employers with 50 or more employees outside MPO areas. Employment was also verified for employers omitted from the data sources, or where there were questions of accuracy of the data source such as described above. Physical location, number of employees, and SIC code were verified. Verification was conducted January-May 2003 for most Partners.

*Employment categories, geocoding, and TAZ aggregation:* Employer SIC codes were used to assign employers to eight (8) employment categories. The employer location addresses were used to geo-code each employer record, and GIS capabilities were then used to assign each employer location to the TAZ within which it was located. Employees in each employment category were tallied for each TAZ, and appended as an attribute to the TAZ polygon boundary file.

### Commercial vehicles

*Vehicle categories, employer categories, geocoding and TAZ aggregation.* As part of the employment verification process, employers in two employment categories were surveyed to obtain their commercial vehicle data. The two categories are Retail Trade and Manufacturing/Industrial/Wholesale/Telecommunications/Utilities, essentially all employers except for those in the highway retail, service, education, and governmental categories. Commercial vehicles for these employers were recorded in three categories, Autos, Light-Medium Trucks, and Heavy Trucks. After geocoding and TAZ-assignment of the employers, the vehicles in each vehicle category were tallied for each TAZ, and appended as an attribute to the TAZ polygon boundary file. Commercial vehicle data collection was conducted January-May 2003 for most Partners.

### Student enrollments

Student enrollments were collected from public and private schools and post-secondary education institutions, and school location addresses and grade levels were verified. Data is as of the start of the 2002 fall semester. Schools were categorized by grade level (K-8, high schools, and colleges/universities/other post-secondary). Day care centers and nurseries were not counted as schools, and no enrollment data was collected for them. The school location addresses were used to geo-code each school record, and GIS capabilities were then used to assign each school location to the TAZ within which it was located. Students in each grade category were tallied for each TAZ, and appended as an attribute to the TAZ polygon boundary file.

### Land use

No field inventory of actual land uses was conducted to derive the categorical data. The inventory was based on information most readily available and reliable to the Partners. Hence, the land use categorical data has limitations as to its reliability and consistency. See the section titled "County Subarea Specific Approaches" for how the Partners may have used differing levels of information.

Current land use data was compiled from several sources, typically including:

- Tax parcel GIS dataset with tax assessor's land use attribute (or tax parcel boundary file with land use planner's assignment of land use attribute);
- Land use plans;
- Water/sewer address data/point dataset with residential/non-residential indicators;
- EMS parcel-based GIS dataset with land use attributes;
- Satellite imagery land cover GIS dataset with Anderson Level 2 (or similar) land cover codes distinguishing type of vegetation and types of developed uses;
- Aerial photography
- Green Assets GIS dataset (provided by UNC Charlotte Urban Institute) showing protected public or private open space of 5 acres or more as of summer 2000; and/or
- Parks department GIS dataset showing current public parks.

## Land Use & Socio-Economic Data and Projections

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In cases where no GIS dataset existed but paper maps were available, digitizing of boundaries or data entry of land use attributes was conducted.

Each Partner followed the general methodology outlined below in creating a land use GIS dataset recording 15 categories of current land use.

1. For each land use source, create a cross-reference table of its land use codes and the 15 categories of current land use adopted for this project. Use the tables to bring all land use sources to a common set of land use categories. Where appropriate, use source data to calculate residential density and assign land use category based on matching actual density with residential land use density category.
2. Use GIS to union all land use source GIS data sets, so that each resulting polygon has a land use category attribute from each of its “parent” GIS datasets. Establish and apply decision rules for combining the parent land use attributes to determine the appropriate final land use assignment to each polygon. Cases where the parent land use attributes do not all agree can be separated for additional review, verification of appropriate weighting of parent attributes, and manual assignment based on local knowledge, as needed.
3. Use GIS to union the TAZ polygon boundary GIS dataset with the final land use GIS dataset (including its final land use category assignment to each polygon). Verify that resulting polygon areas are correct, and recalculate if needed.
4. Calculate acreage by land use category for each polygon: Create one attribute for each of the 15 land use categories; For each attribute, select polygons whose final land use category assignment matches the attribute’s name, and calculate the attribute’s value to be the polygon area in acres. (For each polygon, one attribute has a non-zero acreage value, and the other attributes are all zero acres.)
5. Summarize acreage by TAZ for each attribute, resulting in a table by TAZ with total acreage per TAZ and for each of the 15 categories. Join this table by its TAZ identifier to the TAZ polygon boundary GIS dataset.

### Development Type of area.

This item was derived from a combination of Census urbanized area designation, land use data, and planner’s judgment. The general methodology followed by the Partners is as outlined below.

1. Assign the Type code associated with “Rural” to all TAZs that fall outside the Census designated urbanized area.
2. Assign the Type code associated with “CBD” to all remaining TAZs that fall inside a central business district, using planners judgment to identify the central business district boundaries.
3. Use the TAZ acreage by land use categories attributes to assign the remaining TAZs to either the “residential, urban/suburban non-CBD” or “non residential, urban/suburban non-CBD” TYPE code based on the percent of their acreage that is residential. Specifically, those that are over 50% residential acreage are assigned the residential TYPE code. Review and adjust manually based on local knowledge of cases where acreage considerations should be outweighed by density or intensity of land use considerations.

## Population Projection Methodology

The following outline describes the process followed by the Partners to create population projections per TAZ for horizon years 2010, 2020 and 2030:

- 1) Define Development Potential Areas (DPAs)
  - A) Create GIS Overlays:
    - i) Staff identifies critical Land Development Factors (LDFs) affecting residential growth
    - ii) Staff and Expert Panels assign a “value” to areas within each LDF layer (polygons or raster cells) corresponding to the degree to which that LDF influences residential growth in that polygon or raster cell
    - iii) Staff and Expert Panels determine relative ranking or priority of the LDF overlays
    - iv) Staff convert that ranking to a weighting for each LDF overlay layer and assign an LDF “score” to each cell or polygon in each layer, where score = weight multiplied by value
  - B) Create “Building & Land Opportunity Blocks”, or “BLOB” layer:
    - i) Staff intersect all the scored LDF overlay layers to create a BLOB layer, and sum all the scores to create a composite score
    - ii) Staff and Expert Panels assign a relative growth potential ranking (Hi, Med, Lo) to each resulting BLOB, based on maps of composite scores and land available for residential development
    - iii) Staff use BLOB layer to assign a growth potential ranking (Hi, Med, Lo) to each TAZ
  - C) Define DPA boundaries and assign residential acreage consumed by horizon year:
    - i) Staff aggregates TAZs into DPAs based on adjacency and same/similar growth potential ranking
    - ii) Staff engages local planners in predicting acres consumed per DPA, for each horizon year, evaluating:
      - a) Past residential permit numbers per DPA
      - b) Existing zoning/land use densities allowed
      - c) Likelihood of areas changing density
    - iii) Staff and Expert Panels estimate number of acres consumed by residential development per DPA for each horizon year (2010, 2020, and 2030):
      - a) Staff presents information on past residential growth (both Population and Households), and local planner expectations for the area
      - b) Expert Panel estimates number of total acres to be consumed for residential use by horizon year, per DPA, OR
      - c) Expert Panel assigns Hi, Med, or Lo ranking (with range for % capacity reached attached to each ranking type) to each DPA, using growth trends and rankings as guides.

## Land Use & Socio-Economic Data and Projections

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- 2) Map densities and household projections per DPA:
  - A) Staff and Expert Panels stipulate assumptions re hhs/acre and pop/hh, both a “maximum” for each DPA and by horizon year
    - i) Yr 2000 Households per Acre and Persons per Household for each DPA
    - ii) Households per Acre and Persons per Household trends (1980, '90, '00) for selected areas whose 10-yr or 20-year historical growth trend is deemed a realistic model for a given DPA
  - B) Staff map resulting densities and household sizes by horizon year and check for reasonableness, modifying as appropriate
  - C) Optional step: Estimate maximum residential acres (MRA) available for development or re-development:
    - ⌘ Calculate from land use layer, by TAZ
      - a) Vacant land acres available for predominantly residential development
      - b) Vacant land acres available for “mixed/either res or non-res” development
      - c) Developed land acres likely to re-develop as residential
      - d) Developed land acres likely to re-develop as “mixed/either res or non-res”
    - ii) Modify “mixed/either residential or non-residential” acreage based on assumptions of percent residential acreage in “mixed use/either”
    - iii) Recalculate acres available for future res. Development
    - iv) Calculate redevelopable land based on parcel size and density
    - v) Modify based on local land use policy
  - D) Convert Maximum Residential Acres (MRA) to Maximum Households (MHH):
    - i) Multiply approximate residential developable acreages per TAZ affected by various determined maximum household densities
      - a) Consult residential zoning ordinance or land use plan density areas
      - b) Or use an estimated density for future residential development as determined by the expert panel
- 3) Estimate total Population projected per TAZ
  - A) Calculate Maximum Households (MHH) per TAZ: “Density” x Acres
  - B) Calculate average Persons Per Household (PPH) for county, using 2000 BYI
  - C) Multiply average PPH by Maximum Households (MHH) TAZ, to estimate Maximum Population (MPOP)
- 4) Staff makes sub-allocations to TAZs within each DPA for each horizon year.
  - A) Calculate TAZ residential acres developed = MRA x DPA “percent residential capacity reached” for each horizon year
  - B) Calculate TAZ households = MHH x DPA “percent residential capacity reached” for each horizon year
  - C) Calculate TAZ population = MPOP x DPA “percent residential capacity reached” for each horizon year
- 5) Staff and Expert Panel check for reasonableness:
  - A) Compare TAZ-to-TAZ via map review for HHs and POP

## Land Use & Socio-Economic Data and Projections

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- B) Calculate DPA-level hh density and pop density, prepare maps for each and review for reasonableness
  - C) Compare the projected new housing units derivable from these projections with building permit history
  - D) Refine/change locally-derived projections as needed
  - E) Submit to Regional Land Use Technical Advisor (RLUTA):
    - i) TAZ shapefile with projected HHS, POP, etc.
    - ii) Map images of HH and Pop density by DPA
- 6) Reconcile with Regionally-derived County and Sub-County Area projections from Hammer:
- A) Aggregate Locally-derived projections to County and Sub-County Areas
  - B) Compare with Regionally-derived projections
  - C) Agree on County and Sub-County adjusted projections
  - D) Re-allocate adjusted County and Sub-County projections to TAZs (Hammer adjusts Regional totals as needed, too)

## Employment Projection Methodology

The following outline explains the process by which the Partners allocated these totals:

- 1) Prepare base maps and panel information:
  - A) Create maps for each horizon year for Panel meetings showing:
    - i) Road network and other orientation features
    - ii) Non-residential developable parcels, with coding for applicable land use classifications
    - iii) Population Projection developed areas (DPAs) and existing residential developments
    - iv) Planned improvements or policy changes (through 2030): roads, water/sewer expansion, land use/zoning plans, etc.
    - v) Sufficient white space for notations during meeting
  - B) Create for staff review following meetings showing:
    - i) Layers shown Panel members
    - ii) TAZ boundaries, Subarea boundaries
  - C) Develop list of employment types, as they relate to the 8-SIC group employment categories
    - i) See “Employment Types” handout for list of possible terms to use in panel meetings to define specific employment type
    - ii) Determine means of aggregating those types to the 8-SIC group employment categories
    - iii) Research archetypes (other county-wide examples) for typical development patterns:
      - (a) Record approximate employment density (emps/acre)
      - (b) Describe built form (“strip mall”, “neighborhood convenience”, “medical office park”, etc)
      - (c) Prepare estimated % shares of employment types (8-SIC group employment categories) within archetype  
(i.e. 20%- RTL, 40% - OFFGOV, 40%-LOSVC)
- 2) Staff and Expert Panel identify Employment Potential Areas (EPA):
  - A) Expert Panel reviews development factors and land classifications for horizon year 2010
    - i) Discuss important land development factors for employment
    - ii) Review base map for areas marked for present and future residential development (more information available upon request from UNC Charlotte Urban Institute )
      - (a) Ask Panel to evaluate those parcels marked for residential development
      - (b) Determine if some parcels developed for residential should be reclassified as non-residential developable properties or as “either” classification
  - B) Panel locates Employment Potential Areas (EPAs)
    - i) Identify areas available for employment, per landuse-employment type
    - ii) Draw boundaries for new development areas, in following sequence:
      - (a) *Industrial, Government, Medical, and Educational Employment EPAs*

## Land Use & Socio-Economic Data and Projections

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- (i) List employment types to be included in both expanded and future employment development
      - (ii) Determine shares (%) of listed employment types each EPA will likely receive
      - (iii) Describe built form for each EPA
    - (b) *Population- Chasing Employment EPAs*
      - (i) List employment types to be included in both expanded and future employment development
      - (ii) Determine shares (%) of listed employment types each EPA will likely receive
      - (iii) Describe built form for each EPA
    - (c) *Other Non-Population Chasing Employment EPAs*
      - (i) List employment types to be included in both expanded and future employment development
      - (ii) Determine shares (%) of listed employment types each EPA will likely receive
      - (iii) Describe built form for each EPA
  - iii) Describe built form for each EPA:
    - (a) Cite existing development locations as reference for similar development
    - (b) Use density and use measures for describing unprecedented development types
  - iv) Staff and Expert Panel repeat for Horizon years 2020 and 2030
    - \*Ask Panel to describe predictable trends of employment by location and general type, not to compare with level of detail described in horizon 2010\*\*
- 3) Staff receives data from RLUTA for following categories of employment, for each horizon year (more information available upon request from UNC Charlotte Urban Institute):
- A) Total Regional Employment Projections
  - B) Shares (%) and Totals of Regional Employment in Population-chasing and Non-population chasing employment
    - i) Shares (%) and Totals of Regional Employment per Employment Types
    - ii) Total County Employment Projections
  - C) Shares (%) and Totals of County Employment per 8-SIC group employment categories
  - D) Shares (%) and Totals of County Employment per Population and Non-population chasing employment
- 4) Staff distributes employment totals according to EPA descriptions (employment-land use type and building form) for Horizon year 2010:
- A) Convert Panel meeting employment types to 8-SIC group employment categories
    - i) Assign EPA ID numbers to each EPA
    - ii) For each EPA, apply % shares of employment types to equivalent shares of 8-SIC group employment categories ,
    - iii) Insert data into Partner-created EPA employment master table
  - B) Allocate County employment, per employment types, to each Subarea

## Land Use & Socio-Economic Data and Projections

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- i) Per each of the 8-SIC group employment categories, estimate share of county total contained within each Subarea (based on EPA size and frequency within Subareas)
  - ii) OR Research employment densities (emp/sq ft) or total # employees per present-day employment development type
  - iii) Insert % estimates and consequent employment totals in EPA master table on map
  - iv) Repeat for remaining employment categories, per EPA
  - v) Sum totals per employment type, per Subarea
  - vi) Insert totals per 8-SIC group employment categories in Partner-created Subarea master table
- C) Compare employment totals in Subarea master table to Subarea, County, and 16-category employment totals
- D) Allocate Subarea totals to TAZs
- i) For each EPA, determine share of total EPA employment to be contained within each affected TAZ (% share)
  - ii) Record % share of total EPA employment within TAZs, in Partner-created TAZ master table
  - iii) For each employment type associated with specific EPA, calculate number of employees per 8-SIC group employment categories, to be allocated to TAZ, based on % share of sum
  - iv) Insert totals per 8-SIC group employment categories, per TAZ in TAZ master table
- E) Staff and Expert Panel repeat process for years 2020 and 2030:
- i) Follow same order of calculation
  - ii) Record employment totals by 8-SIC group employment categories
- 5) Check reasonableness with BYI employment, Population Projections for each horizon year



**Appendix B**

**Maps by Model Traffic Analysis Zones**



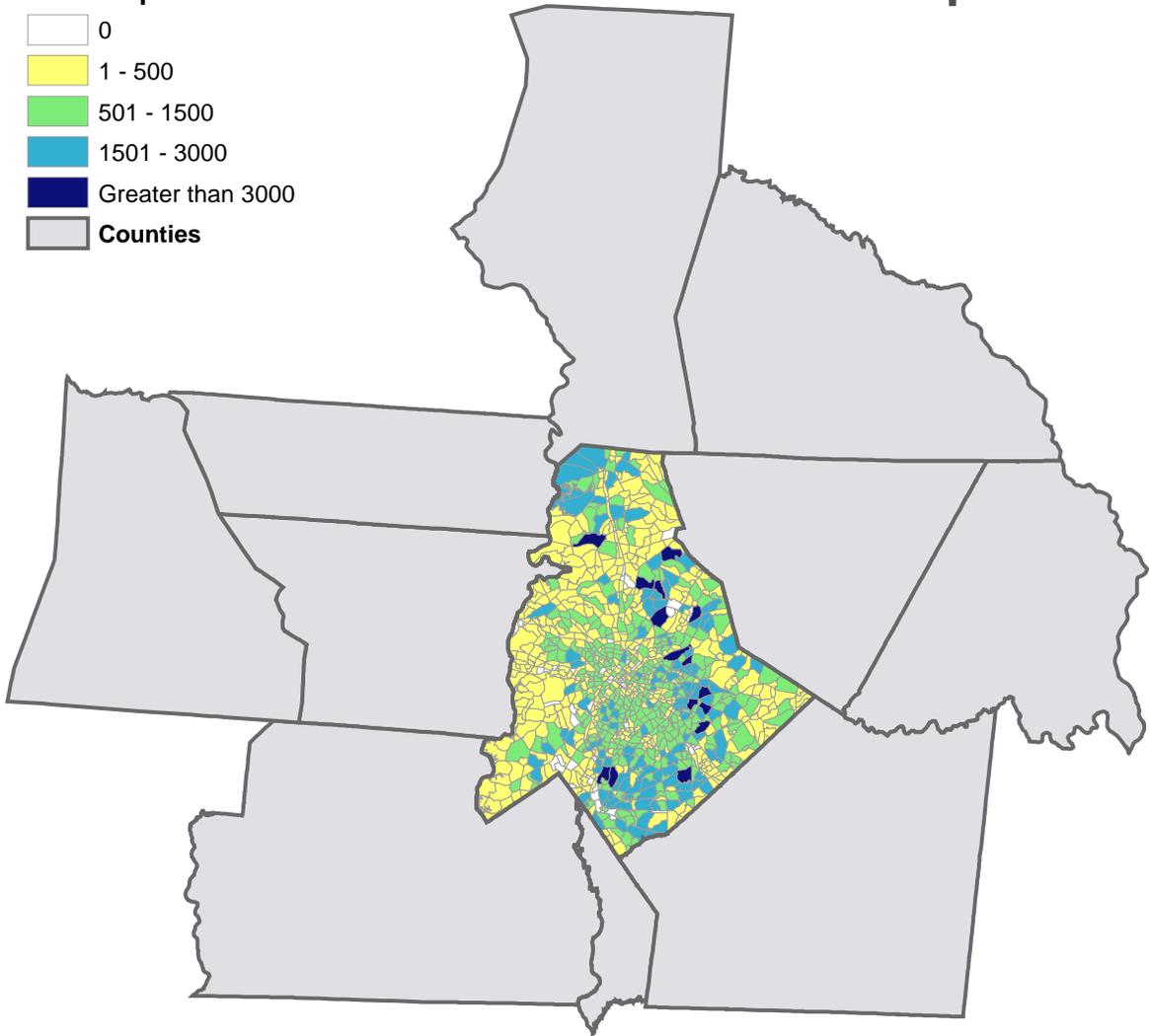
Figure B.1

### 2000 Population by TAZ

**Legend**

**Total Population: 2000**

- 0
- 1 - 500
- 501 - 1500
- 1501 - 3000
- Greater than 3000
- Counties**



**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**

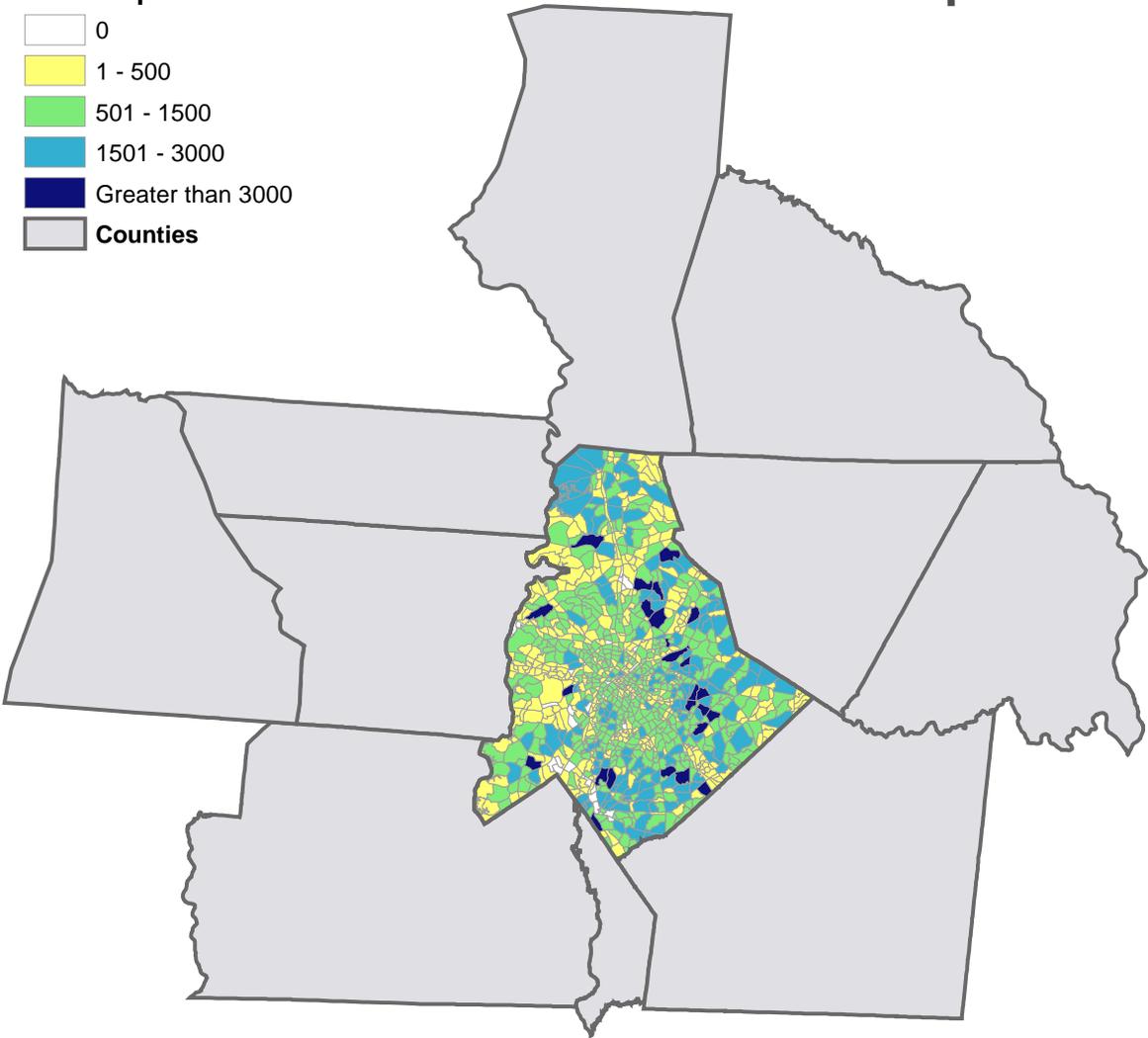
Figure B.2

### 2010 Population by TAZ

**Legend**

**Total Population: 2010**

- 0
- 1 - 500
- 501 - 1500
- 1501 - 3000
- Greater than 3000
- Counties**



**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**

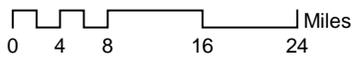
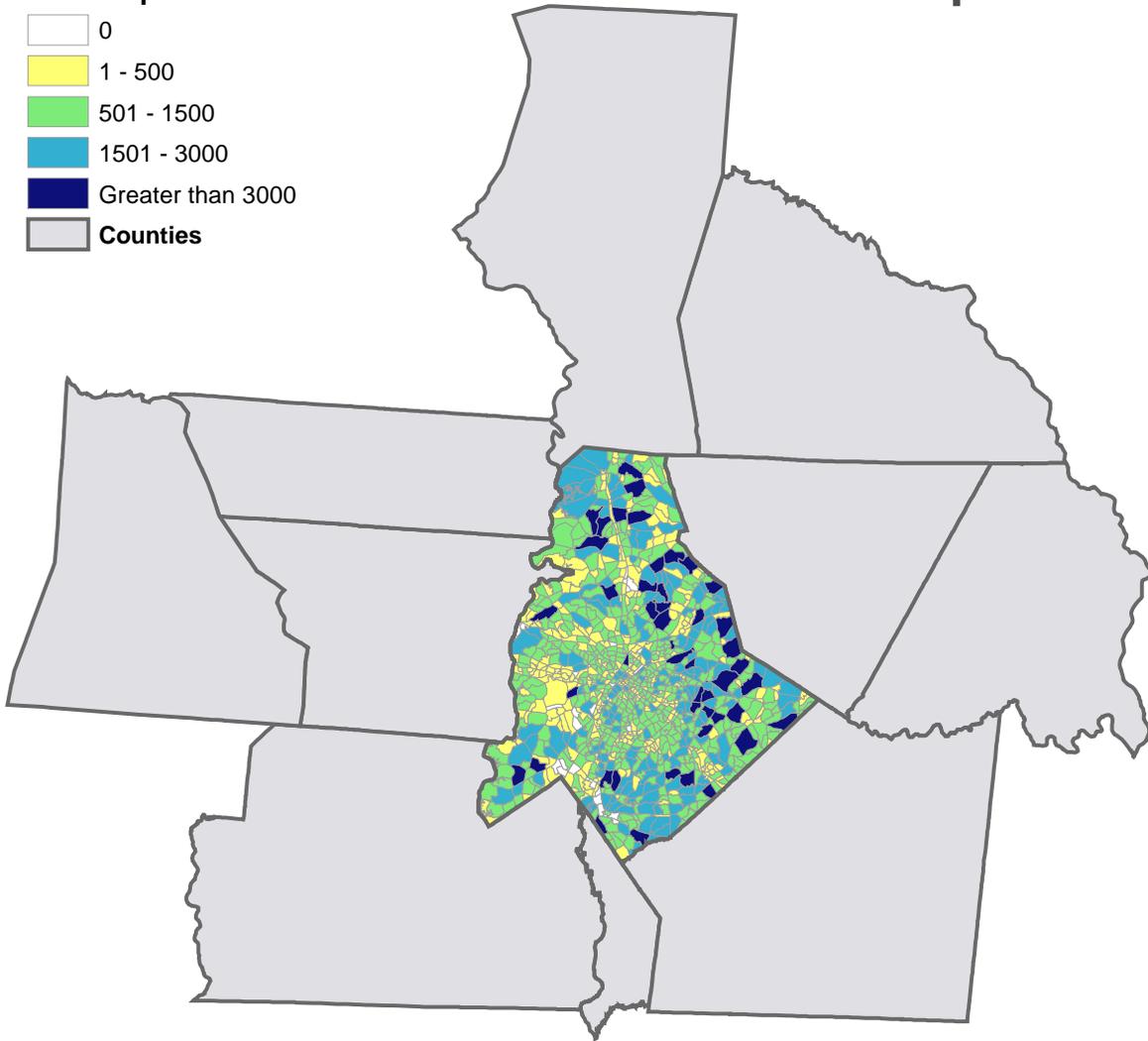
Figure B.3

### 2020 Population by TAZ

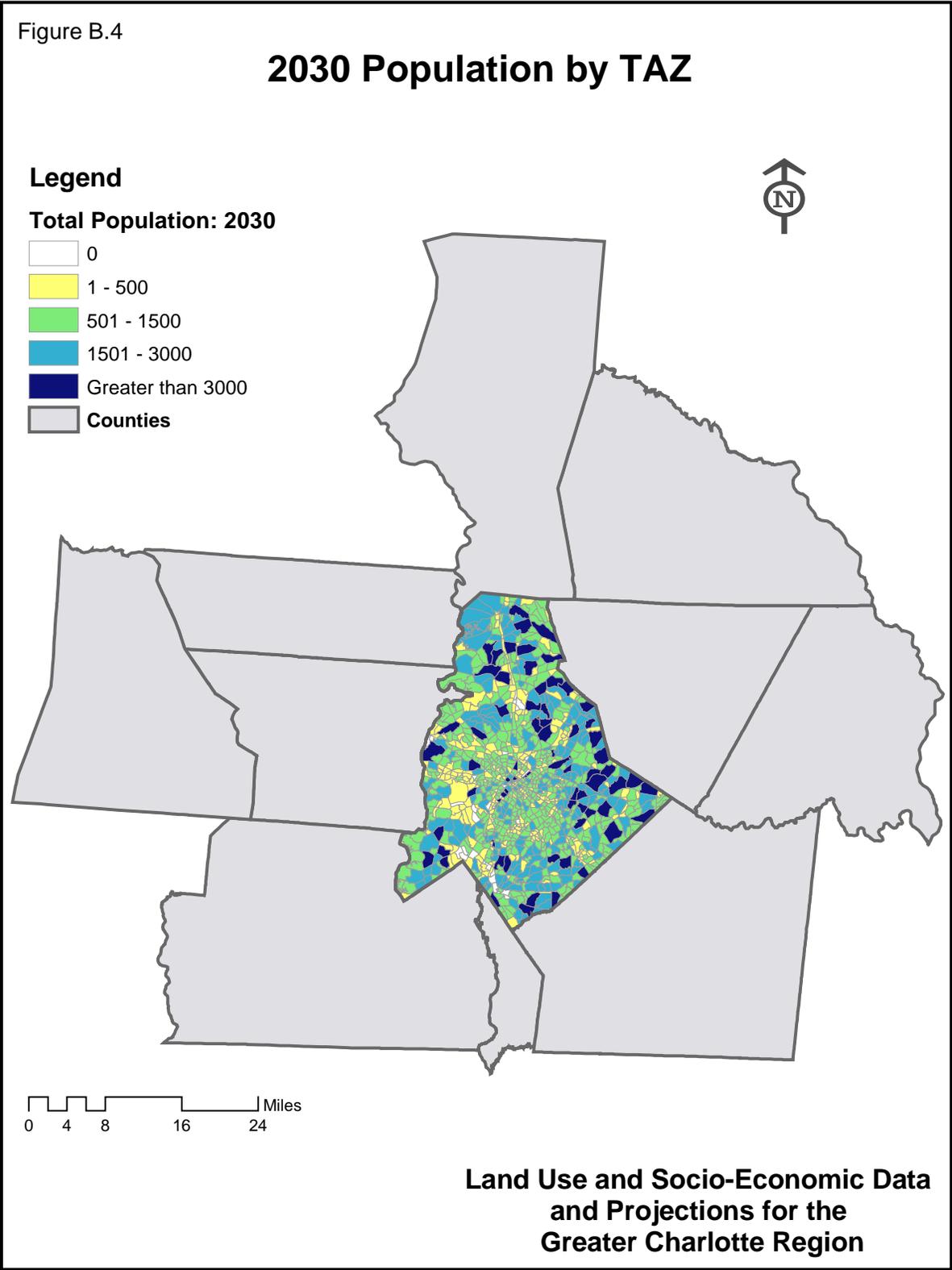
**Legend**

**Total Population: 2020**

- 0
- 1 - 500
- 501 - 1500
- 1501 - 3000
- Greater than 3000
- Counties**



**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**



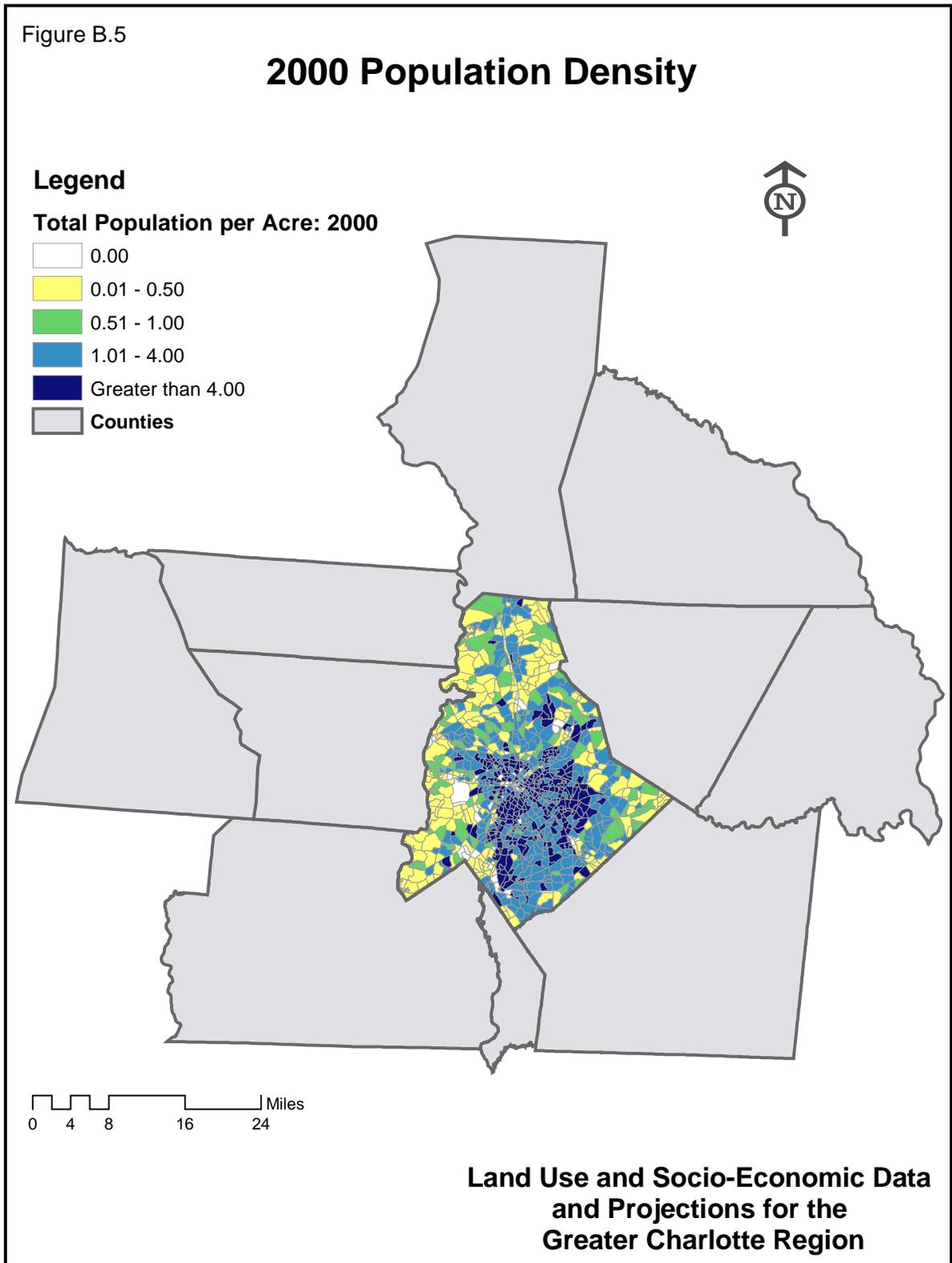




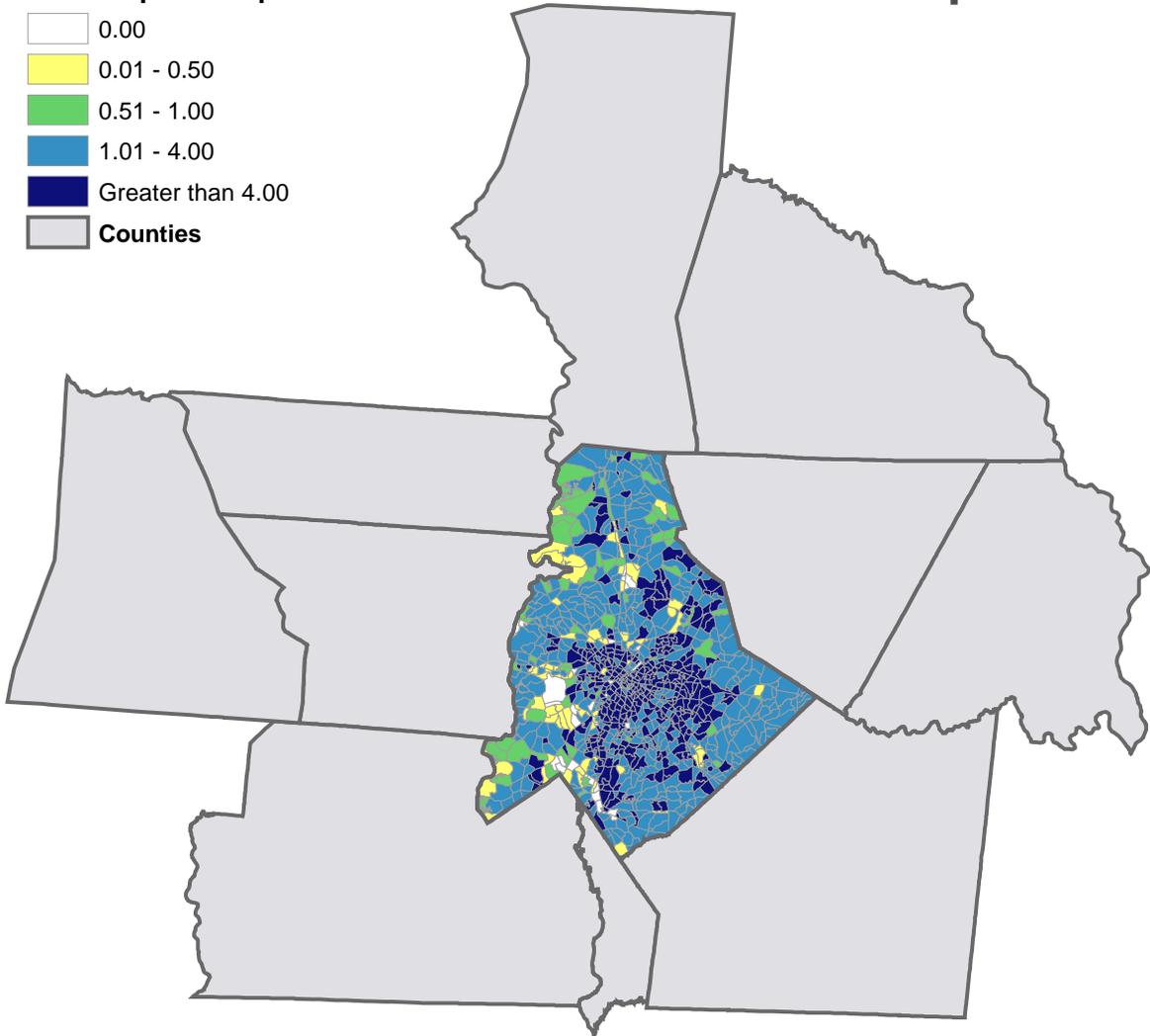
Figure B.7

## 2020 Population Density

### Legend

#### Total Population per Acre: 2020

-  0.00
-  0.01 - 0.50
-  0.51 - 1.00
-  1.01 - 4.00
-  Greater than 4.00
-  Counties



**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**

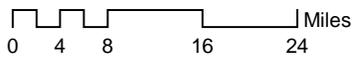
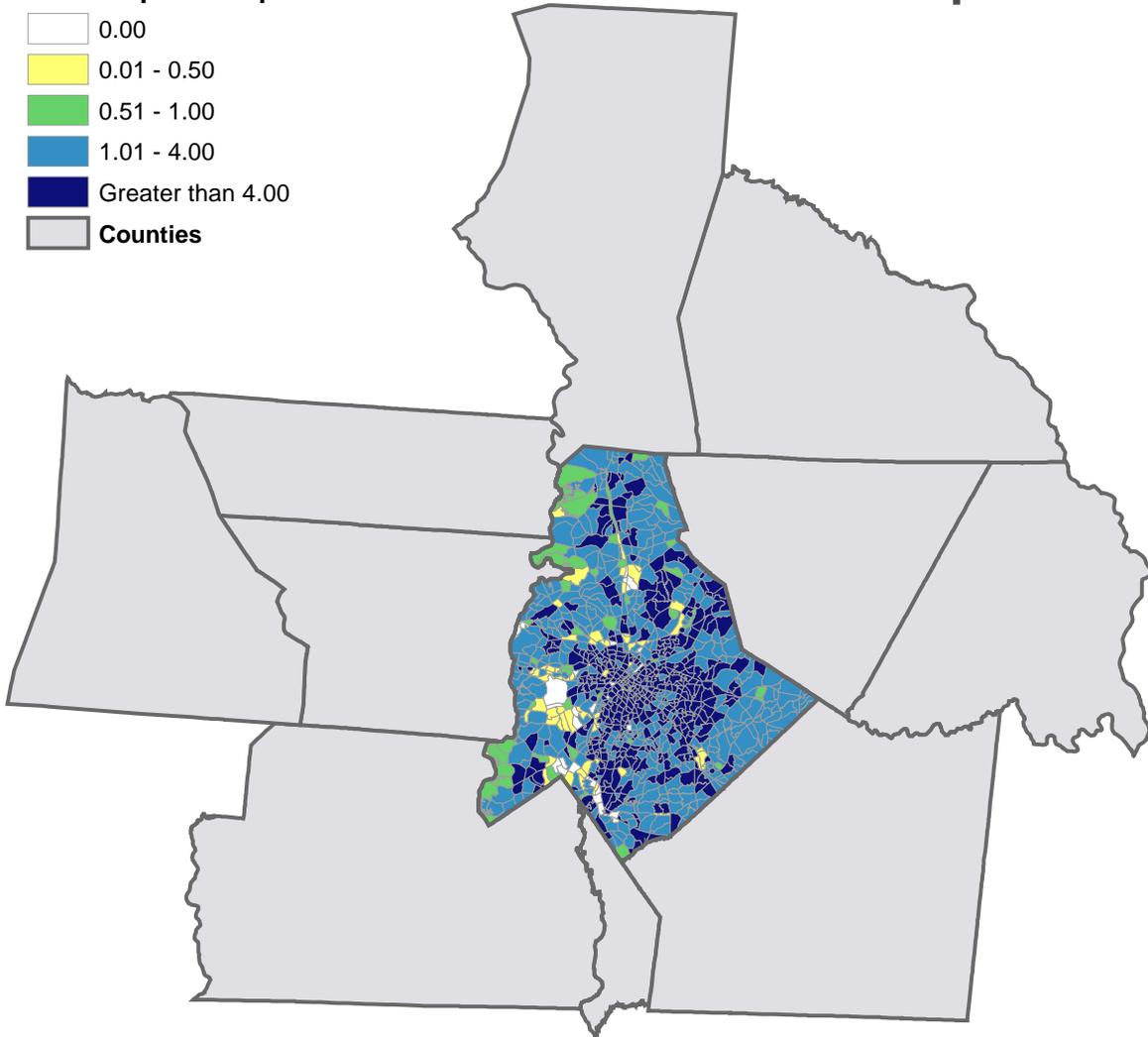
Figure B.8

## 2030 Population Density

### Legend

#### Total Population per Acre: 2030

-  0.00
-  0.01 - 0.50
-  0.51 - 1.00
-  1.01 - 4.00
-  Greater than 4.00
-  Counties



Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region

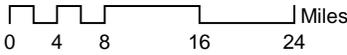
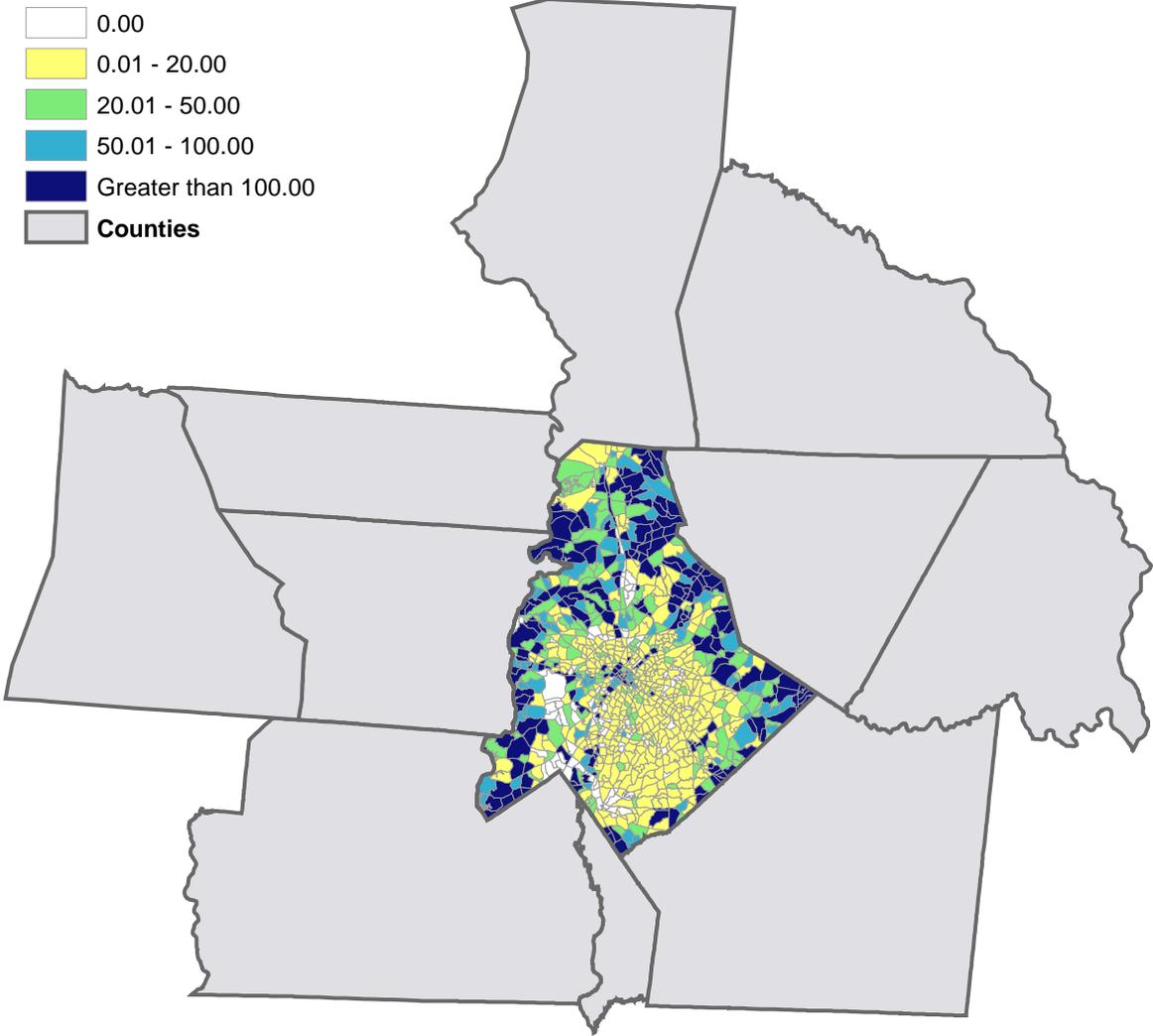
Figure B.9

### Percent Change in Population 2000 - 2010

**Legend**

**Percent Change Total Population: 2000-2010**

- 0.00
- 0.01 - 20.00
- 20.01 - 50.00
- 50.01 - 100.00
- Greater than 100.00
- Counties**



**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**

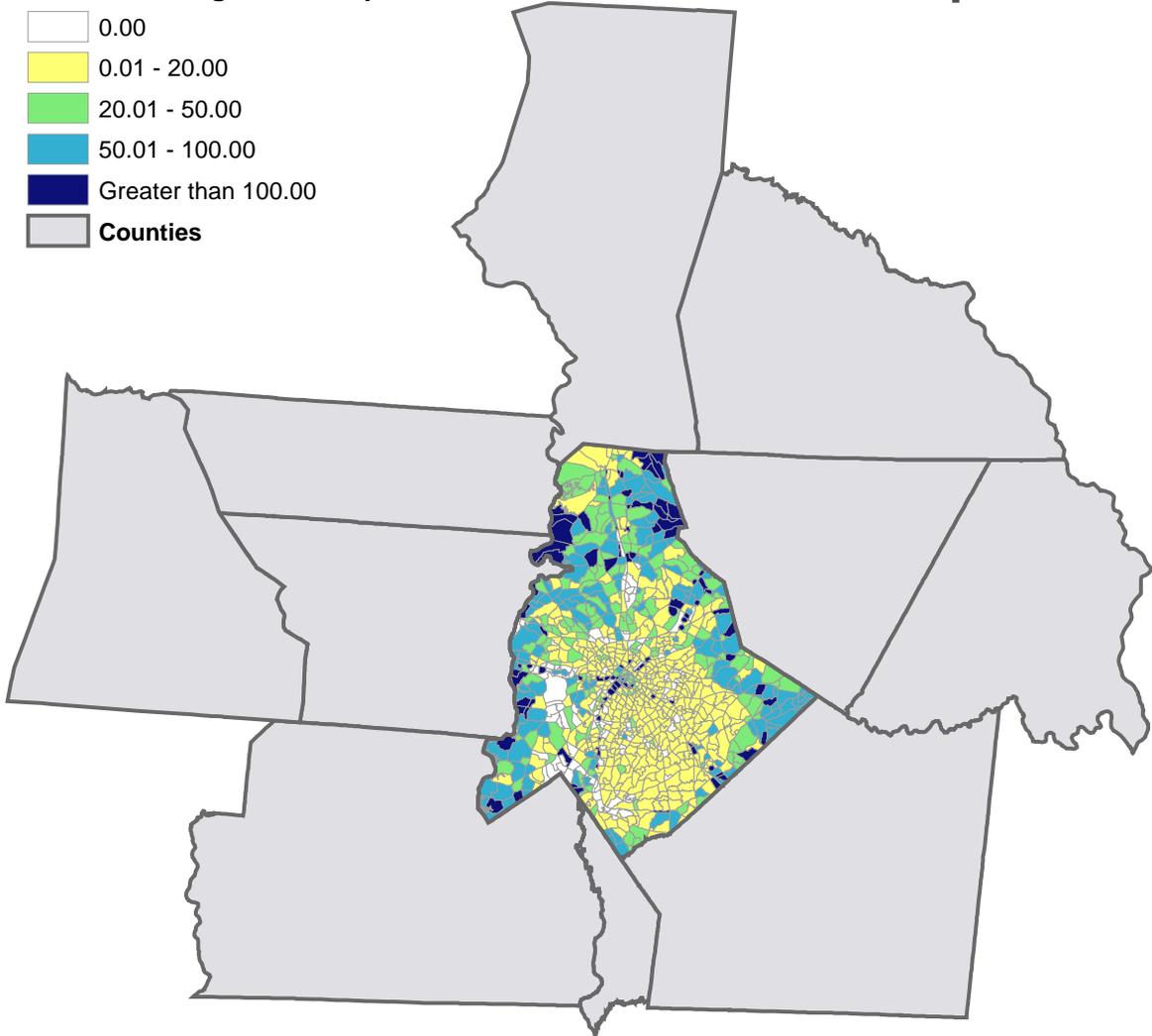
Figure B.10

## Percent Change in Population 2010 - 2020

### Legend

#### Percent Change Total Population: 2010-2020

-  0.00
-  0.01 - 20.00
-  20.01 - 50.00
-  50.01 - 100.00
-  Greater than 100.00
-  Counties



0 4 8 16 24 Miles

Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region

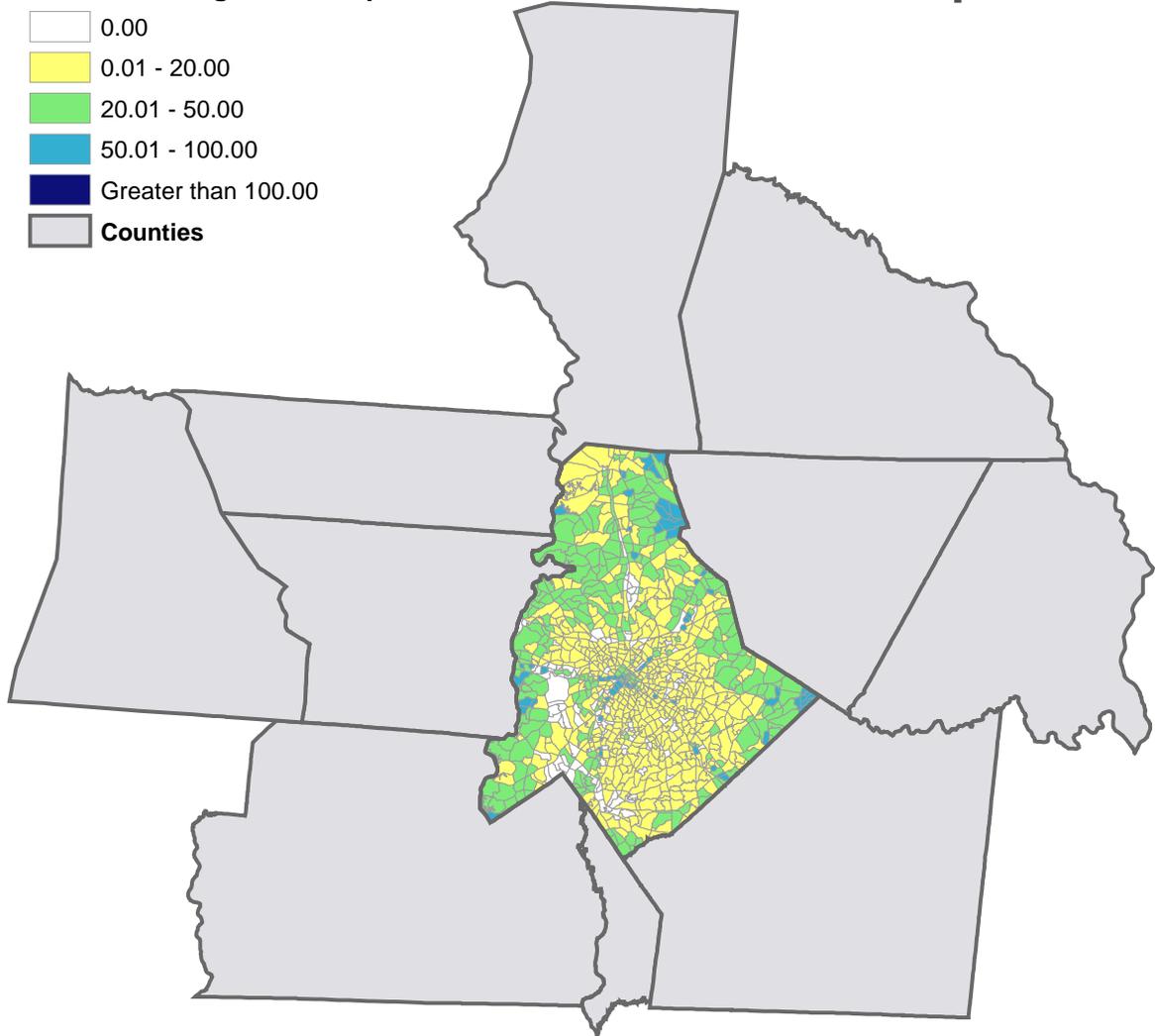
Figure B.11

### Percent Change in Population 2020 - 2030

**Legend**

**Percent Change Total Population: 2020-2030**

-  0.00
-  0.01 - 20.00
-  20.01 - 50.00
-  50.01 - 100.00
-  Greater than 100.00
-  **Counties**



**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**

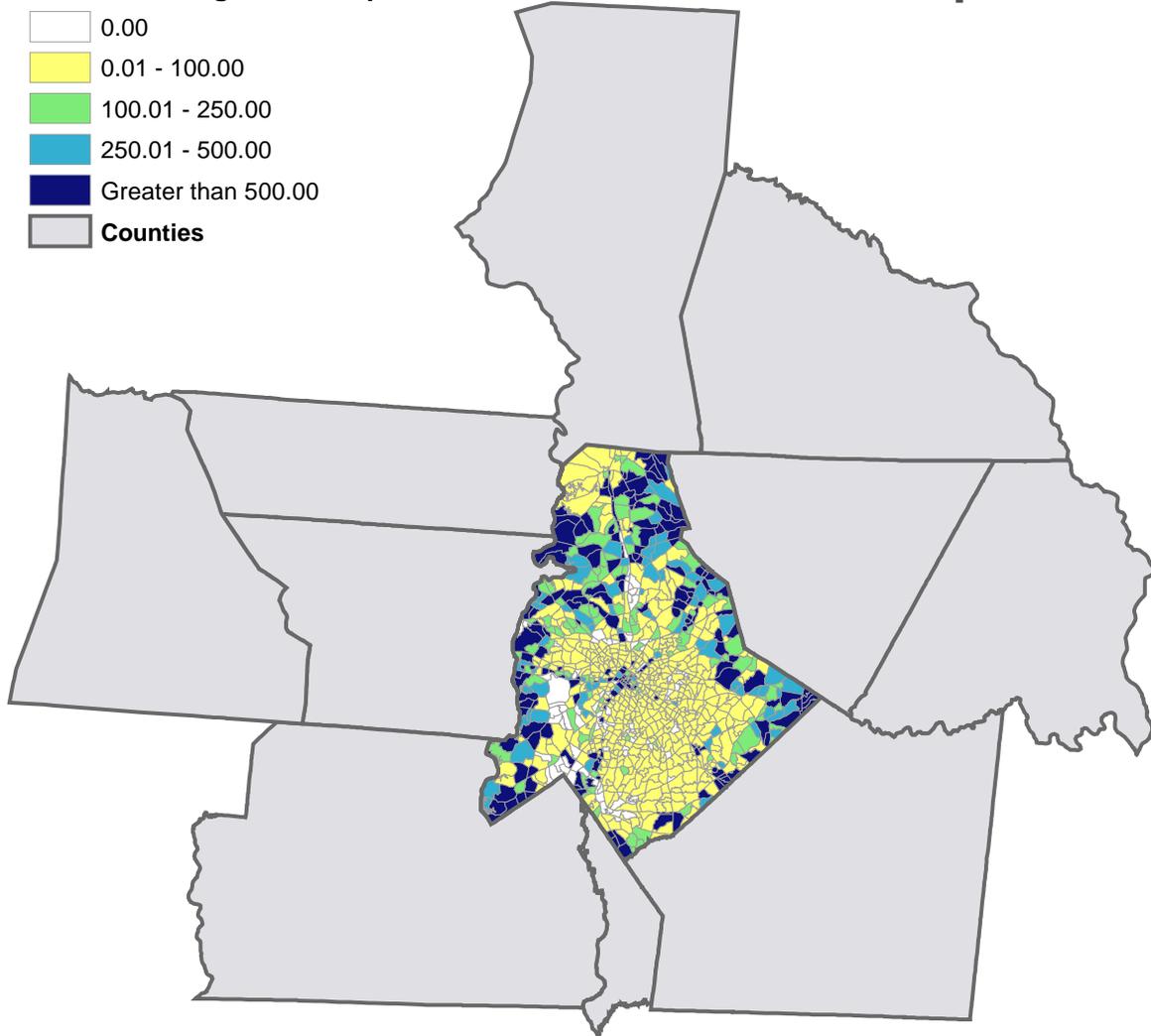
Figure B.12

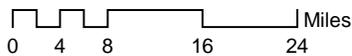
## Percent Change in Population 2000 - 2030

### Legend

#### Percent Change Total Population: 2000-2030

-  0.00
-  0.01 - 100.00
-  100.01 - 250.00
-  250.01 - 500.00
-  Greater than 500.00
-  **Counties**



 Miles  
0 4 8 16 24

Note: Because the horizon for this map covers 30 years instead of the 10 year horizons in previous growth maps, the legend categories represent much larger ranges of values.

**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**

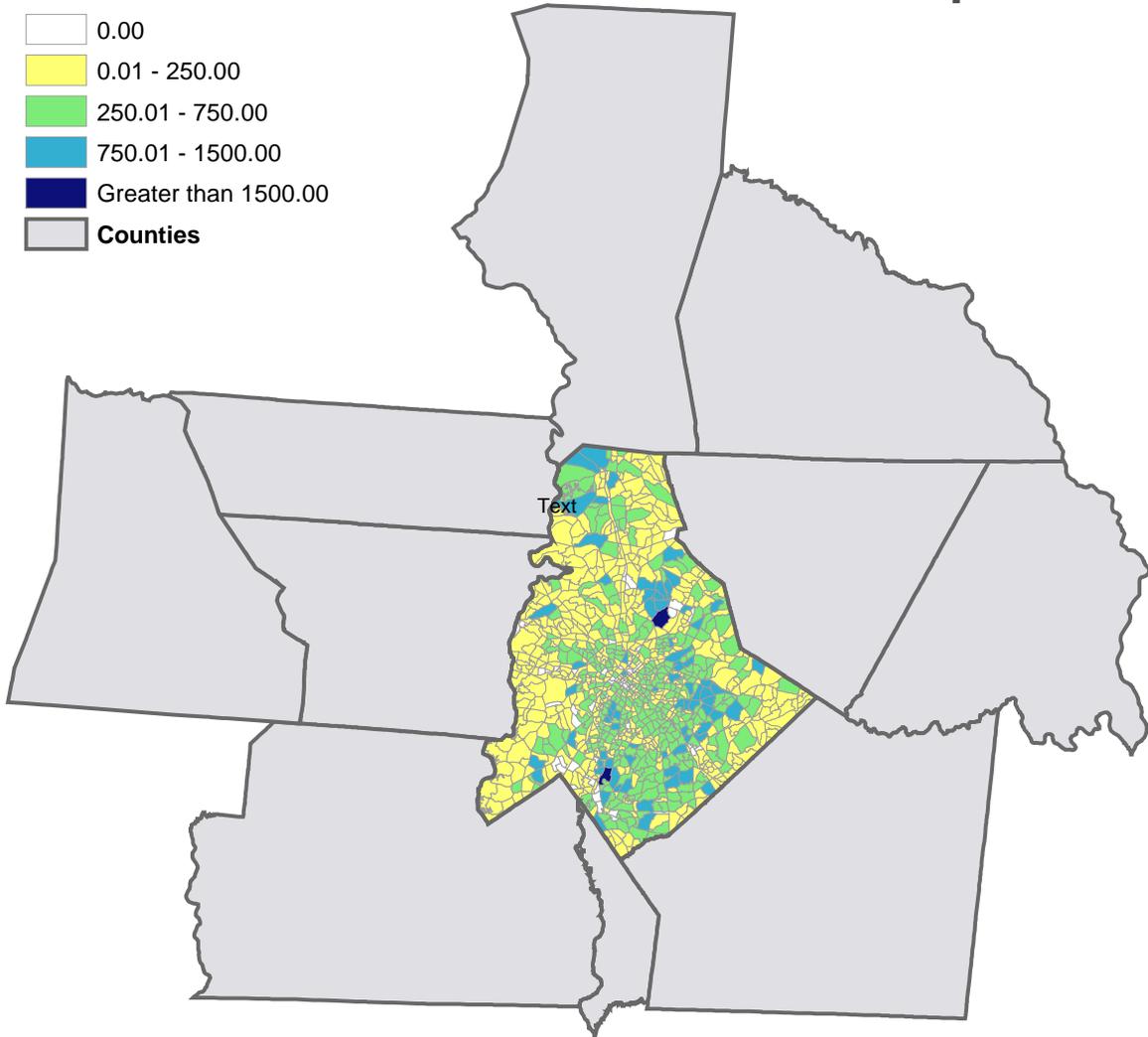
Figure B.13

### 2000 Households by TAZ

#### Legend

#### Total Households: 2000

-  0.00
-  0.01 - 250.00
-  250.01 - 750.00
-  750.01 - 1500.00
-  Greater than 1500.00
-  Counties



Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region

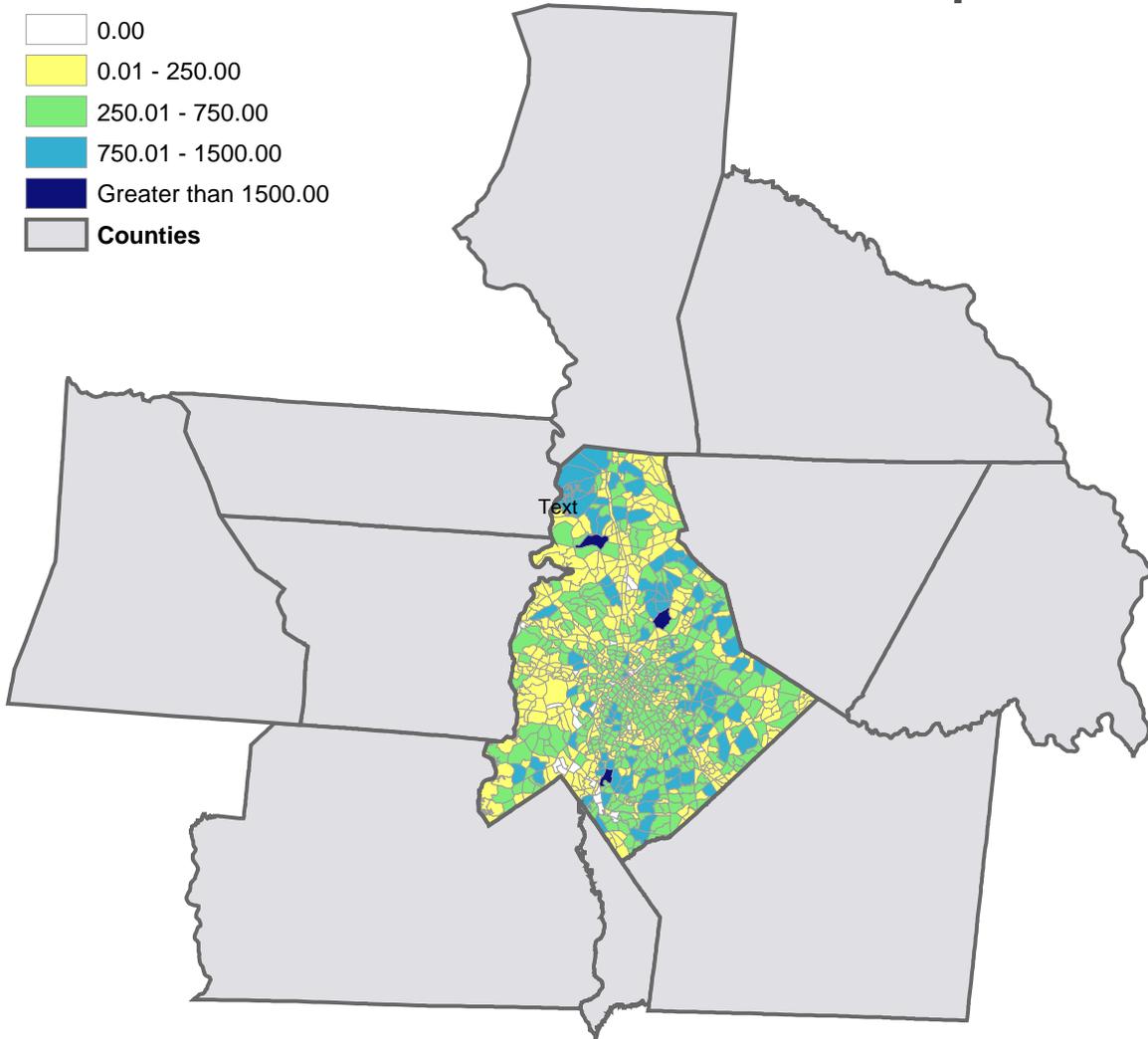
Figure B.14

### 2010 Households by TAZ

**Legend**

**Total Households: 2010**

-  0.00
-  0.01 - 250.00
-  250.01 - 750.00
-  750.01 - 1500.00
-  Greater than 1500.00
-  **Counties**



**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**

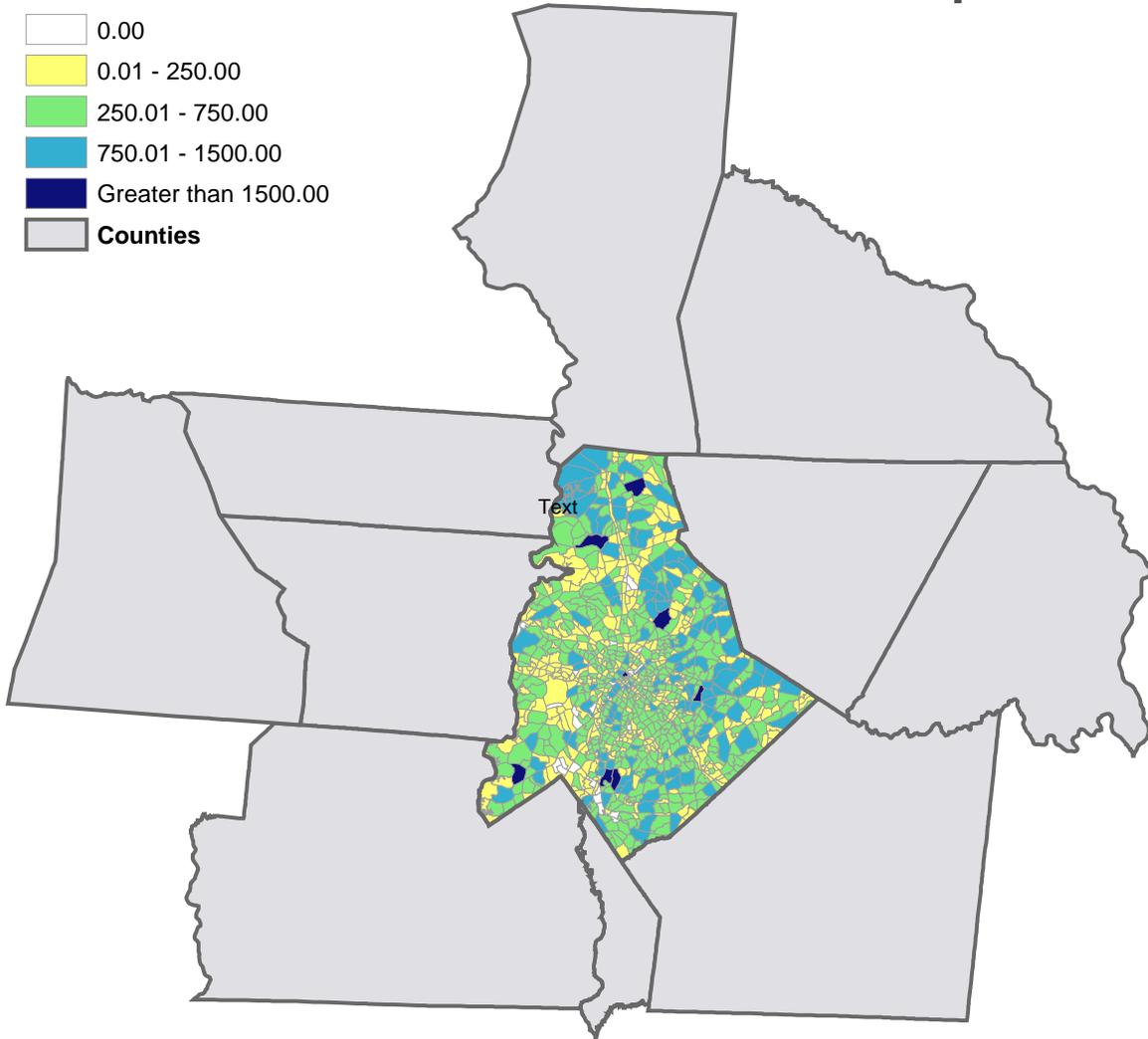
Figure B.15

### 2020 Households by TAZ

#### Legend

#### Total Households: 2020

- 0.00
- 0.01 - 250.00
- 250.01 - 750.00
- 750.01 - 1500.00
- Greater than 1500.00
- Counties



**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**

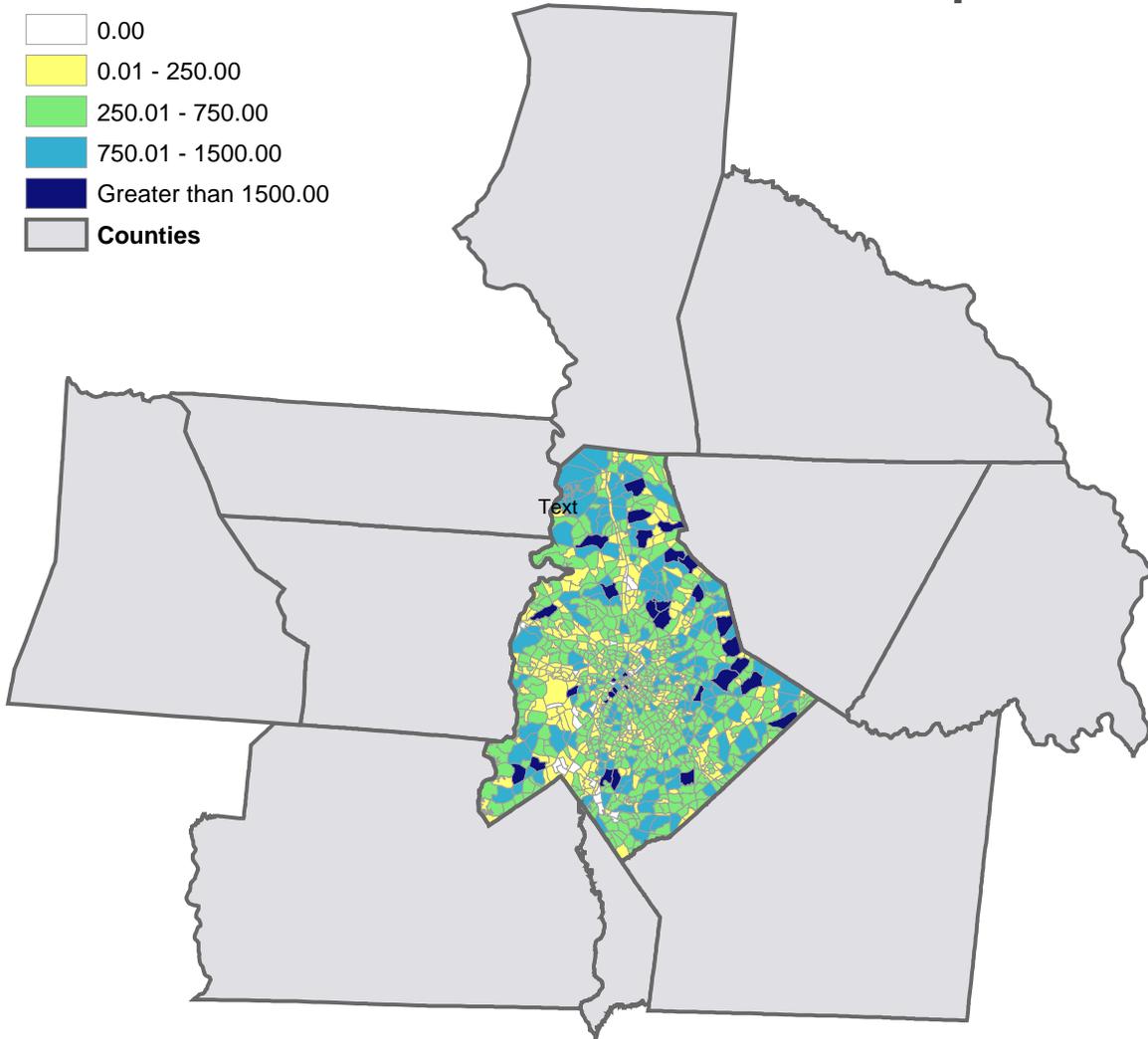
Figure B.16

### 2030 Households by TAZ

#### Legend

#### Total Households: 2030

- 0.00
- 0.01 - 250.00
- 250.01 - 750.00
- 750.01 - 1500.00
- Greater than 1500.00
- Counties



**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**

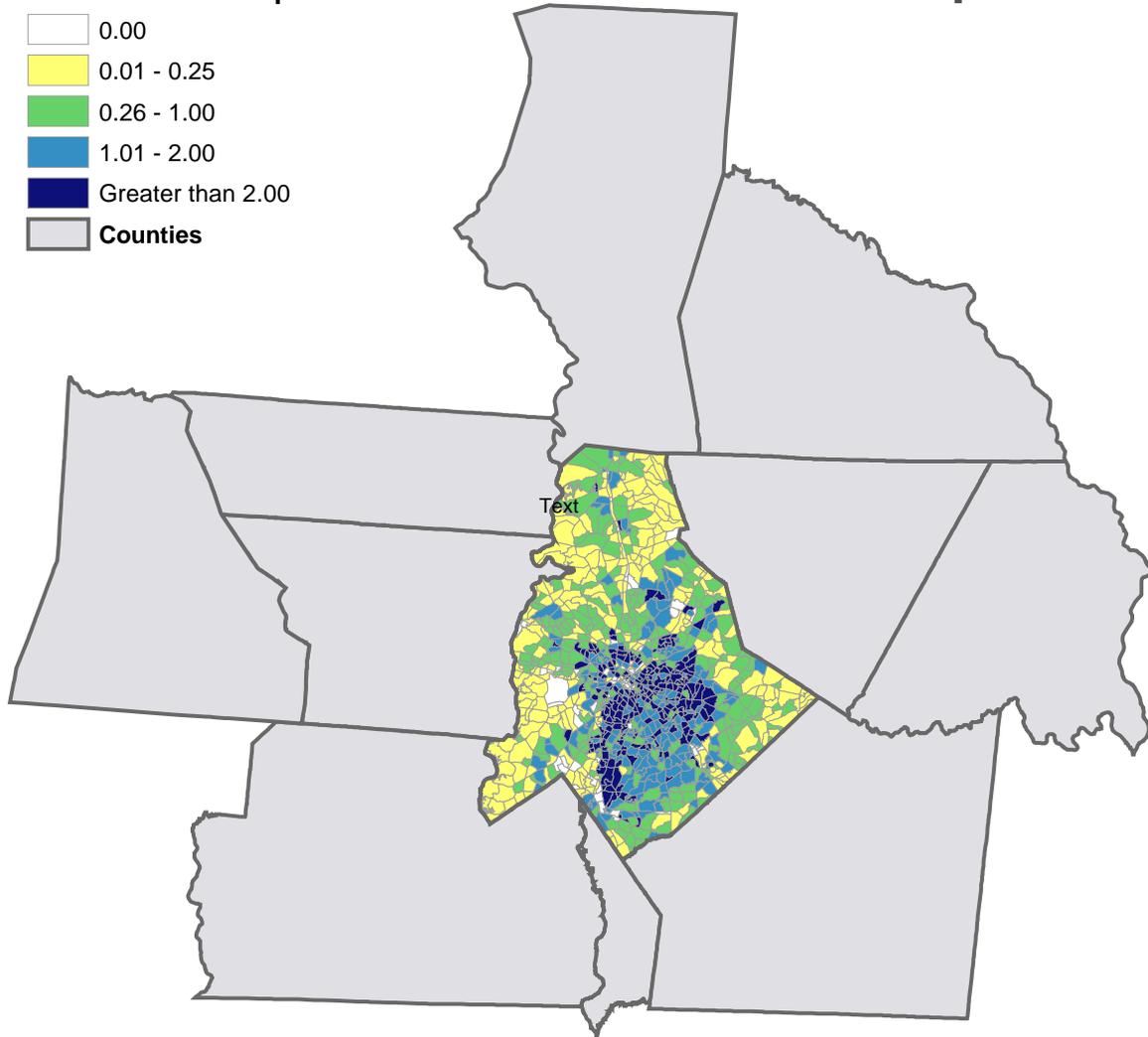
Figure B.17

## 2000 Household Density

### Legend

#### Total Households per Acre: 2000

-  0.00
-  0.01 - 0.25
-  0.26 - 1.00
-  1.01 - 2.00
-  Greater than 2.00
-  Counties



0 4 8 16 24 Miles

Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region

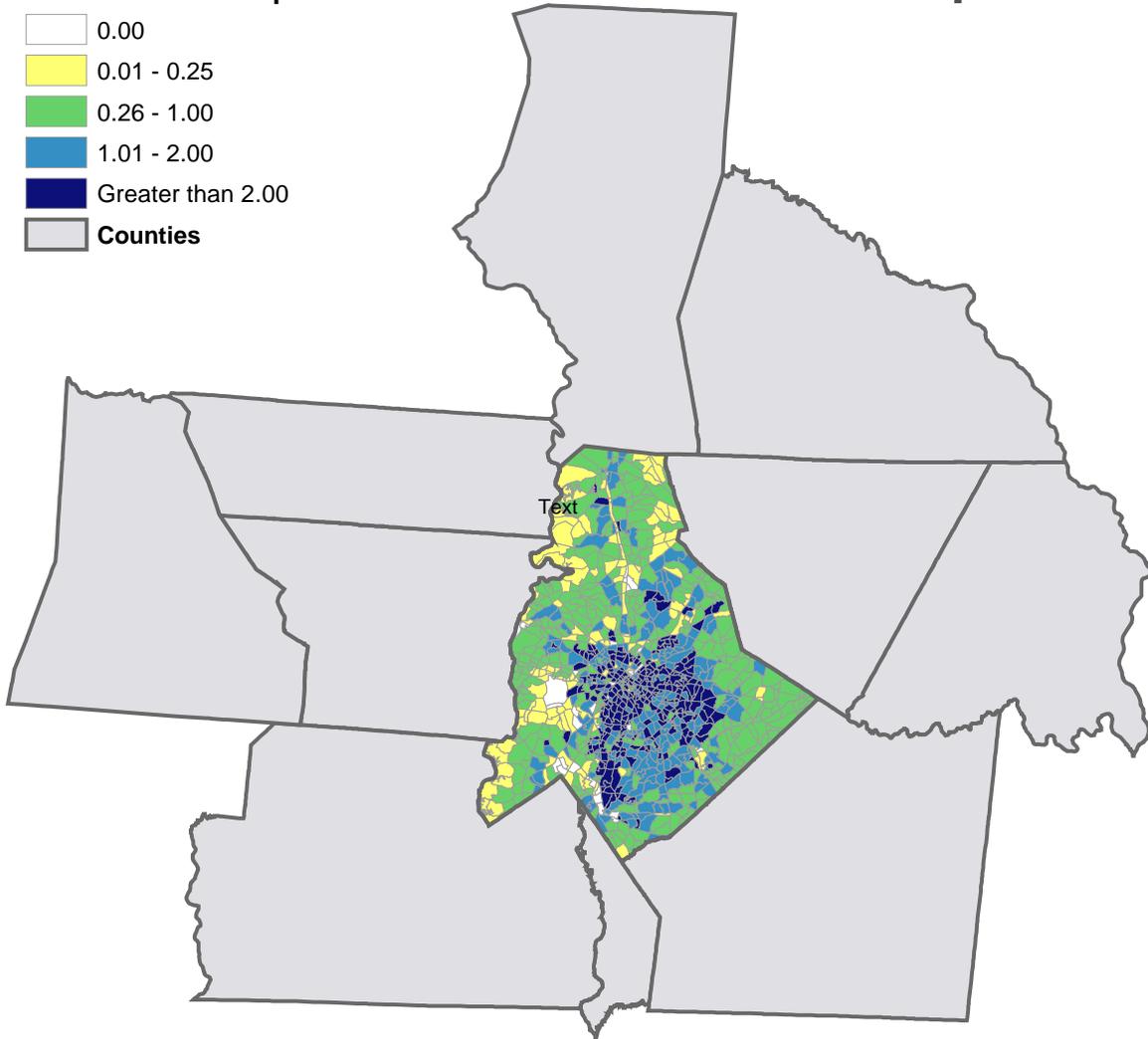
Figure B.18

## 2010 Household Density

### Legend

#### Total Households per Acre: 2010

-  0.00
-  0.01 - 0.25
-  0.26 - 1.00
-  1.01 - 2.00
-  Greater than 2.00
-  Counties



0 4 8 16 24 Miles

Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region

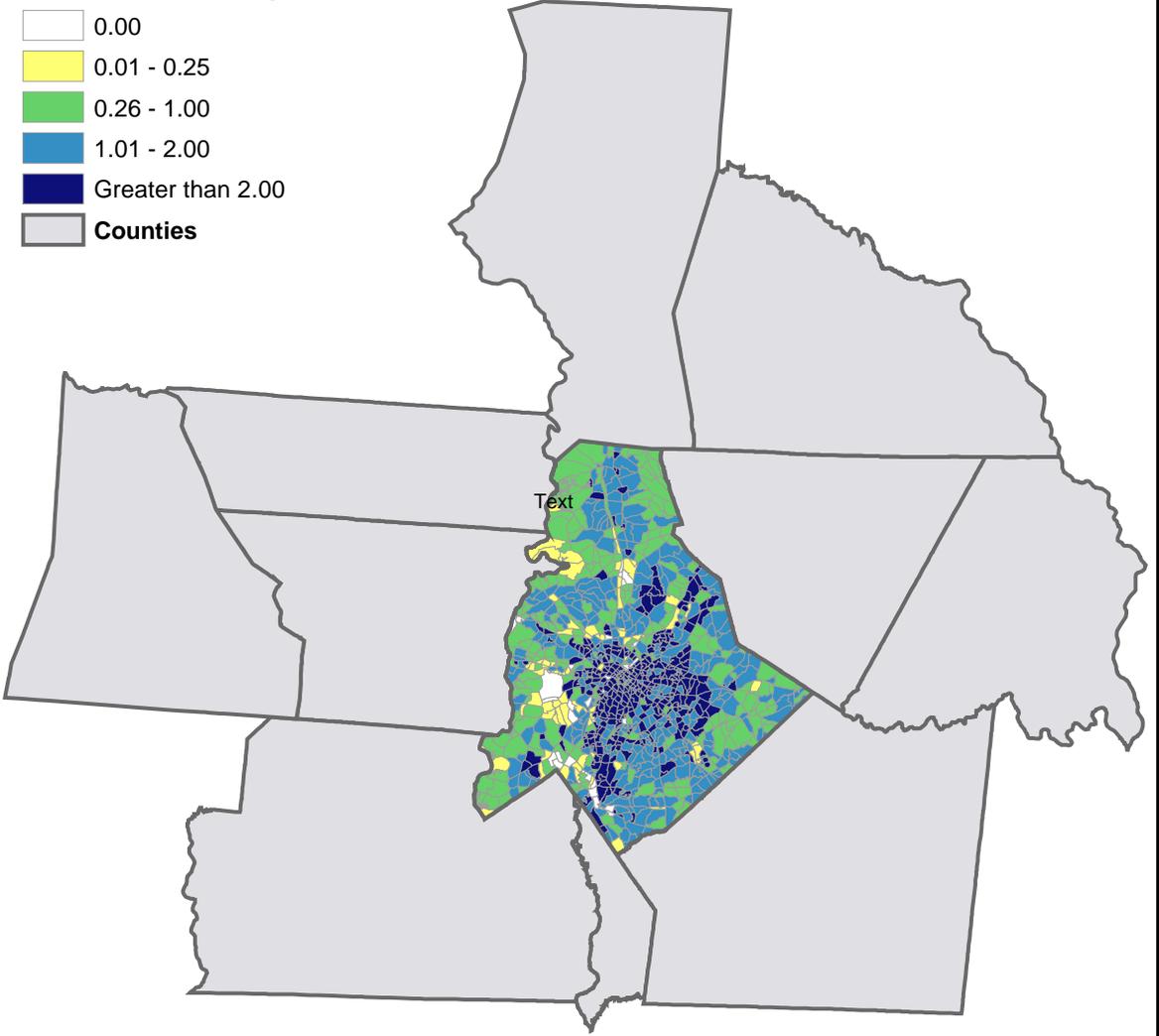
Figure B.20

### 2030 Household Density

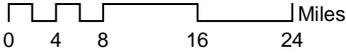
**Legend**

**Total Households per Acre: 2030**

- 0.00
- 0.01 - 0.25
- 0.26 - 1.00
- 1.01 - 2.00
- Greater than 2.00
- Counties**



Text



**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**

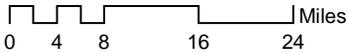
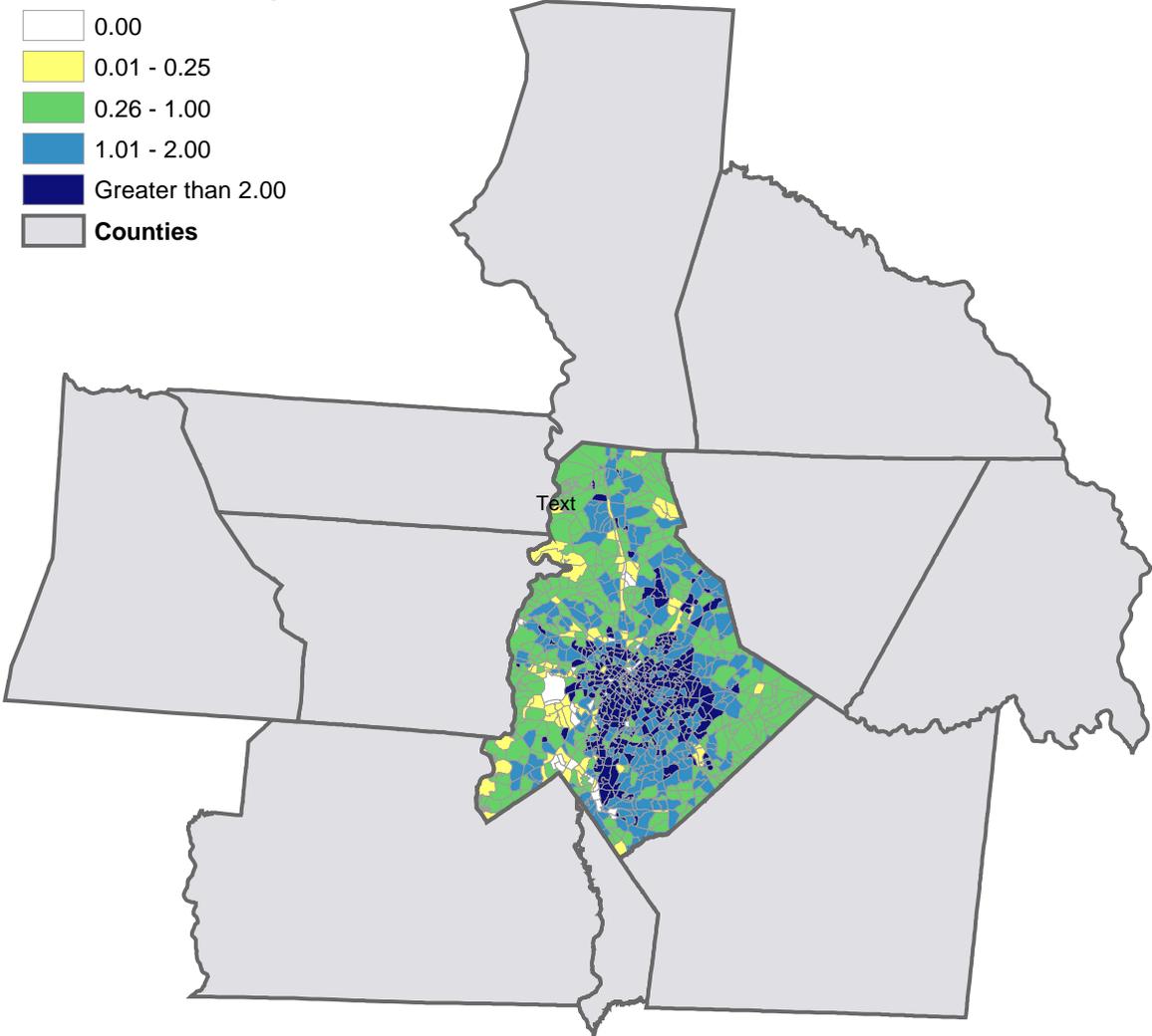
Figure B.19

### 2020 Household Density

**Legend**

**Total Households per Acre: 2020**

- 0.00
- 0.01 - 0.25
- 0.26 - 1.00
- 1.01 - 2.00
- Greater than 2.00
- Counties



**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**

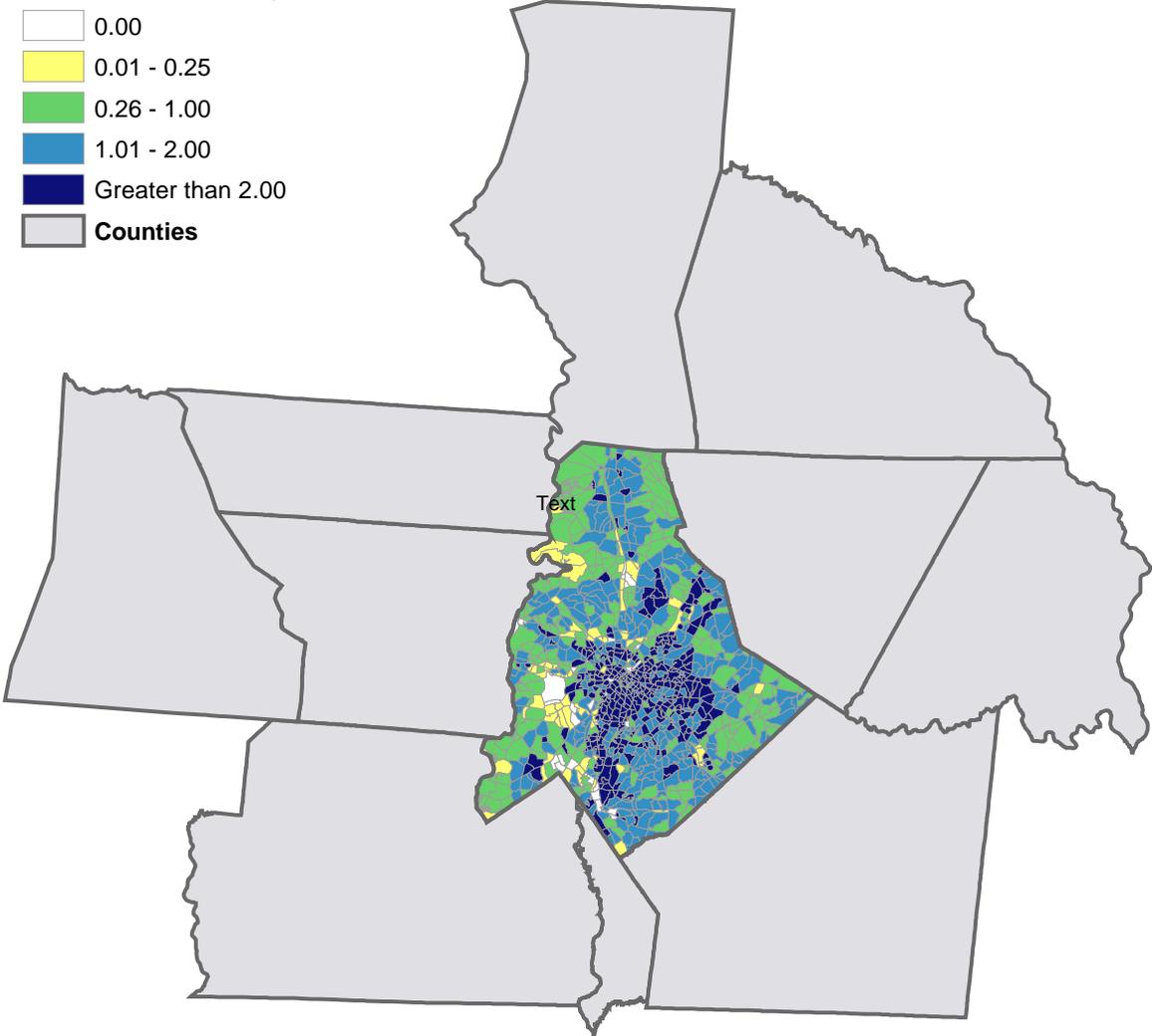
Figure B.20

### 2030 Household Density

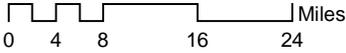
**Legend**

**Total Households per Acre: 2030**

- 0.00
- 0.01 - 0.25
- 0.26 - 1.00
- 1.01 - 2.00
- Greater than 2.00
- Counties



Text



**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**

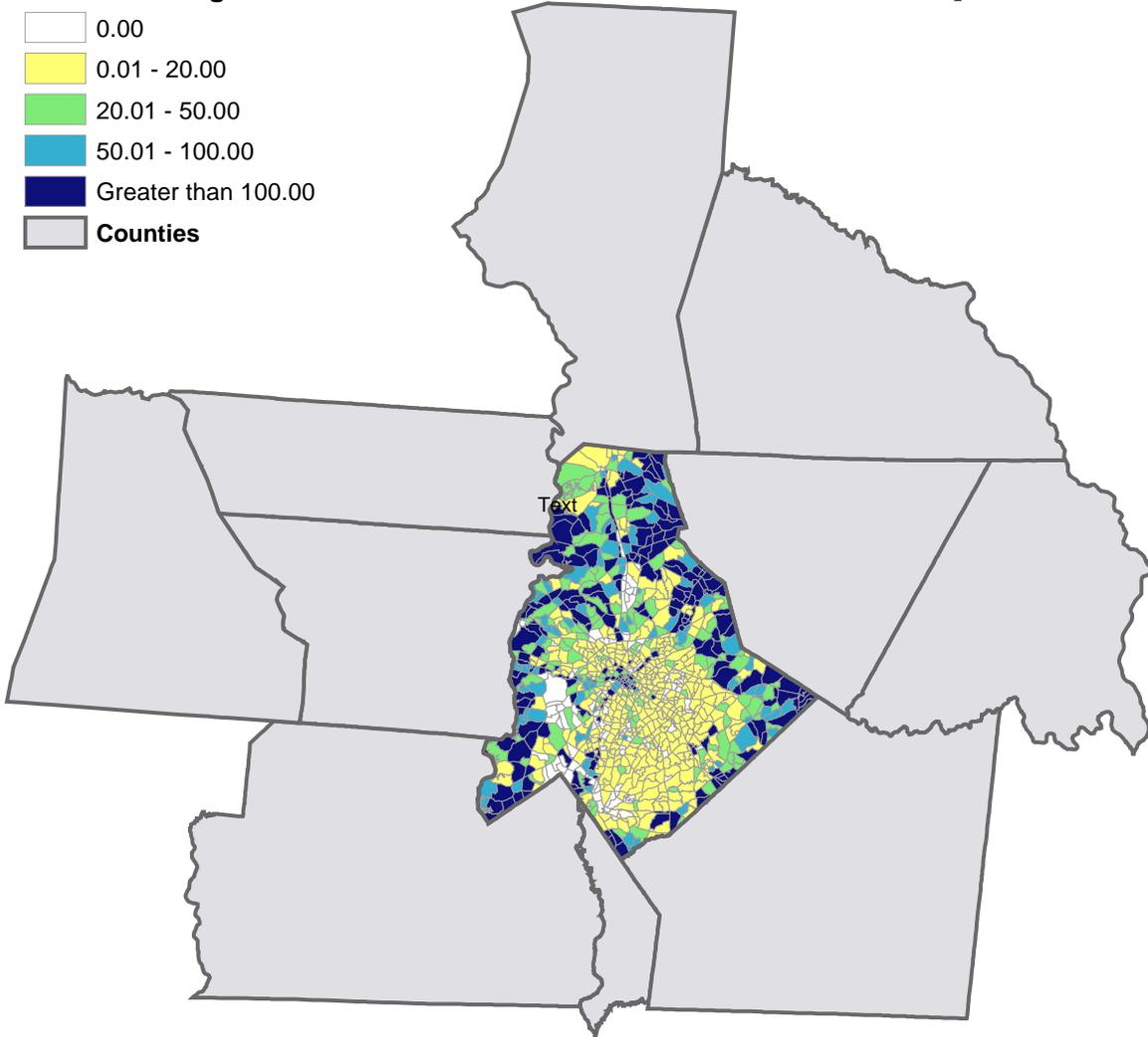
Figure B.21

### Percent Change in Households 2000 - 2010

**Legend**

**Percent Change Total Households: 2000-2010**

- 0.00
- 0.01 - 20.00
- 20.01 - 50.00
- 50.01 - 100.00
- Greater than 100.00
- Counties



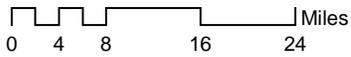
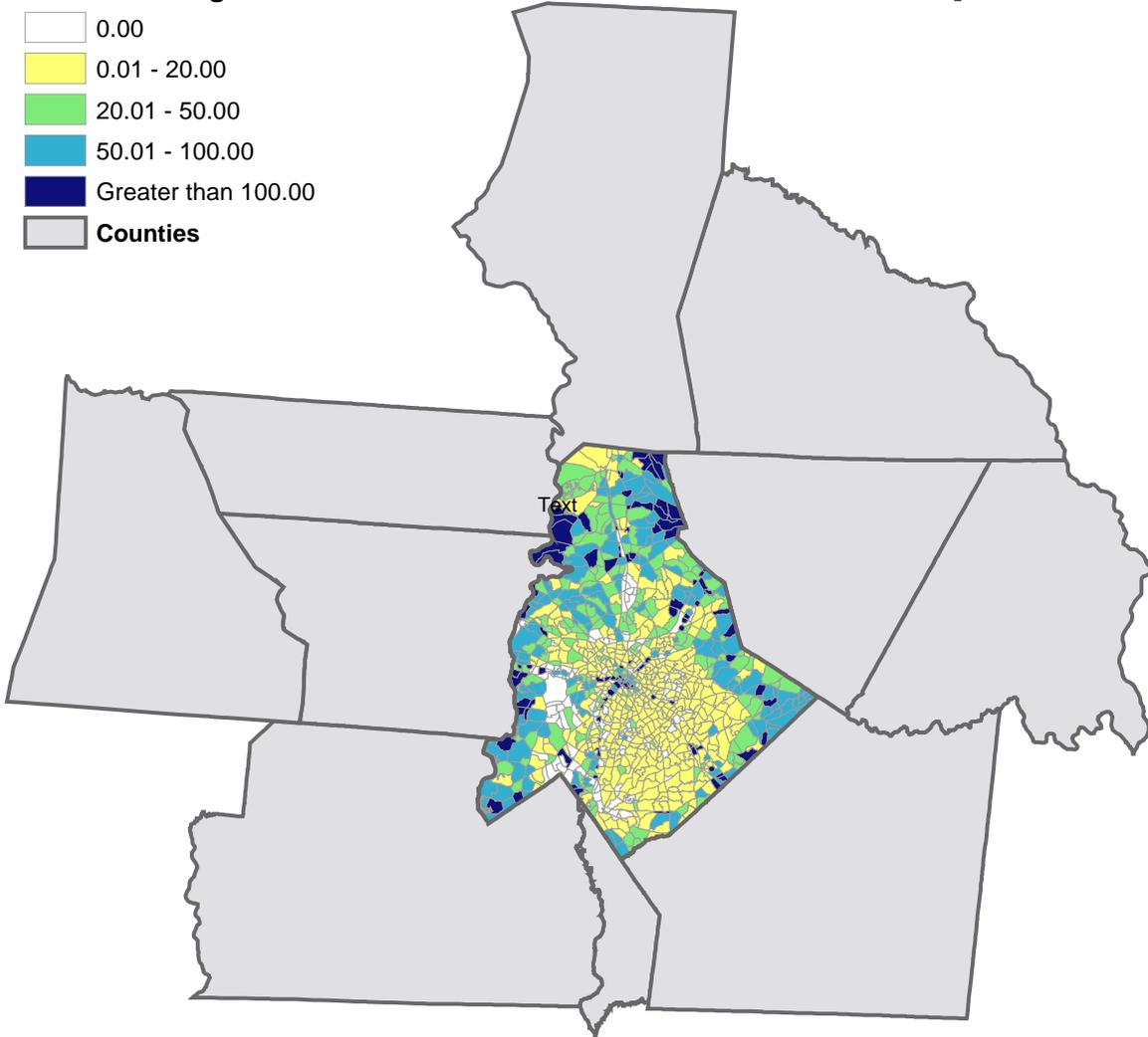
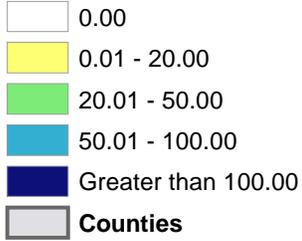
**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**

Figure B.22

## Percent Change in Households 2010 - 2020

### Legend

#### Percent Change Total Households: 2010-2020



Note: Because the horizon for this map covers 30 years instead of the 10 year horizons in previous growth maps, the legend categories represent much larger ranges of values.

**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**

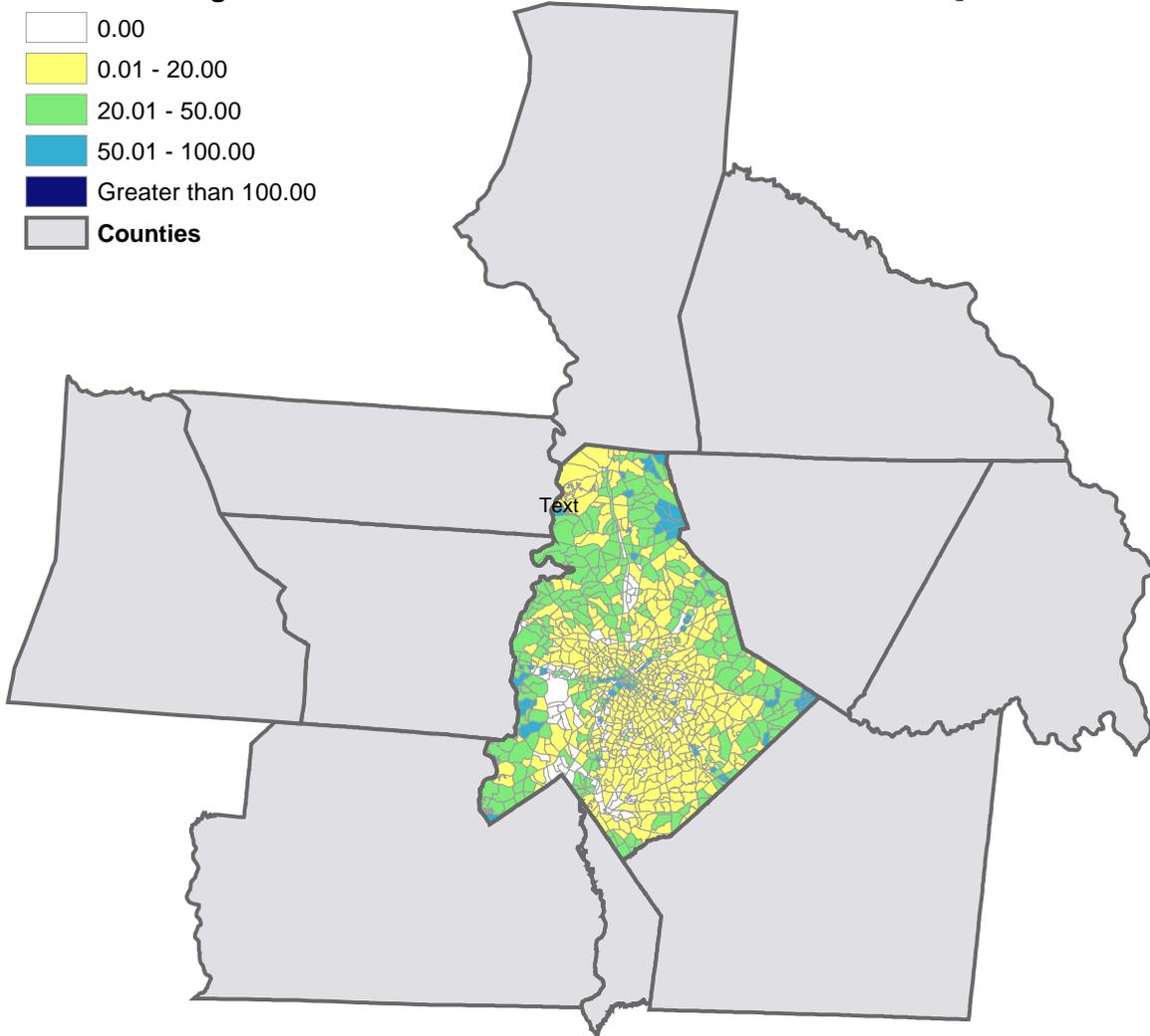
Figure B.23

### Percent Change in Households 2020 - 2030

#### Legend

#### Percent Change Total Households: 2020-2030

- 0.00
- 0.01 - 20.00
- 20.01 - 50.00
- 50.01 - 100.00
- Greater than 100.00
- Counties



0 4 8 16 24 Miles

Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region

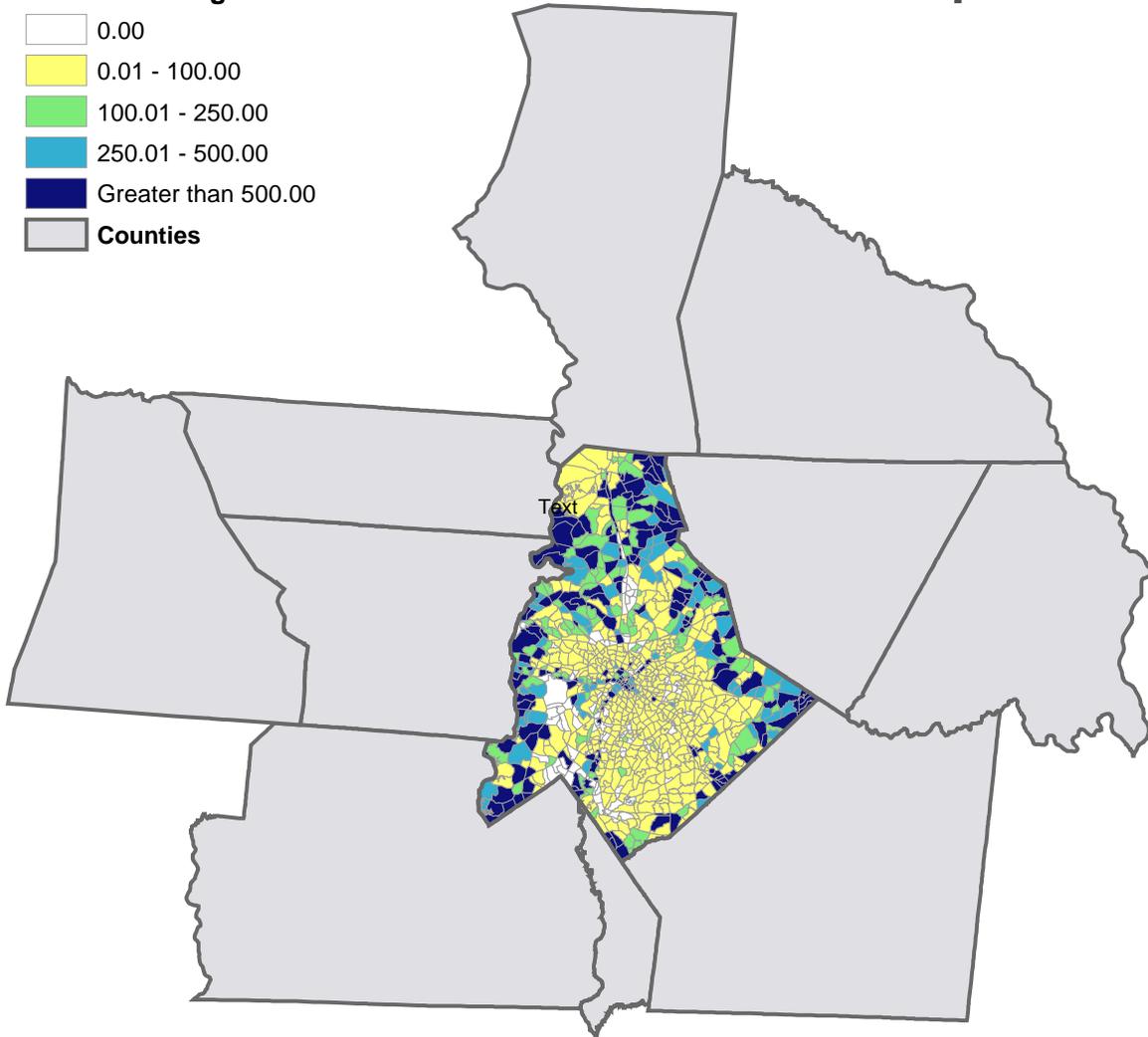
Figure B.24

## Percent Change in Households 2000 - 2030

### Legend

#### Percent Change Total Households: 2000-2030

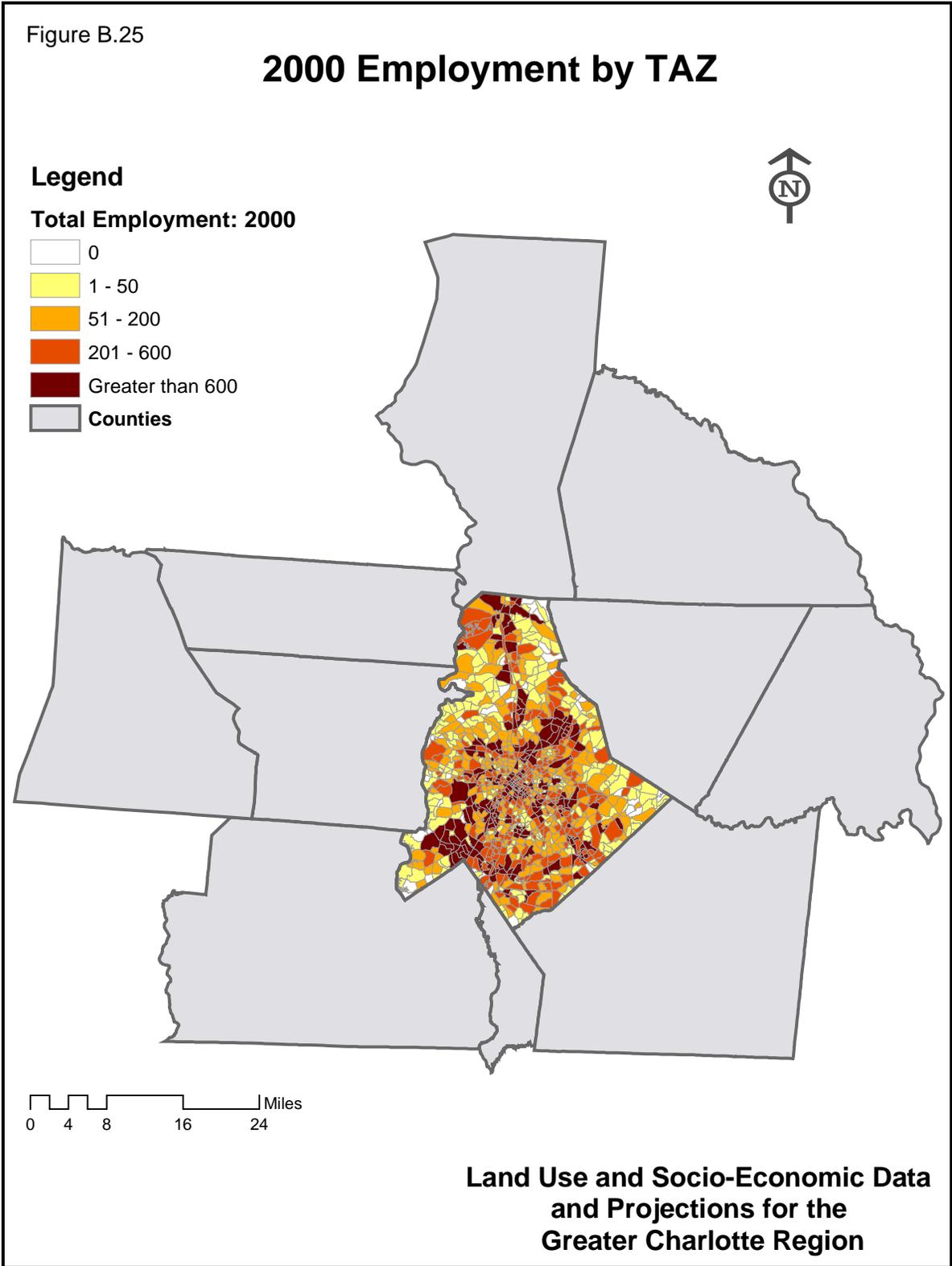
-  0.00
-  0.01 - 100.00
-  100.01 - 250.00
-  250.01 - 500.00
-  Greater than 500.00
-  Counties



0 4 8 16 24 Miles

Note: Because the horizon for this map covers 30 years instead of the 10 year horizons in previous growth maps, the legend categories represent much larger ranges of values.

**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**



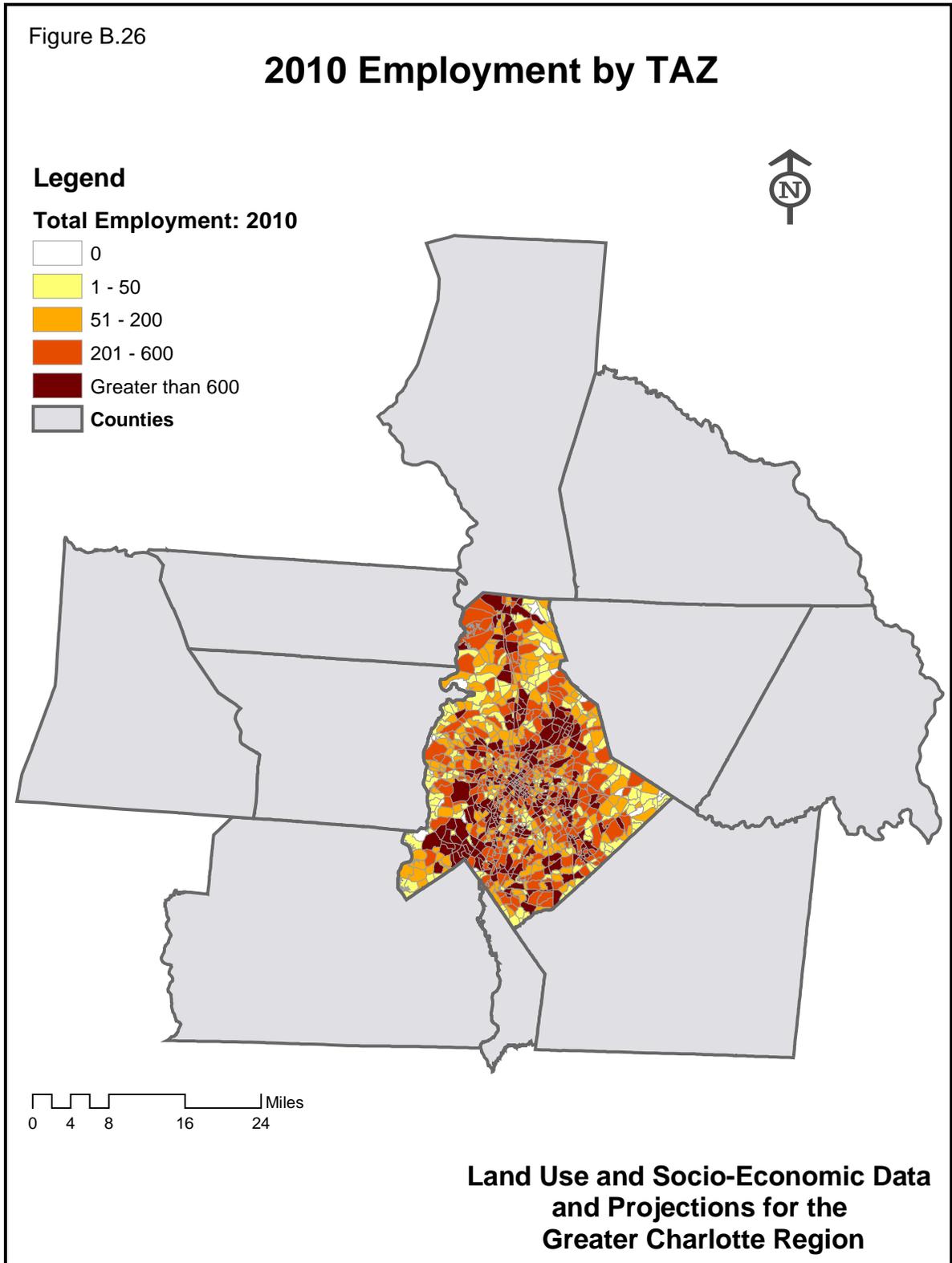


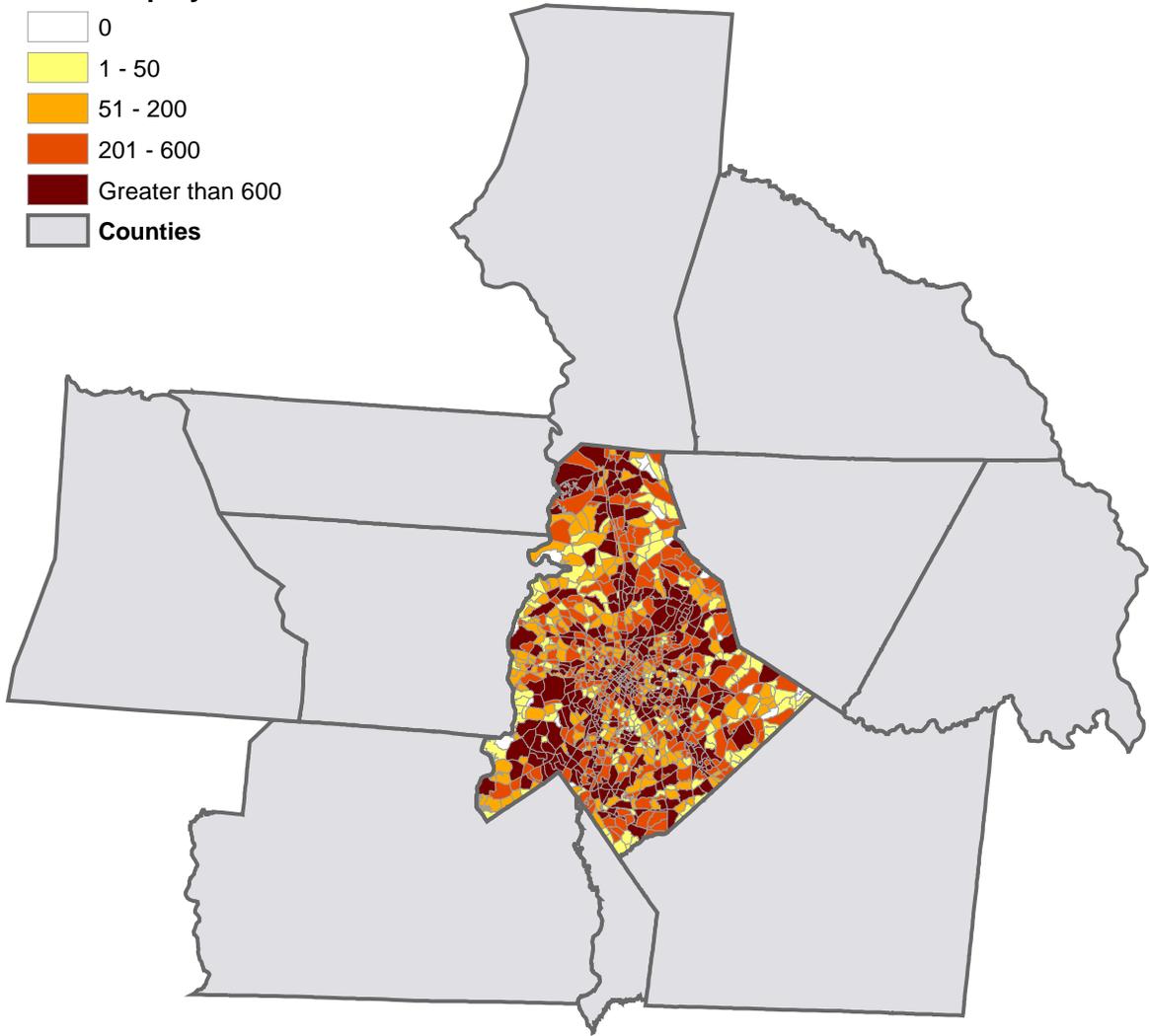
Figure B.27

### 2020 Employment by TAZ

**Legend**

**Total Employment: 2020**

- 0
- 1 - 50
- 51 - 200
- 201 - 600
- Greater than 600
- Counties**



**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**

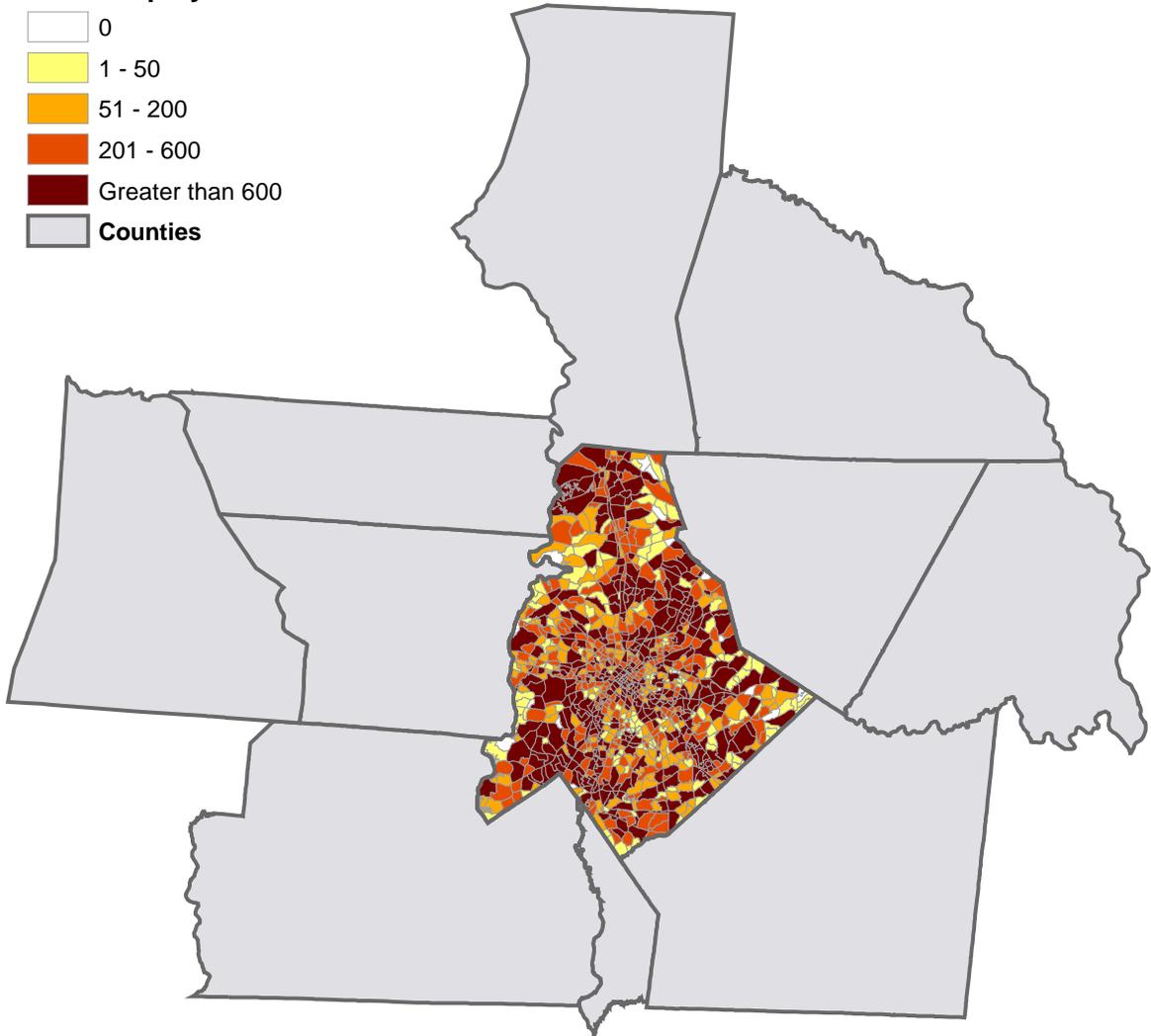
Figure B.28

### 2030 Employment by TAZ

**Legend**

**Total Employment: 2030**

- 0
- 1 - 50
- 51 - 200
- 201 - 600
- Greater than 600
- Counties**



**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**

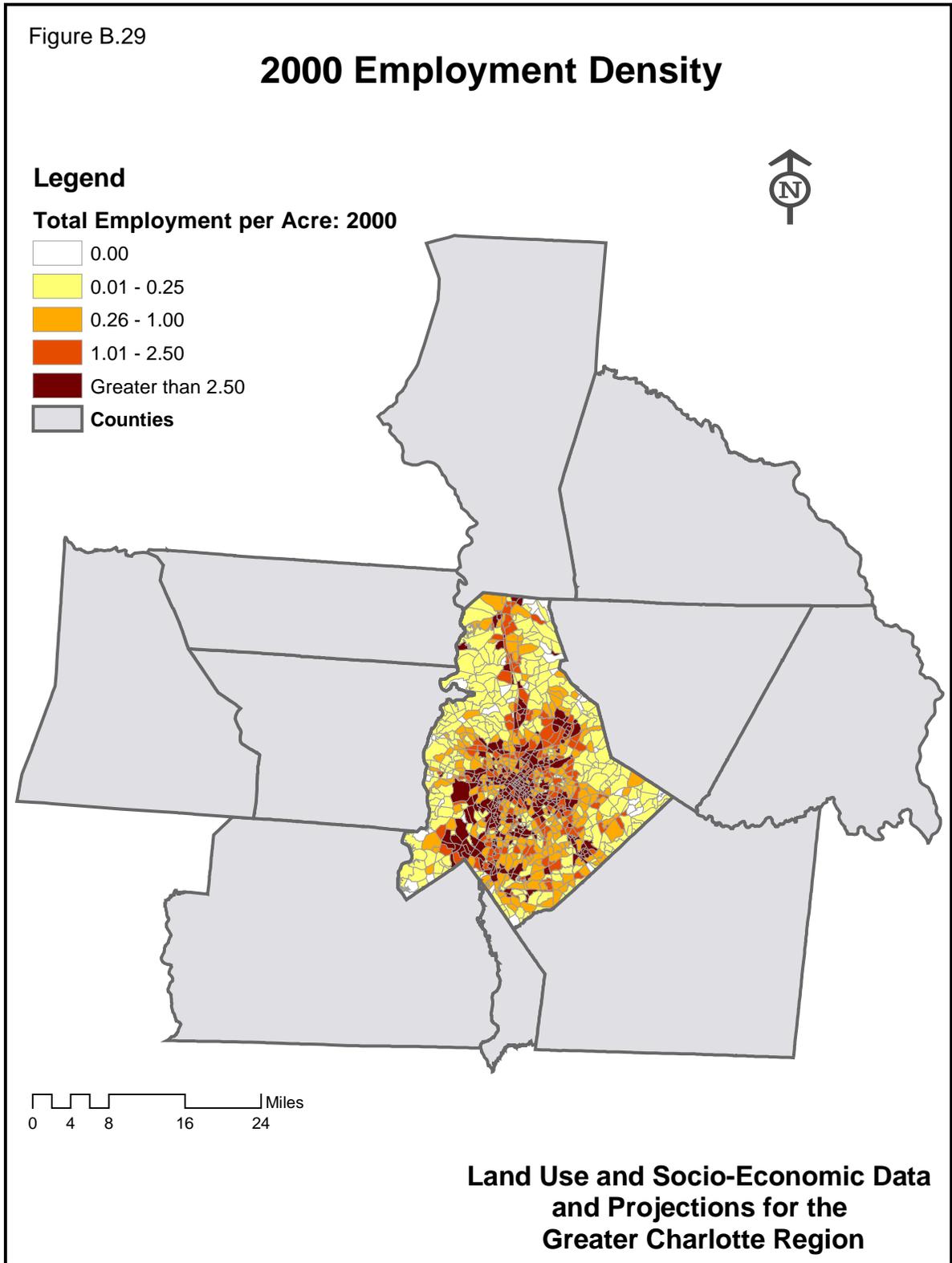


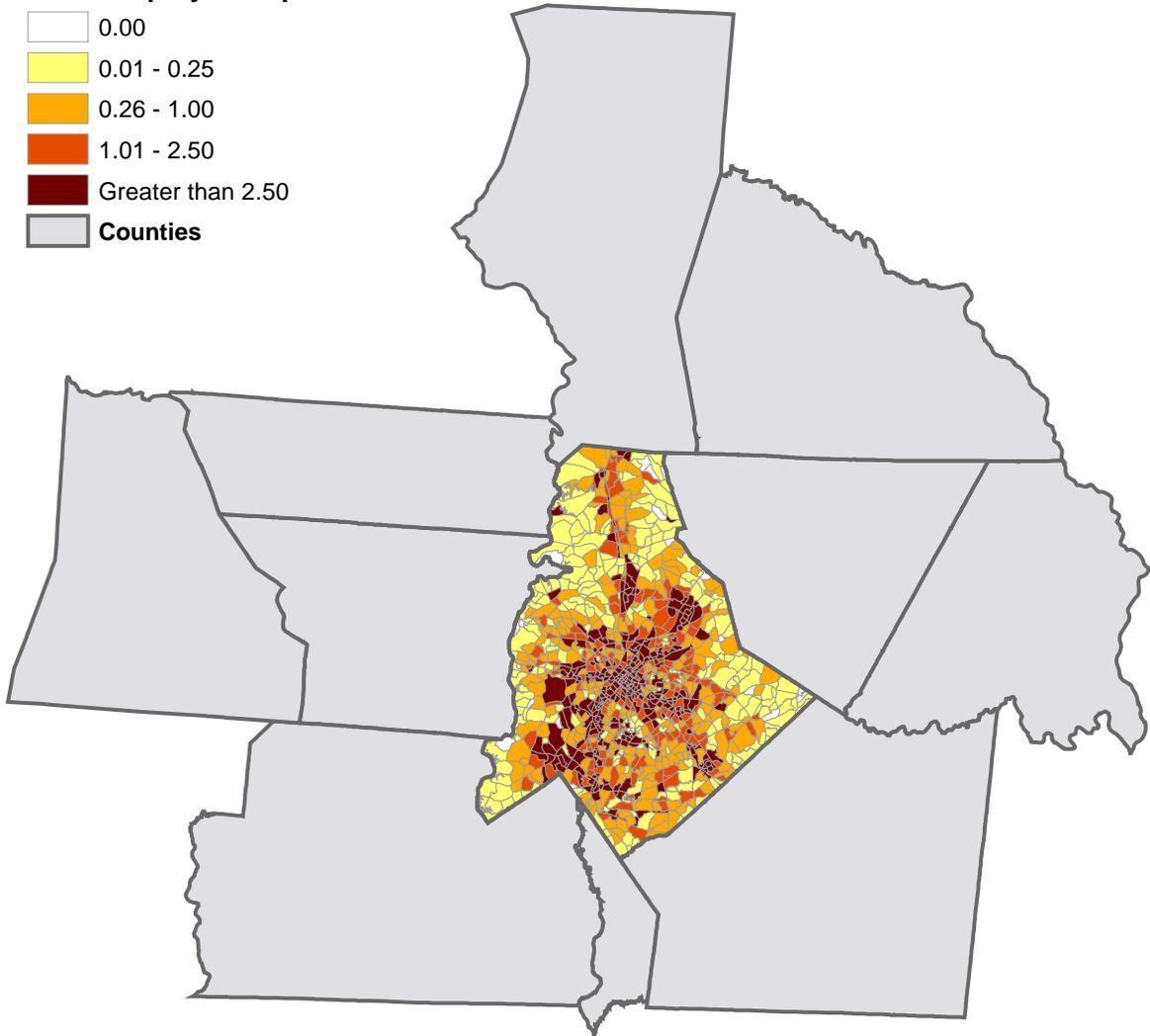
Figure B.30

### 2010 Employment Density

#### Legend

#### Total Employment per Acre: 2010

-  0.00
-  0.01 - 0.25
-  0.26 - 1.00
-  1.01 - 2.50
-  Greater than 2.50
-  Counties



Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region

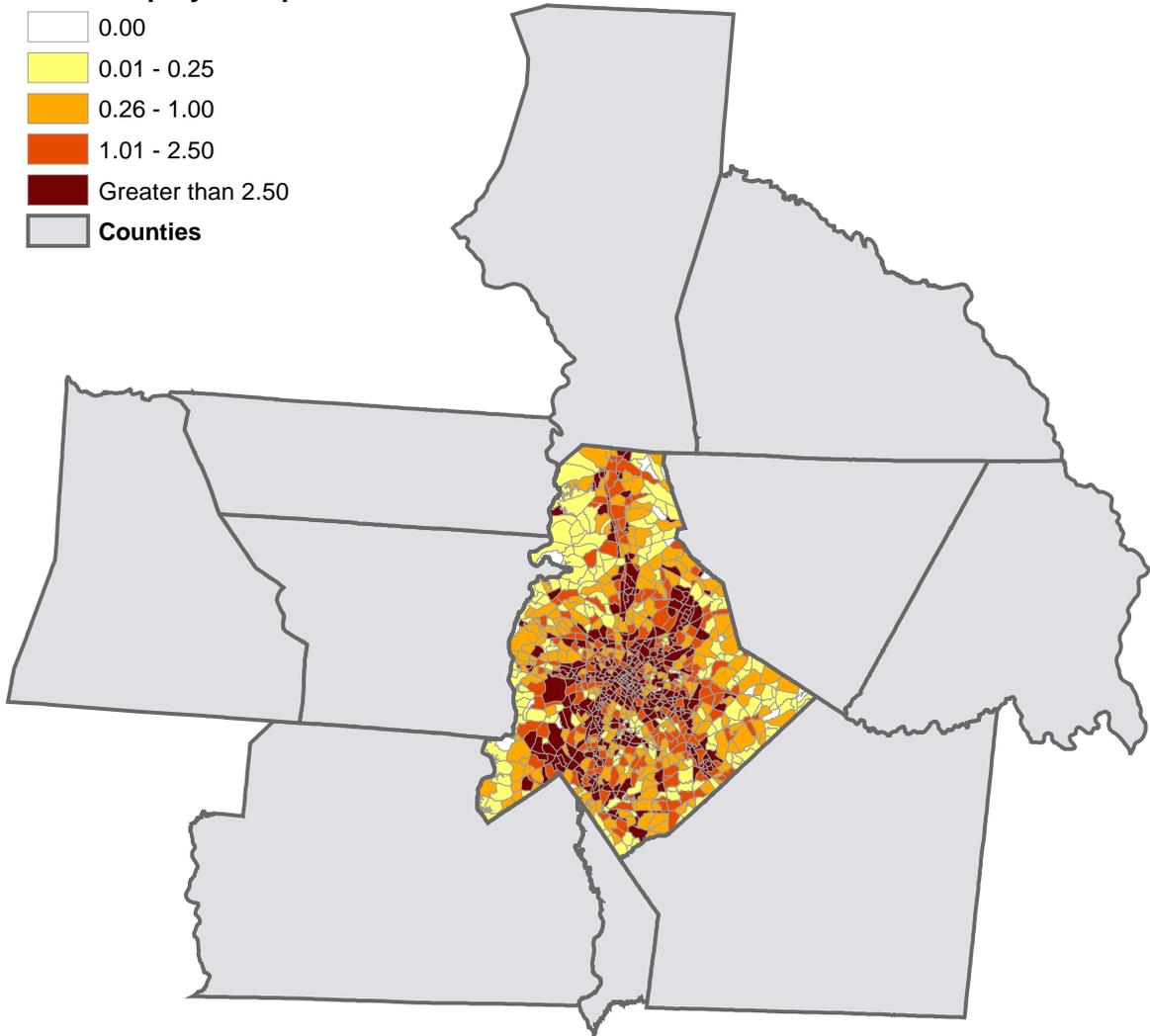
Figure B.31

## 2020 Employment Density

### Legend

#### Total Employment per Acre: 2020

-  0.00
-  0.01 - 0.25
-  0.26 - 1.00
-  1.01 - 2.50
-  Greater than 2.50
-  Counties



**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**

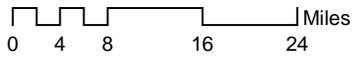
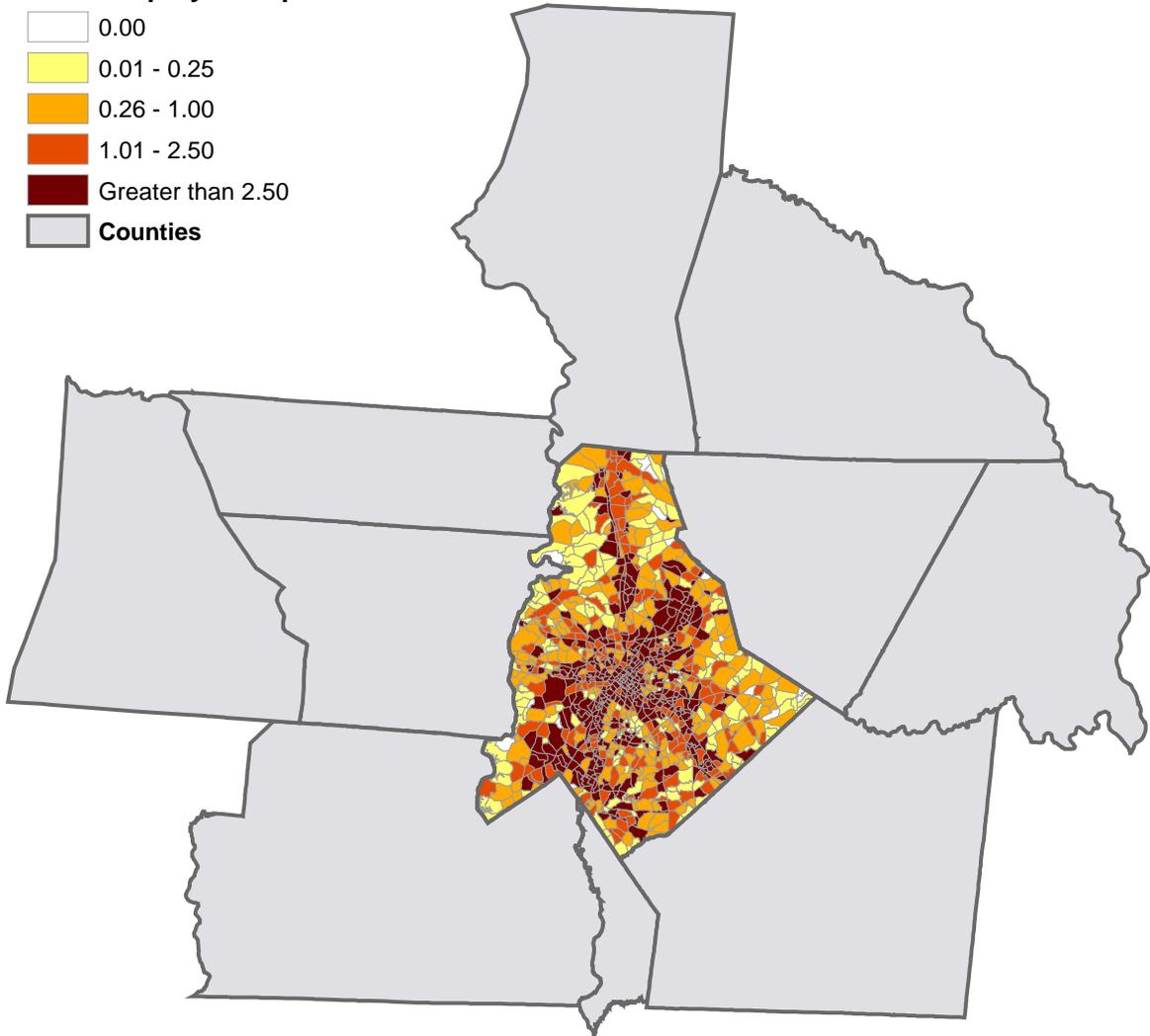
Figure B.32

### 2030 Employment Density

**Legend**

**Total Employment per Acre: 2030**

-  0.00
-  0.01 - 0.25
-  0.26 - 1.00
-  1.01 - 2.50
-  Greater than 2.50
-  **Counties**



**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**

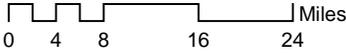
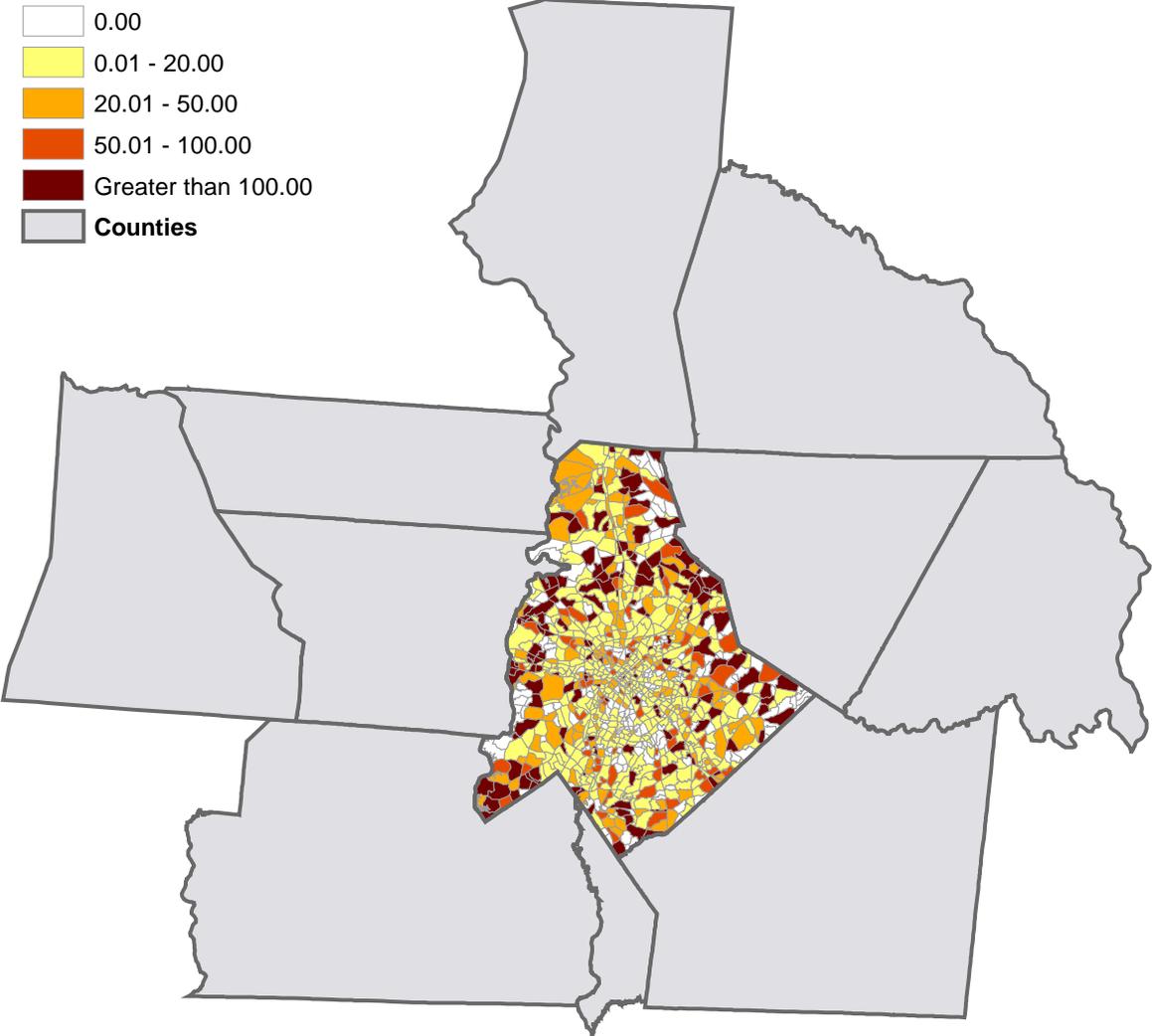
Figure B.33

### Percent Change in Employment 2000 - 2010

**Legend**

**Percent Change Total Employment: 2000-2010**

- 0.00
- 0.01 - 20.00
- 20.01 - 50.00
- 50.01 - 100.00
- Greater than 100.00
- Counties**



**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**

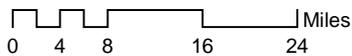
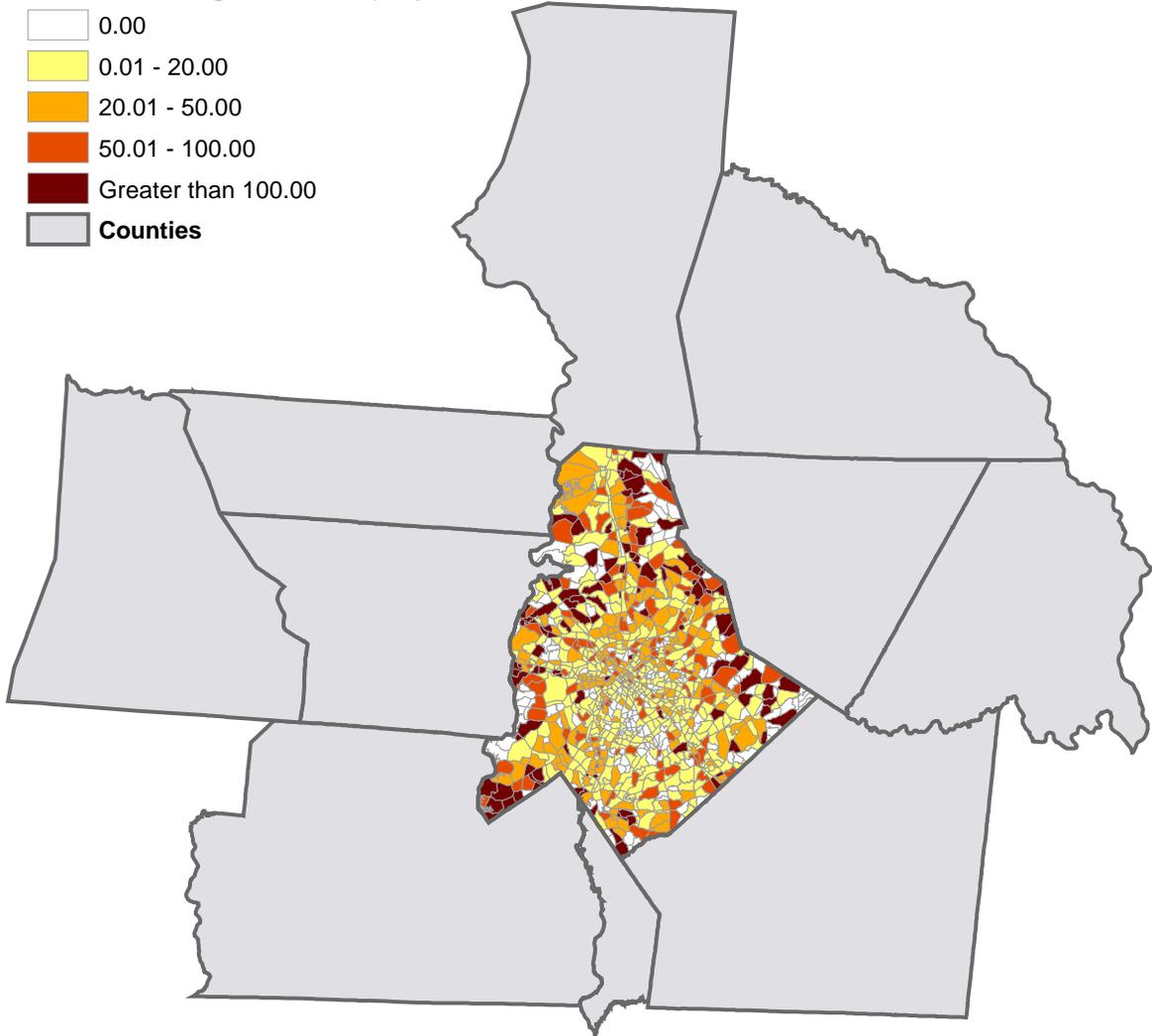
Figure B.34

### Percent Change in Employment 2010 - 2020

**Legend**

**Percent Change Total Employment: 2010-2020**

-  0.00
-  0.01 - 20.00
-  20.01 - 50.00
-  50.01 - 100.00
-  Greater than 100.00
-  **Counties**



**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**

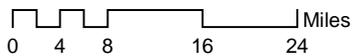
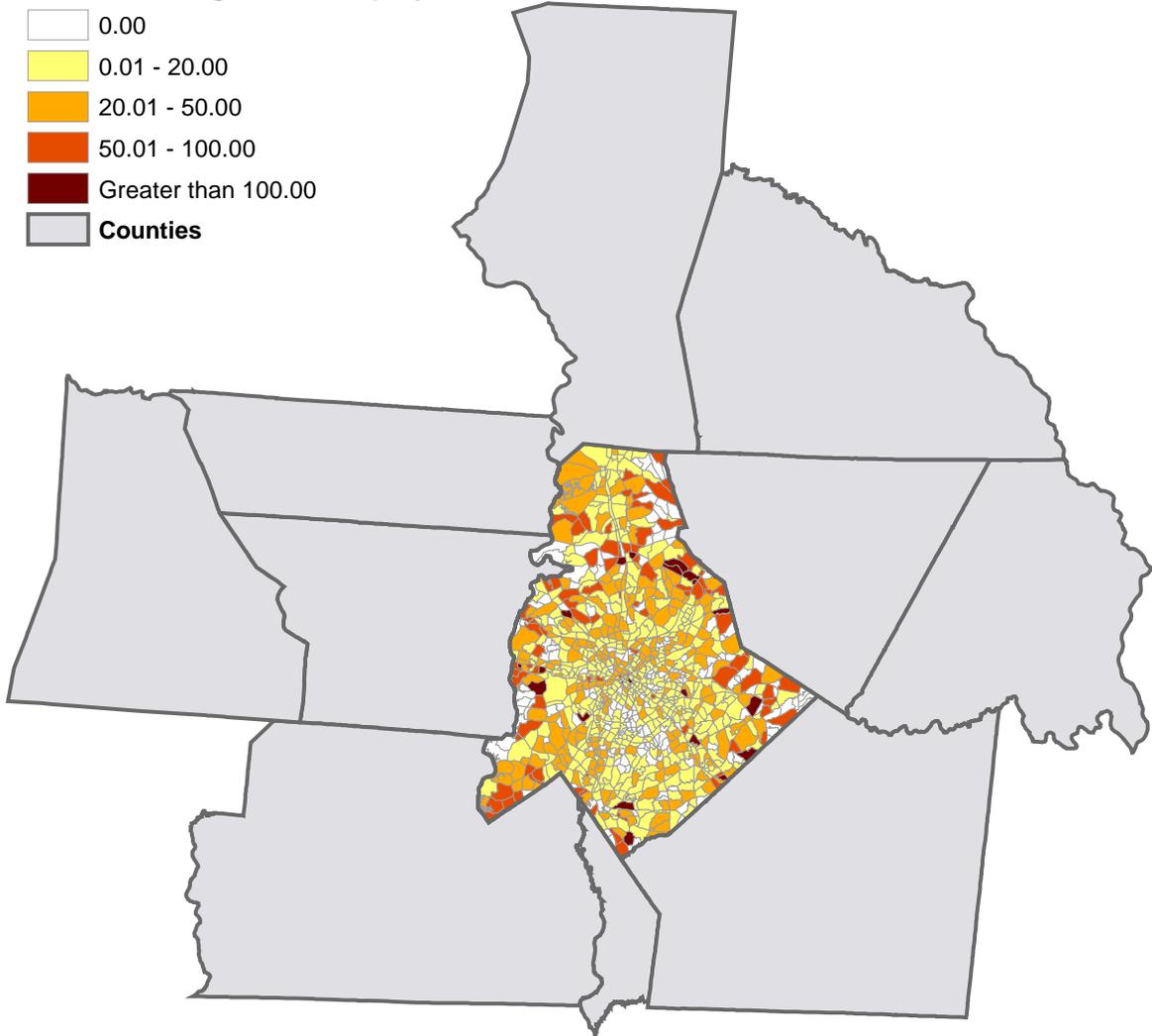
Figure B.35

### Percent Change in Employment 2020 - 2030

**Legend**

**Percent Change Total Employment: 2020-2030**

-  0.00
-  0.01 - 20.00
-  20.01 - 50.00
-  50.01 - 100.00
-  Greater than 100.00
-  **Counties**



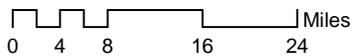
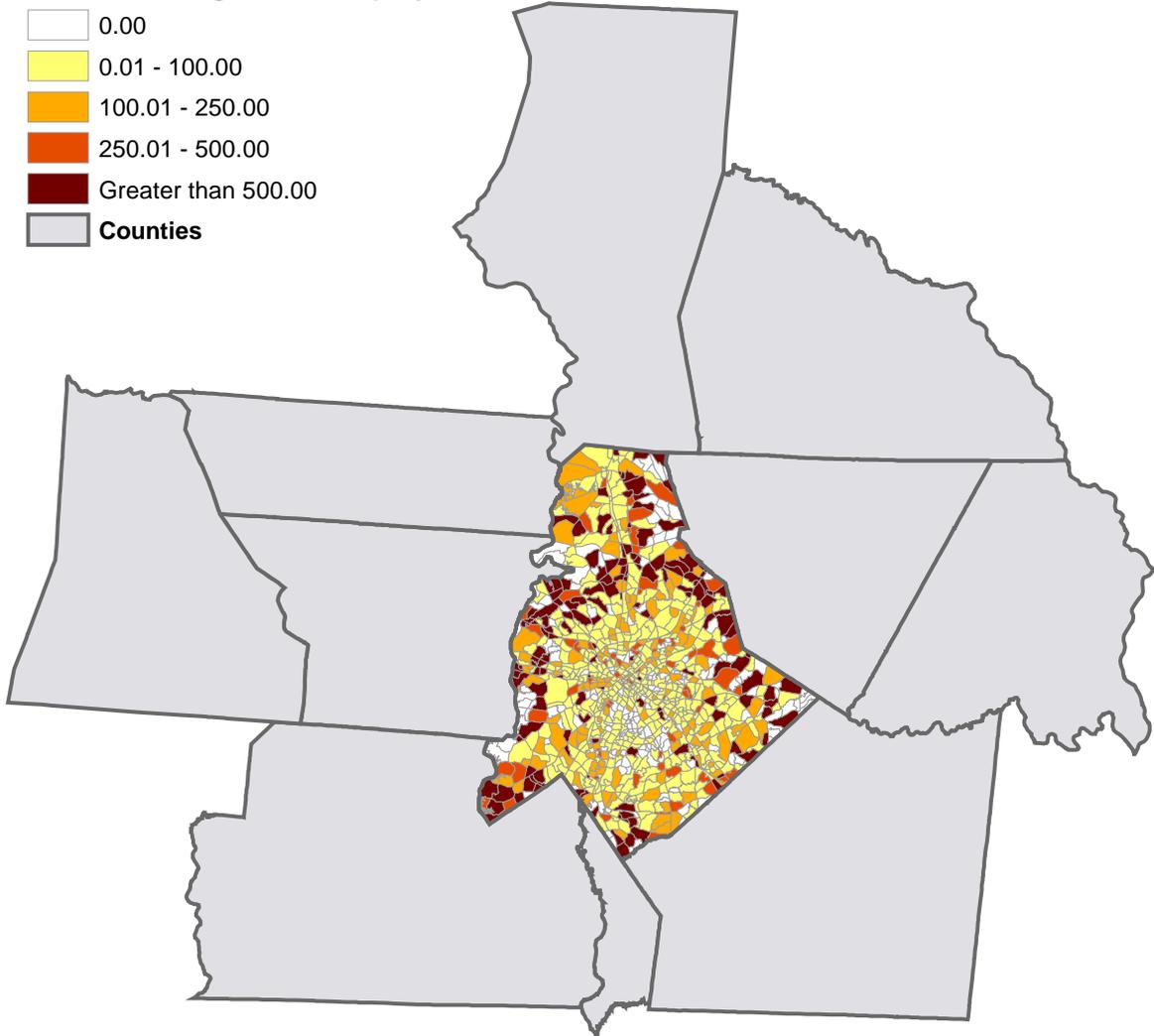
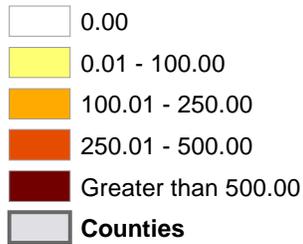
**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**

Figure B.36

## Percent Change in Employment 2000 - 2030

### Legend

#### Percent Change Total Employment: 2000-2030



Note: Because the horizon for this map covers 30 years instead of the 10 year horizons in previous growth maps, the legend categories represent much larger ranges of values.

**Land Use and Socio-Economic Data  
and Projections for the  
Greater Charlotte Region**





**Appendix C**  
**Employment Categories**



### **Employment Categories defined by Standard Industrial Classification (SIC) Codes**

The eight employment categories used in the land use and socio-economic data projections for the regional travel demand model were based on Standard Industrial Classification (SIC) codes, as shown in the table below. The categories are presented in ascending SIC code order, and thus some categories appear more than once since they include non-contiguous ranges of SIC codes.

In some cases, all SIC codes within a particular 2-digit SIC grouping were assigned to the same employer category, and are shown in the table below under the “2 Digit SIC” column. (For example, all 4 digit codes from 0100 to 5199 are included in the MIWTCU employer category, and are thus shown under the 2 Digit SIC column as “01...51”.) In other cases, a portion of the 2 digit SIC grouping was assigned to one employer category and another portion was assigned to a different employer category. In those cases, each is shown as a code or range of codes under the 4 Digit SIC column. (For example, since the 2 Digit SIC grouping “55” is split between the Retail and Highway Retail employer categories, the relevant 4 Digit SIC code or range of codes is shown under the 4 Digit SIC column for each employer category.)

Thus, the complete set of SIC codes assigned to a given employer category includes those listed under both the 2 Digit SIC and 4 Digit SIC columns, for all instances of that category. (For example, Retail employment is defined as all SIC codes 52 through 54 (i.e., 5200 – 5299, 5300-5399, and 5400-5499), plus all SIC codes 5511 through 5531, plus all SIC codes 5551-5599, plus all SIC codes 56 through 57 (i.e., 5600-5699 and 5700-5799), plus all SIC codes 59 (5900-5999).)

The employer categories “Hi Service” and “Lo Service” were defined by the volume of traffic typically generated by businesses in those SIC codes: “Hi Service” employers generate high traffic volumes as compared to “Lo Service” employers. These two categories split so many ranges of 2 Digit SIC codes between them that they each appear six times in the table below. They are highlighted in two different shades of gray to make it easier to distinguish between them and identify the ranges of SIC codes belonging to each.

Also note that the “Office/Govt” employer category appears twice, because it captures both the non-banking portion of “Finance, Insurance and Real Estate” SIC codes and all of the “Public Administration” SIC codes, which are non-contiguous sets of 2 Digit SIC codes.

## Land Use & Socio-Economic Data and Projections

### Employment Categories defined by Standard Industrial Classification (SIC) Codes

Employer Category	2 Digit SIC	4 Digit SIC	Classification
MIWTCU	01 ... 51		Ag, Mining, Construction, Mfg., Wholesale, Telecommunications, Utilities
Retail	52 ... 54	5511 ... 5531	Retail Trade, except for Gasoline Service Stations (5541) and Eating/Drinking Establishments (58), part 1: Building mat'ls, Hardware, Garden Supply, General Merchandise and Food stores, New or used Car, Mobile Home dealers
Highway Retail	58	5541	Gasoline Service Stations (5541) and Eating/Drinking Establishments (58)
Retail	56 ... 57, 59	5551 ... 5599	Retail Trade, except for Gasoline Service Stations (5541) and Eating/Drinking Establishments (58), part 2: Boat/RV/Motorcycle dealers, Clothing, Furniture/Furnishings, Equipment stores
Banking	60		Depository Institutions
Lo Svc	61		Non-Depository Credit Institutions
Office/ Govt	62 ... 67		All other Finance, Insurance, Real Estate
Hi Svc	70 ... 72		Hotels/Lodging, Personal Svcs
Lo Svc		7311 ... 7331	Bus. Svcs: Advertising, Credit Reporting/Collections, Mailing
Hi Svc		7334	Bus. Svcs: Photocopying & Duplicating
Lo Svc		7335 ... 7389	Bus, Svcs: all other business services
Hi Svc	75 ... 76		Automotive, Parking, Misc Repair services
Lo Svc		7812 ... 7829	Motion Pictures: Production & Distribution services
Hi Svc		7832 ... 7911	Motion Picture Theatres, Video Rental, Dance Studios/Schools
Lo Svc		7922 ... 7929	Theatrical Producers (excl. motion pictures)
Hi Svc	80 ... 81	7933 ... 7999	All other Amusement/Recreation services, Health services, legal services
Schools		8211 ... 8222	Educational services: elem, secondary schools, colleges, univ., jr colleges, technical institutes
Hi Svc	83 ... 84	8231 ... 8299	Educational services: libraries, vocational schools, all other; Social services; Museums, art galleries, zoos, botanical gardens
Lo Svc	86 ... 89		Membership Organizations; Engineering, Accounting, Management services; private households; consultants, writers, artists
Office/ Govt	91 ... 97		Public Administration

Legend	Lo Svc
	Hi Svc
	other categories