12-2003

Effects of economic transition on income, occupation, and racial distributions in Birmingham, Alabama 1970-1990

Kendrick James Curtis

To the Graduate Council:

I am submitting herewith a thesis written by Kendrick James Curtis entitled "Effects of economic transition on income, occupation, and racial distributions in Birmingham, Alabama 1970-1990." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Geography.

Charles Aiken, Major Professor

We have read this thesis and recommend its acceptance:

Accepted for the Council:
Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

To the Graduate Council:

I am submitting herewith a thesis written by Kendrick James Curtis entitled "Effects of Economic Transition on Income, Occupation, and Racial Distributions in Birmingham, Alabama, 1970-1990." I have examined the final paper copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Geography.

Charles S. Aiken

Charles S. Aiken, Major Professor

We have read this thesis and recommend its acceptance:

Bruce A. Ralston

Thomas L. Bell

Accepted for the Council:

Vice Provost and Dean of Graduate Studies

Effects of Economic Transition on Income, Occupation, and Racial Distributions in Birmingham, Alabama 1970-1990

A Thesis

Presented for the

Master of Science

Degree

The University of Tennessee, Knoxville

Kendrick James Curtis

December 2003

ACKNOWLEDGEMENTS

I wish to express my appreciation to the people who assisted me in this process. Foremost, let me convey my gratitude to the Geography Department at the University of Tennessee, whose faculty and students contributed to my academic and professional development. I want to thank my committee chair, Dr. Charles S. Aiken, for his assistance in both advising me and lending me his remarkable editorial talents. Dr. Bruce Ralston and Dr. Thomas Bell faithfully supported me in the pursuit of this research; for my committee's direction and encouragement I am exceedingly grateful.

Several individuals assisted me in preparing the data that enabled me to bring this research to fruition. Eleanor Reed, a research librarian at the University of Tennessee, helped me acquire much of the historic census data in a digital form. Ann Reed, of the Statistical Services Office, assisted me in converting this digital data into a usable format. Ann Reed collaborated with me to construct the statistical formulas in the Statistical Package for the Social Sciences so I could correctly calculate the values for analysis. Cathy Bornfleth and my mother, Ruth Curtis, contributed their editorial abilities, tirelessly reading final drafts. For their encouragement and freedom to work on my thesis in its final stage I am indebted to the Local Planning Assistance Office.

Finally, I would like to thank the people whose support helped get me to this point in my career. I wish to thank Gary Green and Angelia Mance at the University of North Alabama, who laid the foundations of my knowledge of geography and awoke in me a love for the discipline. Ultimately, my success was made possible by the love, support, and encouragement shown to me by my parents.

ABSTRACT

Manufacturing no longer constitutes the predominant economic activity in advanced economies. This leading role has been replaced by the provision of services. As economies experience increasing concentrations in service sector occupations, one must consider the effects such alterations have on the intraurban distributions of occupation, income, and race. The link between economic restructuring and increased sociospatial inequality in global cities has been subject to recent study. Changes at other levels of the urban hierarchy have not been addressed.

To examine effects in a middle tier metropolitan area, Birmingham, Alabama was selected as the site of my research. Though an important aspect of the economy, contributing significantly to the economic stability of the area, the iron and steel industry no longer provides the direct livelihood for the majority of the population. Presently, the service industry possesses the lion's share of the Birmingham Metropolitan Area's economic structure. Leading employment sectors are health care and social services, retail trade, manufacturing, and finance and insurance.

U.S. Census data for 1970 and 1990 were assessed through statistical analysis. Occupation variables were divided into three groupings: manufacturing/craft workers, service workers, and professionals. Income was measured for households using both mean and median values. The population is predominately white or black. These variables were examined in regard to race. To assess changes in different parts of the Metropolitan Area, zones were delineated based on the period during which the intense construction occurred.

Increased intraurban social disparity, especially in certain zones, is evident. Changes in the economic base and local employment characteristics affected the social structure of the Birmingham Metropolitan Area. Shifts in the distribution of occupation and income revealed increased inequality and segregation. Spatial inequality of income was evident in the Metropolitan Area at both the zonal and census tract levels. Less desirable sections of the Metropolitan Area increasingly became home to manufacturing/craft and low-wage service workers. A few remnant nodes of affluent professionals remained in the inner city and mature suburb zones, increasing segregation within these zones. Professionals were the principal occupation group residing in the new suburbs. A mix of occupations, however, characterizes certain census tracts in this zone. It is apparent that restructuring local economies are a significant factor in the myriad influences which affect the social structure of metropolitan area, whatever its position in the urban hierarchy.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Growth in intraurban social disparity and polarization are results of post-industrial restructuring in cities. The effects of economic restructuring and occupational change on intraurban spatial distributions are only vaguely understood. The interlinking nature of the workplace and home is such that rarely can restructuring occur without reordering social space. The social impact of restructuring in global cities has been researched, but no studies have been conducted at lower levels in the urban hierarchy. I hypothesize that increased sociospatial inequality and polarization are linked to economic restructuring, not only in global cities, but also in middle tier metropolitan areas. Middle tier metropolitan areas are defined as those with populations between 400,000 and two million people. Testing the hypothesis will increase understanding of the effects of economic restructuring at another level of the urban hierarchy.

The purpose of this study is to examine the effects of post-industrial restructuring on the distribution of occupations, income, and race in Birmingham, Alabama, a middle tier metropolitan area, which had a population of 907,810 in 1990. My research on Birmingham is assessment of the spatial patterns of change that occurred between 1970 and 1990. The premise is expressed by Gottmann in a statement concerning the geography of services. "There must be interplay between these occupations [services], the quaternary especially, and their environments, that is not only the physical circumstances and the built environment but also the structures of the local society"(Gottman 1983, 71).

The service sector has existed as part of the urban economy for thousands of years. However, only in recent decades have services experienced considerable growth and unprecedented change. Agriculture and the extraction of natural resources are the primary sector. The secondary sector is manufacture of goods. Services, the tertiary sector, "deal with intangibles or are immaterial." They constitute a "state, activity or sensation rather than a thing" (Gershuny 1978, 17). Production, recording, dissemination of information and the sale of skills and knowledge are essential to the service sector. No definition of what constitutes the service sector is universally accepted. The sector includes wholesale and retail trade; finance, insurance, and real estate; professional, personal, business, and repair services; and government functions. Transportation, communication, and public utilities are often considered services. Growth in service employment increases inequality of wages and salaries. As a result, service growth affects the spatial disparities of income and occupation.

A body of literature exists across various disciplines regarding services. Recent studies examine the tertiary sector to understand its influences on metropolitan social characteristics. Much of the literature in geography focuses on the service sector's development, distribution, and "diverse and pervasive role ... in modern economic systems"(Daniels 1985, XIII). Advances have been made in comprehending the service sector, yet the "implications of economic restructuring for spatial inequality of incomes are poorly understood" (Preston and McLafferty 1992, 224). Preston and McLafferty, seeking to understand the effect of a dual labor force on geographic disparities of incomes, find that increased polarization exists at the county scale in New York. In a 1993 article, L. S. Bourne recognizes that the "emerging social landscape is ... more

highly segregated and locally differentiated and potentially more socially inequitable" (Bourne 1294). Sectoral shifts in the local employment structure affect metropolitan levels of income inequality. Silver and Bures state that it is "likely that sectoral shifts from more egalitarian manufacturing into less egalitarian service industries are contributing to increases in urban inequality" (Silver and Bures 1997, 70). A pronounced trend in the research is to set studies in "global cities" where polarization is magnified by the global economy.

In a recent study of Toronto Alan Walks states that the "social effects of post-Fordist economic restructuring and the interplay between occupational changes and social and spatial factors within urban areas are not well understood" (2001, 407). Walks's study draws from diverse theory and research concerning the economic base and social characteristics of cities. His study provides an understanding of the social ecology of economic restructuring and reveals the complexities that arise. My research employs measures similar to those in Walks's study but applies them to a smaller metropolitan area. The unique history and current circumstances in Birmingham, Alabama, create an appropriate site to study the effects of the shift from manufacturing to service jobs in a middle tier metropolitan area (Figures 1.1 and 1.2). Birmingham is ideal because the Metropolitan Area's present diversified economy is different from its historic iron and steel base.

Manufacturing no longer is the predominant activity in advanced economies. Its leading role has been replaced by services. As the manufacturing workforce has declined, workers have increasingly been absorbed into the service sector, which is characterized by significant numbers of both high paid professionals and low-wage

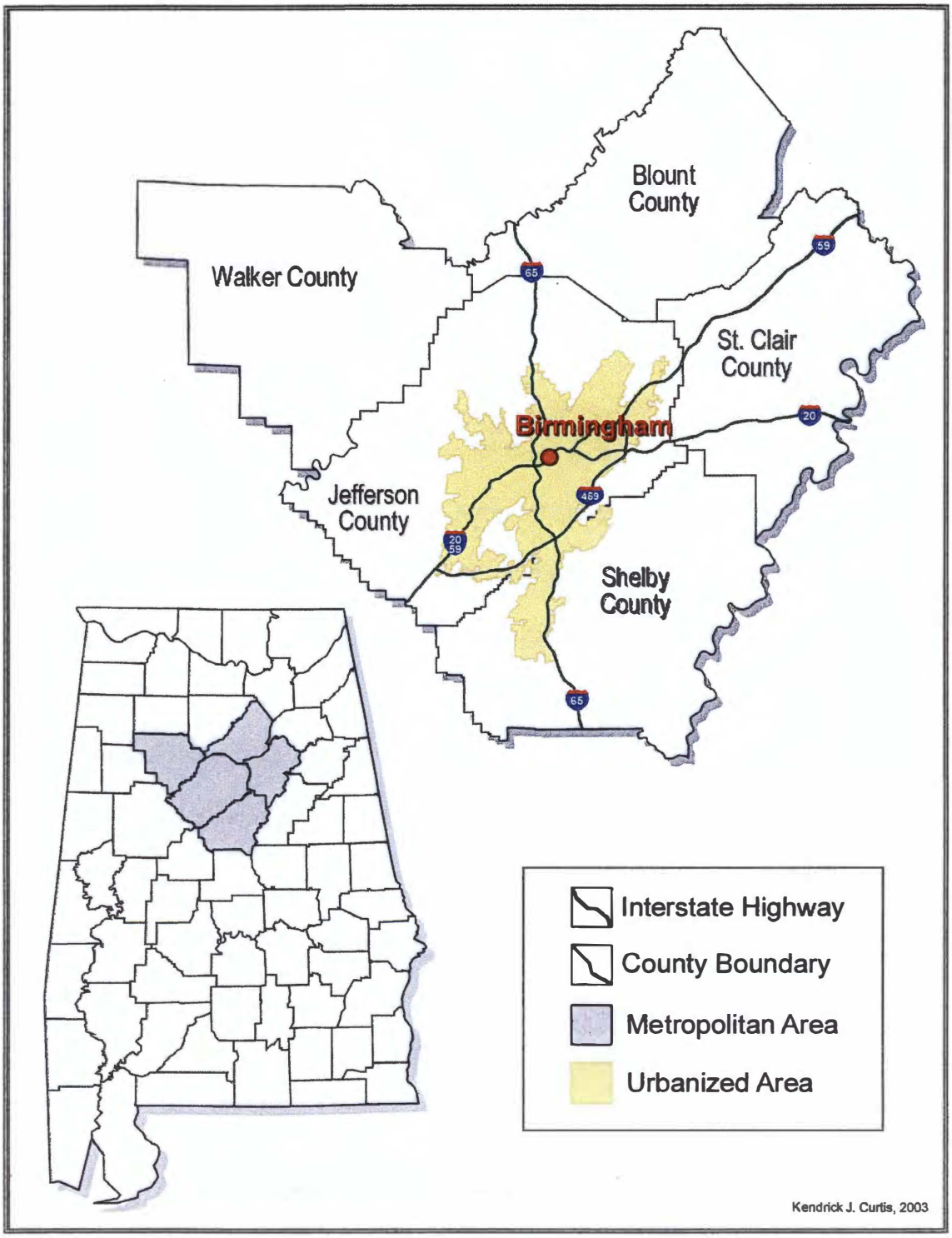

Figure 1.1. Birmingham Metropolitan Area 1990.
Source: U.S. Census, 1990.

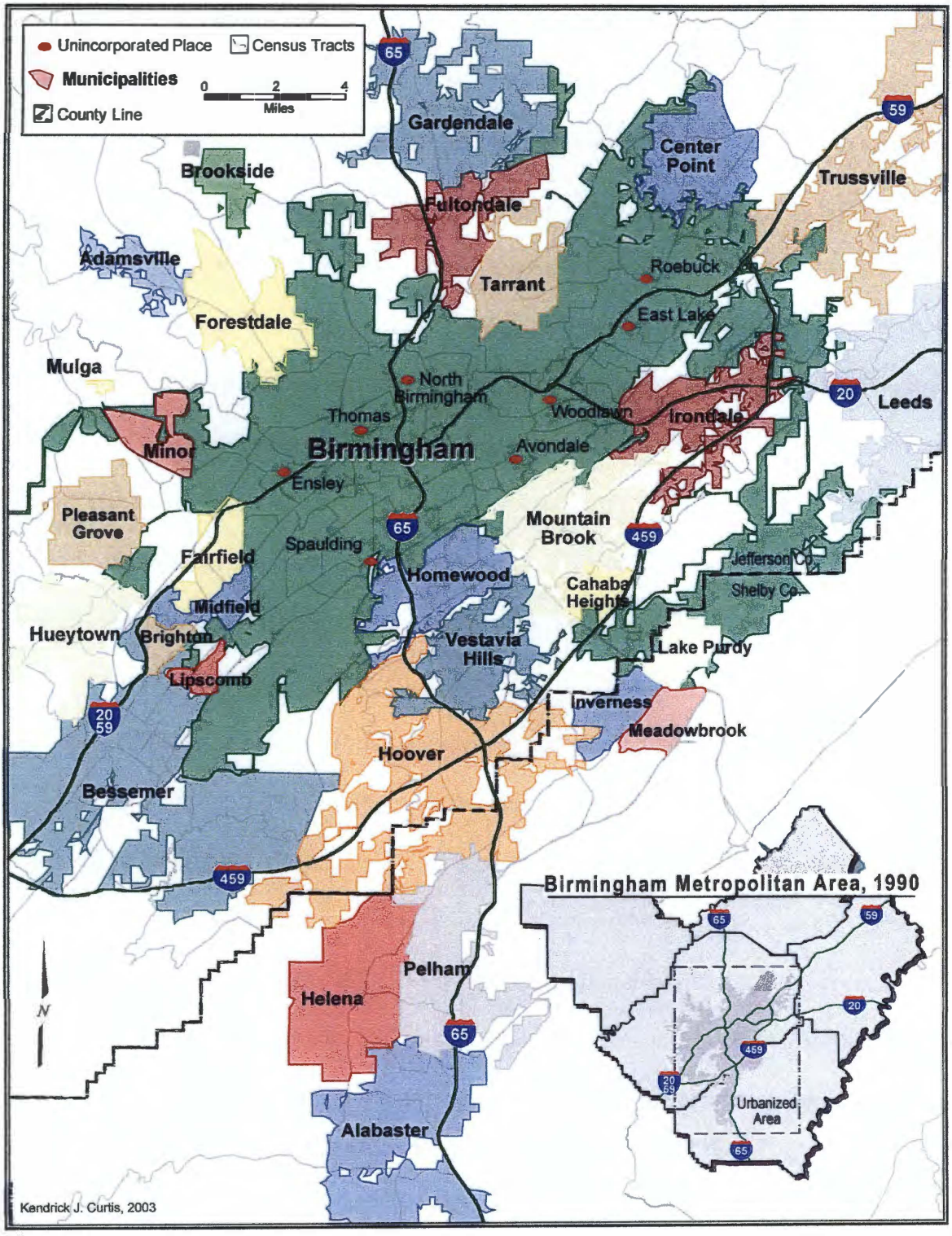

Figure 1.2. Birmingham Urbanized Area 1990.
Source: U.S. Census, 1990.

service workers. Changes in the occupations of employed persons between 1970 and 1990 are shown in Table 1.1. In the nation in 1970, 36 percent of employed persons were manufacturing/craft workers, 38 percent low-wage service workers, and 23 percent were professionals. By 1990 professionals had increased to 30 percent of the national labor force, and manufacturing/craft workers had declined to 26 percent. The Birmingham Metropolitan Area has merit as a case study for examining effects of economic restructuring, for it mirrors changes in the national employment structure. In 1970, 38 percent of employed persons in the Birmingham Metropolitan Area were manufacturing/craft workers, 40 percent low-wage service workers, and 21 percent were professionals. Between 1970 and 1990 the share of professionals increased to 30 percent in both the nation and the Metropolitan Area. Manufacturing/craft workers's share of the Metropolitan Area labor force declined to 27 percent by 1990, a change only one percentage point different than the nation experienced. In 1990 the share of low-wage service workers is comparable in the nation and Metropolitan Area although this occupation group's share of the labor force is slightly higher in the Metropolitan Area. Between 1.5 and 2.5 service jobs are needed to replace the income for each manufacturing job lost (Preston and McLafferty 1992, 224). Manufacturing mitigates income chiefly because of the occupational structure, productivity, and unionization. Manufacturing, with increasing productivity, requires progressively fewer workers. The service sector has embraced a steady flow of labor freed from manufacturing.

Table 1.1. Occupations of Employed Persons

	Professionals	Service Workers	Manufacturing / Craft Workers
United States			
1970	23%	38%	36%
1990	30%	41%	26%
Alabama			
1970	20%	34%	43%
1990	26%	38%	34%
Birmingham Metropolitan Area			
1970	21%	40%	38%
1990	30%	42%	27%

Source: calculations from U.S. Census, 1970 and 1990.

The Birmingham Metropolitan Area

H. H. Chapman clearly depicts Birmingham's founding and early focus on heavy industry:

> By 1900 it had been demonstrated that low cost pig iron and steel could be produced from the iron ore of Red Mountain and the coal from near-by mines. The town that numbered only 3,086 inhabitants in 1880, by 1910 had a population of 132,685, and Birmingham became known as the Magic City. It was a city of iron and steel – the Pittsburgh of the South. Iron and steel brought Birmingham into existence and gave the city and the surrounding area the impetus that resulted in the present development. But in the minds of many it made Birmingham a one-industry town and consequently one with an economy that lacked stability (Chapman, 1954).

Located in north central Alabama, the Birmingham Metropolitan Area lies in the Ridge and Valley physiographic province of Appalachia (Figures 1.2 and 1.3). Locally the area is referred to as the Cahaba Ridges. Birmingham Valley is the area where initial development occurred and where the majority of the population resides. It is bordered on the northwest by Sand Mountain and on the southeast by Shades Mountain. Birmingham Valley has three subsections: Opossum Valley, Jones Valley, and Shades Valley. Flint Ridge and Red Mountain, running northeast to southwest, separate the three valleys. The physical setting of the area influenced manufacturing and settlement. Historically, the industrial district consisted of two sections, a small, compact area to the east of the central business district and a larger area strung out along Opossum Valley. These areas have the remnants of bygone foundries and steel mills. The city's elite historically

Figure 1.3. Central Business District of Birmingham looking northwest from Red Mountain. Kendrick J. Curtis, 2002.

located their homes on the scenic slopes of Red Mountain and Shades Mountain. The Birmingham Metropolitan Area was established in 1950 and included only Jefferson County. Shelby and Walker Counties were included before the 1970 census, and St. Clair County was added in 1973. Blount County was added in 1983 but was dropped from the Metropolitan Area in 1992. Shelby, south of Jefferson County, is the fastest growing county in the area. South of Red Mountain lie the affluent municipalities of Mountain Brook, Homewood, Hoover, and Vestavia Hills. Numerous municipalities are located in the Metropolitan Area, and this creates a unique political landscape. The unusual shape of Birmingham's corporate boundary, extending around and south of Irondale and Mountain Brook, stemmed from a desire to annex the city's water supply, Lake Purdy, and valuable commercial property along U.S. Highway 280 and its intersection with Interstate 459 (Figure 1.2). The unique shape of the corporate limit was in response to the corridor between the municipal boundaries of Irondale and Leeds.

Though dominated by heavy manufacturing since its inception, the Birmingham Metropolitan Area's economy began to restructure during the 1960s and 1970s. The stage was set for further restructuring and diversification in the 1980s and 1990s. In accordance with a national trend, Birmingham experienced diminished employment in manufacturing. The transition to a post-industrial economy was accompanied by an expanded service sector. However, heavy manufacturing remains part of the economy and contributes to the Metropolitan Area's stability. The trend from concentration in manufacturing toward low-level service and high-level professional occupations is evident in economic figures. Primary metals accounted for 46 percent of manufacturing employment in 1960 but fell to 27 percent by 1997. Employment in service industries accounted for over half of

personal income in 1997. Business services (6%); finance, insurance, and real estate (11%); retail trade (10%); government (14%); and health services (12%) were significant.

Research Procedure

The relationship between economic restructuring and social differentiation is analyzed in my research at different spatial levels within the Birmingham Metropolitan Area. Three sets of variables are utilized: occupation, income, and race. Occupation is divided into three groups: professionals, service workers, and manufacturing/craft workers. Two of these, professionals and service workers, are generated by the service sector. Professionals are persons employed in high-skill positions, whereas service workers are employed in low-skill jobs. The three occupation groups are assessed spatially by two statistical measures: the location quotient and the coefficient of localization. Residential patterns are related to occupation. As the status gap widens, the location of residence becomes increasingly dissimilar (Wheeler 1968, 24-25). Various factors, principally growth of service sector occupations, cause the social gap to widen. Therefore, inequalities should exist among census tracts inhabited by professionals, service workers, and manufacturing/craft workers.

To determine if income inequality and spatial segregation are related to economic restructuring, household income variables are assessed statistically. Income reflects the level of compensation a person's skill merits. It also influences residential location. While per capita income reflects individual compensation, it is the household that makes most consumption decisions. Household income variables more accurately reflect alterations to the location of residences and, consequently, the spatial distribution of

income. Alterations to household income between 1970 and 1990 are gauged by employing five measures: a mean/median index, an income ratio, an index of dissimilarity, a neighborhood disparity index, and an intra-tract skewness index. Mean and median household income variables are computed for the index of dissimilarity and neighborhood disparity index, but because of only a slight difference in the two results, only mean household income is discussed.

The effects of economic restructuring on the distribution and segregation of race are determined through statistical measures. Because the Birmingham Metropolitan Area's population is predominately white and black, these variables are examined. Two statistical measures, the location quotient and the coefficient of localization, are used to assess the spatial segregation of each racial group. An element of my research is to determine relationships between race and occupation. The link between race and income and how racial distributions are altered during the economic transition are also analyzed.

This research analyzes three spatial levels: the Metropolitan Area, zones of the Metropolitan Area (inner city/old industrial suburbs, mature suburbs, new suburbs, and exurbs), and census tracts. Census tracts are the largest geographic scale and are the lowest level of the hierarchy. Census tracts were selected rather than the larger scale census blocks. Michael White observes that tracts "offer the best compromise with respect to size, homogeneity, data availability, and comparability" (1987, 19). Alan Walks utilized census tracts to represent neighborhoods, and in my study they also represent neighborhoods (2001, 412). Census tracts that share similar development characteristics comprise a zone of the Metropolitan Area.

The principal sources of data are the United States 1970 and 1990 *Census of Population and Housing*. Maps of 1970 Birmingham census tracts were scanned and digitized. This file served as input to ArcView and Freehand in order to map statistical data. Data for the 1970 census are from the Contextual Data Archive for Census Tracts/Block Numbering Areas. The digital tables were mapped using the 1970 digitized file. Data for 1990 were easier to acquire. The U.S. Census Bureau created Topologically Integrated Geographic Encoding and Referencing (TIGER) system files for 1990, which contained the variables relevant to my research.

The 1970 map file does not conform precisely to the 1990 file. The Census Bureau alters tract boundaries as areas develop and change. In Birmingham, substantial alterations were made to tract boundaries between 1970 and 1990. The 1970 tracts are not as refined as the 1990 tracts. The Census Bureau designated three counties and 146 tracts in the Birmingham Metropolitan Area in 1970. In 1990 the Metropolitan Area consisted of two additional counties and 208 tracts. Some of the 1990 tracts are in the counties added to the Metropolitan Area, but others were created by the division of preexisting tracts. Smaller 1990 tracts reveal more detail than the larger 1970 tracts. Data reported for a tract are not necessarily homogeneous. Portions of some large tracts included areas that are urban, while sizable portions are rural. The urban portion is the critical part for my research. A map can be misleading if small areas skew values for census tracts. This is the case in defining the categories to which some of the tracts belong. Tracts which are split or are on the rural-urban fringe are classified by the number of persons. One tract is oblong with only a portion extending into developed areas along Interstate Highway 65. While much of this tract is in the exurbs, the majority

of the population reside in the portion that is new suburbs. Therefore, it is classified as a new suburb tract.

In the subsequent chapter, the period of economic transition following the Second World War is examined. Chapter 3 discusses the research procedure and the results of the income analysis. Chapters 4 and 5 explain the results of the occupation and race analysis. Chapter 6 is an examination of example census tracts in each of the four development zones.

CHAPTER II

BIRMINGHAM'S ECONOMIC TRANSITION

In this chapter the economic transition of Birmingham is traced. Following an explanation of the origin and initial development of the city, the post-Second World War economy is examined. Diversification and recent economic climate and landscape conclude the section.

Establishment and Early Growth

Birmingham was established in 1871 by industrial entrepreneurs who laid out a town where the South and North Railroad and the Alabama and Chattanooga Railroad intersected in Jones Valley of the Appalachian Ridge and Valley. The location of the settlement was "two miles to the east of Elyton, one mile from a mountain of iron ore, and in the midst of vast coal deposits" (Worley 1948, 47). Red Mountain, a mountain of iron ore, forms the southern boundary of Jones Valley. The principal industrial advantage of the ore was its sheer abundance. The mineral resources of the area were discovered earlier, but not until the coming of the railroad, land speculators, and industrial entrepreneurs was the site transformed into an industrial city of the New South. The industrialist and land speculators included Daniel Pratt, Henry DeBardeleben, James W. Sloss, Enoch Ensley, Samuel Thomas, and Stimpson Woodward. An industrial area developed along Jones Valley with companies and places bearing the men's names. Nowhere else in the industrialized world did deposits of iron ore, coal, and limestone, the mineral resources for iron and steel production, lie in such proximity (Figure 2.1). The propinquity of these resources meant low assembly costs for the area's

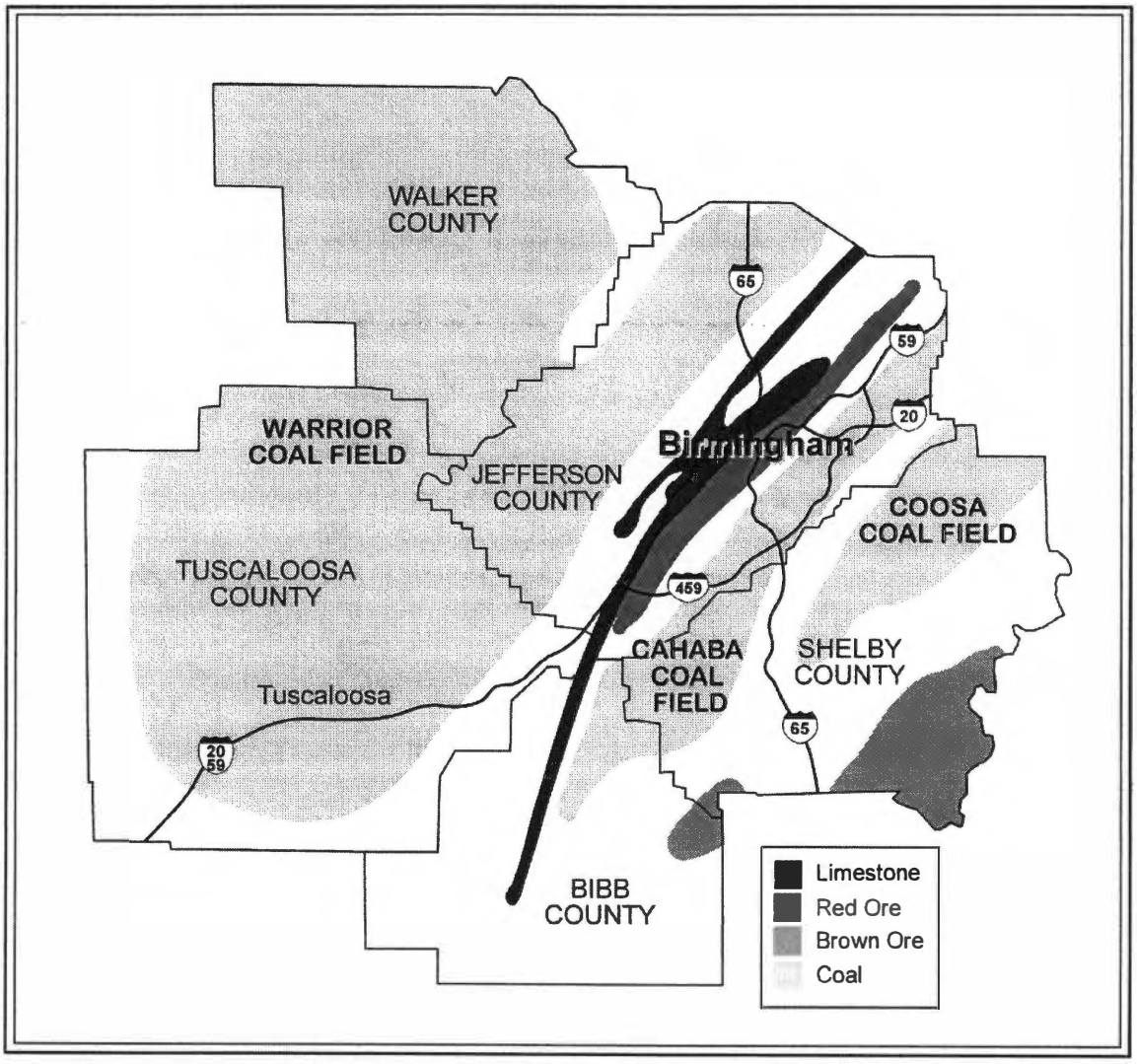

Figure 2.1. Birmingham region mineral resources.
Modified from David Lewis 1994, 6.

early furnaces. The labor necessary for manufacturing was supplied by rural black and white southerners and foreign immigrants. The advantageous juxtaposition of resources, combined with a ready supply of inexpensive labor, allowed the production of the nation's cheapest pig iron, making Birmingham competitive in domestic and foreign markets. Birmingham did not produce steel until 1899, but the city entered the twentieth century manufacturing what "promoters proclaimed as the world's cheapest steel" (Worley 1948, 60).

The role and nature of labor in the founding and development of Birmingham was critical. John W. Cell discusses the labor structure in *The Highest Stage of White Supremacy*. Benefits from the proximity of essential resources is beyond doubt, but Cell states that the "fundamental fact about the industry's spectacular growth ... was the low-class wage that was paid to unskilled labor" (Cell 1982, 126). Birmingham's iron-coal-limestone complex employed large numbers of unskilled workers in heavy underground and surface jobs. All of the small number of skilled technicians, clerks, and managers who supervised the workers were white. Cell observes that "many, though by no means all, of the unskilled workers were black" (Cell 1982, 126). The exploitation of labor by race enabled Birmingham to avoid the turbulent labor climate of northern manufacturing centers. Content blacks filled the most undesirable manufacturing positions typically filled by whites. The white laboring class felt a sense of racial superiority and a sense of equality with the classes above them. Management utilized racial labor discrimination effectively. The rule, not to replace better-paid white workers with low-paid black workers, was implicit and could therefore be broken at will. The threat of breaking this "gentleman's agreement" with white employees, not to hire a "black reserve army," was

a potent weapon. It served to weaken labor and enabled wages to remain depressed. The average wages in coal mines and iron foundries were lower than those of Northern industrial centers but were higher than wages of "Alabama's agricultural workers, whom they drew like a magnet." Cell likens labor in Birmingham to that in South Africa and calls Birmingham "American's Johannesburg" (Cell 1982, 163).

Birmingham Industry 1900-1945

Consolidations and mergers around the turn of the twentieth century resulted in a few companies "controlling the district's coal, iron, and steel output, its mineral resources and 35 percent of Jefferson County land" (White 1981, 52). Tennessee Coal, Iron, and Railroad Company was the dominant operator in Birmingham during the 1880s. Tennessee Coal, Iron, and Railroad Company added extensive DeBardeleben properties and the Bessemer Rolling Mills to its holdings during the 1890s. The Sloss-Sheffield Steel and Iron Company was formed in 1899 by the merger of 12 smaller companies. The Republic Iron and Steel Company was created the same year with principal units in the Birmingham area. During 1899, U.S. Cast Iron Pipe and Foundry of New Jersey consolidated several area pipe companies. In 1907, United States Steel purchased the Tennessee Coal, Iron, and Railroad Company. Pratt Consolidated Coal Company; Woodward Iron Company, which acquired Birmingham Coal and Iron in 1912; and the Alabama Consolidated Coal and Iron Company, which merged into Sloss-Sheffield in the 1920s, were other emerging corporate giants.

United States Steel's acquisition of Tennessee Coal and Iron drastically impacted the Birmingham District. U.S. Steel's practice of pricing Birmingham steel according to

the "Pittsburgh Plus" formula was a factor which impeded the city's competitiveness. The practice of calculating freight rates from Pittsburgh, regardless of a shipment's point of origin, caused the price of Birmingham steel to be greatly inflated. The southern ferrous metals industry grew principally by "attracting pipe mills, stove works, and other foundry-based industries unaffected by Pittsburgh Plus and, therefore, [were] able to capitalize upon the special qualities of the region's natural resources" (Lewis 1994, 294).

In 1900, more than 14,000 workers were employed in 283 manufacturing establishments in the Birmingham area. Area mines and quarries produced in excess of 10 million tons of blacksmith and coking coal, iron ore, and limestone. During the early decades of the century, manufacturers of sugar mill machinery, stoves, hollowware, radiators, architectural and railway products, steam engines, and mining supplies located in the Birmingham area. The Continental Gin Company, formed in 1899 from the merger of several companies, produced complete ginning systems in Avondale. Continental was one of the nation's largest cotton gin manufacturers. Avondale Mills, established in the late 1890s, was one of the Alabama's major textile companies. Four cottonseed oil mills produced cottonseed oil, meal, hulls, and fibers. The cast-iron pipe industry expanded in the area. With relatively low freight rates and an active market, cast-iron pipe was a profitable way to utilize abundant local iron. In 1912 United States Steel built a wire plant near its Ensley Works to convert some of its steel to consumer products including barbed wire, woven wire, nails, staples, and rods (Tennessee Coal and Iron Division 1960, 41). During the First World War, United States Steel built the Fairfield Steel Works to supply steel for shipbuilding at Mobile. After the war the rolling facilities of

this plant were transformed to make and repair railroad cars. The Fairfield Car Works was sold in 1929 to Pullman, Inc., which opened a major railcar plant in Bessemer.

From 1920 to 1940, the Birmingham area supplied the southern market with half of its steel needs. In 1920, the area's industries were producing 17.3 million tons of coal, 2.3 million tons of pig iron, and 1.1 million tons of steel. A cotton tie and hoop mill was completed in 1929 in Fairfield. This mill was one of the largest producers of cotton ties and other types of steel binding strips in the world. However, area industries were inhibited by the small portion of the national market they held. The Southern market for steel was limited by the range of goods required by the realm's rural, agrarian economy.

The Great Depression hit Birmingham hard, and, consequently, little expansion occurred in manufacturing. However, federally funded dams, a $3,000,000 courthouse, a municipal airport, and a Birmingham industrial water supply project supported the construction industry. United States Steel boosted the depression economy when it erected a tin plate mill at Fairfield in 1937. Steel production rose from 1.4 million tons in 1938 to 3.3 million tons in 1942 as the nation moved to a war economy. In 1940, one out of three persons in the Birmingham area labor force was employed in the iron and steel or mining industries.

Post 1945 Expansion and Competition

The Second World War and prosperous post-war years ushered in a period of new demand, reviving the steel mills and causing manufacturing to expand. As the South grew in population and prosperity, the steel market expanded to meet the growing economy's demands. A 1957 *Birmingham News* editorial illustrates the economic

optimism. With "increased urbanization and industrialization, combined with higher incomes and standards of living, the demand for steel in the South is certain to increase" (Huddleston 1957).

In the 1950s, the Birmingham Metropolitan Area experienced plant expansion and high production levels (Figure 2.2, Table 2.1 and Table 2.2). In Jefferson County, 13,100 workers were added to the manufacturing sector between 1950 and 1956. Manufacturing employment in Jefferson County rose from 53,100 to 66,200. During this time, 682 plants and 82 mines produced 3,206 products in the Birmingham area. An average of more than 2,000 employees were added annually through 43 new or expanded manufacturing and wholesale trade facilities between 1950 and 1963. The average annual capital investment was $23,147,000 (Table 2.3). In the early 1950s, U.S. Steel installed several new coke ovens and open-hearth furnaces at its Fairfield Works. This increased annual steel capacity to 4.2 million tons at Fairfield. A 1954 *Birmingham News* article identifies Republic Steel, American Cast Iron Pipe, and Sloss-Sheffield Steel and Iron as Birmingham companies in the midst of expansion ("State Steel Capacity Up by 376,000 tons" C-7, 1954). With the "rising demand for traditional products ranging from nuts and bolts to iron piping and machine components, Sloss-Sheffield continued to prosper, launching a major expansion of its furnace capacity in 1956" (Lewis 1994, 437).

The post-war world presented Birmingham industry a considerable market for its steel. However, by 1960 the rebuilt economies of Europe and Japan had newer, more modern steel mills and lower labor costs than American mills. Low-cost iron and steel made in Japanese plants were imported to American markets, which were not protected by high tariffs. The steel industries in Europe and Japan installed the new basic oxygen

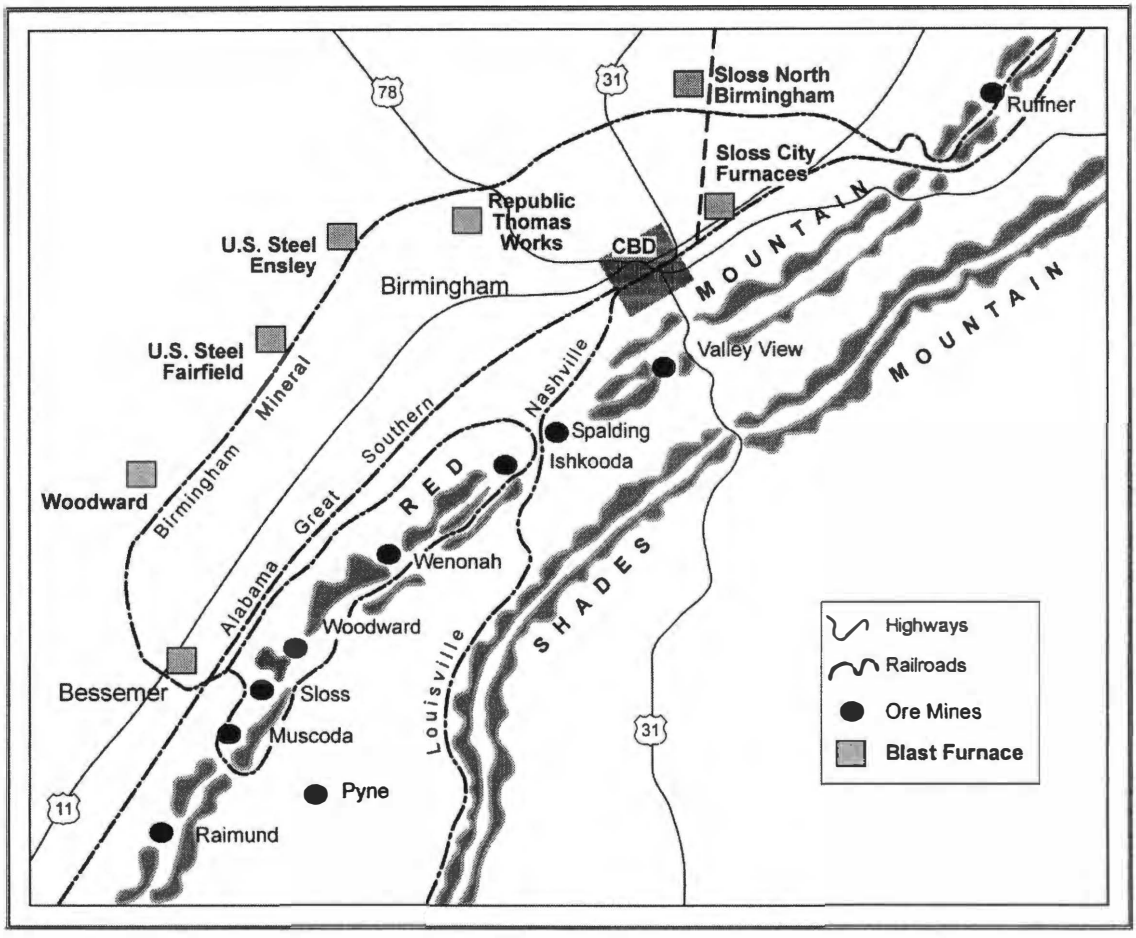

Figure 2.2. Blast furnaces and Red Mountain mines circa 1950. Modified from Philip Morris and Marjorie White 1997, 16.

Table 2.1. New Company Facilities Creating 6,000 Jobs, 1950-1952

Company	Product or Service
Hayes Aircraft	Aircraft manufacture
Appleton Electric	Electrical equipment
Federated Metals Division, American Smelting and Refining	Non-ferrous metals
Borden Metal Products	Steel gratings for steps/walkways
Butler Manufacturing	Steel buildings and tanks, grain bins, cleaners' equipment
Vulcan Steel Container Co.	Steel containers
Hammond Iron Works	Steel tanks, stacks, reservoirs
Southern States Iron Roofing	Aluminum and galvanized steel sheet roofing
Gerrard Steel Strapping	Steel strapping manufacture and distribution
General American Transportation	Storage and large containers for industry
Harnischfeger Corporation	Prefabricated homes and industrial equip.
The Trailmobile Co.	Bus and truck equipment
South East Joslyn Company	Pole line equipment
United Specialties Co. of Birmingham	Carburetor air cleaners, automobile air conditioning equipment
Midland Division, Essex Wire Corp.	Wire, automotive systems
Bethea Co.	Line equipment
Polan Industries	Rebuilt army tanks and transporters
Skilsaw	Automotive and industrial tools - warehouse
Sinclair Oil	Storage and distribution center
Goodyear Tire and Rubber	Warehousing operations
Leeds Packing	Meat processing
Vulcan Furniture	Furniture
Vulcan Asphalt Refining	Asphalt, gasoline, fuel and oil
Waicote Co. of America	Waterproofing material
Westinghouse	Welding electrodes
Elliot Adding Machine Co.	Division office
Kellogg Switchboard	Regional office
Fuller Brush Co.	Southern office for 15 states
Travelers Insurance Co.	Divisional office
Continental Union Insurance Co.	Home office – insurance
Patterson, Emerson and Comstock	Industrial engineers
Internal Revenue Bureau	District office for Alabama, Mississippi, Tennessee

Source: *Birmingham, Number One Test Market of the South*, 1952.

Table 2.2. Expansion of Existing Companies, 1950-1952

Company	Product or Service
Southeastern Metals	Steel tubing
TCI Division, U.S. Steel	Steel products, new office building
Vulcan Steel Container Co.	Steel containers
Southern States Iron and Roofing	Containers
Sloss-Sheffield Co.	Pig iron
McWane Cast Iron Pipe Co.	Cast iron pipe
Stockham Pipe and Fittings	Fittings and pipe
Woodward Iron Co.	New blast furnace
Alabama By-Products	New mechanized coal mine, coke ovens
Alabama Power Co.	New steam plant
Southern Natural Gas Co.	Fuel gas
Englander Co.	Sleep equipment – shells
Weir Kilby Co.	Railroad track
McCullough Industries	Dredging, ore and stripping
Anderson Brass Co.	Brass
Harbison-Walker Co.	New brick refractories
Birmingham Paper Co.	Paper products
Bender Equipment Co.	Wheel alignment equipment
Hill Stores	Groceries and meats
Cosby Hodges	Flour and feed
Atlantic and Pacific Tea Co.	Groceries and meats

Source: *Birmingham, Number One Test Market of the South*, 1952.

Table 2.3. New and Expanded Manufacturing and Wholesale Trade Facilities, 1950-1963

	Manufacturing plants			
	Number	Employment		Capital Investment
New Facilities	197	21,011	$	151,001,500
Expanded Facilities	208	9,785	$	121,087,000

	Wholesale Trade Facilities			
	Number	Employment		Capital Investment
New Facilities	105	2,409	$	16,622,000
Expanded Facilities	55	894	$	12,205,000

Source: *Preliminary Report of The Current Economic Conditions of Metropolitan Birmingham, Alabama*, 1963.

furnaces, which reduced the time to produce a heat of steel from more than six hours to forty minutes. Because foreign mills heightened competition, additional capital investments were required for Birmingham to remain competitive. Increased foreign imports, higher labor costs, and shortage of capital for improvements necessitated by age and environmental pollution requirements placed U. S. Steel's Fairfield Works at a competitive disadvantage. Production levels varied between 61 and 77 percent of capacity between 1959 and 1964.

In 1959, James R. Brown observed that, while steel was the "raison d'etre for Birmingham and continues to provide the largest single source of employment," this mature industry's "dominance in the city's economy is gradually diminishing." Brown found that trade and other service sectors surpassed steel in rates of growth and stated that they "expand rapidly as incomes rise and the economic base of the community broadens" (Brown 1959, 6). In spite of industrial expansion during the post war years, primary metals began to diminish as a source of employment. Employment in primary metals slipped from one-fifth of Birmingham's total employment in 1947 to one-sixth in 1957, while total employment increased by a third. Birmingham was in the initial stage of economic transformation (Table 2.4).

Industry Hardships and Increased Economic Diversity

Iron, steel, and coal were facing difficult times in the Birmingham Metropolitan Area by the late 1960s. The market for iron bars, known as merchant iron, collapsed due to changes in market conditions, new environmental pollution regulations, importation of cheap foreign iron, and substitution of plastics and iron made from scrap steel (White

Table 2.4. Employment in Primary Metals* Manufacturing

Year	Employment in Primary Metals	Total Area Employment	Percent of Total	Area
1930	12,179	17,893	68%	Birmingham City
1940	25,682	173,001	15%	Jefferson Co.
1950	35,600	192,200	18%	Jefferson Co.
1965	35,400	390,110	9%	Birmingham MSA

* Primary metals includes employment in blast furnaces, steel mills, foundaries, and fabricating plants

Source: White 1981. *The Birmingham District.*

1981, 67). The 3.7 million tons of steel Birmingham produced in 1965 was equivalent to 1955 production levels, but it supplied only 19 percent of the Southern market, which was increasingly accessible to both foreign and other domestic producers. Coal suffered because of increasing substitution of hydroelectric power, natural gas, and petroleum. By 1965 employment in the coal industry had plummeted to 4,300, a loss of 12,800 jobs since 1953. The economic advantages of utilizing cheap foreign iron ore from open-pit operations in Canada and Latin America made the mining of Red Mountain's low-grade ore uneconomical. During the 1960s, most of the employment losses in the metals industries were in the production sector. Nonetheless, employment in machinery and transportation, metal-using industries, increased. The chemical industry, heavily oriented toward coke by-products and explosives, also experienced employment losses (*Economic Atlas* 1973, section 5 page 2).

While coal, iron, and steel faced serious problems in the 1960s, the Birmingham Metropolitan Area's economy experienced growth on other fronts. The University of Alabama at Birmingham, begun in 1944, witnessed rapid growth and expansion during the 1960s. The university's growth in the Southside area in response to urban renewal projects attracted doctor's offices, medical equipment suppliers, motels, and retail stores. The construction industry benefited from the erection of new hospitals, educational facilities, office buildings, expressways, and shopping centers.

Alabama's largest banks, insurance companies, real estate agencies, and utility companies grew in importance. The corporate offices of AmSouth Bancorporation, Southern Bancorporation, and Central Bancshares of the South were in the city. Protective Life Insurance Company and Torchmark were nationwide insurance firms

headquartered in Birmingham. Leading utilities included Alabama Power Company, Alabama Gas Corporation, Southern Natural Resources, and South Central Bell Telephone. Each had multistate operations. South Central Bell, now part of Bell South, located its headquarters in Birmingham in 1968. Serving a network of 5.5 million telephones, South Central Bell's workforce, "composed of computer operators and other technically oriented employees, was much different from the low-wage operatives who had once formed the city's economic base" (Lewis 1994, 452). As the 1960s closed, the heavy industries that were dominant in the past faced many obstacles, while other sectors of the economy expanded. In 1971 three major high-rise office towers were under construction, displaying the importance of administrative, financial, and trade activities.

Industry Alterations and Further Diversification

Birmingham's economic diversification in education, health care, government, and financial sectors continued through the 1970s, but manufacturing remained significant. In 1970, Birmingham was still the major steel producer in the South. Steel was manufacturing's most important segment in employment, value added, control of land area, and transportation (White 1981, 71). However, during the 1970s the percentage of employment in manufacturing in the Birmingham Metropolitan Area dropped from 28 to 18 percent (*Birmingham Area Profile* 1981, section 2). The diversified economy weathered the recession of the early 1980s, but the steel industry was struck particularly hard.

Alterations to the American steel industry played a significant part in changes to Birmingham's economy. Assumptions about prices and demand, the lag to embrace

more efficient technology, and the failure to recognize errors and change strategy set the stage for a major restructuring of the American steel industry in the 1970s and 1980s. The years following the Second World War witnessed increasing numbers of small and medium-sized metal fabrication firms in the Birmingham Metropolitan Area. The minimills expanded and captured market niches from the integrated mills. Converting ferrous scrap in electric arc furnaces, minimills are efficient and have a competitive advantage in certain markets. The increasing use of the basic oxygen furnaces by integrated mills caused the demand and the price of scrap metal to be depressed, reducing the cost of the minimills' primary raw material.

By 1975 the world had excess steel-making capacity. Despite the growth of minimills, the United States steel industry was still dominated by capital-intensive integrated firms. Nearly half of the nation's steel production was from large basic oxygen furnaces. However, these furnaces were becoming outdated. American steel companies still lacked the foresight to embrace new technology such as continuous casting. Falling demand, increasing domestic and foreign competition, and excess capacity placed integrated mills at a competitive disadvantage. Poor management spread limited capital too thin, preventing the integrated mills from making investments which could have reestablished their competitiveness.

The 1980s were a time of restructuring, and the steel industry changed vastly during this decade. As the integrated mills faltered in the early 1980s, the opportunity arose for minimills to expand. Poor labor relations with management escalated during the 1970s. By 1980, rising wages and unproductive labor practices had created serious friction within integrated firms. A strong United States dollar lured foreign subsidized

steel companies to enter the national market in the mid-1980s, creating a highly competitive situation. Plants closed or downsized. Birmingham was not immune. During the summer of 1980, 3,000 employees were laid off at U.S. Steel's Fairfield Plant, and 450 employees lost their jobs at the Pullman-Standard plant in Bessemer.

The integrated plants that remained, including U.S. Steel's Fairfield Works, were upgraded by capital investment in new technology, making them competitive. Although the large integrated mills relinquished huge segments of the market to minimills, they took advantage of their steel's higher quality. Integrated companies focused their facilities on the production of high-value-added commodities such as flat rolled steel and seamless pipe. United States Steel, under its new name, USX, advertises that Fairfield "serves construction, fabrication, automotive, steel container, appliance, electrical, furniture, and service center industries" (USX webpage 2001). The steel industry today is a new entity created through the pains of restructuring and realignment.

Present Industrial Sector

The Birmingham Metropolitan Area continues to be a viable heavy industry region for steel production, fabrication, and processing. However, by the late 1980s, less than three percent of the workforce was employed in steel and related industries, compared to the 68 percent in 1930. Although employment in heavy industry declined, production did not. Birmingham Steel, USX, and SMI Steel produced 3.5 million tons of steel and blooms in 1996. The area's production potential is 4.3 million tons (Morris and White 1997, 70). The basic oxygen process and continuous casting economizes

production. Fewer people are employed in the industry, but steel production remains an important part of the Birmingham Metropolitan Area economy.

Value added by manufacturing reveals the importance of an industry in an economy (Tables 2.5 and 2.6). Value added is the difference between the revenue from the sale of a commodity and the cost incurred in producing it (Small and Witherick 1989, 239). The Birmingham Metropolitan Area witnessed fluctuations over the economic transition in value added in primary metals. To assess this measure, values were adjusted to 2001 dollars. From $1,342,723,000 in 1954, the value added in primary metals rose to a peak of $2,782,739,000 in 1963. It then dropped in the 1970s and 1980s but recovered to $1,176,374,000 by 1992. To measure the effect of capital investment, new technology, and reductions in employment, value added was computed per employee. Value added per employee increased from $60,255 in 1954 to $112,036 in 1992.

The 1997 Economic Census reveals manufacturing is the leading sector of Birmingham's economy by value added. Primary metal manufacturing is followed by fabricated metal products, food and kindred products, nonmetallic mineral products, and printing. Heavy industry, integrated and minimill steel plants, is still an important aspect of the economy, but it is only one part of a diversified region.

Local Efforts Contributing to Diversification

Birmingham leaders' realization that the economy was shifting resulted in efforts to develop an infrastructure to encourage diversification. Dave Gladney, Executive Vice President of the Metropolitan Development Board, stated in 1982 that, "if we are doing $140 million of research annually, then we are arriving at discoveries that create spin-off

Table 2.5. Value Added by Manufacturing
in the Birmingham Metropolitan Area ($1,000)*

Ind. Code	Industry	1954	1963	1972	1982	1992
20	Food & kindred Products	221,581	349,839	542,230	470,642	468,990
23	Apparel & related products	20,892	38,206	132,179	81,946	94,855
24	Lumber & wood products	28,727	25,063	82,770	54,509	69,946
25	Furniture & fixtures	24,134	50,519	144,848	114,871	98,251
26	Pulp, paper and products	16,706	42,382	51,098	47,741	74,097
27	Printing & publishing	116,903	124,556	184,966	323,578	614,543
28	Chemicals & products	77,874	118,656	118,666	98,043	98,503
32	Stone, clay, & glass products	198,517	190,358	275,760	197,366	253,114
33	Primary metal industries	1,342,723	2,782,739	1,732,264	715,932	1,176,374
34	Fabricated metal products	330,052	500,554	685,389	613,499	428,230
35	Machinery, except electrical	122,556	104,896	179,476	236,144	255,755
36	Electrical machinery	31,739	56,569	98,818	130,602	104,919
37	Transportation equipment	236,896	460,548	269,426	181,087	133,728

*Adjusted to 2001 dollars

Source: Bureau of the Census, Census of Manufactures.

Table 2.6. Value Added per Employee in Manufacturing
in the Birmingham Metropolitan Area *

Ind. Code	Industry	1954	1963	1972	1982	1992
20	Food & kindred Products	41,911	58,219	68,637	84,043	61,709
23	Apparel & related products	19,878	34,828	50,838	48,204	49,924
24	Lumber & wood products	19,595	31,645	59,121	49,554	63,587
25	Furniture & fixtures	36,959	42,489	62,977	57,436	70,179
26	Pulp, paper and products	29,206	56,359	56,776	59,676	82,330
27	Printing & publishing	58,745	59,653	71,141	87,454	118,181
28	Chemicals & products	65,276	103,720	98,888	98,043	140,719
32	Stone, clay, & glass products	67,248	82,945	86,175	78,946	115,052
33	Primary metal industries	60,255	122,739	71,581	65,085	112,036
34	Fabricated metal products	57,530	60,939	72,146	68,167	65,882
35	Machinery, except electrical	39,483	67,806	71,790	63,823	62,379
36	Electrical machinery	45,020	73,658	70,584	68,738	74,942
37	Transportation equipment	33,095	61,292	52,829	53,261	51,434

* Adjusted to 2001 dollars

Source: Bureau of the Census, Census of Manufactures.

industries. If we don't have a place for them to develop, then business will go elsewhere" (O'Shea 1982). The effort to establish Birmingham as a major research center specializing in medicine and engineering is built on regional strengths. The University of Alabama at Birmingham is an institution of higher education combined with a major medical center. The University of Alabama at Birmingham, the Southern Research Institute, expanding services and communications, and a central location in the South contributed to economic diversification. However, the stigma of Birmingham as the "Pittsburgh of the South" is difficult to surmount. Don Newton of the Chamber of Commerce expressed it. "We're trying to show that this is not the same city by a long shot that it was 20 years ago, 15 years ago, even 12 years ago, that there has been a ... positive transition, that in fact it was a planned transition" (O'Shea 1982). The image problem still confounds growth, but the Birmingham Metropolitan Area's service sector has grown 60 percent since 1983 (Tables 2.7 and 2.8).

Professional and Service Economy

The Birmingham Metropolitan Area is home to nearly a million people whose per capita buying power is three percent above the national average. It is the business, cultural, and educational core of Alabama. In recent years the service sector has generated a "disproportionate share" of new jobs (Growth Strategies Organization 1998, 4). Half of the area's employment is in the trade and service sectors, and ten percent is in health care. The headquarters of four regional bank holding companies: AmSouth Bancorporation, Compass Bancshares, Regions Financial Corporation, and SouthTrust

Table 2.7. Birmingham's Largest Employers 1982

Ranked by number of employees	
1. University of Alabama at Birmingham	9,619
2. South Central Bell	8,000
3. US Steel Corporation	6,000
4. Alabama Power Company	4,686
5. Birmingham Board of Education	4,569
6. Jefferson County Board of Education	4,300
7. City of Birmingham	3,700
8. Baptist Medical Centers	3,500
9. American Cast Iron Pipe Company	3,200
10. Jefferson County Government	3,143
11. Alabama By-Products	3,100
12. Jim Walter Resources / US Pipe	2,750
13. Hayes International	2,700
14. Bruno's, Inc.	2700
15. U.S. Department of Health & Human Services	2,656
16. Carraway Methodist Hospitals	2,300
17. Brookwood Medical Center	1,891
18. Drummond Coal Company	1,800
19. Stockham Valves & Fittings	1,800
20. First National Bank of Birmingham	1,729
21. Southern Company Services, Inc.	1,700
22. U.S. Postal Service	1,650
23. Beverly Enterprises	1,500
24. Rust Engineering Company	1,500
25. Southern Railway Company	1,500

Source: Birmingham Office of Economic Development

Table 2.8. Birmingham's Largest Employers 1998

Ranked by number of employees	
1. University of Alabama at Birmingham	14,797
2. US Government	8,934
4. Baptist Health System	6,580
5. Bruno's, Inc.	6,190
6. Jefferson County Board of Education	5,386
7. South Trust Bank	5,200
8. Bell South	5,059
9. City of Birmingham	4,606
10. Birmingham Public Schools	4,500
11. Jefferson County Commission	3,979
12. Wal Mart	3,650
13. AmSouth Bank	3,381
14. Shelby County Board of Education	3,164
15. Alabama Power Company	3,000
16. Blue Cross & Blue Shield of Alabama	2,900
17. American Cast Iron Pipe Company	2,650
18. Brookwood Medical Center	2,597
19. USX Fairfield Works	2,500
20. Jim Walter Resources	2,400
21. Eastern Health System	2,200
22. Health South Corporation	2,070
23. Carraway Methodist Medical Center	2,064
24. Children's Health System	2,054
25. Compas Bank	2,054

Source: Birmingham Office of Economic Development

Corporation, along with other financial firms, make Birmingham a leading financial center in the Southeast. National insurance companies, including Torchmark, Protective Life, and Vesta Insurance Group, are based in Birmingham. The University of Alabama at Birmingham, the leading employer in the metropolitan area, is the center of education and research and the "prime source of technology-based and export-oriented entrepreneurship." Employing more than 15,000 people, the university is essential in the transition from manufacturing to professional and service occupations (Growth Strategies Organization 1998, IV). Publishing also is important to the diversified economy. The Southern Progress Corporation, publisher of *Southern Living, Progressive Farmer,* and other magazines, is the area's largest publisher. With outstanding transportation connections, Birmingham is the major retail and wholesale trade center of Alabama. Important to the city's diversified economy are engineering and construction firms and utilities, including BellSouth, Alabama Power, Southern Nuclear Operating Company, and Southern Company Services, the engineering and technical services support division of the Southern Company.

Recent Economic Climate and Landscape

One of Birmingham's industrial landscape signatures, the eerie red glow against the sky generated by flowing pig iron, is gone. Transformed heavy industry remains, but giant "bull ladles" of white-hot pig iron are not a mark on the landscape. Parts of the city's industrial landscape give the visual impression of a bygone time, not a high-tech economy. Most of the old company towns in the industrial belt of Jones Valley, including Fairfield and Ensley, are characterized by dilapidated rows of what was once

company housing (Figure 2.3). Yet, the new economy is bustling on the slopes and in the valleys south of Red Mountain, an area commonly referred to as "over the mountain." The movement of jobs from the industrial areas of the inner city to suburban locations along major arterial roadways is a national trend apparent also in Birmingham (Figure 2.4). The landscape along U.S. Highway 280 in Shelby County is drastically different from that along the industrial belt which runs through the northern and western sections of Jefferson County. The rapid commercial development along 280 helped to make Shelby County the fifteenth fastest growing county in the nation among counties with 100,000 or more people, according to 1997 Census Bureau statistics.

"Diverse, robust and growing, the Birmingham area is booming." From its birth in the late nineteenth century as an industrial city of the New South, Birmingham has "grown into a shining star of the Sunbelt" (O'Donnell 1998, 45). The iron and steel foundation upon which Birmingham was constructed has been altered in recent decades. Birmingham's future lies in the service sector, composed of both professional and low-level service occupations, and in a lean, viable manufacturing base.

Figure 2.3. Old industrial suburbs housing, Fairfield. Kendrick J. Curtis, 2002.

Figure 2.4. New suburb housing, Mountain Brook. Kendrick J. Curtis, 2002.

CHAPTER III

RESEARCH DESIGN AND ANALYSIS OF INCOME

The purpose of this research is to assess whether labor force restructuring is expressed in spatial inequality; polarization; and segregation of income, occupation, and race. In this chapter the demarcation of metropolitan zones and statistical methodology are discussed. Analysis of spatial change in income concludes the chapter.

Distinguishing Zones of Development

Designation of development zones of the Birmingham Metropolitan Area is essential to this study. The zones are similar to those for a dispersed city described in *The Dynamics of the Dispersed City* by Filon and Bunting. The zones are a historio-spatial division of city structure (1996). I divide Birmingham into three zones for 1970 and four zones for 1990. The zones for 1970 are inner city/old industrial suburbs, mature suburbs, and exurbs. In addition to these three zones, for 1990 I identify suburbs built after 1970, which are classified as new suburbs. (Tables 3.1 and 3.2, Figures 3.1, 3.2, 3.3, and 3.4).

The Birmingham Metropolitan Area, like northern manufacturing cities, developed as a dispersed city. Such cities are characterized by a central business district, associated neighboring land uses, and dispersed industrial suburbs. The inner city/old industrial suburb zone consists of census tracts in Birmingham's central business district and adjacent residential and industrial areas, including tracts around Woodlawn, East Lake, and Ensley (Figures 3.2 and 3.4). This zone is also comprised of dispersed old

Table 3.1. Classification of Development Zones

1970	
Zone	Years of Construction
Inner City / Old Industrial Suburbs	Before 1949
Mature Suburbs	1950 - 1970
Exurbs	Rural
1990	
Zone	Years of Construction
Inner City / Old Industrial Suburbs	Before 1949
Mature Suburbs	1950 - 1970
New Suburbs	1970 - 1990
Exurbs	Rural

Source: U.S. Census, 1970 and 1990.

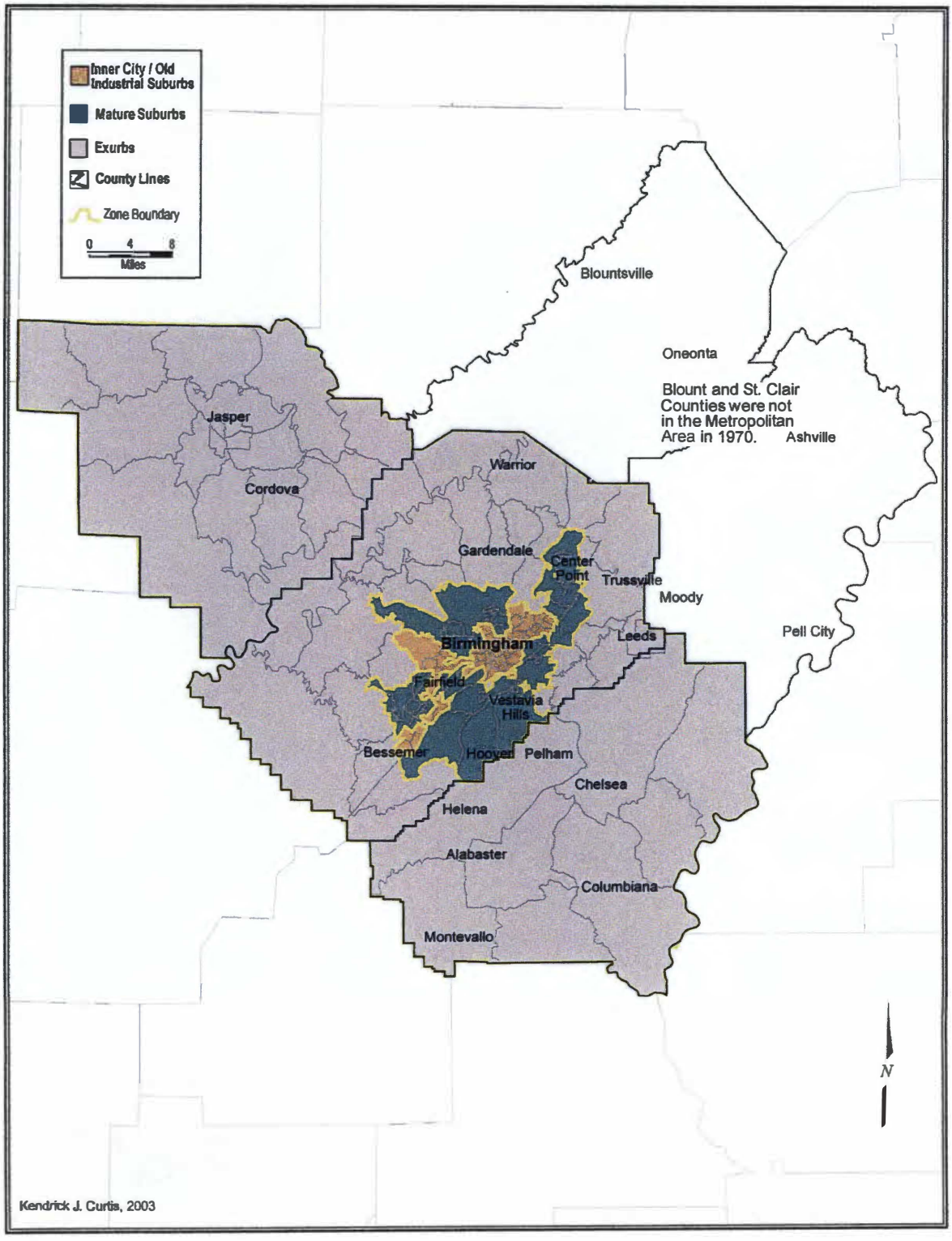

Figure 3.1. 1970 Birmingham Metropolitan Area and development zones. Source: U.S. Census, 1970.

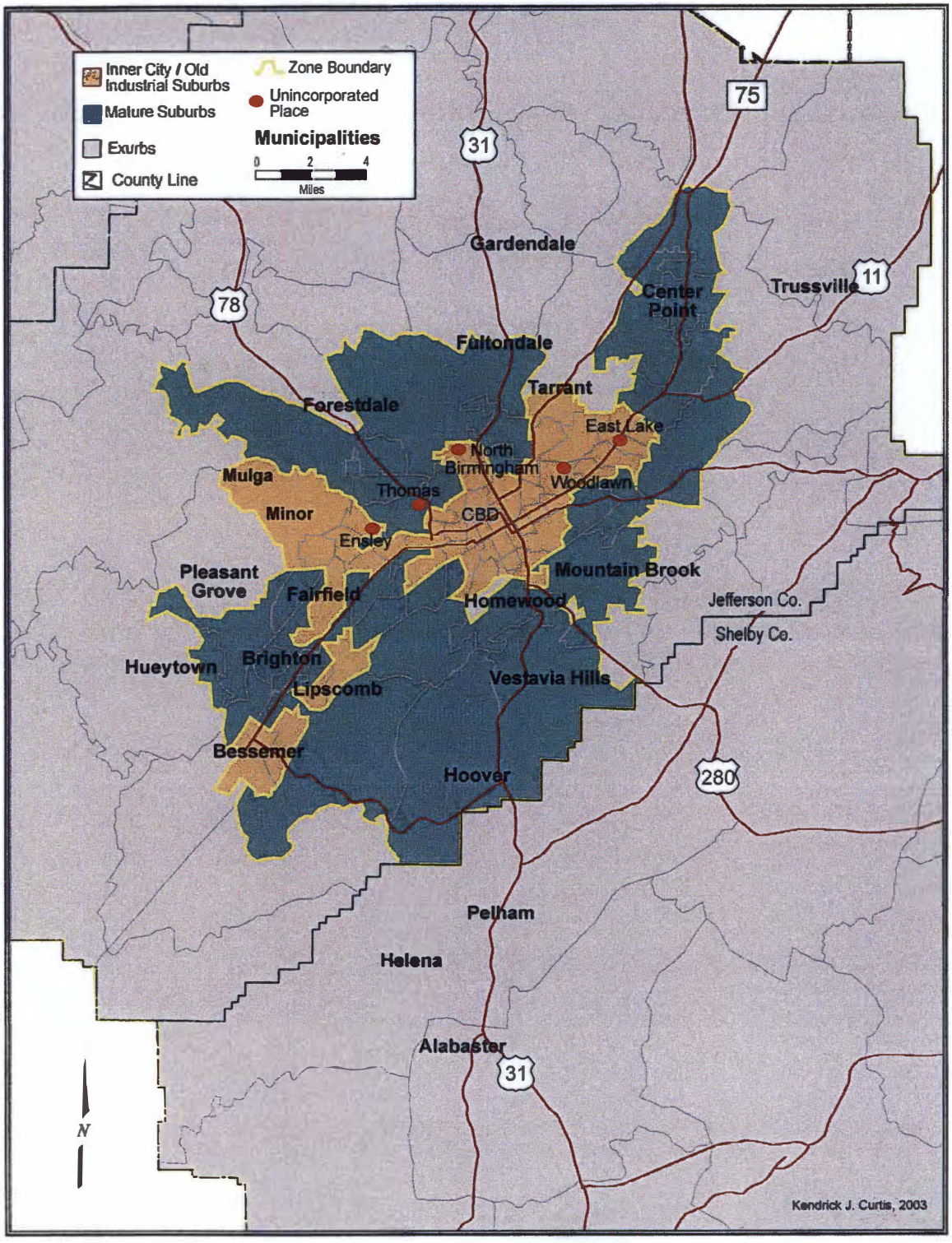

Figure 3.2. 1970 development zones. Urbanized Area.
Source: U.S. Census, 1970.

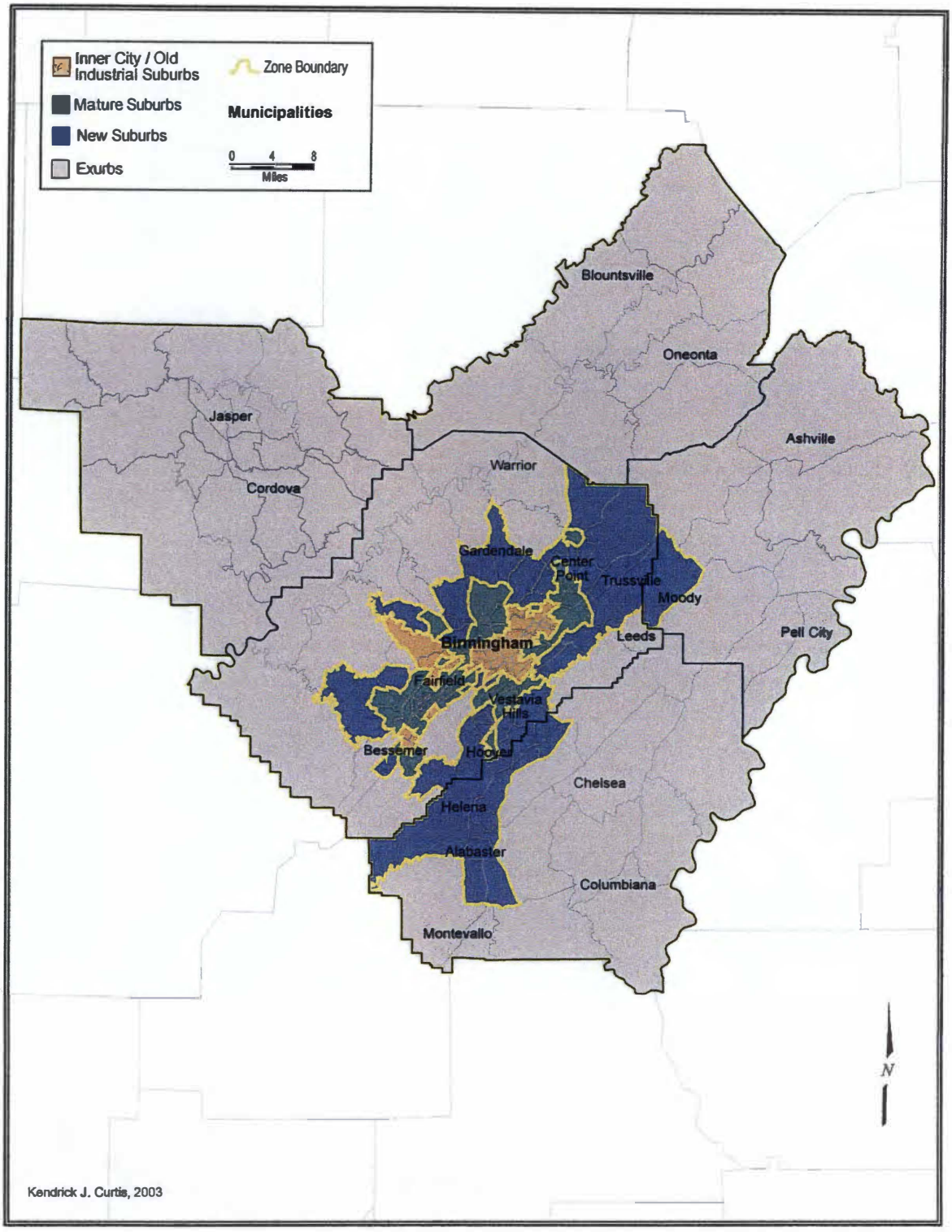

Figure 3.3. 1990 Birmingham Metropolitan Area and development zones. Source: U.S. Census, 1990.

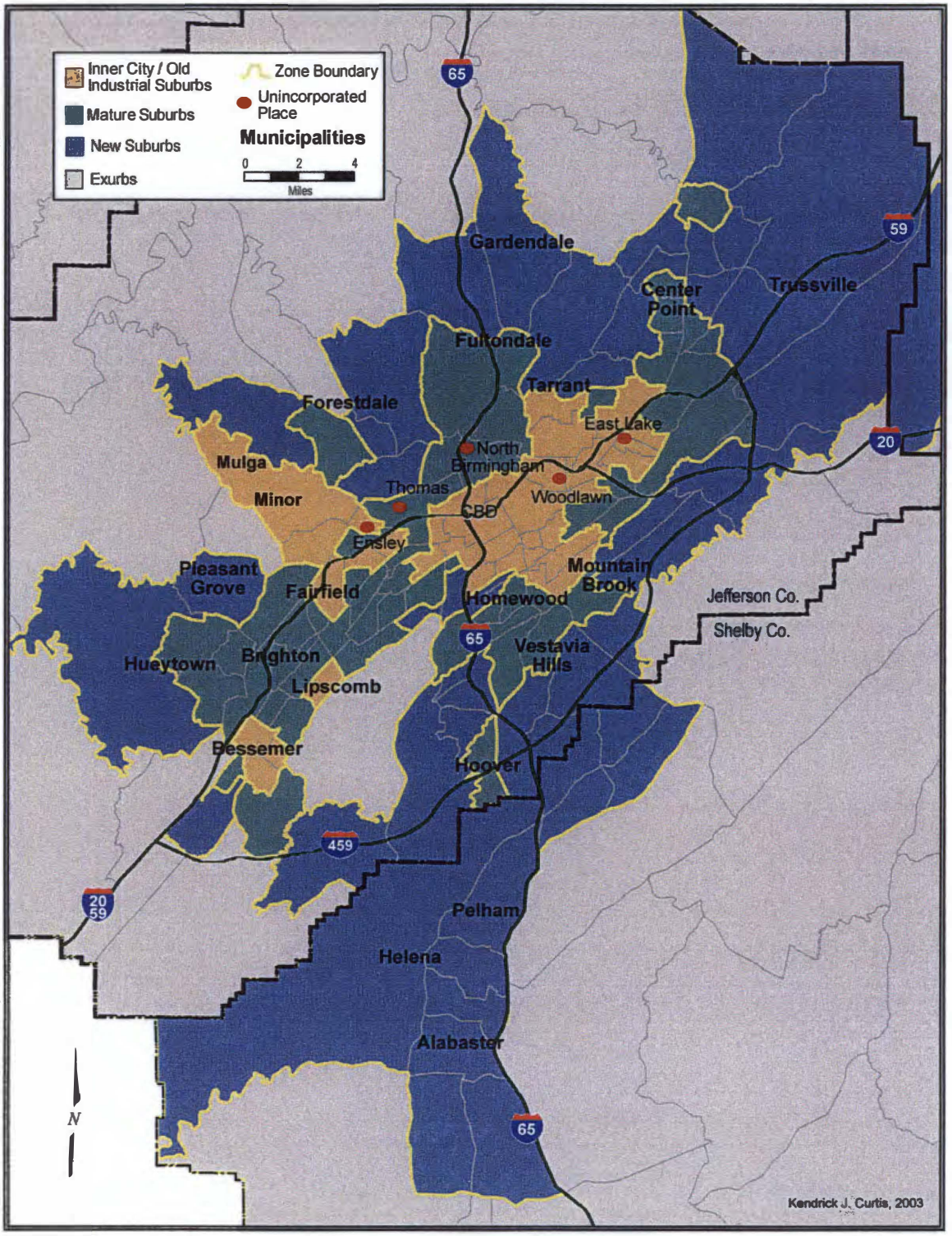

Figure 3.4. 1990 development zones. Urbanized Area.
Source: U.S. Census, 1990.

Table 3.2. Types of Places in the Birmingham Metropolitan Area

Place	Development Zone	1970 Population	1990 Population
Adamsville	Exurbs	2,412	4,233
Alabaster	New Suburb	2,642	14,732
Avondale*	Inner City	NA	NA
Bessemer	Old Industrial Suburb / Mature Suburb	33,428	33,497
Birmingham City	Inner City / Mature Suburb	300,910	265,852
Brighton	Mature Suburb	2,277	4,518
Cahaba Heights (U)	New Suburb	NA	4,778
Center Point (U)	Mature / New Suburbs	15,675	22,658
Eastlake*	Inner City	NA	NA
Ensley*	Old Industrial Suburb / Mature Suburb	NA	NA
Fairfield	Old Industrial Suburb / Mature Suburb	14,369	12,200
Forestdale	Mature / New Suburbs	6,091	10,395
Fultondale	Mature / New Suburbs	5,163	6,400
Gardendale	New Suburb	6,502	9,251
Helena	New Suburb	1,110	3,918
Homewood	Mature Suburb	21,245	22,922
Hoover	New Suburb	1,393	39,788
Hueytown	Mature Suburb	7,095	15,280
Inverness (U)	New Suburb	NA	2,638
Irondale	Mature / New Suburb	3,166	9,454
Lake Purdy (U)	Exurbs	NA	1,785
Leeds	Exurbs / New Suburb	6,991	9,905
Lipscomb	Old Industrial Suburb / Mature Suburb	3,225	2,892
Meadowbrook (U)	New Suburb	NA	4,621
Midfield	Mature Suburb	6,399	5,559
Minor (U)	Old Industrial Suburb	NA	3,311
Mountain Brook	Inner City / Mature / New Suburb	19,474	19,810
North Birmingham*	Inner City / Mature Suburb	NA	NA
Pelham	New Suburb	931	9,765
Pleasant Grove	New Suburb	5,090	8,458
Roebuck*	Inner City / Mature Suburb	NA	NA
Spaulding*	Mature / New Suburb	NA	NA
Tarrant	Inner City / Mature Suburb	6,835	8,046
Thomas*	Mature Suburb	NA	NA
Trussville	New Suburb	2,985	8,266
Vestavia Hills	Mature Suburb / New Suburb	8,311	19,749
Woodlawn*	Inner City	NA	NA

* Indicates a place inside the city of Birmingham

(U) Indicates an unincorporated place

Source: U.S. Census, 1970 and 1990

industrial suburb tracts outside the city of Birmingham, which are of similar age as the inner city. The old industrial suburb census tracts are in the municipalities of Bessemer, Lipscomb, Fairfield, Tarrant, Mulga, and Minor. The mature suburb zone of 1970 is predominately a residential area which developed after the Second World War. This zone was dependent on the inner city for employment and for the provision of specialized goods and services. The mature suburb zone developed in response to the automobile and has low-density housing. The new suburb zone is characterized by a "hodge-podge of land use patterns" and has various types of economic activities. Land use and spatial organization are aspatial, created by "disparate locational processes." Often, land uses in the new suburb zone appear "footloose," with locational choices determined by "aspatial factors such as attraction to landscape or the generation of scale economies" (Filion and Bunting 1996, 10). The boundaries of the development zones vary in places due to the redrawing of census tract boundaries. Discrepancies were generated by large 1970 census tracts. The smaller 1990 tracts produced more precise delineation of zones.

The primary criterion used to determine the zone to which a census tract belongs is the period in which intense construction of buildings occurred. The years of development are before 1950 for the inner city/old industrial suburbs, between 1950 and 1970 for the mature suburbs, and after 1970 for the new suburbs. A tract is considered in the inner city/old industrial suburbs if over half of its buildings were built before 1949. Outlying census tracts with low population densities, less than 200 people per square mile, or municipalities that developed independent of Birmingham are classified as exurbs. Tracts with population densities greater than 200 per square mile are in one of the urban zones. After determining the period buildings were constructed, other factors

such as density and location were considered. It was readily apparent to which zone most tracts belong. For those that were difficult, field examination was employed to identify the appropriate zone.

Dr. Bobby Wilson geographer at the University of Alabama verified my classification. He stated, "you do a good job in picking out the CBD, old industrial suburbs, including Fairfield, Ensley, and Bessemer in the western part of the Metropolitan Area and Eastlake in the eastern." He continued, "you do a ... good job in identifying the new suburbs" (Wilson interview February 15, 2001).

Income Variables and Statistical Measures

Household income is utilized to analyze the distribution of income. The manner in which the Bureau of the Census reports income changed between 1970 and 1990. For 1970 I utilize the income for "families and unrelated individuals." This variable is comparable with "income of households" in 1990. Both variables include the income of the head of a household and all other persons 15 and older. Five statistical measures are employed to assess spatial changes in income: an index comparing mean to median income in a tract, an income ratio for median household income, an index of dissimilarity, a neighborhood disparity index, and an intra-tract skewness index. (See Appendix I for the statistical formulas and description.)

Mean to Median Income Index

Increasing difference between mean and median income indicates increases in both lower and upper income households. A value was calculated by dividing the mean by the median (Table 3.3). Household income in Birmingham became increasingly

Table 3.3. Mean / Median Household Income Index,
Birmingham Metropolitan Area 1970 and 1990

	Metropolitan Area	Inner City / Old Industrial Suburbs	Mature Suburbs	New Suburbs	Exurbs
1970	1.13	1.16	1.11	---	1.12
1990	1.22	1.35	1.25	1.17	1.21

Source: calculations from U.S. Census, 1970 and 1990.

skewed between 1970 and 1990. In the Metropolitan Area, the mean/median ratio increased from 1.13 to 1.22. The distribution of household income also became more skewed within each zone. It was most skewed in the inner city/old industrial suburbs, and the least in the new suburbs.

Median Household Income Ratio

The income ratio for median household income is used to compare incomes among census tracts. The ratio is median income of a census tract to median income of the Metropolitan Area. A tract with a ratio of 1.0 indicates an income equal to the Metropolitan Area. Ratios greater or less than 1.0 indicate median incomes greater or less than that of the Metropolitan Area.

Histograms illustrate how the economic transition affected the segregation levels of income in the Metropolitan Area (Figures 3.5 and 3.6). The histograms reveal a slight increase in the proportion of census tracts with income ratios below 1.0. This signifies that by 1990 slightly more tracts had ratios below the level of equality than in 1970. More revealing are the parts of the index range in which change occurred. Gains were made at the highest parts of the range. Tracts with values over 1.4 increased from 13 percent in 1970 to 17 percent in 1990. The section of the range slightly below the level of equality, between 0.7 and 0.9, experienced considerable gains over the transition. By 1990 there were more tracts with values in this range than in any other. A slight increase occurred in the number of most destitute tracts, those with income ratios under 0.6. Tracts with income ratios between 1.1 and 1.3 decreased during the economic transition. In 1970, 29 percent of tracts had values in this range, contrasted with 21 percent in 1990. The changes in the percentages of census tracts reveal increasing polarization. In 1990

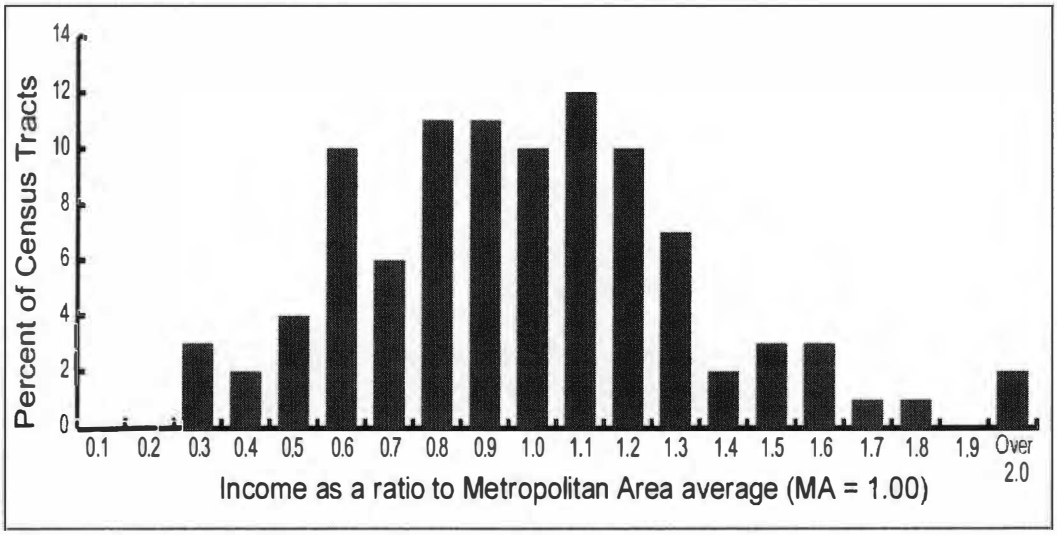

Figure 3.5. Distribution of census tracts by median household income ratio Birmingham Metropolitan Area 1970.

Source: calculations from U.S. Census, 1970.

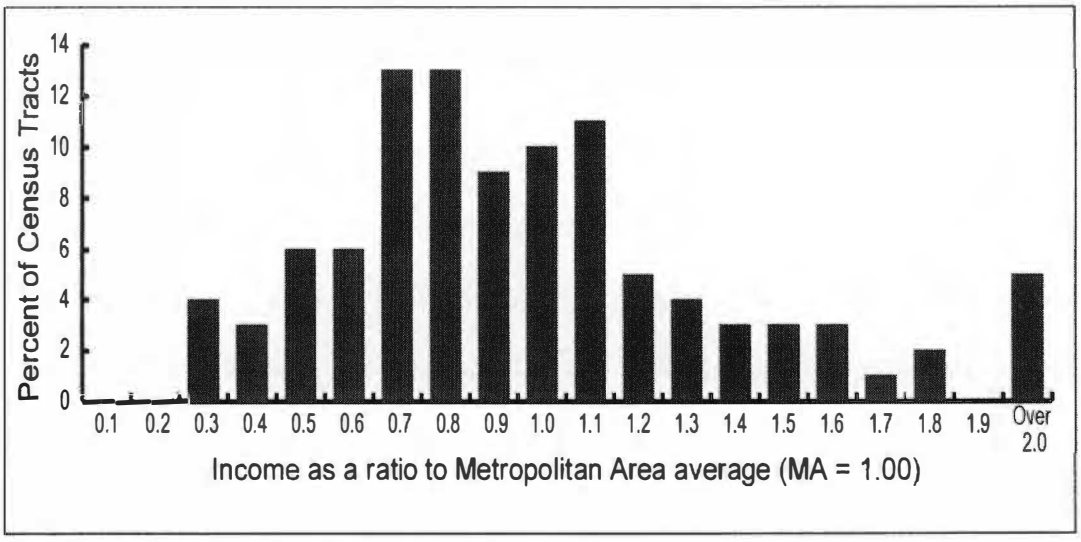

Figure 3.6. Distribution of census tracts by median household income ratio Birmingham Metropolitan Area 1990.

Source: calculations from U.S. Census, 1990.

there were fewer tracts with income ratios at or slightly above the level of equality than in 1970. The histograms reveal the nature of the disparity by showing that the high section and the section of the range slightly below equality had greater percentages of tracts in 1990.

The income ratio for median household income is also used to compare the spatial distributions of incomes in census tracts in 1970 and 1990 (Figures 3.7, 3.8, 3.9, and 3.10, Table 3.4). In 1970 several inner city tracts around the CBD had exceedingly low income ratios. Two other areas had clusters of tracts with ratios less than 1.0 but greater than 0.5. One of the clusters was a large crescent shaped area adjoining the CBD on all sides except the south. Centered on North Birmingham, this area extended west to Ensley, east to Woodlawn, and southeast to Avondale. Another cluster of tracts with low ratios was between Bessemer and Brighton.

The highest income levels in 1970 were census tracts in the affluent "over the mountain" area of south-central Jefferson and north Shelby Counties. Census tracts in Homewood, Vestavia Hills, and Mountain Brook had high income ratios. The three tracts with the highest ratios in the Metropolitan Area were located over the mountain. The tracts in the Center Point area had high income ratios. A cluster of tracts in and around the municipality of Farifield also had above average income ratios. Five tracts had ratios above 1.3. Fairfield is an old industrial suburb and had tracts with inner city/old industrial suburb and mature suburb characteristics.

By 1990, the income ratio of virtually all census tracts in the inner city/old industrial suburbs had dropped significantly. Almost all of the tracts with the highest income ratios were in new suburbs of the Metropolitan Area. Seventy percent of the

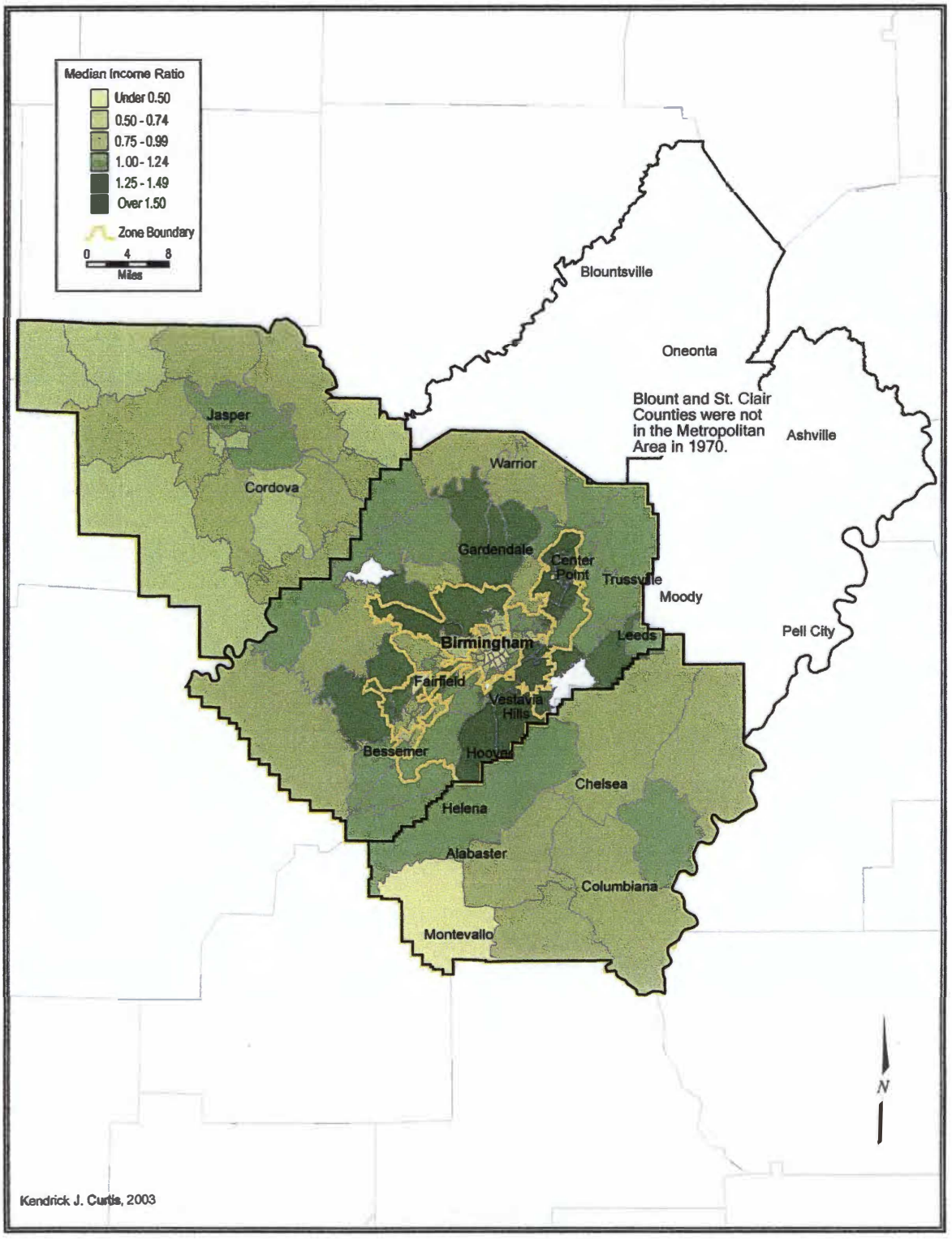

Figure 3.7. Income ratio for median household income 1970. Source: calculations from U.S. Census, 1970.

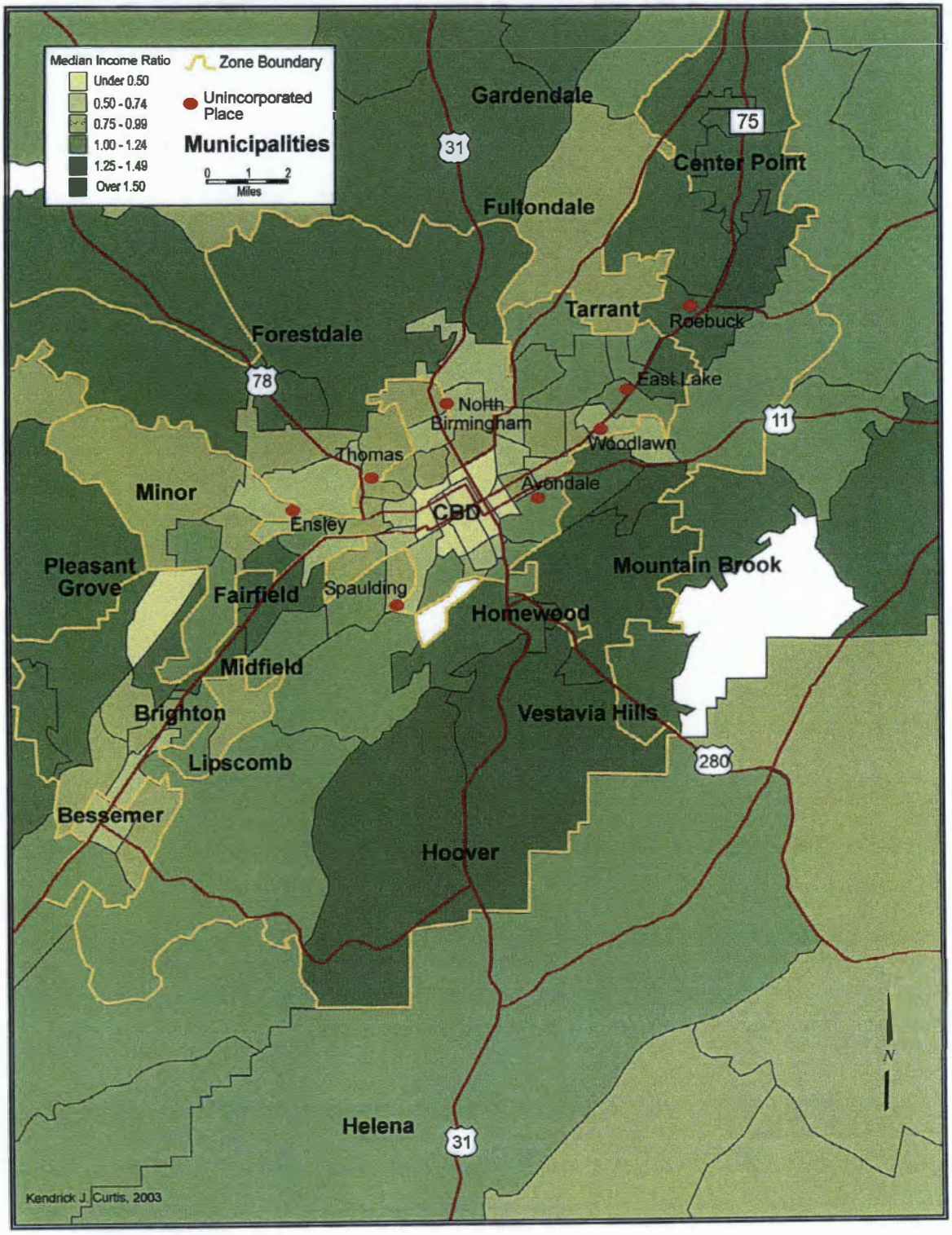

Figure 3.8. Income ratio for median household income 1970. Urbanized Area. Source: calculations from U.S. Census, 1970.

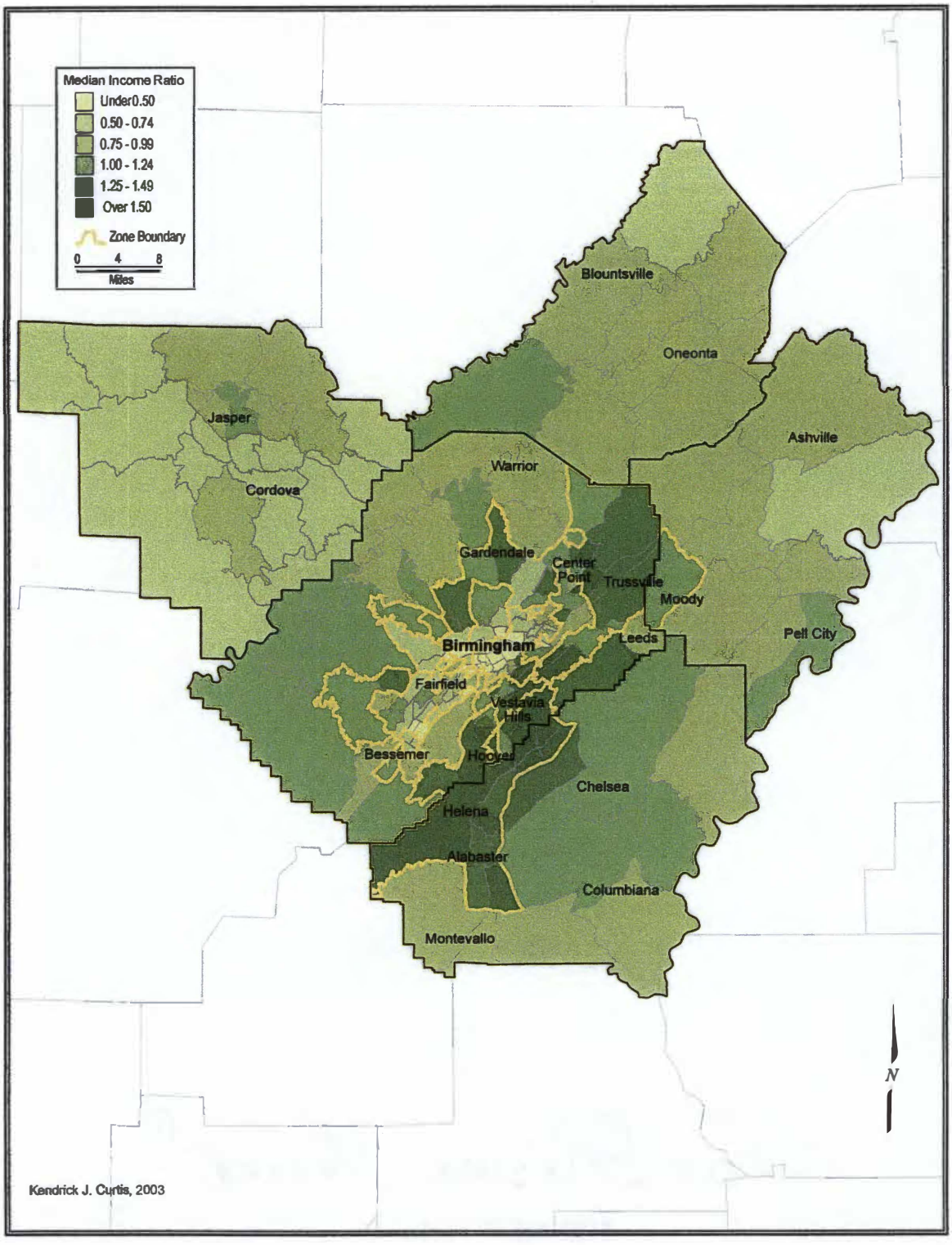

Figure 3.9. Income ratio for median household income 1990. Source: calculations from U.S. Census, 1990.

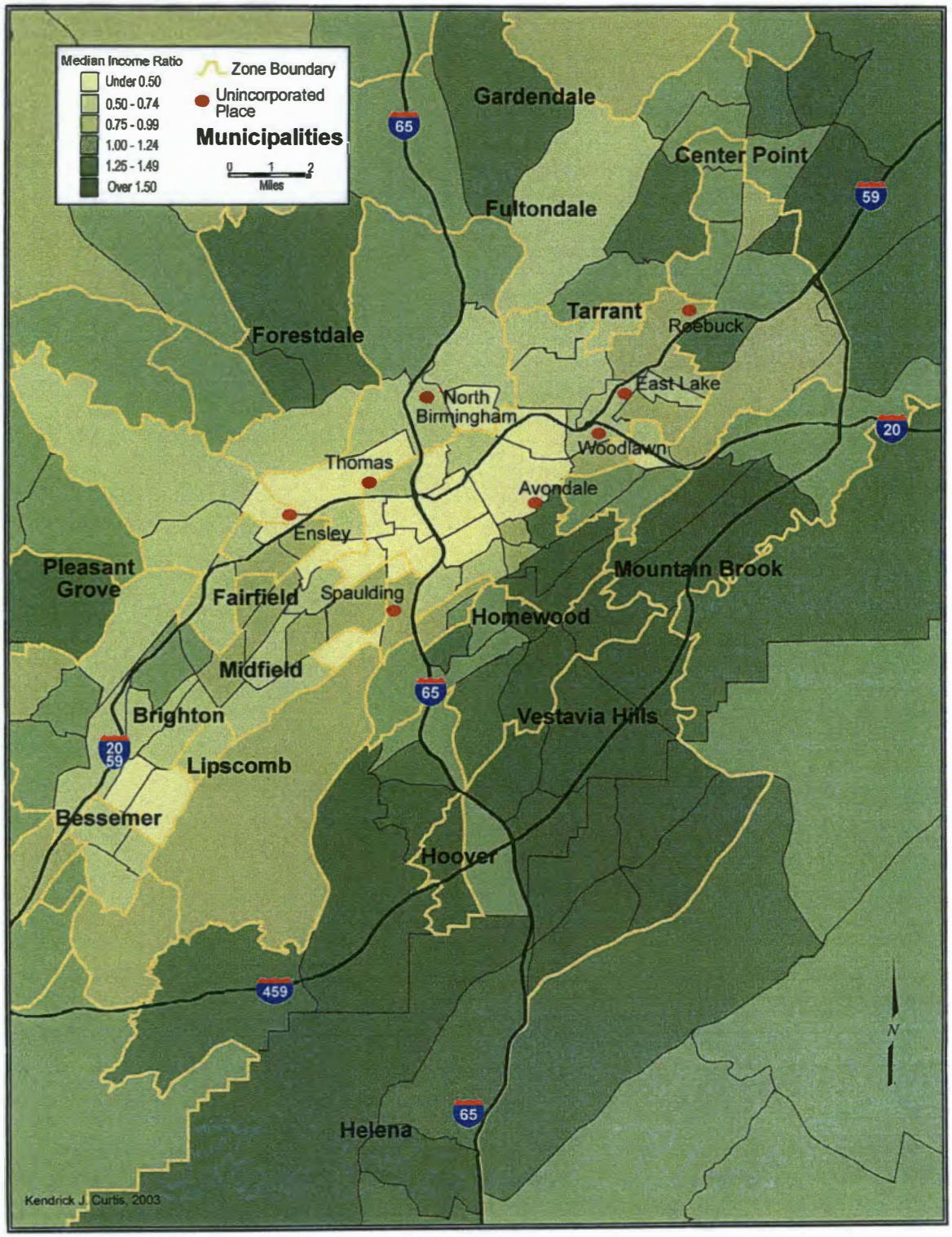

Figure 3.10. Income ratio for median household income 1990. Urbanized Area. Source: calculations from U.S. Census, 1990.

Table 3.4. Median Household Income Ratio

1970			
Zone	Ratio		Income
Inner City/Old Industrial Suburbs	0.83	$	5,278
Mature Suburbs	1.23	$	7,857
Exurbs	1.00	$	6,417

1990			
Zone	Ratio		Income
Inner City/Old Industrial Suburbs	0.70	$	19,243
Mature Suburbs	0.94	$	25,681
New Suburbs	1.42	$	38,632
Exurbs	0.88	$	24,123

Source: calculations from U.S. Census, 1970 and 1990.

the wealthier areas in 1970 maintained their elite status, while the poorer tracts experienced diminished income ratios during the transition. Characterized by low income ratios in 1970, the CBD and adjacent areas retained low ratios in 1990. Census tracts with low income ratios expanded to the east and west of the CBD. The income ratios of tracts in North Birmingham dropped significantly between 1970 and 1990. The area around Fairfield, which had high income ratios in 1970, eroded to a small cluster of tracts with values just below 1.0.

Index of Dissimilarity

The index of dissimilarity is used to measure the degree to which wealthier census tracts contain larger shares of household income in the Metropolitan Area and in each zone. The index of dissimilarity values ranged from 0 to 1. A measure of 0 indicates complete equality of household income among tracts, while a result of 1 reveals extreme segregation of income. The index of dissimilarity value for the Metropolitan Area indicates that the distribution of income became slightly more segregated between 1970 and 1990 (Table 3.5). Values increased from 0.203 to 0.210. Changes were greater at the zone level.

Increasing income inequality occurred in the inner city/old industrial suburbs and mature suburbs, while income became more evenly distributed in the new suburbs and exurbs. In 1970, the inner city/old industrial suburbs, with a value of 0.210, had the most unequal distribution of income. The mature suburbs' index was 0.167 in 1970 and 0.257 in 1990. In 1990 it was 0.256 for the inner city/old industrial suburbs. The new suburbs had the most equal income distribution in 1990, with an index of 0.164. The exurbs in

Table 3.5. Measures of Spatial Income Inequality 1970 and 1990

	Metropolitan Area	Inner City / Old Industrial Suburbs	Mature Suburbs	New Suburbs	Exurbs
Index of Dissimilarity - *(Mean Household Income)*					
1970	0.203	0.210	0.167	---	0.208
1990	0.210	0.256	0.257	0.164	0.165
Percentage Change	3.4%	21.9%	53.4%	---	-20.7%
Neighborhood Disparity Index - *(Mean Household Income)*					
1970	0.096	0.098	0.108	---	0.082
1990	0.098	0.129	0.111	0.088	0.065
Percentage Change	2.1%	31.6%	3.1%	---	-21.0%
Intra-tract Skewness Index - *(Difference in Mean and Median Household Income)*					
1970	16.6	20.0	13.7	---	15.4
1990	24.0	35.0	24.7	17.7	22.1
Percentage Change	44.5%	75.2%	80.0%	---	43.9%

Source: calculations from U.S. Census, 1970 and 1990.

1990, with an index of 0.165, also had a more equal income distribution than the inner city/old industrial suburbs or the mature suburbs.

Neighborhood Disparity Index

The neighborhood disparity index is employed to evaluate inequality between contiguous tracts. The index measures the difference between the ratio of mean income of a central tract and the ratio of mean income of adjoining tracts. This index was computed for each zone and for the Metropolitan Area. The results range from 0 to 1.0, with 0 indicating no disparity and 1.0 indicating high disparity in income between the central tract and its neighboring tracts. The process of neighbor identification is made simpler by employing topologically structured databases within a vector based geographic information system (GIS) model. Identification and calculation were performed employing an Avenue script in ArcView. The Avenue script structured, identified, and analyzed Bureau of the Census TIGER data (See Appendix II for the Avenue script and its explanation).

Both mean and median household income variables were computed, but because of only a slight difference in the two results, only mean income is reported (Table 3.5). The values for the neighborhood disparity index are comparable to values for this measure in Walks study of Toronto. The level of segregation this value reveals in the Birmingham Metropolitan Area is higher than for Toronto.

The neighborhood disparity index increased slightly at the Metropolitan Area level between 1970 and 1990, from 0.096 to 0.098, indicating a moderate increase in inequality. Significant changes occurred in the zones. The most extreme changes were in the inner city/old industrial suburbs where the neighborhood disparity index increased

32 percent. The index for the new suburbs in 1990 was 18 percent lower than the value for the 1970 mature suburbs. In 1970, the mature suburbs had the highest level of income disparity. By 1990 the level of disparity had increased slightly in the mature suburbs. The intensification in the inner city/old industrial suburbs was so great that by 1990 this zone had the highest degree of disparity. The inner city/old industrial suburbs' neighborhood disparity value increased from 0.098 to 0.129, while the mature suburbs value increased to 1.11. The mature suburbs higher disparity index indicates that the area was less homogenous than the new suburbs. The new suburbs and exurbs, which were developed during the restructuring of the economy, had lower levels of disparity.

Intra-tract Skewness Index

An intra-tract skewness index is utilized to measure polarization within census tracts. The index compares the difference between mean and median household income of a census tract, standardizing it by median income. A range of values is produced. Zero is a sign of no difference between mean and median income levels, implying no skewness and a minimum of disparity in the tract. Higher values indicate income disparity (Table 3.5). Walks utilized this measure but recognized that limitations are inherent in it. While it is "suggestive of increasing incomes at the upper ends of the spectrum coupled with greater numbers of mid to low income earners," it does not necessarily indicate greater polarization (Walks 2001, 415). This measure is useful in my study because it complements other measures.

Between 1970 and 1990 intra-tract income disparity intensified in the Birmingham Metropolitan Area and in each zone. The Metropolitan Area index increased from 16.6 to 24.0. The inner city/old industrial suburbs, with values of 20.0 in

1970 and 35.0 in 1990, had the highest level of disparity in both years. With a value of 13.7, the mature suburbs had the lowest level of disparity in 1970. The new suburbs, with a value of 17.7, had the lowest level in 1990. The level of disparity intensified in all zones between 1970 and 1990. The mature suburbs had the greatest increase, with the index rising from 13.7 to 24.7. The new suburbs compared to the 1970 mature suburbs had the lowest increase, with a 28 percent increase.

The Birmingham Metropolitan Area's income trends reveal disparity increasing between 1970 and 1990. Statistical measures disclose the spatial effects of household income change. These changes need to be considered with the alterations in occupations and race, which are examined in chapters 4 and 5.

CHAPTER IV

ANALYSIS OF OCCUPATIONS

Employment Trends in the Zones

The spatial distribution of occupation groups is assessed employing statistical methods, maps, and graphs. Occupation variables help to explain the relationship between economic restructuring and sociospatial disparity. Occupation variables are groupings of census classified occupations of similar nature. The three occupation groups are: manufacturing/craft workers, professionals, and service workers. Professionals and service workers are occupation groups generated by the expanded service sector of the economy. Professionals are persons employed in high-skill positions, whereas service workers are employed in low-skill service jobs. The census definitions and titles of occupation groups changed between 1970 and 1990 (Table 4.1). However, the changes are in semantics and do not affect categorical comparisons. Between 1970 and 1990, Birmingham's economy experienced a relative decline in manufacturing employment and increases in service and professional occupations. While there was a slight increase in the number of manufacturing employees during this period, they declined from 38 to 27 percent of the Metropolitan Area workforce (Table 4.2). Professionals increased from 21 to 30 percent of the Metropolitan Area workforce and service workers from 40 to 43 percent.

Professionals increased in all zones between 1970 and 1990, except the mature suburbs, where they remained consistent at 28 percent (Table 4.2). The mature suburbs' total workforce declined from 111,724 to 90,915 between 1970 and 1990 (Table 4.3). The number of professionals in the zone dwindled from 31,340 to 25,757. While the

Table 4.1. Occupations in the Birmingham Metropolitan Area 1970 and 1990

Occupation Category	1970 Occupations	1990 Occupations
Professionals	Professional, technical & kindred	Executive, administrative, & managerial
	Health workers	Professional specialty
	Teachers, elementary/secondary	Technicians and related support
	Managers & administrators	
	Salaried	
	Self employed	
Service Workers	Sales workers	Sales
	Clerical & kindred	Administrative support, clerical
	Service workers	Private household
	Cleaning & food service	Protective service occupations
	Protective service workers	Service occupations, except private household and protective service
	Personal & health service workers	
	Private household workers	
Manufacturing/Craft Workers	Craftsmen, foremen & kindred	Precision production, craft & repair
	Construction craftsmen	Machine operators, assemblers & inspectors
	Mechanics & repairmen	
	Operatives (except transport)	Transportation & material moving
	Transport equipment operatives	Handlers, equipment cleaners, helpers & laborers
	Laborers (except farm)	

Source: U.S. Census, 1970 and 1990.

Table 4.2. Percent of Workforce by Occupation, 1970-1990

	Inner City/Old Industrial Suburbs		Mature Suburbs		New Suburbs	Exurbs		Metropolitan Area	
	1970	1990	1970	1990	1990	1970	1990	1970	1990
Professionals	17%	28%	28%	28%	39%	16%	21%	21%	30%
Service Workers	44%	47%	41%	48%	43%	32%	37%	40%	43%
Manufacturing /Craft Workers	38%	25%	31%	24%	18%	52%	42%	38%	27%

Source: calculations from U.S. Census, 1970 and 1990.

Table 4.3. Zonal Workforce by Occupation, 1970-1990

Occupation Group		Metropolitan Area	Inner City/Old Industrial Suburbs	Mature Suburbs	New Suburbs	Exurbs
Professionals						
1970	Workforce	57,483	15,066	31,340	---	11,077
1990	Workforce	119,894	16,895	25,757	53,926	23,316
Service Workers						
1970	Workforce	106,301	38,225	46,120	---	21,956
1990	Workforce	172,038	28,528	43,484	58,750	41,276
Manufacturing/Craft Workers						
1970	Workforce	103,266	33,316	34,264	---	35,686
1990	Workforce	108,431	15,312	21,674	24,815	46,630
Total Workforce						
1970	Workforce	267,050	86,607	111,724	---	68,719
1990	Workforce	400,363	60,735	90,915	137,491	111,222

Source: calculations from U.S. Census, 1970 and 1990.

percentage of manufacturing/craft workers decreased in all zones, they decreased the least in the mature suburbs, declining from 31 to 24 percent of the labor force. In 1990, 53,926 professionals resided in the new suburbs, which was more than in any other zone. The percentage of professionals in the new suburbs' workforce in 1990 was 39 percent compared to 28 percent in the mature suburbs. The most severe decline in manufacturing occupations was in the inner city/old industrial suburbs, where the share of manufacturing/craft workers dropped from 33,000 to 15,000; from 38 to 25 percent of the workforce. Service workers constituted the greatest percentage of the workforce in all but the exurb zone before and after the transition.

Occupation Statistical Measures

Two statistical measures are used to assess alterations in distribution of occupation groups. The location quotient measures the concentration of an occupation in a census tract to its concentration throughout the Metropolitan Area. The location quotient ranges from 0 to infinity. A value of 1.0 indicates that the percent of the persons in an occupation group in a tract is the same as in the Metropolitan Area. A value below 1.0 signifies lesser concentration, and values above 1.0 signify a greater concentration.

The coefficient of localization measures spatial segregation of occupations. This measure is calculated by subtracting the percent of the target occupation group from the percent of the base variable (workforce) for each census tract. The absolute value of the differences is summed, and the sum is divided by two. Values range between 0 and 100. Zero represents an equal distribution of workers in an occupation in census tracts, indicating a lack of segregation. A value of 100 signifies maximum segregation. The

coefficient of localization is used to assess segregation of occupations in zones and the Metropolitan Area, but it can not be calculated for each census tract.

Professionals

Historically, Birmingham's elite, seeking refuge from undesirable industrial areas, resided on the ridges south of Jones Valley. In 1970 the area from Mountain Brook and Homewood south toward Vestavia Hills and Hoover had a concentration of professionals. Census tracts in this area of south-central Jefferson County ranged across zones. Older tracts near the CBD were in the inner city, while tracts outside the inner city were suburb or exurb in character. Between 1970 and 1990 this affluent, professional area expanded in area and number of inhabitants (Table 4.4, Figures 4.1, 4.2, 4.3, and 4.4). In 1970 the affluent, "over the mountain" area had census tracts with the highest location quotients for professionals in the Metropolitan Area. Location quotients in these tracts for professionals ranged from 1.30 to 4.68. More than 23,000 professionals, 40 percent of those in the Birmingham Metropolitan Area, resided here. While the "over the mountain" section was the principal concentration of professionals, there were other clusters. A large concentration of professionals with a location quotient over 1.0 was northeast of the CBD around Center Point. Five census tracts had location quotients over 1.2. In 1970, Center Point was home to 5,234 professionals, nine percent of those in the Birmingham Metropolitan Area. Clusters of professionals also existed in two census tracts in Fairfield and in two tracts west of the CBD.

The spatial distribution of census tracts with location quotients for professionals above 1.0 in 1990 is similar to that for 1970. High concentrations of professionals are in south-central Jefferson and north Shelby Counties and scattered pockets elsewhere in the

Table 4.4. Location Quotients for
Birmingham Metropolitan Area Zones

Zone	Professionals	Service Workers	Manufacturing / Craft Workers
1970			
Inner City / Old Industrial Suburbs	0.74	1.11	1.04
Mature Suburbs	0.96	1.03	1.00
Exurbs	0.74	0.70	1.41
1990			
Inner City / Old Industrial Suburbs	0.87	1.11	0.96
Mature Suburbs	0.90	1.12	0.92
New Suburbs	1.26	1.00	0.71
Exurbs	0.67	0.86	1.58

Source: calculations from U.S. Census, 1970 and 1990.

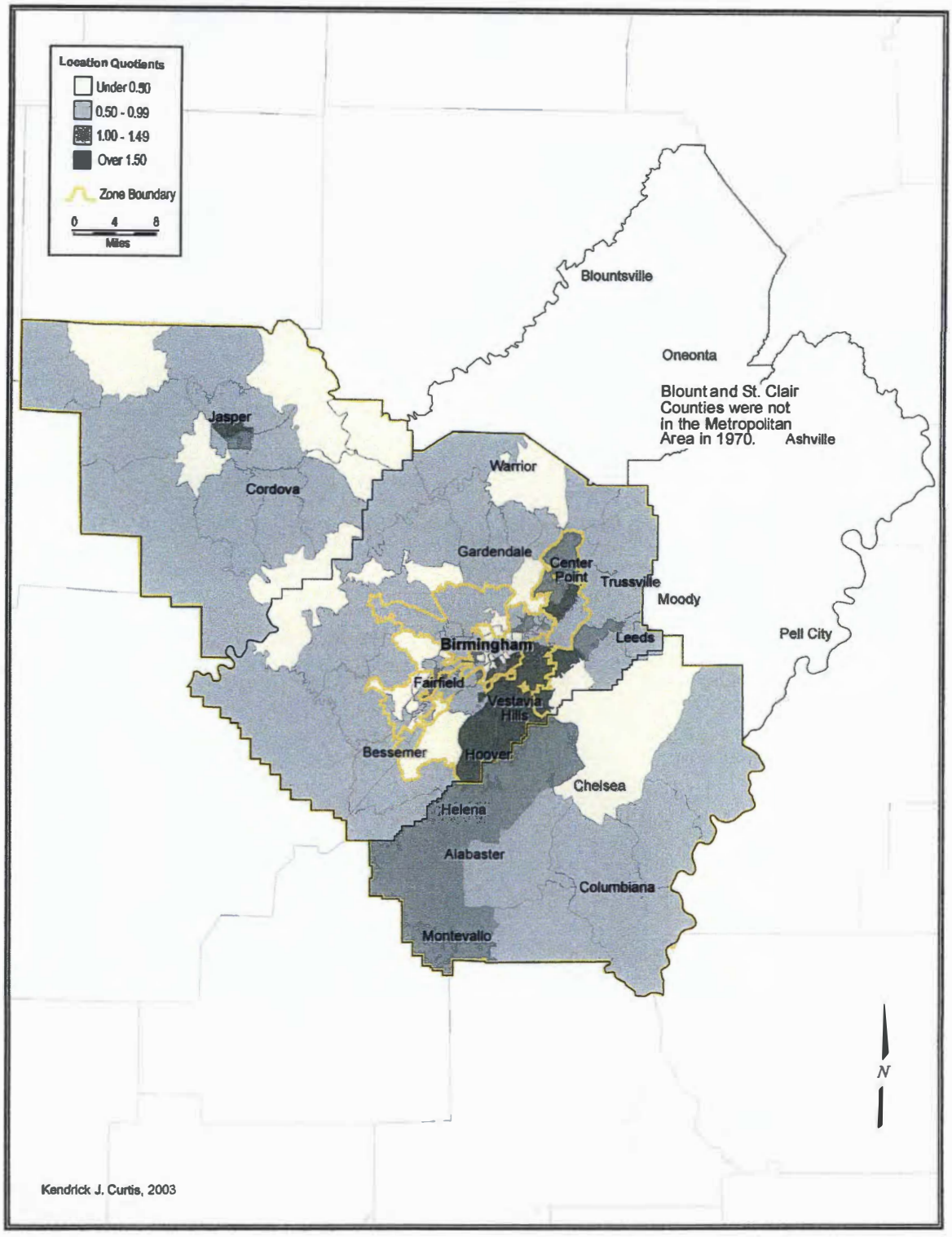

Figure 4.1. Location quotients for professionals 1970.
Source: U.S. Census, 1970.

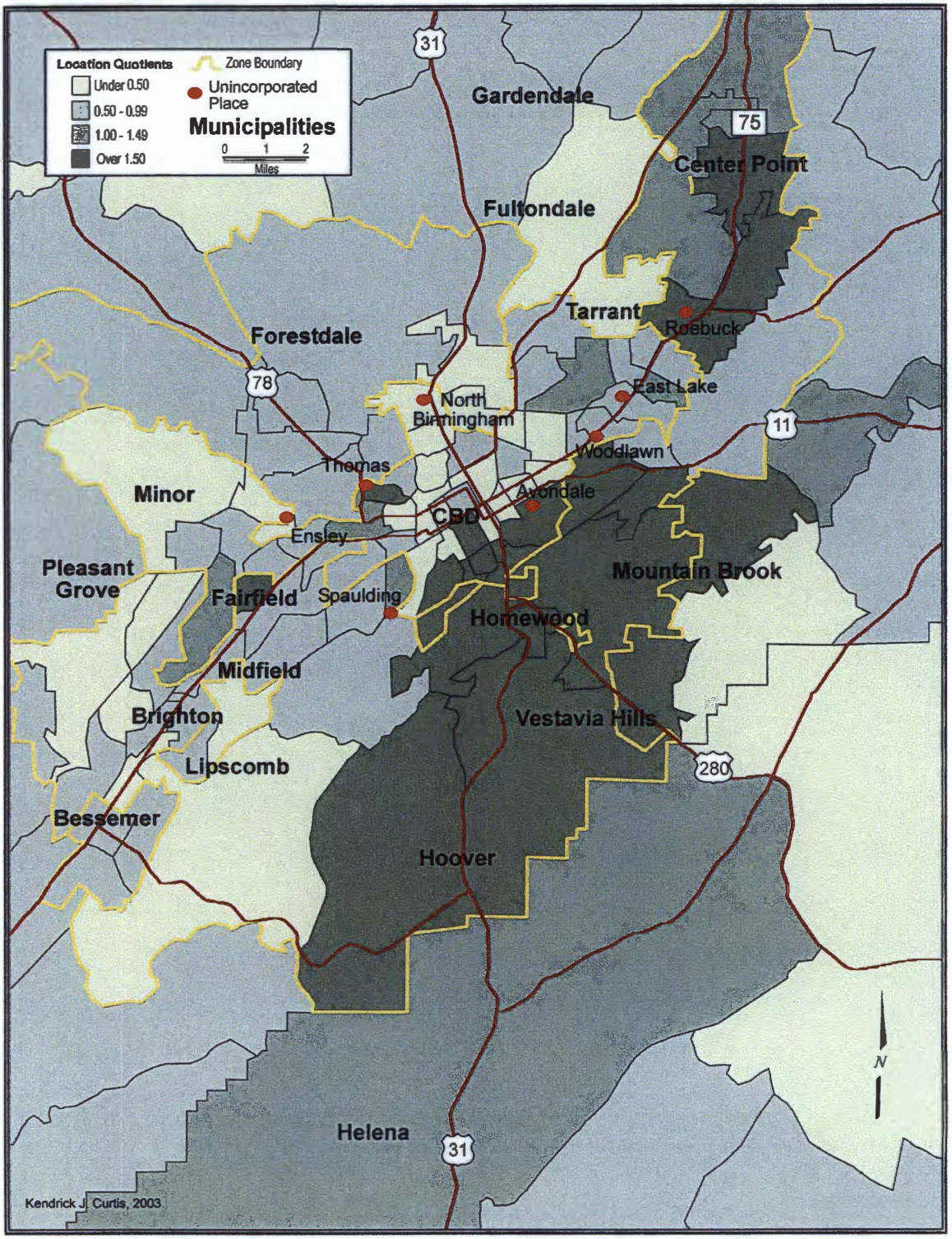

Figure 4.2. Location quotients for professionals 1970. Urbanized Area. Source: U.S. Census, 1970.

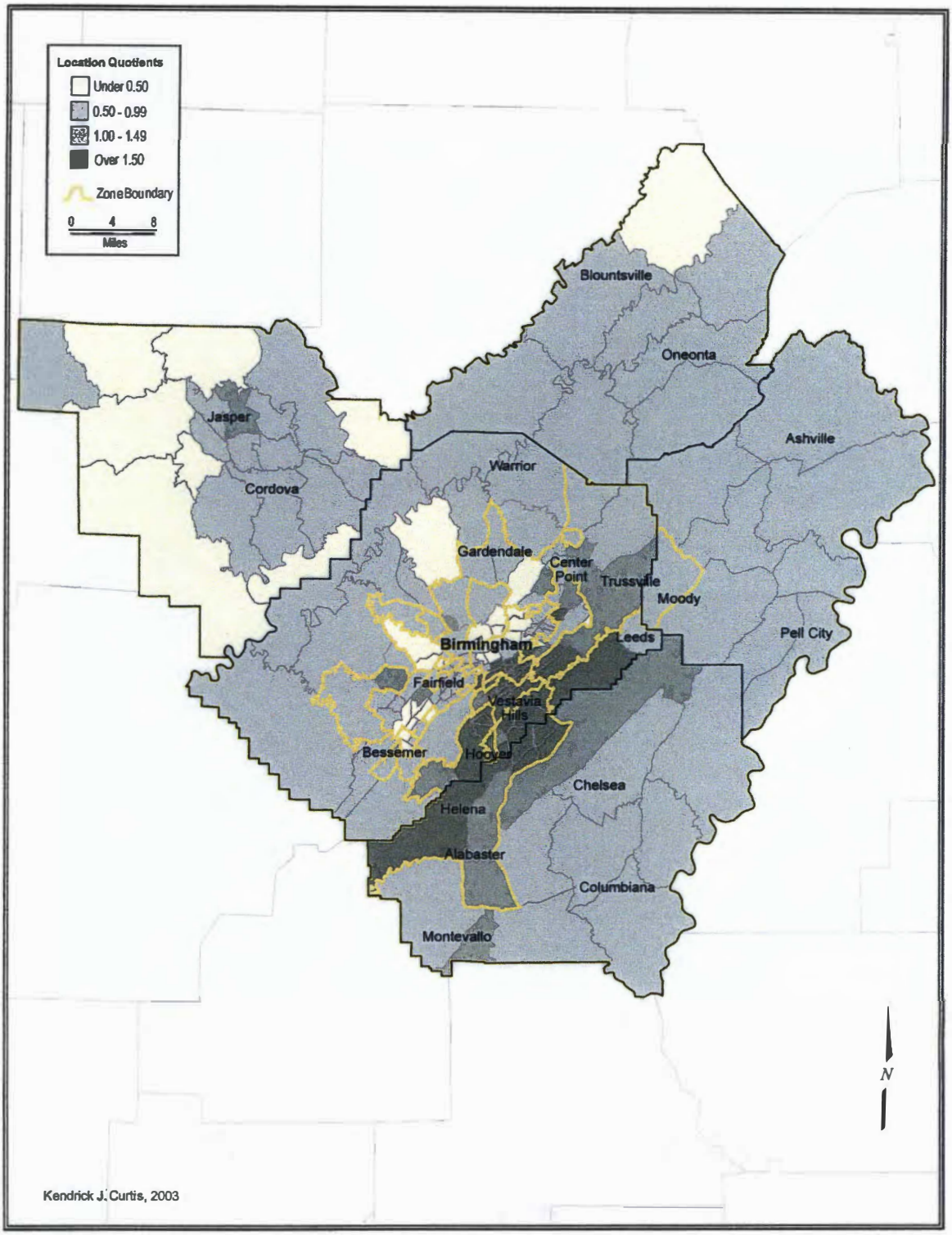

Figure 4.3. Location quotients for professionals 1990.
Source: U.S. Census, 1990.

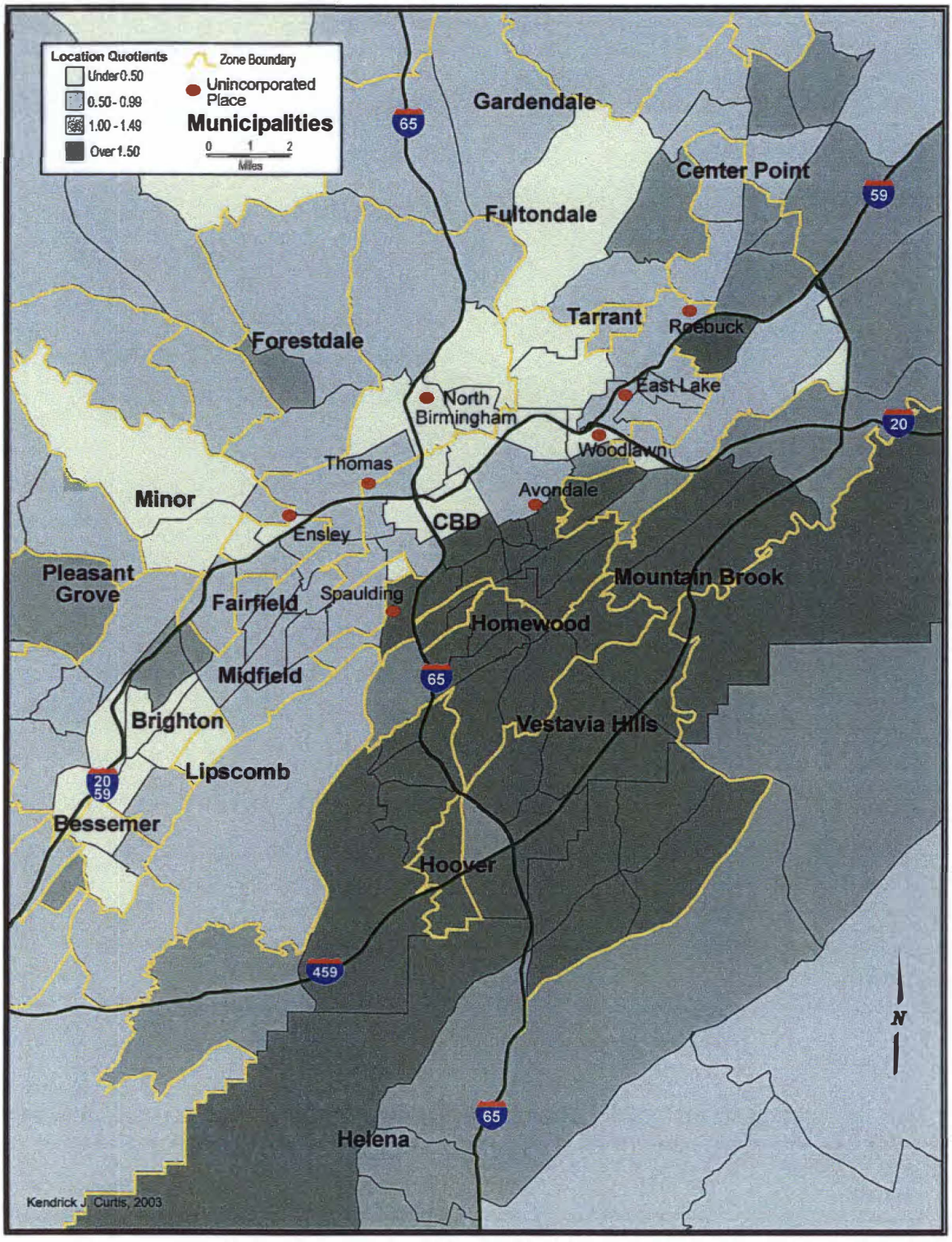

Figure 4.4. Location quotients for professionals 1990. Urbanized Area. Source: U.S. Census, 1990.

Metropolitan Area. Census tract refinements in 1990 allow for more distinct demarcation. The pie-shaped region of professionals in south-central Jefferson and north Shelby Counties in 1970 had expanded further to the south by 1990. It is not surprising that the inertia of an established, elite area attracted additional professionals generated by the shift to a post-industrial economy. Also revealing are the changes in the professional location quotients in other parts of the Birmingham Metropolitan Area. There was a decline in the location quotient in the cluster of tracts with relatively large numbers of professionals west of the CBD between Thomas and Spalding. No tracts in the area have a location quotient greater than 1.0 in 1990; they declined to levels slightly below 1.0. A cluster of tracts with location quotients for professionals slightly above equality remain in Fairfield. These tracts are slightly to the south of the area of professionals in 1970. The values of the 1990 tracts in the cluster are almost 1.0.

Three new pockets of professionals with location quotients above 1.0 developed between 1970 and 1990. None are large. One pocket is southwest of Bessemer. Its location quotient is 1.09. The other two pockets are in the small cities of Pleasant Grove and Forestdale. The pocket in Pleasant Grove approximates the city's boundaries. The location quotient increased from 0.59 to 1.03 between 1970 and 1990. The pocket in Forestdale is only a portion of the municipality, but it had a sizable increase in its location quotient for professionals. By 1990, Center Point still had tracts with location quotients above 1.0, but the average dropped from 1.28 to 0.87.

Service Workers

There is not a great difference in the range of location quotients for service workers between 1970 and 1990 (Table 4.4, Figures 4.5, 4.6, 4.7, and 4.8). It is revealing to examine tracts with location quotient values around 1.0 and tracts with extreme values. In 1970 service workers had the highest location quotients in the inner city/old industrial suburb and mature suburb zones. Census tracts with the lowest location quotients were in rural areas of the exurb zone. There were few employment opportunities for service workers away from developed areas. Service worker's limited income did not support long commutes.

In 1970 the CBD and the area surrounding it was characterized by high concentrations of service workers. The exception was the census tract with the University of Alabama at Birmingham. The three census tracts with the highest location quotients for service workers in the Metropolitan Area, ranging from 1.4 to 1.5, were in the CBD. With a high level of professionals, the census tract where the university is located had very low location quotients for service workers (0.7) and manufacturing/craft workers (0.5). To the west of the university were several tracts with moderately high location quotients for service workers. High location quotients existed in two other areas in 1970. One was a census tract in Woodlawn with a value of 1.3. The other area was three nonadjacent tracts in the mature suburbs west of the CBD. Tracts in Ensley and northwest of Spalding and had location quotients of 1.3. The tract with the highest value, 1.4, was between the two.

During the course of Birmingham's economic transition, service worker location quotient patterns were relatively stable. In 1990 most tracts with service worker location

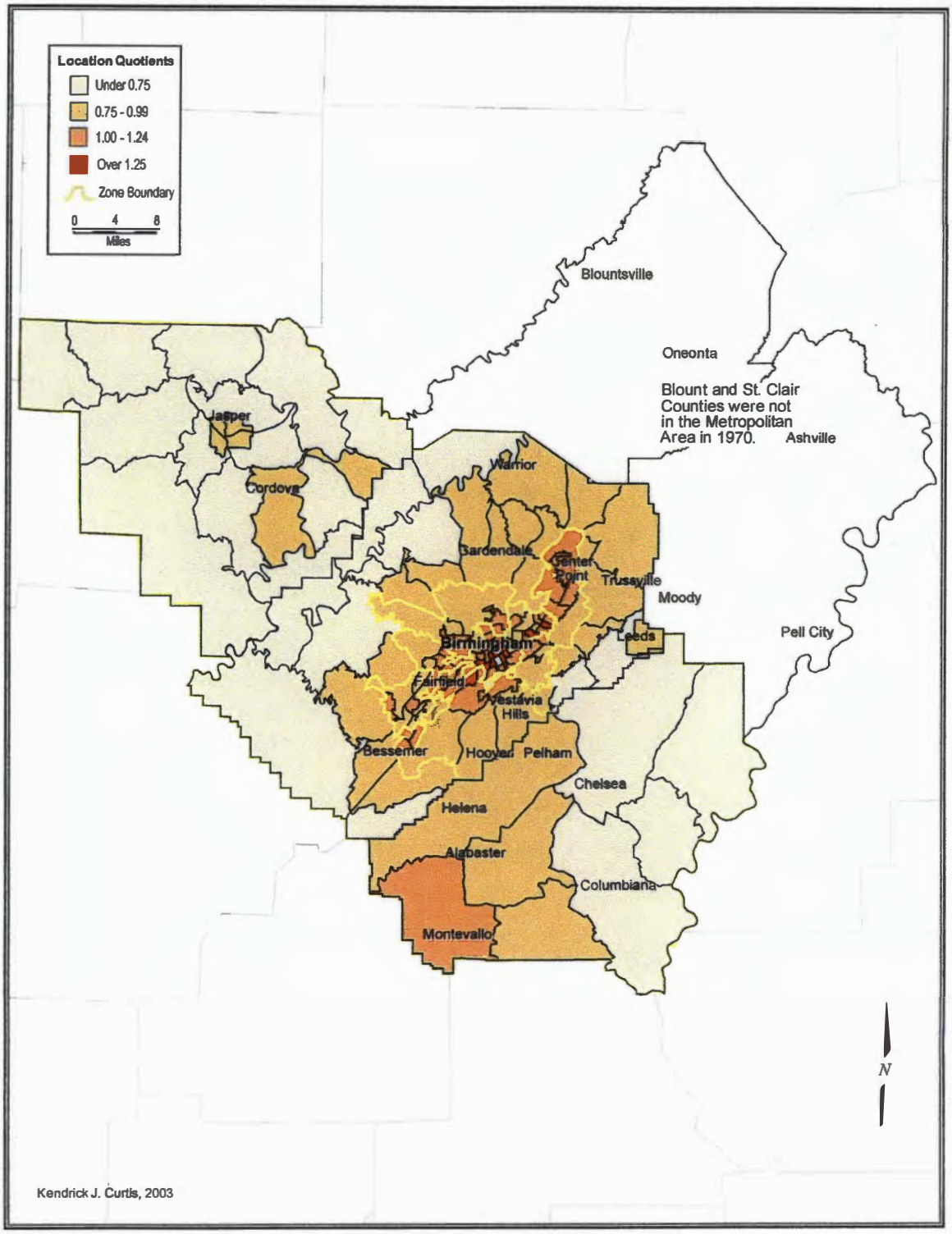

Figure 4.5. Location quotients for service workers 1970. Source: U.S. Census, 1970.

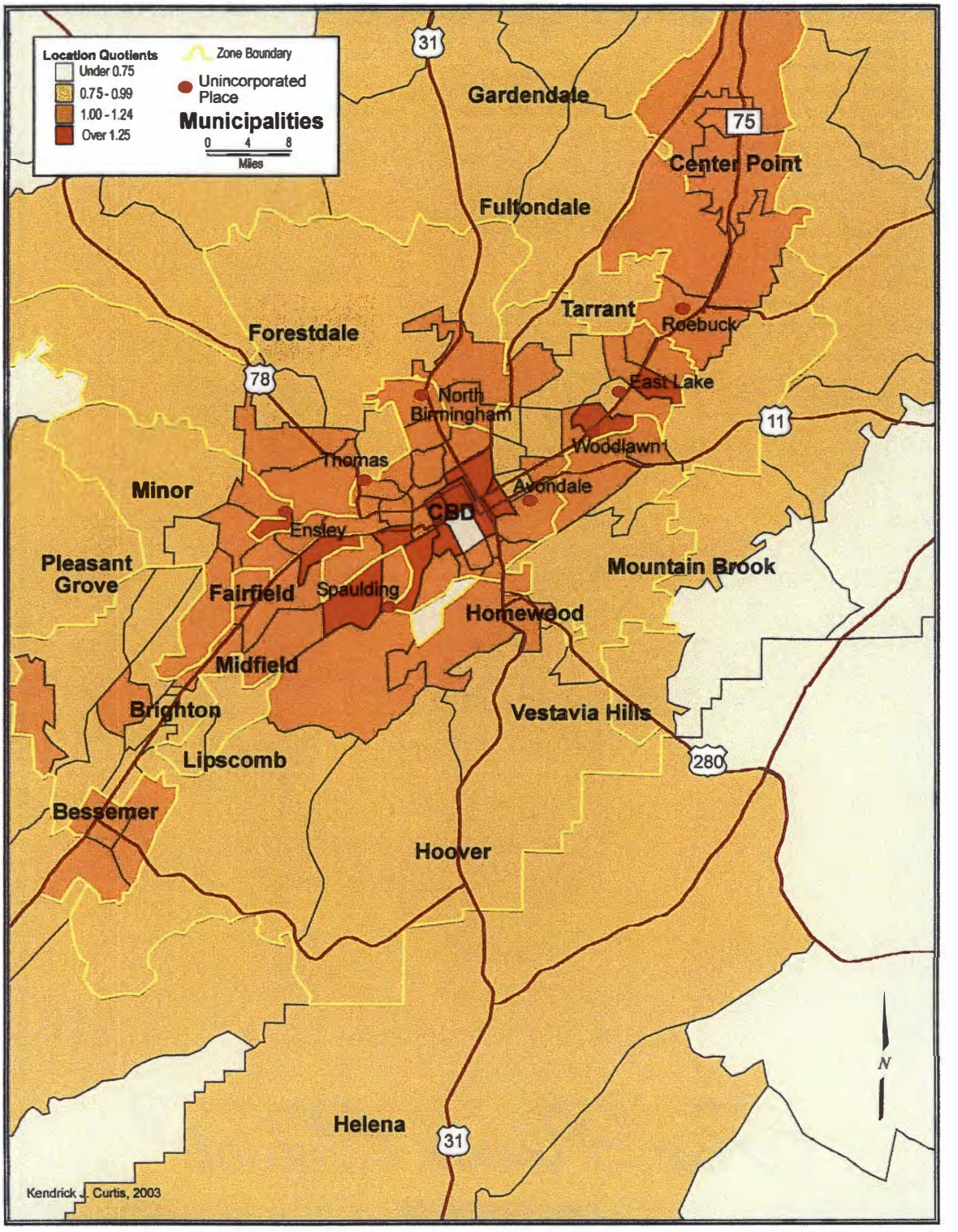

Figure 4.6. Location quotients for service workers 1970. Urbanized Area. Source: U.S. Census, 1970.

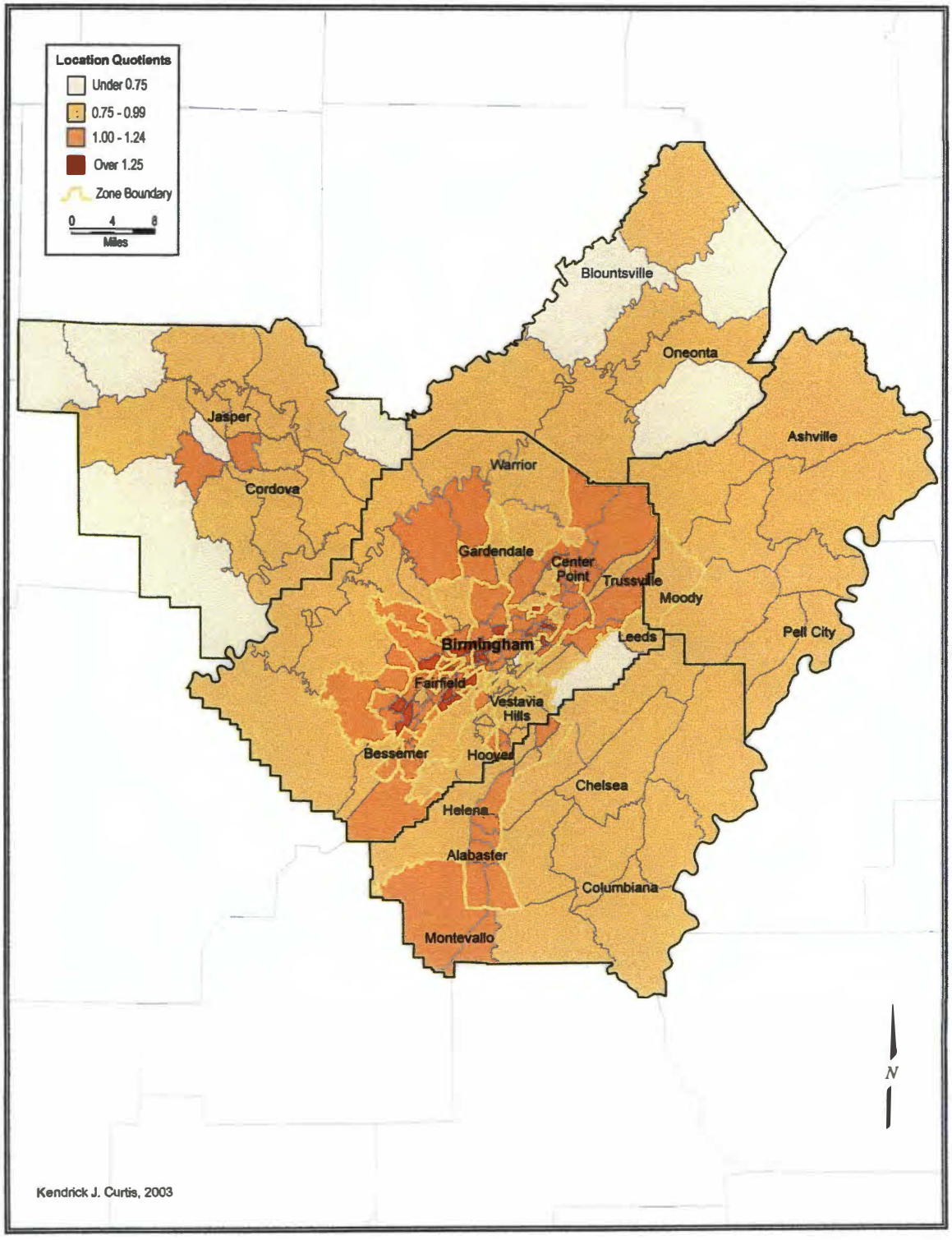

Figure 4.7. Location quotients for service workers 1990.
Source: U.S. Census, 1990.

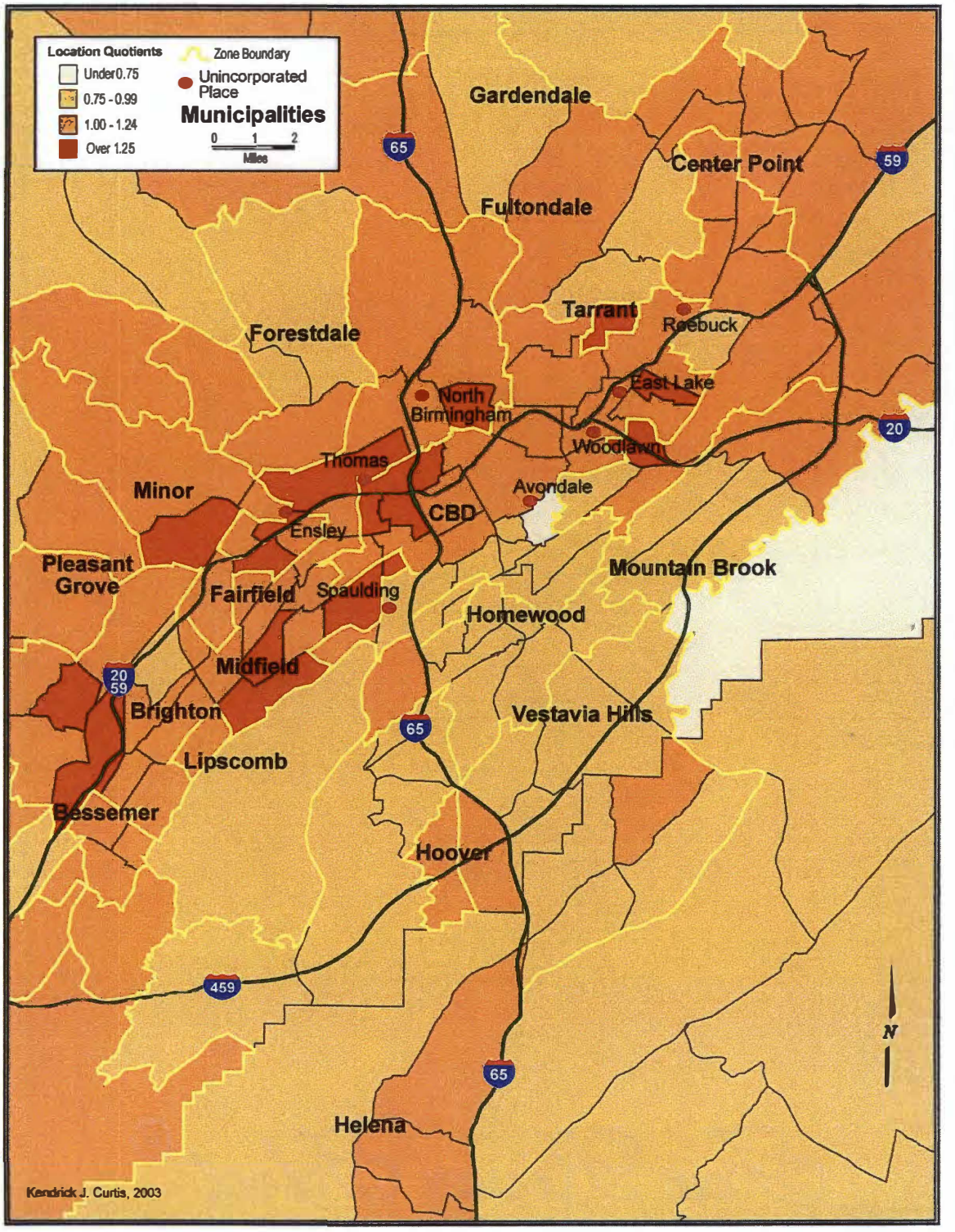

Figure 4.8. Location quotients for service workers 1990. Urbanized Area. Source: U.S. Census, 1990.

quotients over 1.0 were in the inner city/old industrial suburb or mature suburb zones. The 1990 pattern is similar to that for 1970, but higher values for service workers reveals intensification. Service workers are generally in the less desirable sections of the Metropolitan Area where they can afford housing close to sources of employment. The tract with the highest location quotient was adjacent to the CBD. As development expanded into the new suburbs, tracts with high levels of service workers increased. Location quotients for service workers in the new suburbs closely approximate 1.0, the level of equality with the Metropolitan Area. In 1990, 28 of the 52 tracts in the new suburbs had location quotients over 1.00; however, fifteen were between 1.00 and 1.08. A line of census tracts, with values slightly above the level of equality in the new suburbs extend north and south of the city of Birmingham along Interstate Highway 65. There was a decline in the service worker location quotients in the affluent, "over the mountain" area. The census tract with the highest location quotient for service workers had a value of 1.14 in 1970 compared to 0.95 in 1990. In 1990, tracts in south-central Jefferson and north Shelby Counties were slightly below the level of equality for service workers.

Manufacturing/Craft Workers

The most apparent trend in the distribution of manufacturing/craft workers in 1970 is the low location quotients in the elite areas of professionals "over the mountain" and around Center Point (Table 4.4, Figures 4.9, 4.10, 4.11, and 4.12). Analysis of the 15 census tracts in the "over the mountain" section reveals an inverse relationship between manufacturing/craft workers and professionals. Tracts with the lowest manufacturing/craft worker location quotients are ones with the highest values for professionals. Also, few manufacturing/craft workers lived in the innermost CBD tracts.

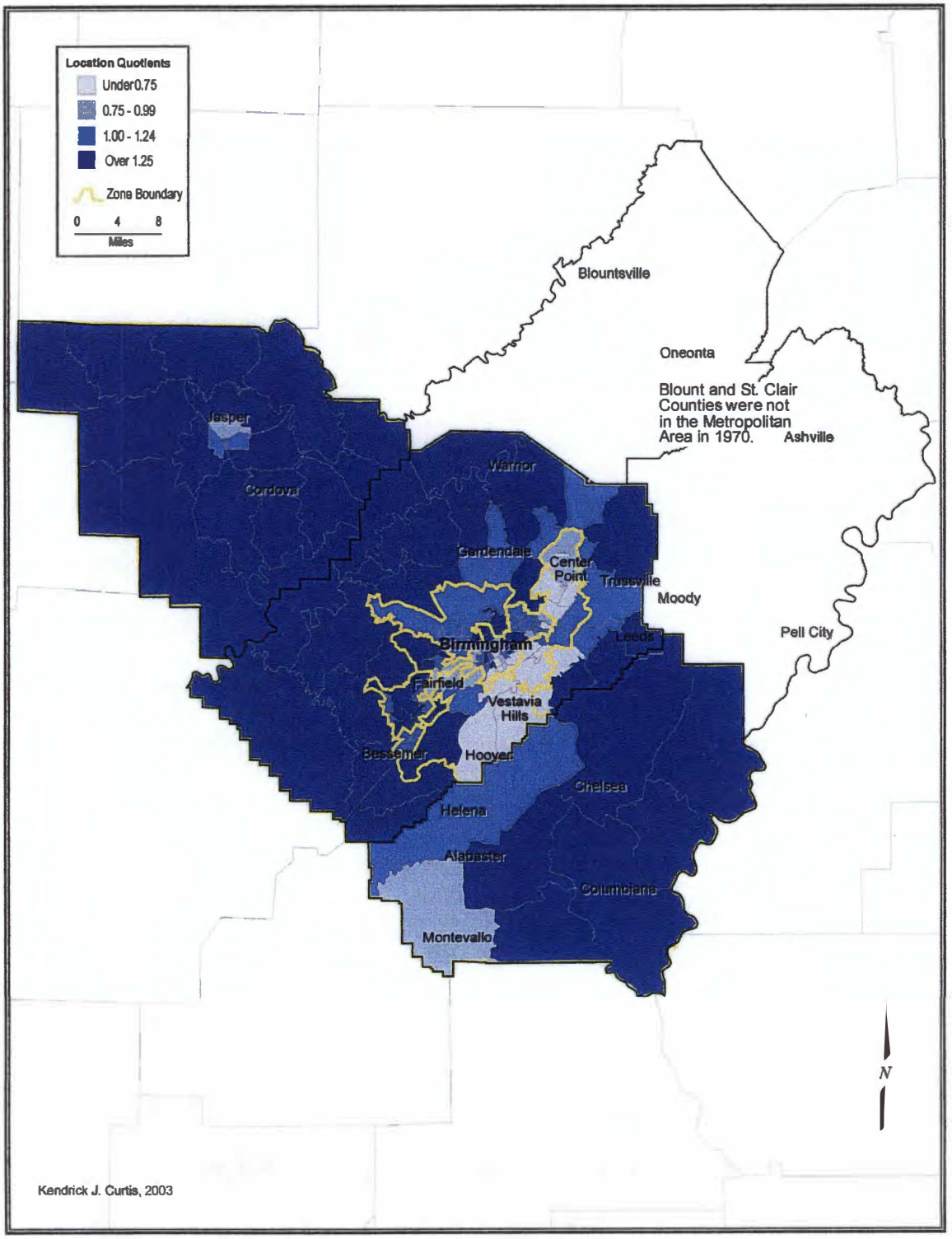

Figure 4.9. Location quotients for manufacturing/craft workers 1970. Source: U.S. Census, 1970.

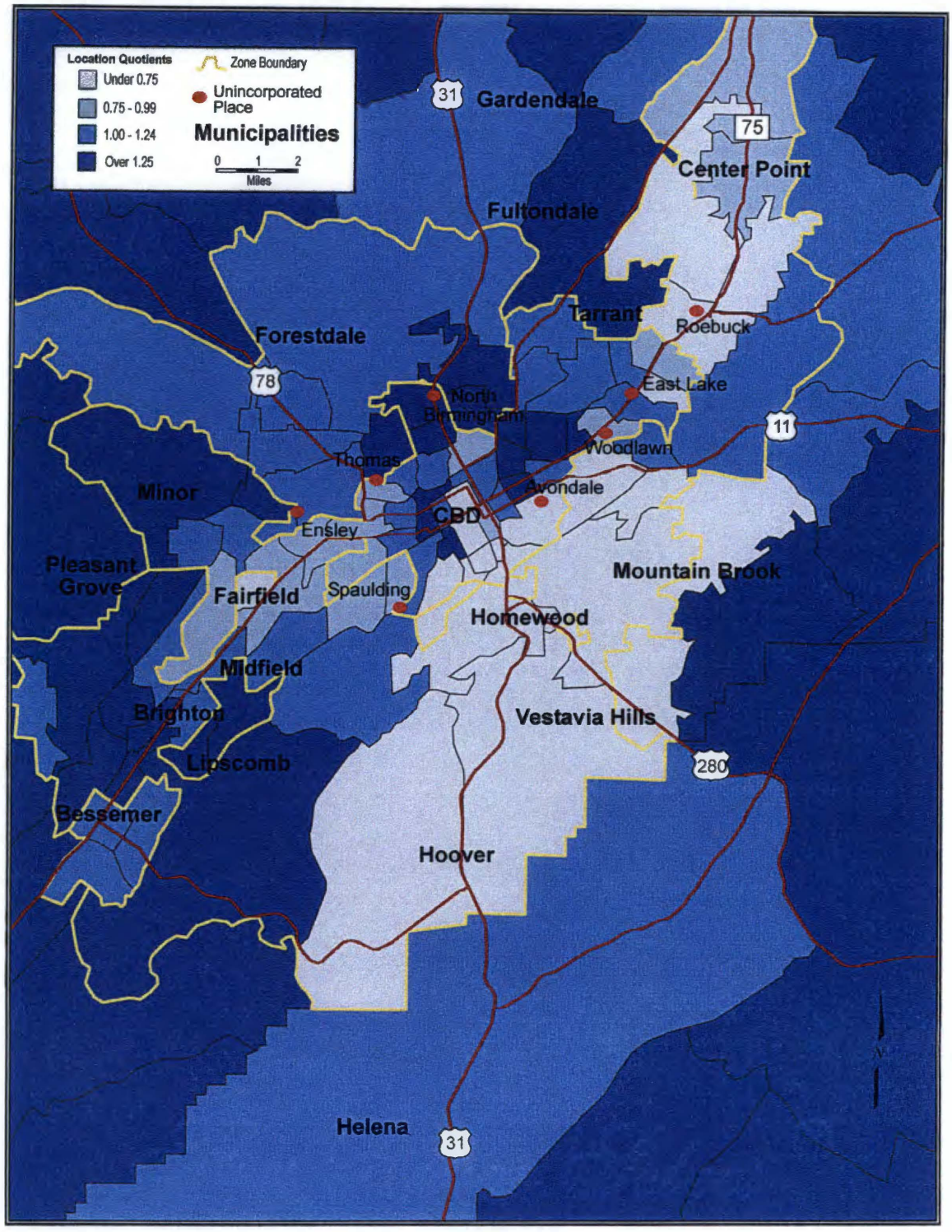

Figure 4.10. Location quotients for manufacturing/craft workers 1970. Urbanized Area. Source: U.S. Census, 1970.

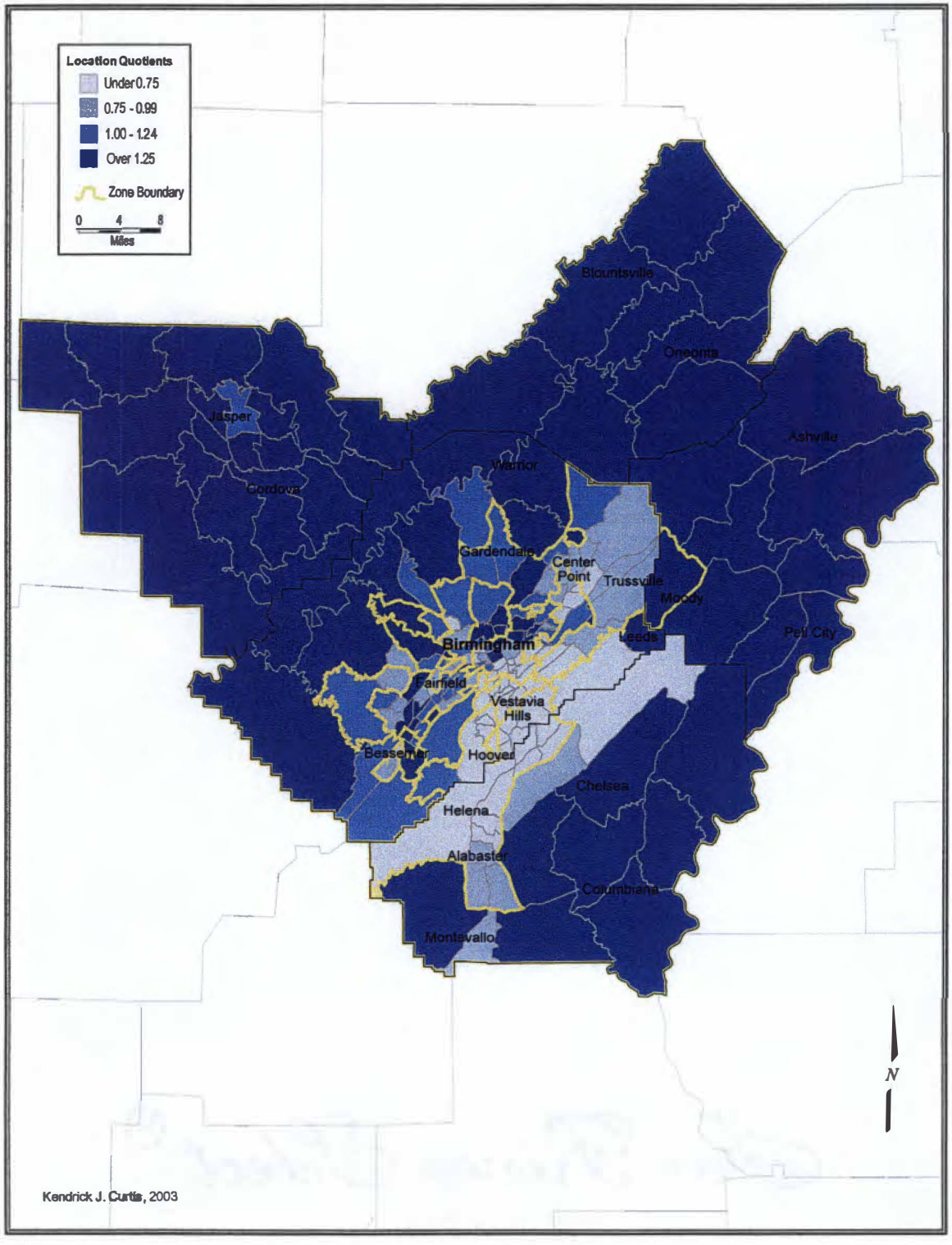

Figure 4.11. Location quotients for manufacturing/craft workers 1990. Source: U.S. Census, 1990.

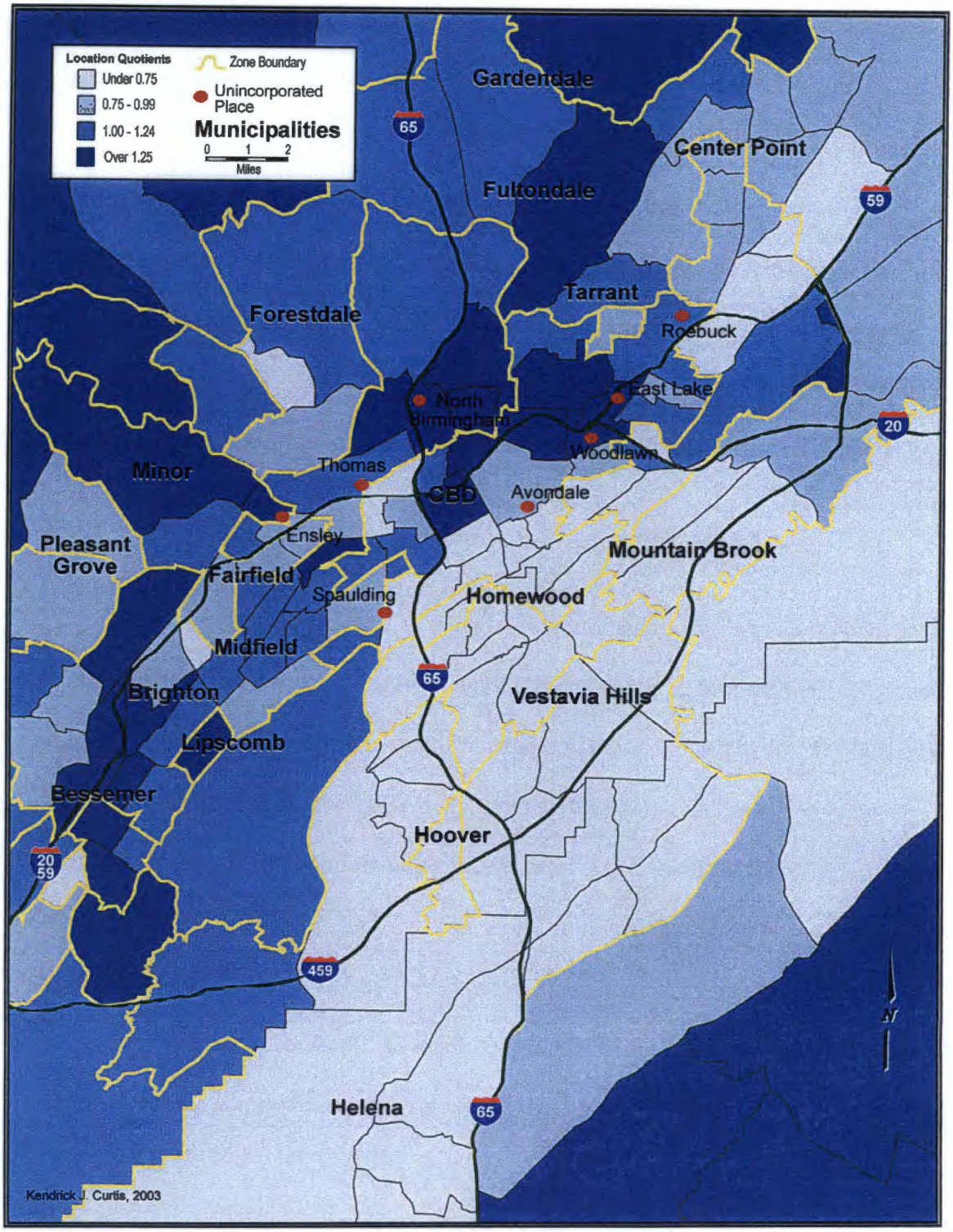

Figure 4.12. Location quotients for manufacturing/craft workers 1990. Urbanized Area. Source: U.S. Census, 1990.

However, the CBD was ringed by tracts with high manufacturing/craft location quotients. The exurb zone census tracts had so few professional and service workers in 1970 that the location quotients for manufacturing/craft workers are high.

There were two areas of high location quotients for manufacturing/craft workers in the Metropolitan Area in 1970. One area near Brighton and Lipscomb was composed of seven tracts with location quotients between 1.3 and 1.5 and was home to nearly 6,000 manufacturing/craft workers. The other area was around Tarrant, Fultondale, and Gardendale. This area had eight census tracts with location quotients between 1.4 and 1.6. Over 14,000 people in this area were manufacturing/craft workers. Few of the tracts had many professionals.

After the economic transition, several areas of manufacturing/craft workers were evident. In 1990 the area of manufacturing/craft workers in North Birmingham still existed. While the highest location quotients in this area dropped from 1.6 to 1.5, more census tracts possessed high values than in 1970. The section expanded slightly to the east along Interstate Highway 59. The other large area of manufacturing/craft workers was still southwest of the Metropolitan Area. However, it shifted from its 1970 location. Areas around Brighton, Lipscomb, and Bessemer, which had high location quotients for manufacturing/craft workers in 1970, retained them in 1990. Location quotients for manufacturing/craft workers dropped significantly in newly urbanized Shelby County census tracts.

Histogram Assessment of Occupations

Census tracts are graphed by location quotients to analyze the effect of the economic transition on the concentration of occupation groups (Figures 4.13 and 4.14). For professionals, the number of census tracts with location quotients less than 1.0 decreased between 1970 and 1990, while tracts with values greater than 1.0 increased. In 1970, 23 percent of the tracts had location quotients greater than 1.0; by 1990, 33 percent were over 1.0. Although more census tracts had location quotients above the average for the Metropolitan Area, there were fewer with extremely high values. Over the study period, tracts below 1.0 became more evenly distributed, and an increase occurred in the number of tracts with low location quotients for professionals. Clusters are evident above and below the Metropolitan Area average on the 1990 histogram, implying that segregation increased.

On the histogram for service workers for 1970, the distribution is clustered around 1.0, implying an almost even distribution in tracts across the Metropolitan Area (Figures 4.15 and 4.16). In 1970 seventy-one percent of census tracts had location quotients between 0.8 and 1.2. However, 87 percent of 1990 tracts were in this range. This signifies that tracts increasingly had similar levels of service workers. The distribution of service workers expanded with the development of the new suburbs. The refinement of 1990 census tracts is another cause for increasing numbers of tracts approximating 1.0. More of the newly created tracts were in the inner city/old industrial suburbs, mature suburbs, and new suburbs. Few new tracts were in the exurbs, where service workers are less present. This is revealed on the 1990 maps for service workers (Figures 4.7 and 4.8). Concentrations clustered around the Metropolitan Area average reveal a more even

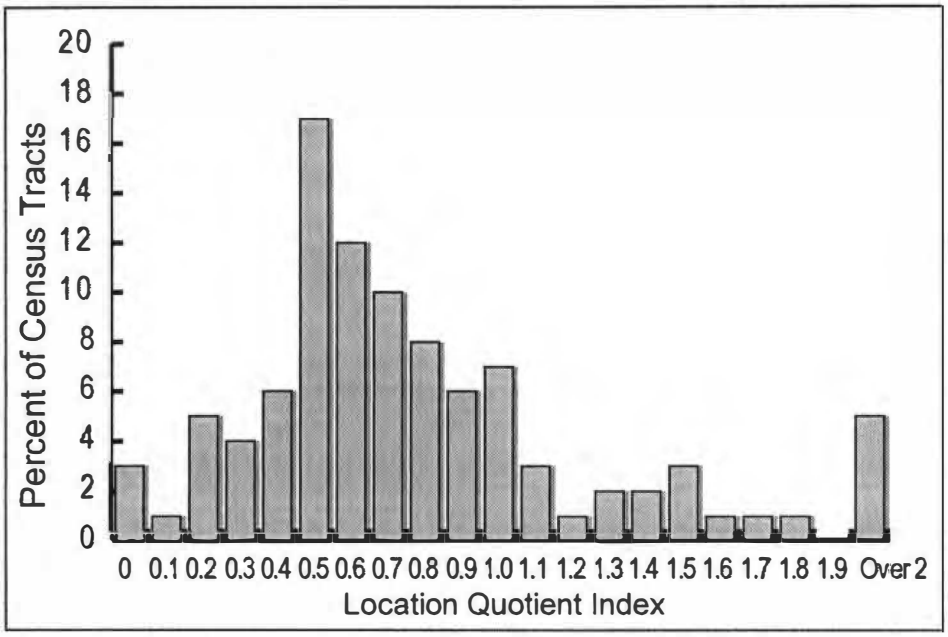

Figure 4.13. Distribution of census tracts with professionals 1970.
Source: U.S. Census, 1970

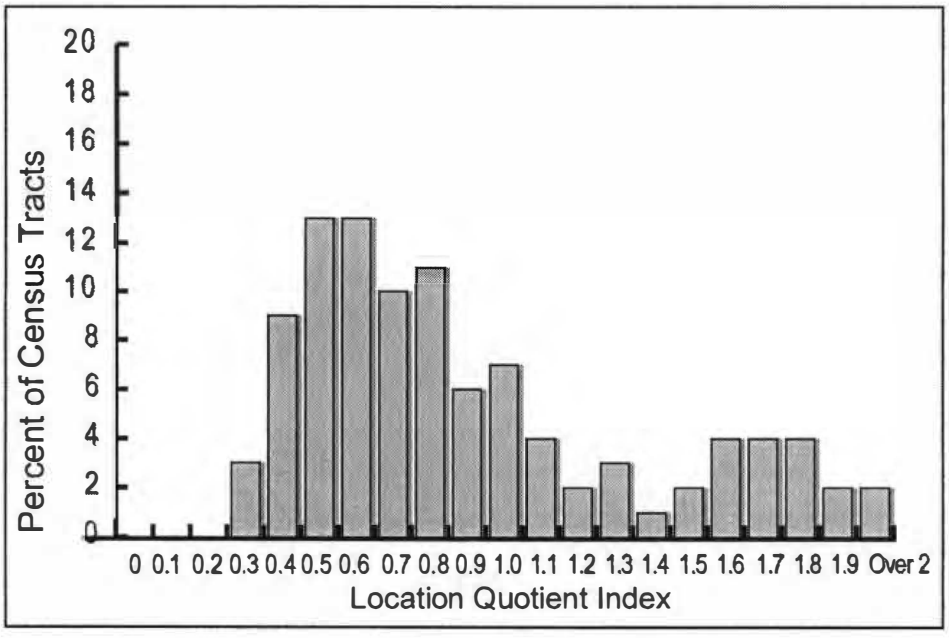

Figure 4.14. Distribution of census tracts with professionals 1990.
Source: U.S. Census, 1990

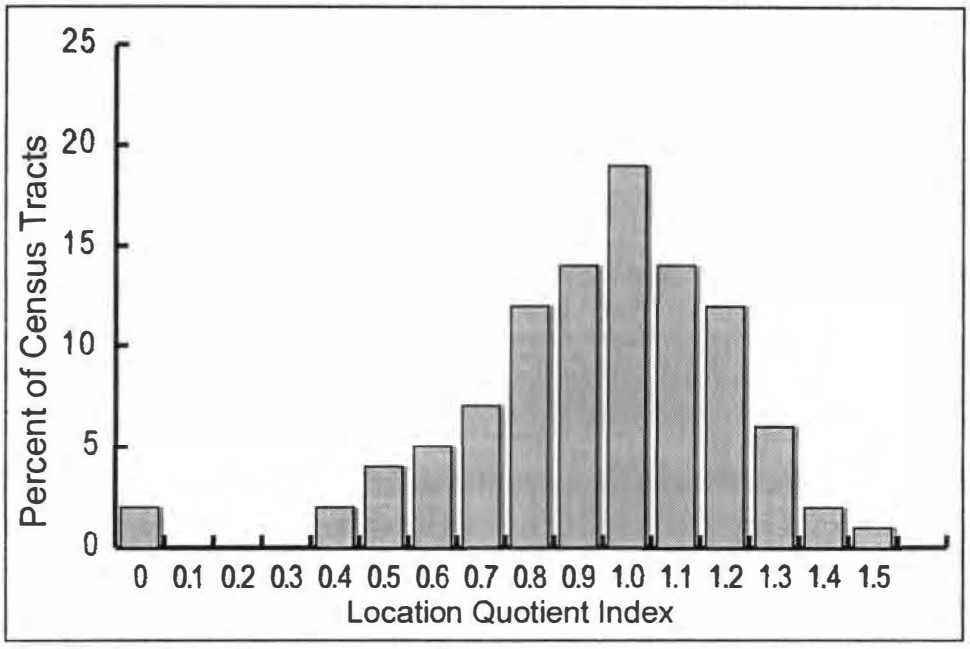

Figure 4.15. Distribution of census tracts with service workers 1970. Source: U.S. Census, 1970

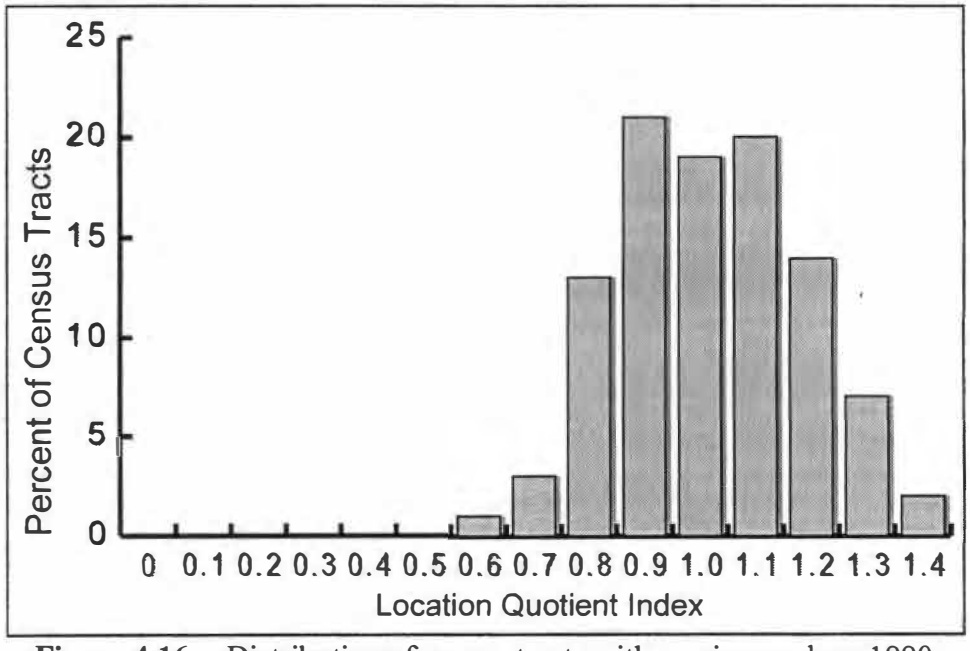

Figure 4.16. Distribution of census tracts with service workers 1990. Source: U.S. Census, 1990

distribution. However, strong concentrations exist in the inner city/old industrial suburbs and mature suburbs. Service worker location quotients are lowest in the new suburbs. New suburb tracts with the strongest presence of service workers are in the less affluent sections of the zone.

In 1970, there was a cluster of census tracts with location quotients for manufacturing/craft workers between 0.9 and 1.5. Seventy-one percent of tracts in the Metropolitan Area had values within this range. By 1990 this cluster had eroded to 56 percent of tracts between 0.9 and 1.5. Thirty-eight percent of the tracts in 1990 had concentrations of manufacturing/craft workers below 1.0. This is opposite of the trend for service workers. Polarization occurred in manufacturing/craft workers at the Metropolitan Area level during the economic transition. Thirty percent of the census tracts in 1990, as opposed to 18 percent in 1970, have values below 0.8. Also, 18 percent in 1990 and 11 percent in 1970 have values above 1.6. An increased number of tracts had far above or below 1.0 (Figures 4.17 and 4.18).

Occupation Coefficient of Localization

The changes in the spatial segregation of occupational classes between 1970 and 1990 can also be assessed by the coefficient of localization. Values for this measure range between 0 and 100. Zero represents an equal distribution in census tracts and indicates a lack of segregation of occupation. Conversely, a value of 100 indicates maximum segregation. By examining the segregation of occupations in the different zones several conclusions are drawn (Table 4.5). Of the Metropolitan Area's 1970 workforce, 41 percent lived in the suburbs, 32 percent in the inner city/old industrial

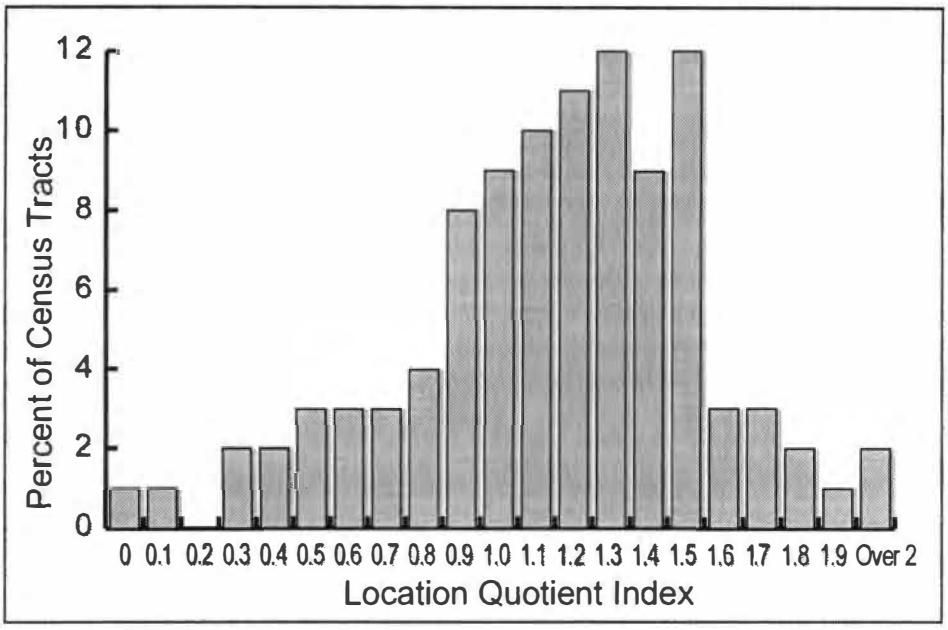

Figure 4.17 Distribution of census tracts with manufacturing/craft workers 1970.
Source: U.S. Census, 1970

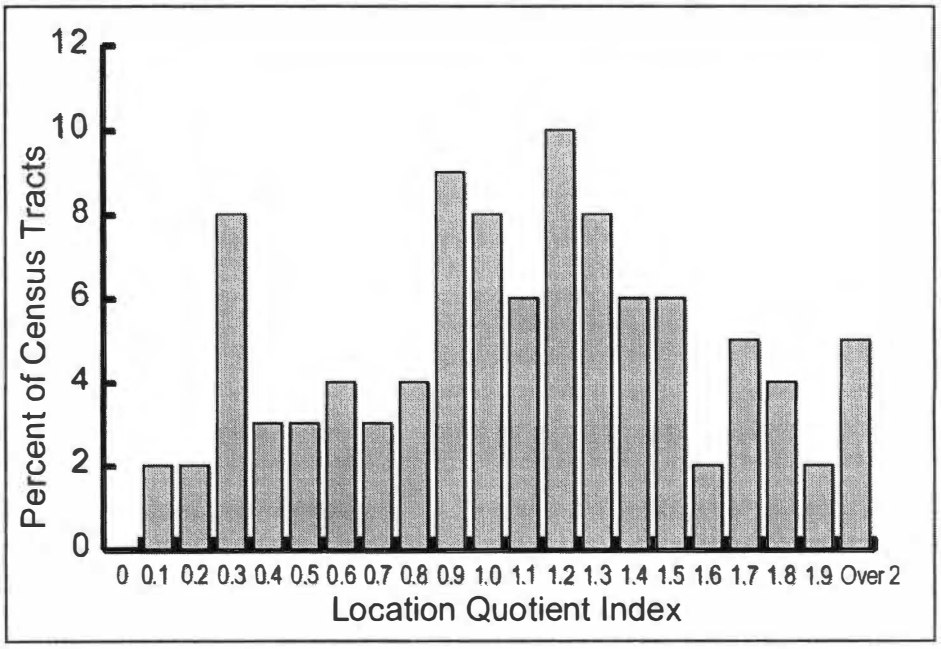

Figure 4.18 Distribution of census tracts with manufacturing/craft workers 1990.
Source: U.S. Census, 1990

Table 4.5. Index of Occupation Segregation: Coefficient of Localization

	Metropolitan Area	Inner City / Old Industrial Suburbs	Mature Suburbs	New Suburbs	Exurbs
Manufacturing/Craft					
1970	15.91	10.87	21.75	---	7.12
1990	20.98	18.57	17.87	22.25	9.53
Professionals					
1970	24.38	21.39	24.63	---	14.95
1990	20.32	24.28	20.68	13.39	12.98
Service					
1970	7.03	4.11	4.85	---	7.99
1990	6.53	6.93	4.32	4.62	4.99

Source: calculations from U.S. Census, 1970 and 1990.

suburbs, and 26 percent in the exurbs. Professionals were more segregated than manufacturing/craft workers in the Metropolitan Area and in each zone in 1970. This suggests professionals had greater discretion in location of their homes and tended to cluster in elite areas. While each occupation group had a presence in the mature suburbs in 1970, they were not evenly dispersed. In 1970 the highest degree of segregation existed for professionals and manufacturing/craft workers in the mature suburbs. This suggests that in the mature suburbs of 1970 there existed segregated sections inhabited by each of the two occupation groups.

Decisions of people and changes in economic opportunities produced alterations in the distributions of occupation groups between 1970 and 1990. By 1990, professionals had swept into the new suburbs as the dominant occupation group. The number of professionals declined in the mature suburbs, and those who remained were largely concentrated in affluent sections of the zone. This left manufacturing/craft workers in the mature suburbs where they had traditionally resided. Professionals composed 39 percent of the workforce in the new suburbs, while manufacturing/craft workers accounted for 18 percent (Table 4.2). Manufacturing/craft workers were the most spatially segregated group at the Metropolitan Area level in 1990, and had their highest level of segregation in the new suburbs.

Segregation increased in the inner city/old industrial suburbs for all occupations between 1970 and 1990. By 1990, this zone had the highest degree of segregation for all occupations except manufacturing/craft workers, who had the highest degree of segregation in the new suburbs. In 1990 segregation of occupations decreased outward from the inner city. This gradient of decline from the inner city to the exurbs is

illustrated in the coefficient of localization for professionals (Table 4.5). Professionals were most segregated in the inner city/old industrial suburbs. They were less segregated in the new suburbs and the least segregated in the exurbs. A reason for professionals' lower level of segregation is the strength of their presence. Of the tracts with location quotients for professionals over 1.0, 53 percent were in the new suburbs. Only 10 percent of the census tracts with manufacturing/craft location quotients over 1.0 were in the new suburbs.

Low coefficients of localization for 1990 indicate that service workers were more evenly distributed than the other two groups. There is less disparity and variation in the distributions of service workers because traditionally they were located throughout the Metropolitan Area. An explanation for service workers in the new suburbs is that they are members of households where other members are professionals. Teenage children and spouses of professionals may occupy service jobs.

The spatial pattern of change revealed by the coefficient of localization is an important indicator of the altered sociospatial patterns in Birmingham. The comparison of occupation distributions with income and racial statistics contribute to further understanding the emerging social ecology of post-industrial cities.

CHAPTER V

ANALYSIS OF RACIAL GROUPS

In 1970, 70 percent of the Birmingham Metropolitan Area's population was white, and 29 percent was black. By 1990, the composition was 72 percent white and 27 percent black. Changes in the racial compositions of municipalities in the Metropolitan Area also occurred between 1970 and 1990 (Table 5.1). The major trend is whites moving from Birmingham's inner city/old industrial suburbs and mature suburb zones. A relative increase in black population characterizes the municipalities in these zones. The city of Birmingham's black population increased from 42 to 63 percent over the two decades. In Bessemer, an old industrial suburb municipality, the black population increased from 52 to 58 percent. Hueytown is a municipality west of Brighton composed of mature suburbs. Its population was 0.9 percent black in 1970. However, by 1990 Hueytown was 14 percent black. Other municipalities with increasing black population include Fairfield (75% black in 1990), Lipscomb (47% black in 1990), Forestdale (18% black in 1990), Tarrant (13% black in 1990), and Midfield (10% black in 1990). The affluent, mature suburban municipality of Homewood was seven percent black in 1970 but increased to only eight percent by 1990. Affluent blacks can afford to live in this municipality, but the few who moved there did not displace whites or instigate white flight.

The trends of low and decreasing percentages of blacks in municipalities in the new suburb zone is apparent over the transition. Gardendale (1%), Center Point (4%), Fultondale (2%), Vestavia Hills (2%), and Trussville (1%) had low percentages of blacks in 1990. Mountain Brook and Pleasant Grove experienced reductions in the percentage

Table 5.1. Types of Places* and Percent Black

Place	Development Zone	1970 Population	1990 Population	1970	1990
Adamsville	Exurbs	2,412	4,233	30%	14%
Alabaster	New Suburb	2,642	14,732	42%	11%
Bessemer	Old Industrial / Mature Suburb	33,428	33,497	52%	58%
Birmingham City	Inner City / Mature Suburb	300,910	265,852	42%	63%
Blountsville	Exurbs	1,254	1,538	0%	0%
Brighton	Mature Suburb	2,277	4,518	64%	87%
Calera	Exurbs	1,655	2,136	16%	15%
Carbon Hill	Exurbs	1,929	2,124	13%	9%
Center Point (U)	Mature / New Suburbs	15,675	22,658	0%	4%
Columbiana	Exurbs	2,248	2,708	17%	20%
Cordova	Exurbs	2,750	2,704	11%	13%
Docena (U)	New Suburb	1,140	-	67%	-
Dora	Exurbs	1,862	2,214	13%	14%
Fairfield	Old Industrial / Mature Suburb	14,369	12,200	48%	75%
Forestdale (U)	Mature / New Suburbs	6,091	10,395	1%	18%
Fultondale	Mature / New Suburbs	5,163	6,400	0%	2%
Gardendale	New Suburb	6,502	9,251	0%	1%
Graysville	Exurbs	3,182	2,169	35%	35%
Helena	New Suburb	1,110	3,918	24%	7%
Homewood	Mature Suburb	21,245	22,922	7%	8%
Hoover	New Suburb	1,393	39,788	0%	3%
Hueytown	Mature Suburb	7,095	15,280	0%	14%
Irondale	Mature / New Suburb	3,166	9,454	19%	17%
Jasper	Exurbs	10,798	13,553	17%	14%
Leeds	Exurbs / New Suburb	6,991	9,905	23%	15%
Lipscomb	Old Industrial / Mature Suburb	3,225	2,892	24%	47%
Midfield	Mature Suburb	6,399	5,559	2%	10%
Montevallo	Exurbs	3,719	4,210	15%	24%
Mountain Brook	Inner City / Mature / New Suburb	19,474	19,810	1%	0%
Oneonta	Exurbs	4,390	4,808	10%	8%
Parrish	Exurbs	1,742	1,433	30%	30%
Pell City	Exurbs	5,381	8,118	25%	17%
Pleasant Grove	New Suburb	5,090	8,458	2%	2%
Ragland	Exurbs	1,239	1,807	24%	18%
Roosevelt	Mature Suburb	3,663	-	98%	-
Springville	Exurbs	1,153	1,910	19%	11%
Tarrant	Inner City/Mature Suburb	6,835	8,046	6%	13%
Trussville	New Suburb	2,985	8,266	0.1%	1%
Vestavia Hills	Mature / New Suburb	8,311	19,749	0.2%	2%
Trussville	New Suburb	2,985	8,266	0%	1%
Vestavia Hills	Mature / New Suburb	8,311	19,749	0%	2%
Vincent	Exurbs	1,419	1,767	28%	22%
Warrior	Exurs	2,621	3,280	26%	18%

* Incorporated and unincorporated places with over 1,000 persons in 1970

(U) indicates an unincorporated place

Source: calculations from U.S. Census, 1970 and 1990

of black population. In Leeds the percentage of the black population dropped from 23 to 15 percent.

The trend of predominantly nature of white new suburban municipalities should not be mistaken to imply that they are homogenous. No blacks live in Mountain Brook and only one percent of Trussville's population is black. While these municipalities are similar racially they differ in affluence. Per capita income in 1989 was $39,610 in Mountain Brook and $15,795 in Trussville. Little difference exists in per capita income for whites ($15,823) and blacks ($14,461) in Trussville.

The patterns of relative increases of blacks in the inner city/old industrial suburbs and mature suburban municipalities and whites in new suburban municipalities are revealed in the statistics for race by zone (Tables 5.2 and 5.3). The inner city/old industrial suburbs zone was 56 percent white in 1970 and decreased to 43 percent by 1990. The mature suburbs were 71 percent white in 1970 and 52 percent white in 1990. Eighty-seven percent of the new suburbs' population was white in 1990.

Statistical Assessment of Racial Groups

The location quotient and the coefficient of localization are employed in analyzing racial groups. The location quotient, which ranges from 0 to infinity, gauges the concentration of a racial group in a census tract to its concentration in the Metropolitan Area. A value of 1.0 indicates equality between the persons of a race in the tract and the Metropolitan Area. A value below 1.0 signifies a smaller concentration, whereas one above 1.0 signifies a greater concentration. The coefficient of localization measures segregation within the zones and the Metropolitan Area.

Table 5.2. Race by Zone, 1970

Zone	White	Black	Total
Inner City / Old Industrial Suburbs	129,805	102,406	232,732
Mature Suburbs	214,898	85,727	301,095
Exurbs	175,845	28,943	205,456
Total	520,548	217,076	739,283

Percent of the Metropolitan Area's Population

	White	Black	Total
Inner City / Old Industrial Suburbs	18%	14%	32%
Mature Suburbs	29%	12%	41%
Exurbs	24%	4%	28%
Total	70%	30%	

Percent of the Zone's Population

	White	Black
Inner City / Old Industrial Suburbs	56%	44%
Mature Suburbs	71%	28%
Exurbs	86%	14%

Source: calculations from U.S. Census, 1970

Table 5.3. Race by Zone, 1990

Zone	White	Black	Total
Inner City / Old Industrial Suburbs	65,962	86,455	154,055
Mature Suburbs	113,840	103,374	218,606
New Suburbs	233,918	32,913	269,511
Exurbs	241,433	22,518	265,638
Total	655,153	245,260	907,810

Percent of the Metropolitan Area's Population

	White	Black	Total
Inner City / Old Industrial Suburbs	7%	10%	17%
Mature Suburbs	13%	11%	24%
New Suburbs	26%	4%	30%
Exurbs	27%	2%	29%
Total	73%	27%	

Percent of the Zone's Population

	White	Black
Inner City / Old Industrial Suburbs	43%	56%
Mature Suburbs	52%	47%
New Suburbs	87%	12%
Exurbs	91%	8%

Source: calculations from U.S. Census, 1990

To determine how the economic transition affected the residential polarization of racial groups, location quotients were graphed for 1970 and 1990 (Figures 5.1, 5.2, 5.3, and 5.4). For whites the percentage of census tracts with location quotients over 1.0 increased, while tracts with location quotients below 1.0 increased for blacks. This indicates that the races were more segregated in 1990 than in 1970. Tracts had either low or high location quotients. The histogram for whites indicates that in 1970, 53 percent of census tracts had location quotients of 1.2 or higher, while 15 percent had 0.2 and under. The percentages for these ranges changed by 1990. While the percentage of tracts 0.2 and under declined one percent between 1970 and 1990, the share of tracts at the upper extreme increased to 62 percent. Overall, a greater percentage of census tracts had concentrations of whites above 1.0 in 1990, signifying that more tracts were predominantly white.

Histograms reveal that few tracts had location quotients near 1.0 for blacks in 1970 (Figure 5.3). Most census tracts had extremely high or extremely low location quotients, signifying disparity. This remained the case in 1990, but there were fewer tracts with location quotients for blacks around the level of equality. Ten percent of the tracts in 1970 were between 0.8 and 1.2, while only 7 percent were in this range in 1990. In 1970, 32 percent of tracts had location quotients of 1.5 or greater, and 34 percent had location quotients of 0.2 or less. By 1990, the percentage of tracts for blacks with location quotients under 0.2 had increased to 45 percent (Figure 5.4). More tracts were below the Metropolitan Area average in 1990 than in 1970. In 1970, 61 percent of census tracts had location quotients below 1.0, and by 1990 tracts in this range increased to 68 percent.

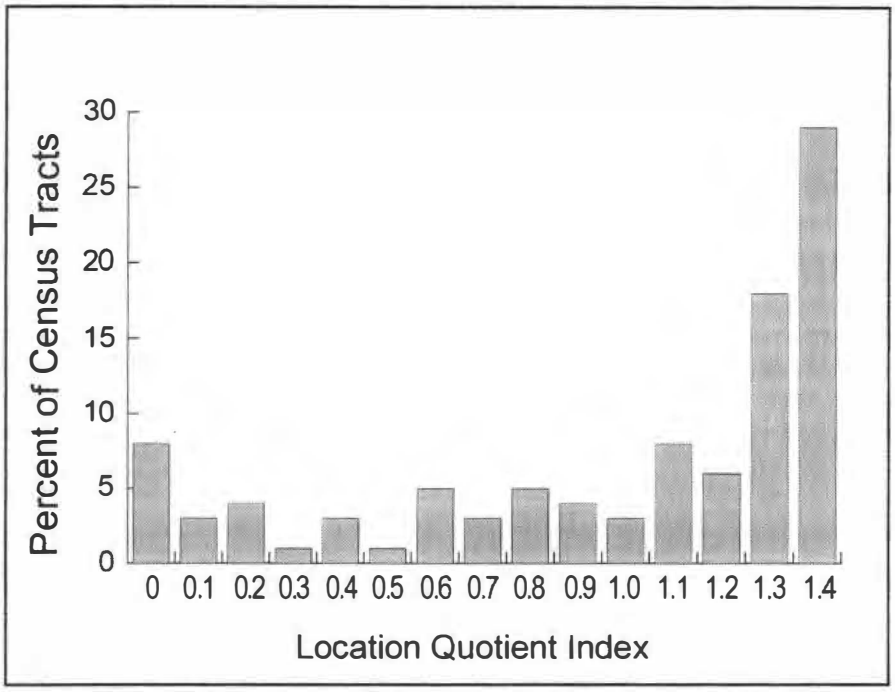

Figure 5.1. Distribution of census tracts of whites 1970.
Source: U.S. Census, 1970

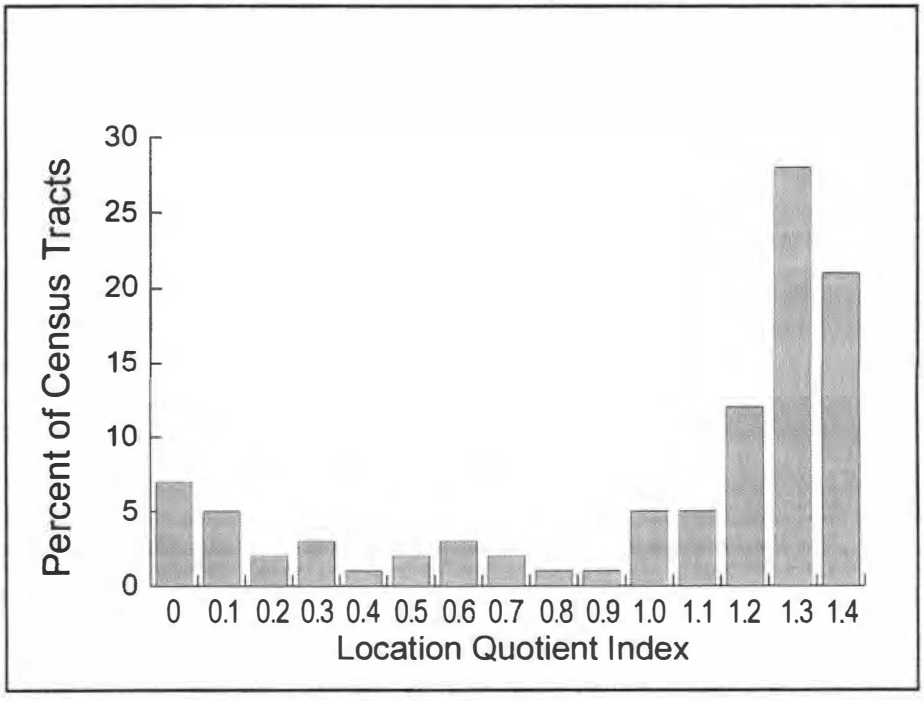

Figure 5.2. Distribution of census tracts of whites 1990.
Source: U.S. Census, 1990

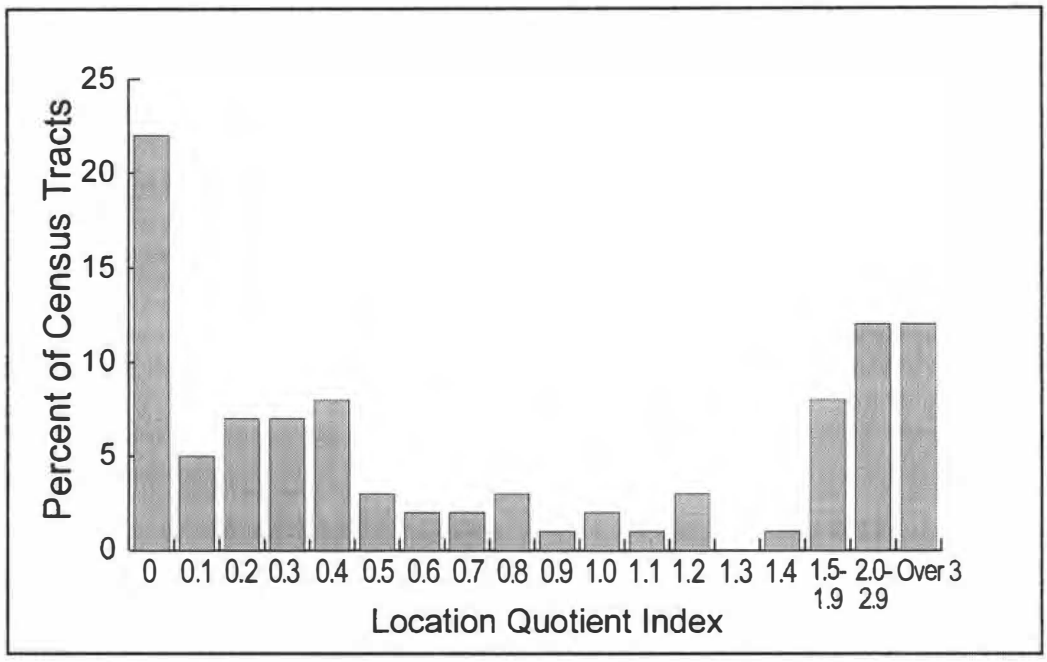

Figure 5.3. Distribution of census tracts of blacks 1970.
Source: U.S. Census, 1970

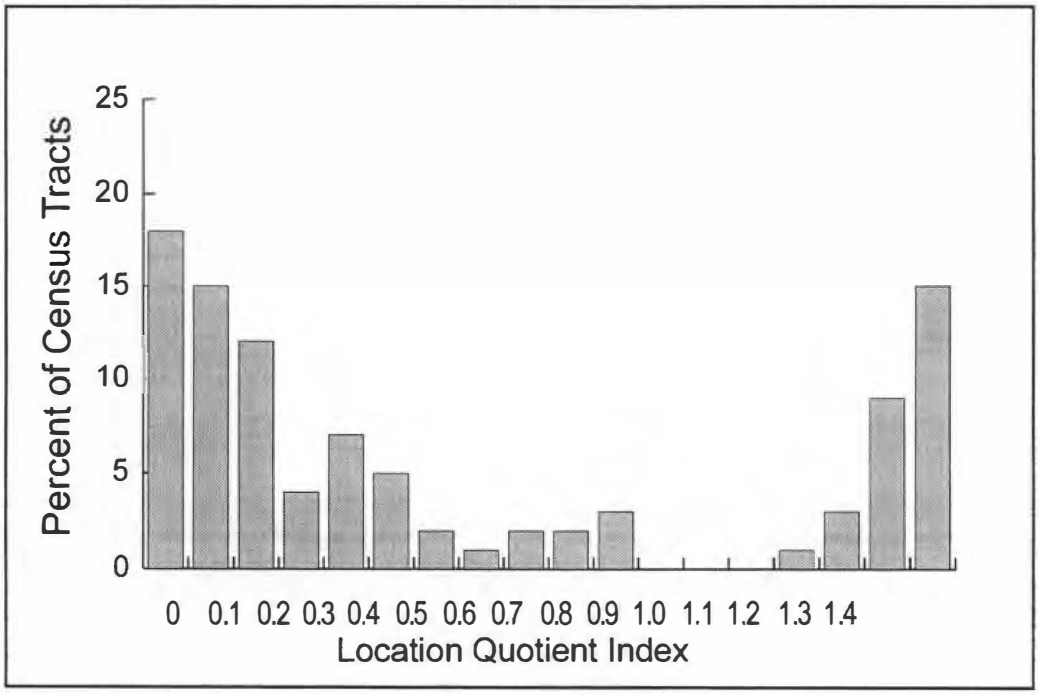

Figure 5.4. Distribution of census tracts of blacks 1990.
Source: U.S. Census, 1990

Histograms of the location quotients for the racial groups do not reveal changes specific tracts experienced. The locations of concentrations of whites and blacks were altered between 1970 and 1990. In 1970, whites were concentrated in three parts of the Metropolitan Area: pockets of the inner city/old industrial suburbs and mature suburbs in the industrial valley; affluent, mature suburbs of professionals over Red Mountain; and the exurbs (Figures 5.5 and 5.6). The location of the pockets of whites in the inner city/old industrial suburbs is revealing, for these areas experienced noticeable change in their racial composition by 1990. Census tracts with high concentrations of whites, signified by high location quotients, include ones in Lipscomb, Fairfield, Brighton, Center Point, and an area south of Tarrant and north of Interstate 20/59 extending to East Lake. In 1990 areas of the inner city/old industrial suburbs and mature suburbs with high location quotients for whites in 1970 had noticeably smaller white populations (Figures 5.7 and 5.8). Flight of whites from the inner city/old industrial suburbs and mature suburbs to the new suburbs and exurbs is the prevailing trend. Redrawing of census tract boundaries make it problematic to directly compare tracts experiencing change.

Location quotients of census tracts with high concentrations of blacks were largely in the inner city/old industrial suburbs and the mature suburbs of Jones Valley in 1970 (Figures 5.9 and 5.10). One cluster extended from Ensley through Thomas to North Birmingham. On the Ensley edge of this cluster were two tracts with particularly high concentrations. Another cluster extended northeast from Bessemer through Brighton to Midfield and into Fairfield.

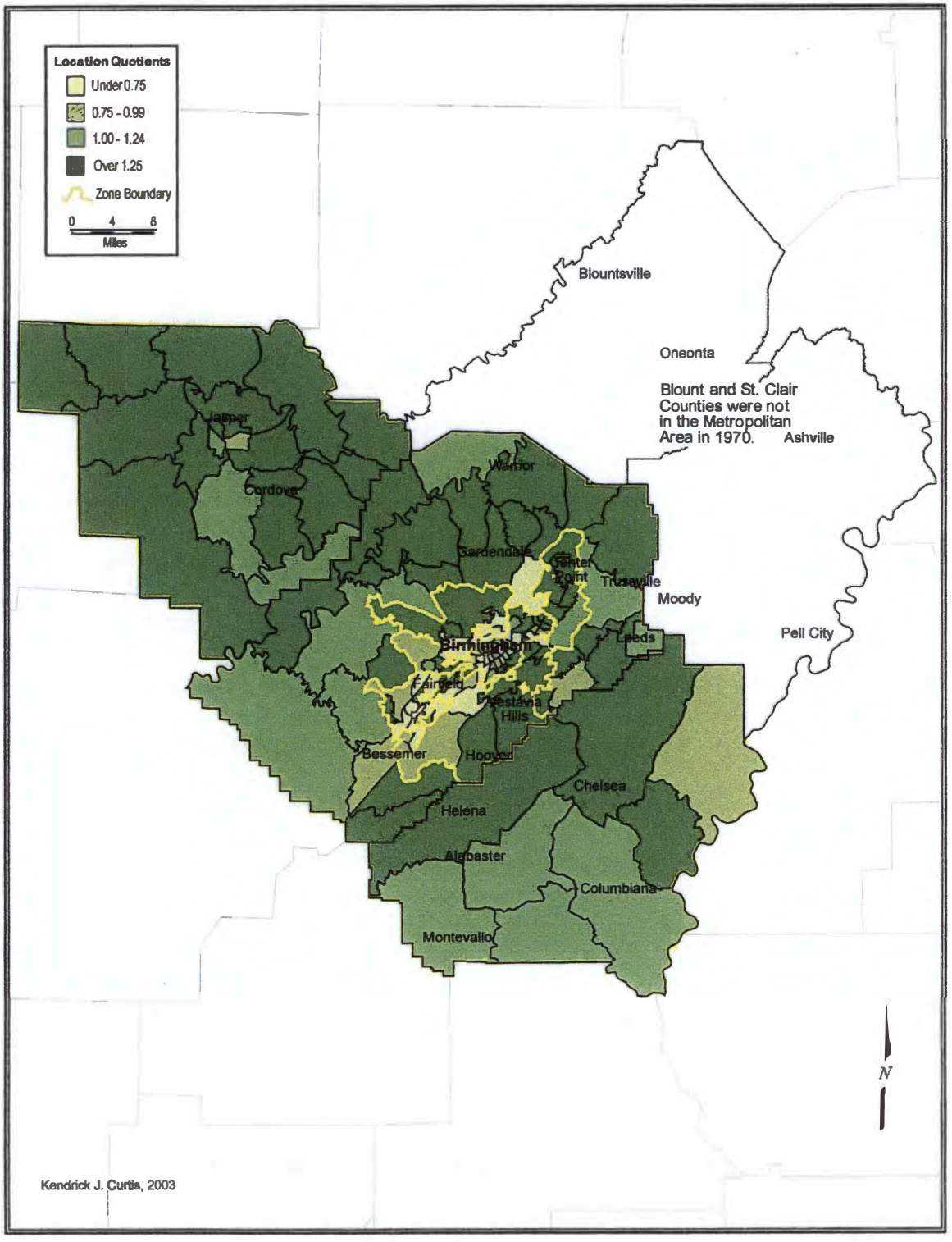

Figure 5.5. Location quotients for whites 1970.
Source: U.S. Census, 1970.

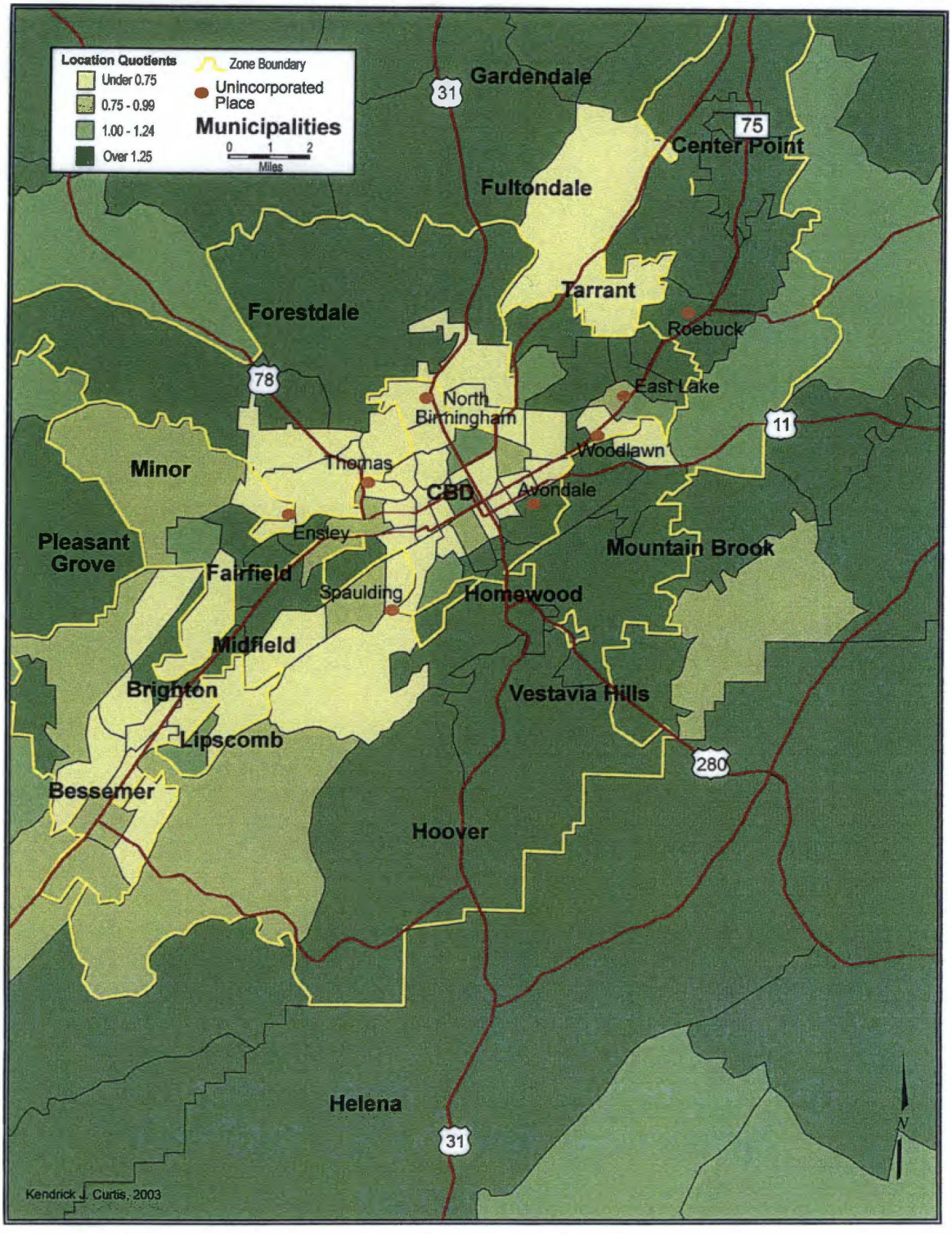

Figure 5.6. Location quotients for whites 1970. Urbanized Area. Source: U.S. Census, 1970.

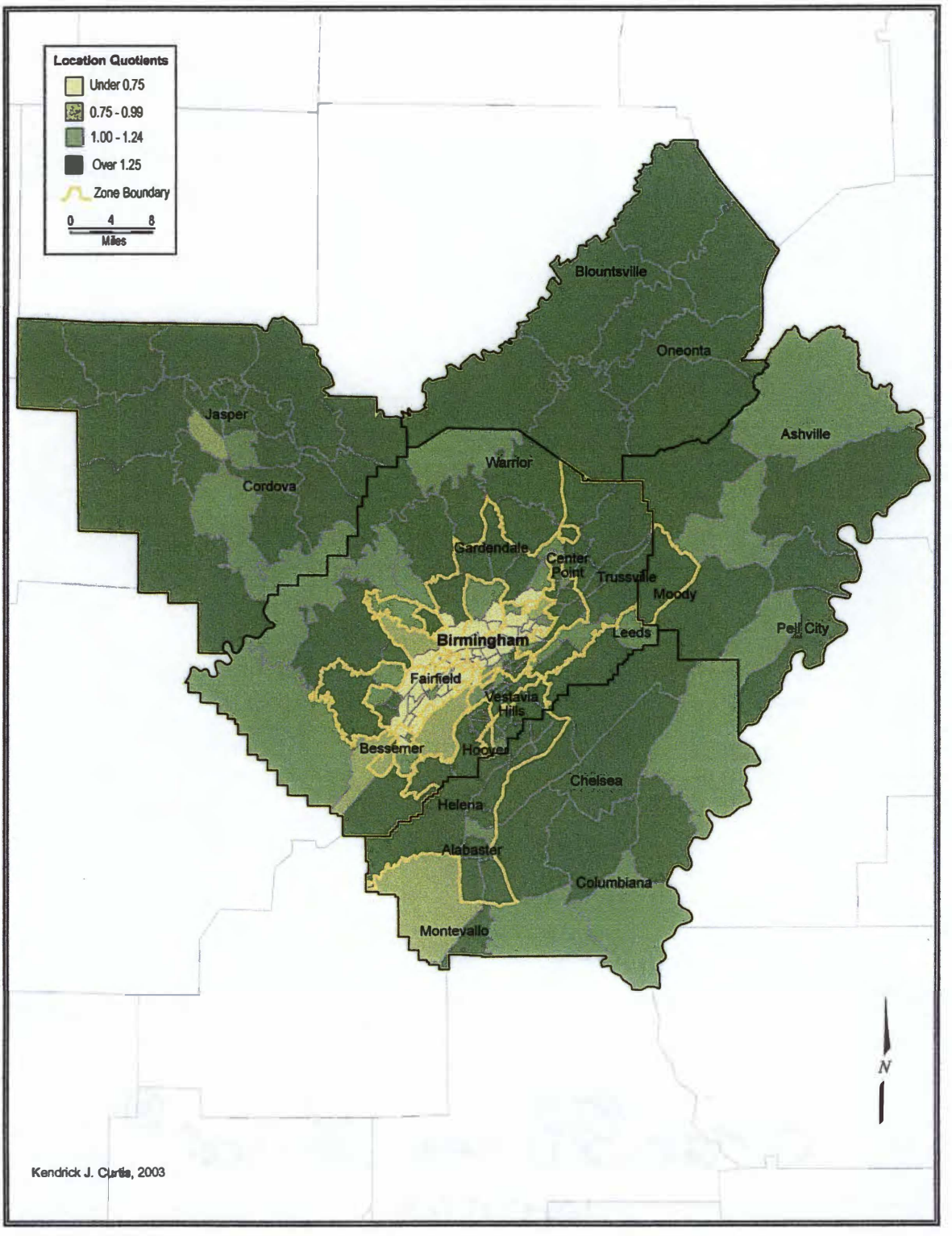

Figure 5.7. Location quotients for whites 1990.
Source: U.S. Census, 1990.

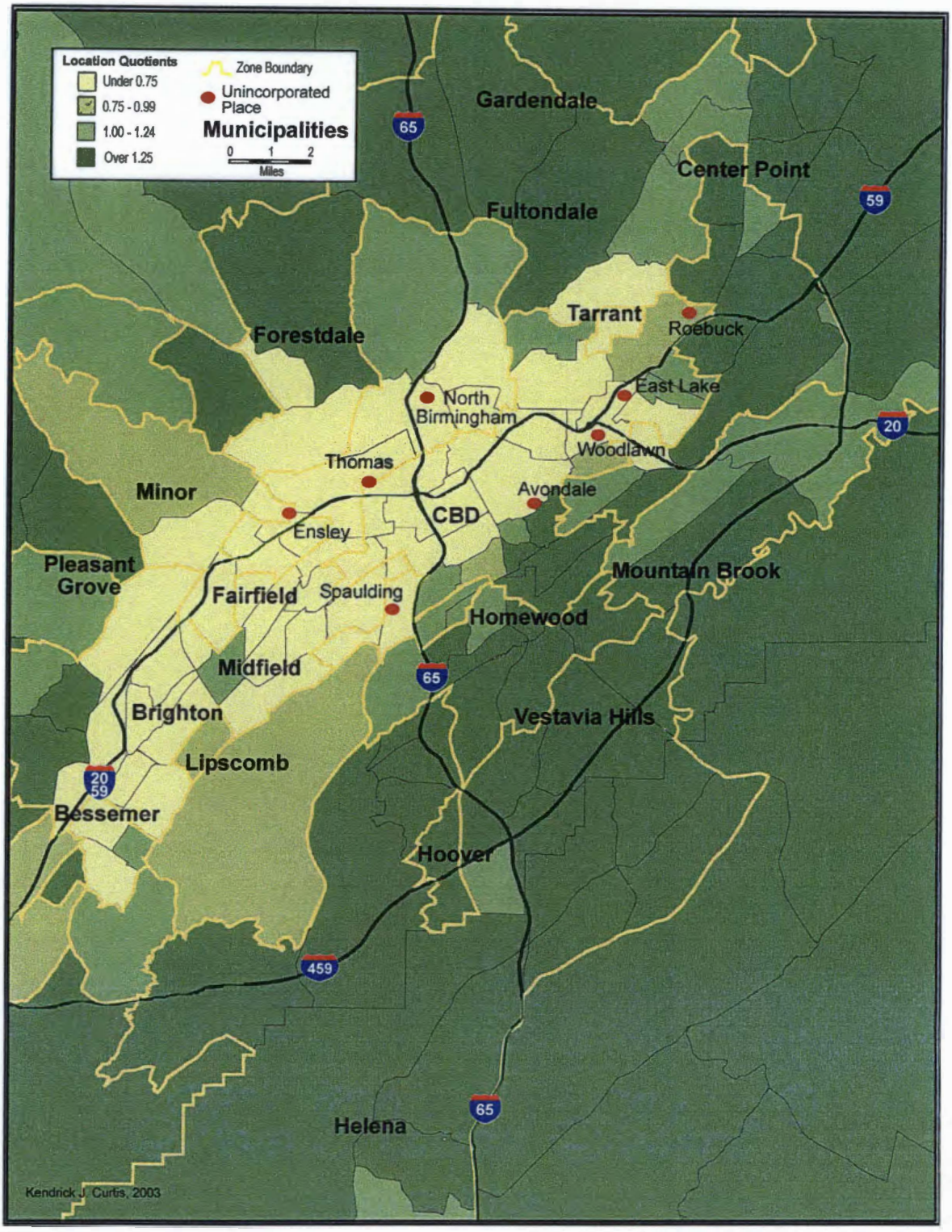

Figure 5.8. Location quotients for whites 1990. Urbanized Area. Source: U.S. Census, 1990.

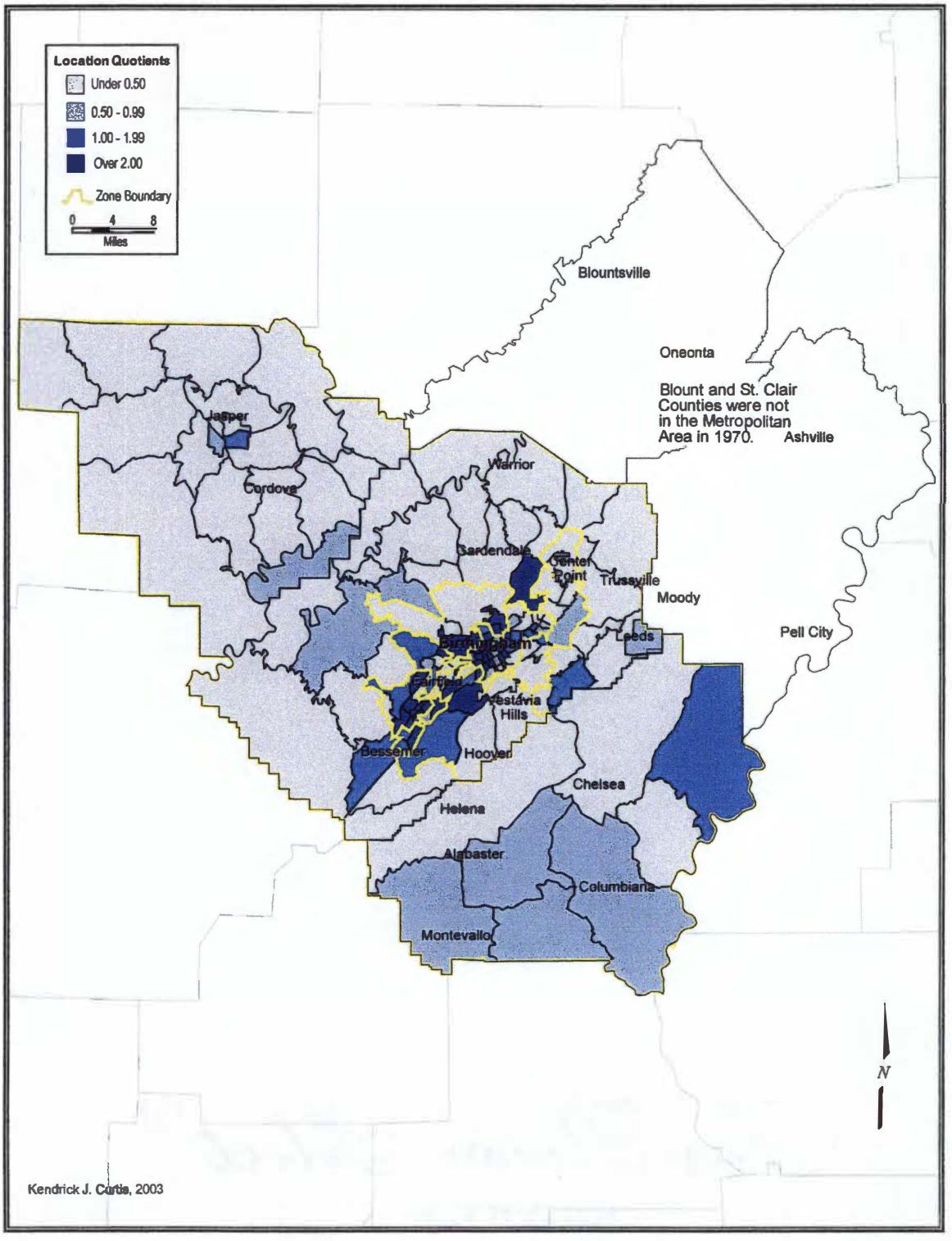

Figure 5.9. Location quotients for blacks 1970.
Source: U.S. Census, 1970.

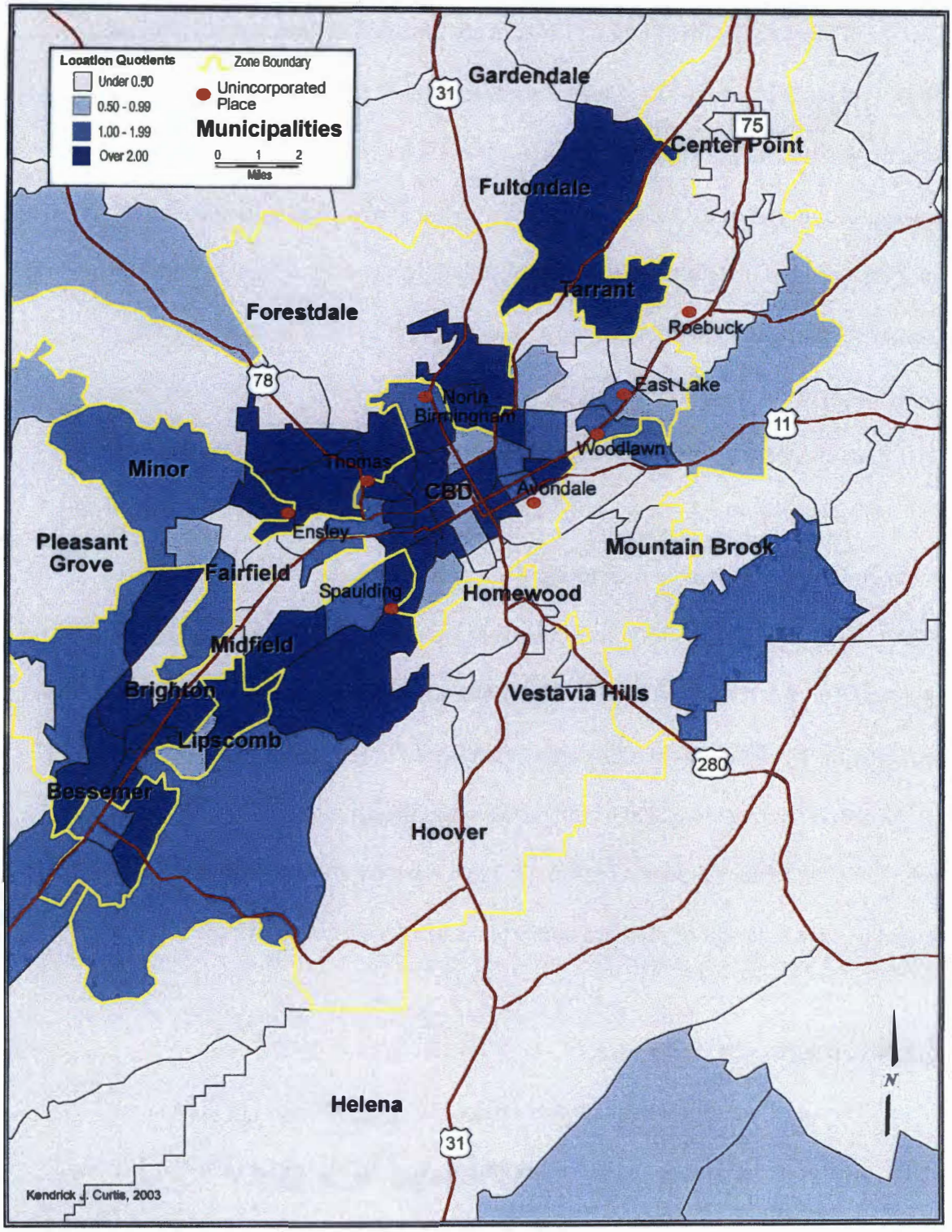

Figure 5.10. Location quotients for blacks 1970. Urbanized Area. Source: U.S. Census, 1970.

Changes in the distribution of blacks are revealed in the location quotients for 1990 (Figures 5.11 and 5.12). Clusters of census tracts in the inner city/old industrial suburbs and the mature suburbs, which had low location quotients for blacks in 1970, experienced increases by 1990. The only lingering census tract with low values for blacks is centered on Midfield. In 1990 Midfield was still predominantly home to white manufacturing/craft or service workers. The black population increased in this municipality from two percent in 1970, to 10 percent in 1990. Midfield's population is older than the Metropolitan Area average in 1990 (18% versus 13% were over 65 years old). Although Midfield was a racial anomaly in 1990, the older population of whites had begun to give way to an increasing black population. In other parts of the Metropolitan Area, concentrations of blacks spread eastward into tracts between East Lake and Tarrant. Census tracts directly south of the CBD experienced increased quotients for blacks by 1990. This area extends into Homewood west of U.S. Highway 31. However, this is the extent of the incursion of blacks into the "over the mountain" area. Only six of the 52 new suburb tracts have location quotients for blacks over 1.0, and the six are adjacent to predominantly black sections of other zones.

Race Coefficient of Localization

The coefficient of localization is utilized to gauge changes in the spatial segregation of racial groups in the Metropolitan Area and in zones between 1970 and 1990 (Table 5.4). Values range between 0 and 100. Zero represents an equal distribution of a race among census tracts, indicating a lack of segregation. Conversely, a value of 100 signifies maximum segregation among tracts.

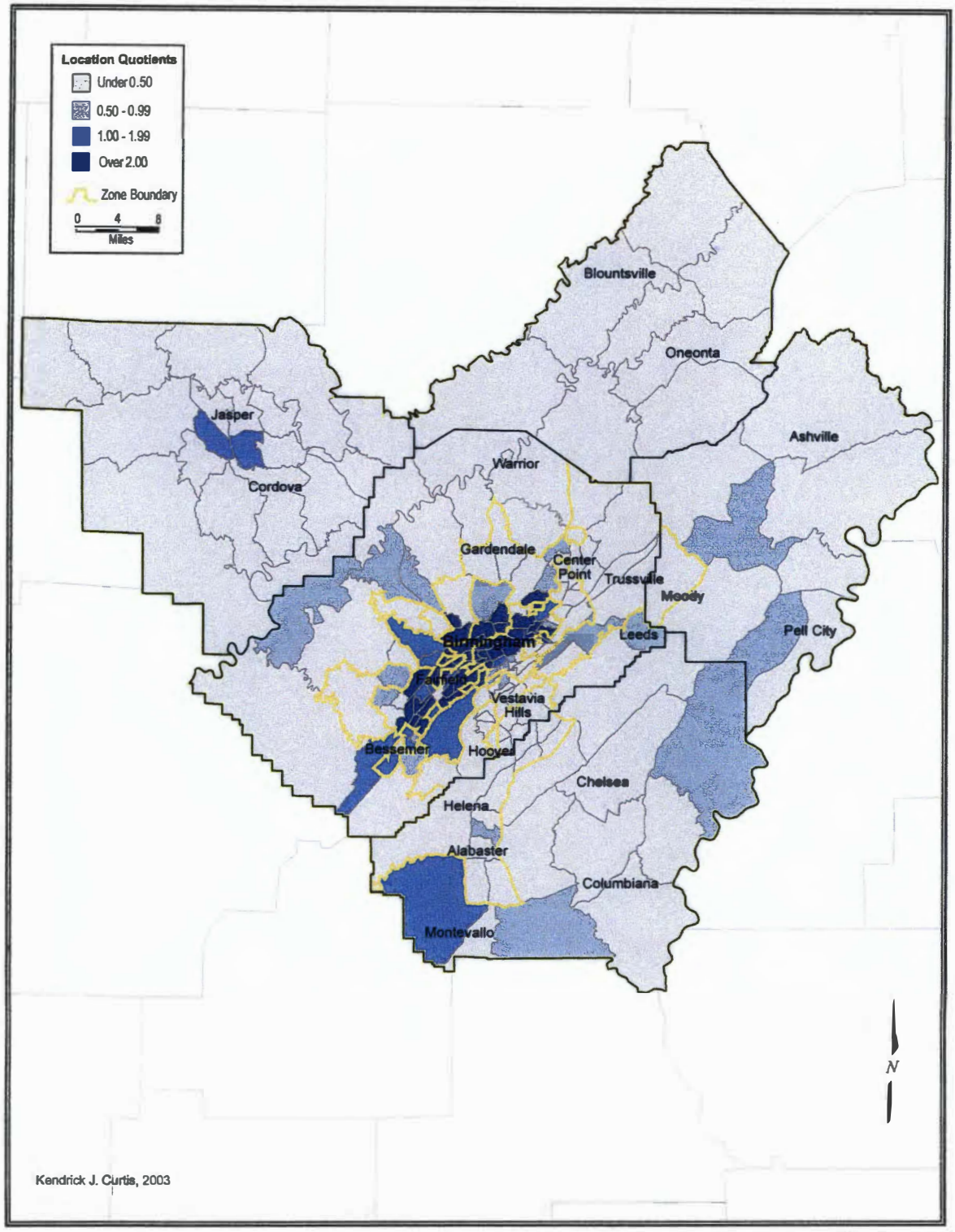

Figure 5.11. Location quotients for blacks 1990.
Source: U.S. Census, 1990.

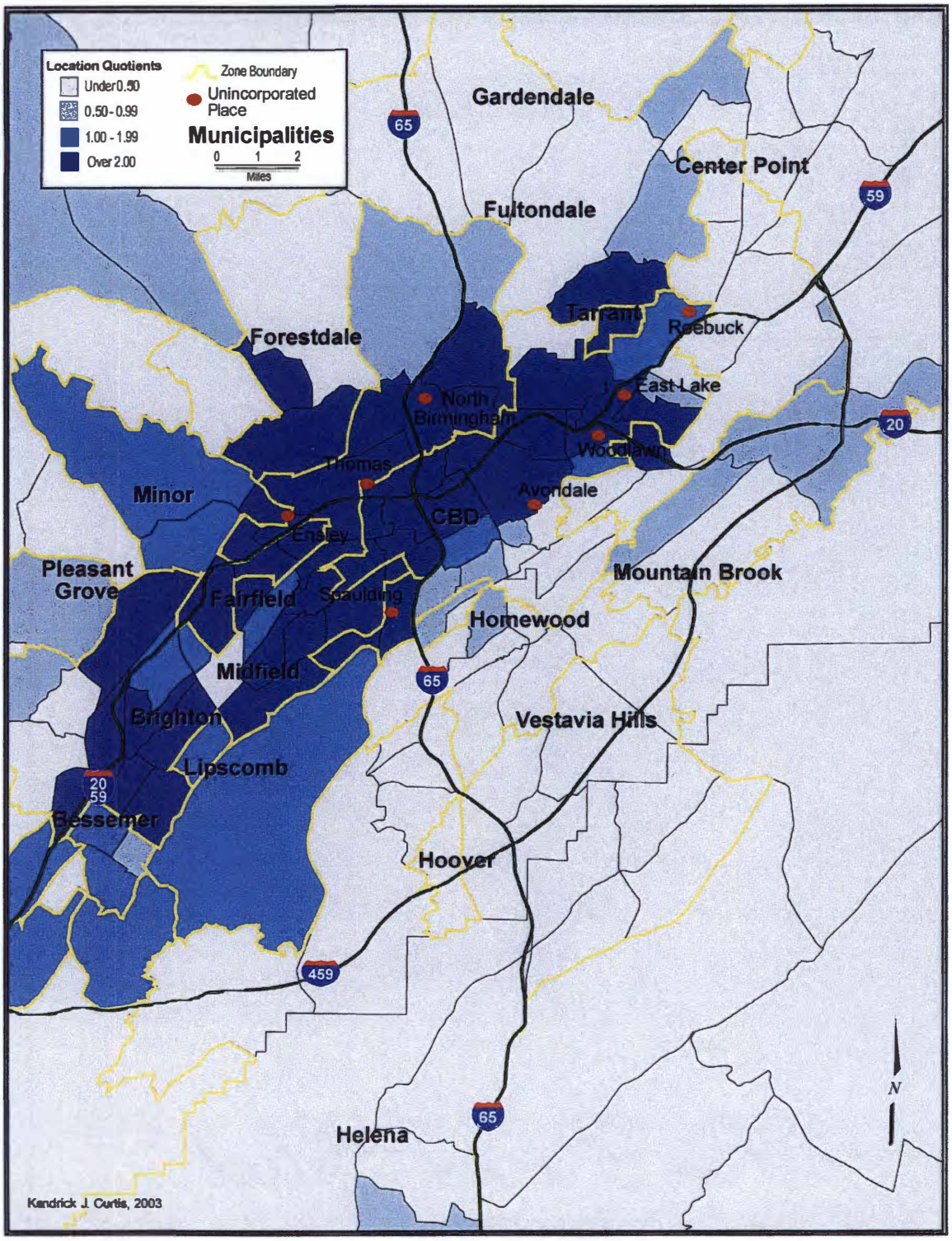

Figure 5.12. Location quotients for blacks 1990. Urbanized Area. Source: U.S. Census, 1990.

Table 5.4. Index of Racial Segregation: Coefficient of Localization

	Metropolitan Area	Inner City / Old Industrial Suburbs	Mature Suburb	New Suburb	Exurbs
White					
1970	19.84	26.79	21.74	---	6.27
1990	19.57	33.55	36.42	7.55	3.86
Black					
1970	47.65	34.03	54.56	---	37.44
1990	52.47	25.82	40.42	54.1	41.58

Source: calculations from U.S. Census, 1970 and 1990.

No appreciable change occurred in segregation of whites at the Metropolitan Area level between 1970 and 1990, but changes occurred within the various zones. In 1970, whites were most segregated in the inner city/old industrial suburbs and the least segregated in the exurbs. Over the twenty-year period, segregation increased for whites in the inner city/old industrial suburbs and mature suburb zones. The percentage of the white population living in the mature suburbs dropped from 29 to 13 percent (Tables 5.2 and 5.3). The coefficient of localization increased, giving the mature suburbs the highest level of segregation for whites in the Metropolitan Area. Blacks increased from 28 percent of the mature suburb population in 1970 to 47 percent in 1990. As blacks increased, the level of segregation for whites rose from 21.74 to 36.42. Blacks became increasingly evenly distributed; their coefficient of localization dropped from 54.56 to 40.42.

In 1990 the level of segregation for whites in the new suburbs was lower than had been in the mature suburbs in 1970. The new suburbs were 87 percent white, while the mature suburbs were 52 percent white in 1990. Blacks, a small portion of the new suburb population (12%), were more segregated in this zone than in any other. This is indicated in the high coefficient of localization of 54.1.

CHAPTER VI

SAMPLE STUDY OF TRENDS

Statistical analysis of income, occupation, and race reveals sociospatial change in the Birmingham Metropolitan Area between 1970 and 1990. To obtain a more comprehensive understanding of the changes, it is important to examine example cases. Census tracts in each of the four zones are analyzed. Data for the case studies are from the 1990 Census of Population and are in Appendix III.

Inner City and Old Industrial Suburbs

Census tracts south and southeast of the CBD differ from other tracts in the inner city. Professionals earning high salaries reside in this area of Birmingham. Census tract 47.02 southeast of the CBD is representative (Figures 6.1 and 6.2). This census tract has the highest location quotient in the Metropolitan Area for professionals (2.17) and low quotients for manufacturing/craft (0.23) and service workers (0.67). The per capita income was $29,175 in 1989 and was more than twice that ($13,082) for the Metropolitan Area. Tract 47.02 is 97 percent white, two percent black, and one percent Asian. The largest age group, 34 percent, is between 30 and 49.

Occupation and education characteristics explain the level of affluence in census tract 47.02. Fifty-eight percent of the population 25 and older hold a bachelor's or higher degree. Blacks in the tract are well-educated. The proportion of children enrolled in private schools is the second highest in the Metropolitan Area. Fifty-two percent in kindergarten through the twelfth grade are in private schools. Managerial and professional specialty occupations account for over half (59%) of the tract's workers.

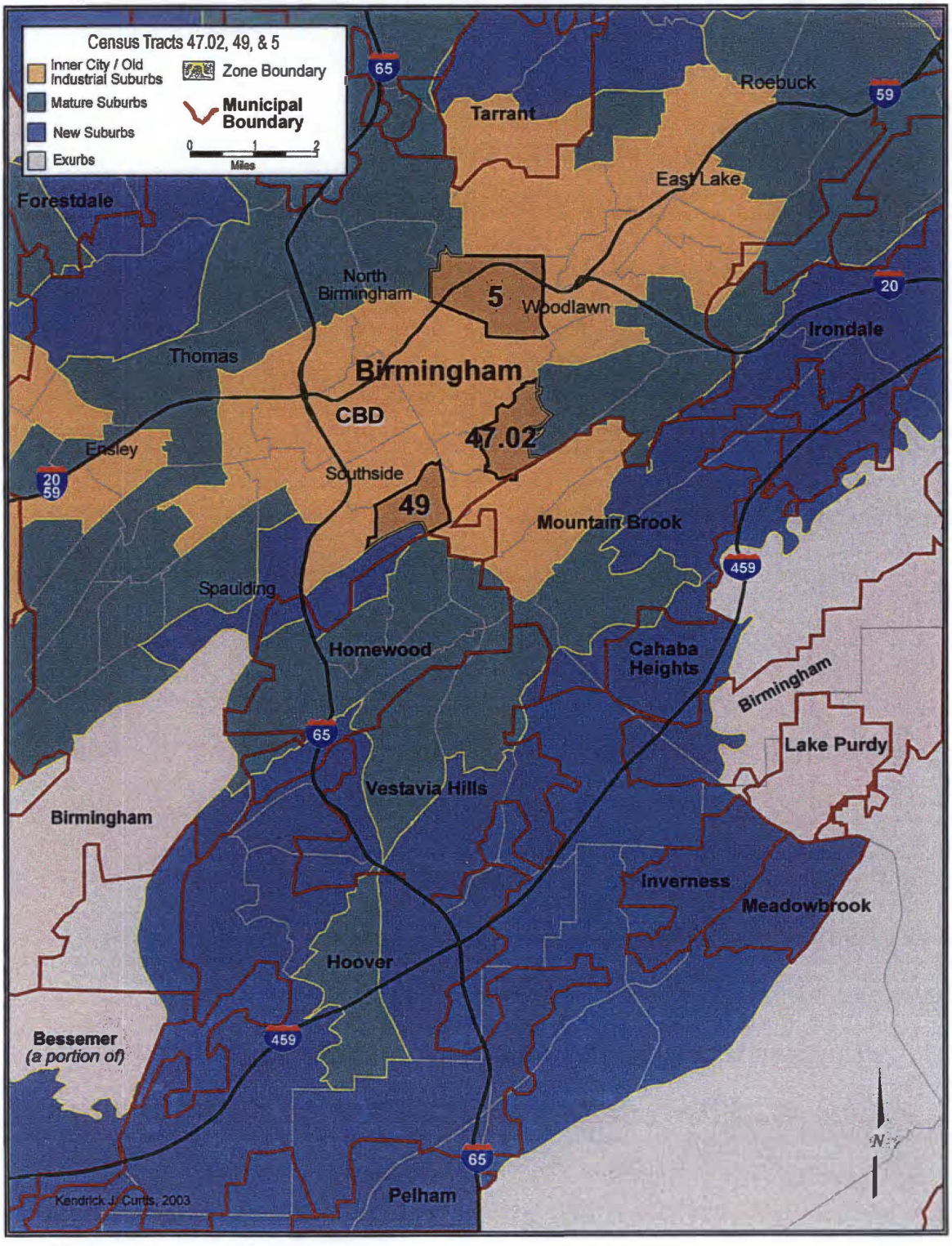

Figure 6.1. Case studies in the inner city/old industrial suburbs. Source: U.S. Census, 1990

Example 1

Example 2

Figure 6.2. Inner city housing, census tract 47.02. Kendrick J. Curtis, 2003.

Seventy-seven percent of the workforce is employed in the central city. The means of transportation to work reveal the proximity of home to work and level of affluence. Eighty-nine percent of the workforce drives to work alone. The commute is a 10 to 19 minute trip for 55 percent. Few households in the tract (2%) depend on public assistance. Fifty-six percent have interest, dividend, or rental income.

Census tract 49 lies between the southern portion of the CBD and the northern face of Red Mountain. It is part of the area known as Southside. Of the 5,056 people residing in the tract in 1990, 71 percent were white, 26 percent were black, and three percent were Asian. The workforce of census tract 49 is professional, but not as affluent as that of tract 47.02 (Figures 6.1 and 6.3). A high professional location quotient of 1.55 reflects the tract's professional composition. Location quotients for manufacturing/craft (0.61) and service workers (0.86) are low. Although per capita income ($15,551) is lower than in tract 47.02, it exceeds the per capita income for the Metropolitan Area. Males comprise 56 percent of the population, compared to 47 percent in the Metropolitan Area. Fifty-seven percent of the population are between ages 25 and 49 and 19 percent between 16 and 24. The predominant household is non-family (74%). Twelve percent of households are married couples with no children. Forty percent have never married, compared to 20 percent in the Metropolitan Area.

Leading occupations in census tract 49 are managerial and professional specialty (36%), administrative support and clerical (15%), service (11%), and technician (11%). A minimal portion of the labor force is employed as craft and production workers (6%), machine operators (4%), and laborers (4%). Seventy-two percent of the labor force work in the central city, compared to the Metropolitan Area average of 52 percent. Driving to

Example 1

Example 2

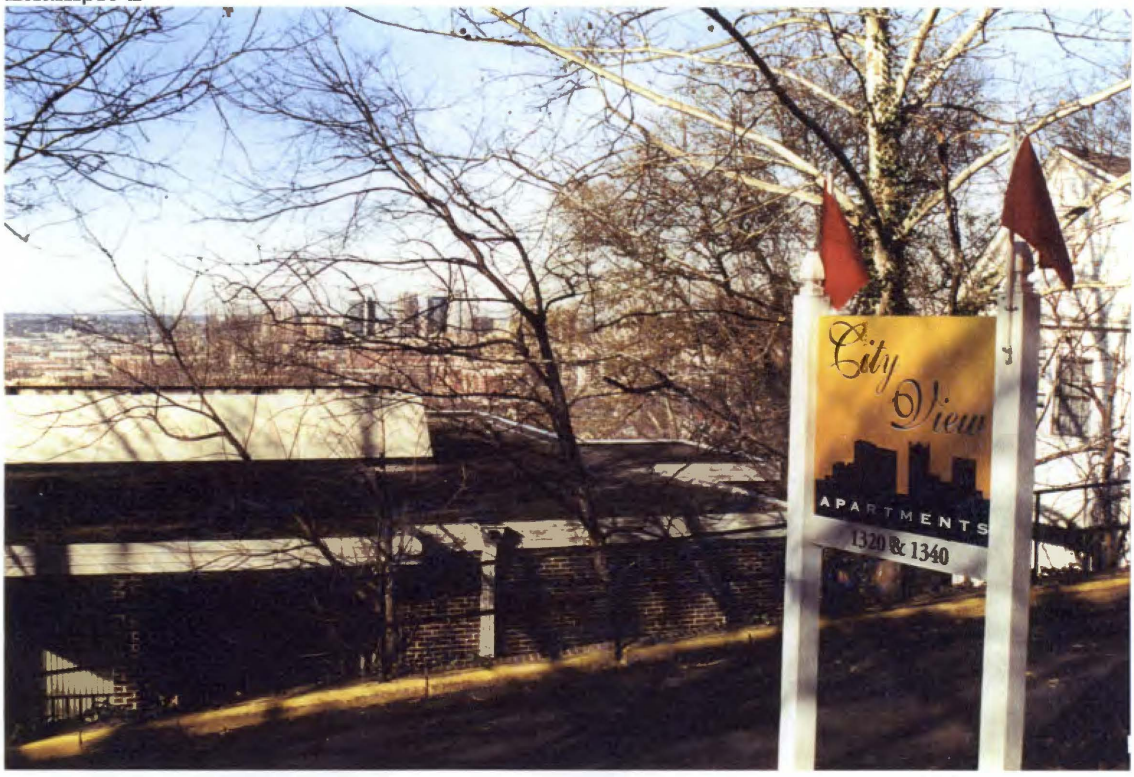

Figure 6.3. Inner city housing, census tract 49. Kendrick J. Curtis, 2003.

Example 3

Example 4

Figure 6.3. Continued.

work alone, while by far the preferred transportation means, is lower (74% compared to 81%) than in the Metropolitan Area. The most notable difference is the seven percent who walk or bicycle, compared to the one percent in the Metropolitan Area. Of the 290 people who bicycle to work in the Metropolitan Area, 19 percent live in census tract 49. Forty-six percent of the workforce travel between 10 and 19 minutes to work, while only four percent travel more than 35 minutes.

Education enrollment and attainment levels of people in census tract 49 reveal the population's stage in life, affluence, and attitude toward education. This is largely a neighborhood of young adults. Twenty-one percent attend college. Forty-three percent of whites hold a bachelor's or a higher degree, and 68 percent of blacks have one or more years of college. The proportions differ for the races in age groups in school. More blacks than whites are enrolled in kindergarten through the twelfth grade. However, more whites are enrolled in college. This is explained in part by the age of the population. Twenty-nine percent of the blacks are between 25 and 29, while 28 percent of the whites are between 30 and 39. Also, 21 percent of whites are over 50, but only three percent of blacks are over 50. There were few blacks in this neighborhood in 1970. The growth in the black population resulted from an influx of young black professionals and service workers. College students were predominantly white and had scholarships or other financial assistance, enabling them to rent apartments while attending the University of Alabama at Birmingham. Eighty-four percent of the occupied housing units in census tract 49 are rented. Some people rent to avoid homeownership responsibilities; others rent temporarily until they begin families and enter another life stage. Young professionals are attracted to the flexibility and mobility renting offers.

In comparing the two professional inner city neighborhoods, census tract 47.02 is an area of established professionals further advanced in careers and life stage than the young professionals and college students inhabiting census tract 49. Tract 49 is a more transitory neighborhood than tract 47.02.

In order to understand less affluent inner city neighborhoods and how their populations differ from those in census tracts 47.02 and 49, tract 5 was selected for study (Figures 6.1 and 6.4). Census tract 5 is an example of a destitute inner city neighborhood. The tract is located in the Woodlawn area near the Birmingham International Airport. In 1990 this tract was home to 6,624 people, with a slightly greater percentage of females (56%) than the Metropolitan Area (53%). The greatest number of people are under age 15 (27%). With 64 percent between ages 25 and 64, a large portion of the population is in prime working years. Census tract 5 is 96 percent black and only 4 percent white. The Metropolitan Area average is 27 percent black, but the city of Birmingham is 63 percent black. Of the 2,449 households, a much lower percent are married-couple families, 25 percent, compared to the Metropolitan Area's 57 percent. Fewer people in this tract were ever married, 69 percent versus the Metropolitan Area's 80 percent. Females head 37 percent of households, compared to 14 percent in the Metropolitan Area. Non-family households are only slightly higher than the Metropolitan Area average, 34 compared to 27 percent.

The population in census tract 5 is poorer than in the Metropolitan Area as a whole and poorer than the inner city tracts south of the CBD. The tract's per capita income was $5,506 in 1989. Per capita income is approximately the same for whites as for blacks. The tract's median income ratio (0.35) is below the Metropolitan Area's

Example 1

Example 2

Figure 6.4. Inner city housing, census tract 5. Kendrick J. Curtis, 2003.

average. Lower percentages of households have wage or salary income (67% versus 78%), interest income (7% versus 32%), or retirement income (10% versus 16%) than in the Metropolitan Area. A greater share of households have income from social security (35% versus 29%) and public assistance (21% versus 7%). Tract 5's lower level of affluence is evident in the higher percent of the workforce that carpools, 30 percent, compared to the Metropolitan Area's 14 percent. Thirteen percent travel between 5 and 9 minutes to work, 40 percent between 10 and 19 minutes, and 41 percent between 20 and 34 minutes.

Census tract 5 is principally inhabited by manufacturing/craft and service workers. The location quotients for manufacturing/craft (1.40) and service (1.22) workers are above the Metropolitan Area levels. Sectors of the economy employing the greatest percentages of the labor force are retail trade (24%), manufacturing (18%), and health services (14%). Regarding occupations, service workers (33%) followed by machine operators (15%) are leaders. The location quotient for professionals is low (0.32). Only 7 percent of the workforce have managerial and professional specialty occupations, compared to 59 percent in census tract 47.02 and 26 percent in the Metropolitan Area. The level of handlers, equipment cleaners, and laborers (8%) is double the 4 percent in the Metropolitan Area.

The education level of census tract 5's population reveals the residents' attitude toward upward mobility. Students in public elementary through high school comprise 22 percent of the population. Also, the tract has a lower percent enrolled in college than the Metropolitan Area average. Forty-nine percent of the residents do not hold a high school degree, 26 percent are high school graduates, and only 4 percent have a bachelor's or

higher degree. Census tracts 47.02, 49, and 5 reveal inequalities between affluent and depressed inner city neighborhoods.

Mature Suburbs

The mature suburb zone is a residential area that developed between the end of the Second World War and 1970. Development occurred on the edges of the inner city/old industrial suburbs. Census tracts in both affluent and depressed areas of the mature suburbs are chosen as case studies. Census tract 107.03 is in an affluent area south of Red Mountain in south-central Jefferson County. Located on the eastern side of Homewood and adjacent to Mountain Brook, tract 107.03 lies between U.S. Highways 280 and 31 (Figure 6.5). The southern boundary is formed by Shades Creek Parkway. Tract 107.03 is predominantly a residential area. In 1990 it was home to 2,299 persons, 99 percent of whom were white. Asians accounted for the remaining one percent. Blacks were minimal in this affluent "over the mountain" area, but most census tracts contained small black populations. However, the population of census tract 107.02, adjacent to tract 107.03 on the west, is 15 percent black. Tracts 107.03 and 107.02 were examined to determine if racial composition creates other differences. Most of the population of tract 107.03 are 15 and under (21%), 35 to 49 (22%), and over 65 (24%). These are also the primary age ranges for tract 107.02. The age ranges of tract 107.03 approximate those of the Metropolitan Area. However, the population of this tract is slightly more elderly than the population in the Metropolitan Area. The percentage of Metropolitan Area population over 65 is 13 percent.

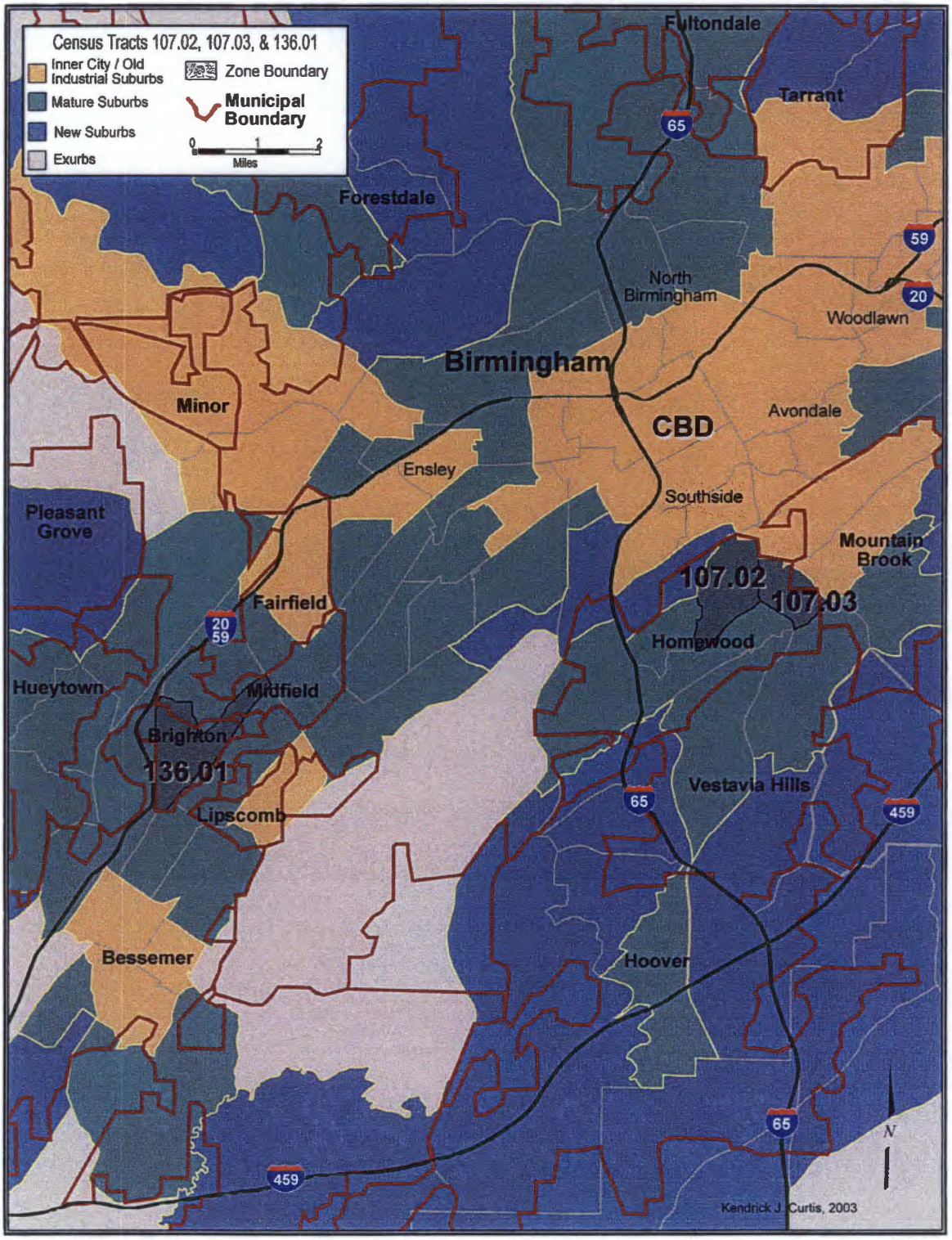

Figure 6.5. Case studies in the mature suburbs.
Source: U.S. Census, 1990

Census tract 107.03 is home to professional whites. Fifty-two percent of the labor force is employed in managerial and professional occupations. The location quotient (1.79) reveals the prevalence of professionals. Manufacturing/craft (0.25) and service worker (0.92) location quotients are well below the Metropolitan Area averages. Tract 107.02 has a slightly lower quotient for professionals (1.60) and slightly higher quotients for manufacturing/craft (0.43) and service workers (0.94) than tract 107.03. Family and household structures are principal differences between the two tracts. Non-family households are higher in tract 107.02 (41%) than in tract 107.03 (27%). Tract 107.03 has a higher percentage of persons (21%) who have never been married than tract 107.02 (17%). However, married couples comprise 61 percent of households in tract 107.03, compared to 42 percent in tract 107.02. Tract 107.03 also has a greater percentage of married couple households without children under 18. A weaker family structure in tract 107.02 is apparent in that females head 14 percent of households compared to 11 percent in tract 107.03.

The age of housing stock and permanence of the residents in the two tracts further expose dissimilarities. Census tract 107.03 has a more permanent population than tract 107.02. In 1990, fifty percent of the population had lived in tract 107.03 more than 10 years and 20 percent more than 30 years, compared to 39 percent and 13 percent in tract 107.02. Dwellings are larger in tract 107.03 (Figure 6.6). In 1990, seventy-five percent of dwellings had three or more bedrooms, while only 50 percent had that many in tract 107.02. In 1990 dollars, the median value of a house in tract 107.02 was $90,500, compared to $119,300 in tract 107.03. Fewer people rent in tract 107.03 (16%) than in 107.02 (39%). Median gross rent in tract 107.02 was $371 in 1990, $38 dollars lower

Example 1

Example 2

Figure 6.6. Mature suburbs housing, census tract 107.03. Kendrick J. Curtis, 2003.

than rent in tract 107.03. Assessing rent in regard to race reveals limitations faced by blacks. Eighty-five percent of whites in tract 107.02 paid $300 or more monthly rent, while only 35 percent of blacks paid this amount. Blacks living in the tract are unable to spend as much on housing as whites. They can not afford to buy the more expensive housing in tract 107.03, restricting them to lower cost housing in tracts such as 107.02.

To evaluate the diversity of inhabitants of mature suburbs, economically depressed census tract 136.01 is compared with tracts 107.02 and 107.03. Tract 136.01 encompasses the majority of the city of Brighton (Figure 6.5). The town developed along the streetcar line to the east of the Woodward Iron Company. Although it was incorporated in 1901, only nine percent of the housing units in 1990 were built before 1939. The tract is classed as a mature suburb since 56 percent of the units were built between 1950 and 1969 and only eleven percent after 1970. In 1990, 5,053 people lived in tract 136.01. Forty-eight percent are male and 52 percent are female. The tract is 76 percent black and 23 percent white.

The level of school enrollment in tract 136.01 approximates the Metropolitan Area average, and proportionally, there is no difference in enrollment in regard to race. The educational attainment level for the population is below the Metropolitan Area average, particularly in regard to persons possessing a bachelor's degree, two percent compared to 12 percent in the Metropolitan Area. Educational attainment for whites is slightly lower than for blacks. Forty-one percent of the whites have less than a high school education, compared to 39 percent for blacks. Only one percent of whites in this tract hold a graduate or professional degree, while four percent of the black population have one. The low educational attainment levels are reflected in income and type of

employment. In 1990 a large part of the labor force of census tract 136.01 was employed in manufacturing/craft occupations, revealed in the high location quotient (1.5). The level of service workers, with a location quotient of 1.1, approximated the Metropolitan Area average, but the level of professionals (0.43) was below the average. The share of the tract's workforce employed as handlers and laborers (10% versus the Metropolitan Area's 4%); machine operators, assemblers, and inspectors (10% versus 6%); and production, craft, and repair workers (15% versus 12%) reveal the importance of manufacturing in Brighton.

The low-skill service and manual labor workers in census tract 136.01 have meager incomes. Per capita income was $7,354 in 1989. The poverty of the population is reflected in sources of income. Only 38 percent of the tract's population is in the labor force, compared to 45 percent in the Metropolitan Area. Nine percent of households, compared to 32 percent in the Metropolitan Area, have interest, dividend, or rental income. More people in tract 136.01 receive retirement income, social security benefits, and public assistance than in the Metropolitan Area. The low incomes of the population are evident in their mode of transportation to work. Twenty-one percent of the workforce commuted in carpools. This exceeds the percent in the Metropolitan Area (14%) and the more affluent tracts (7% in tract 47.02).

Low incomes are revealed in the housing of tract 136.01. The same percentages of households rent and owned homes in this tract as in the Metropolitan Area. The median value of a house was $29,700 in 1990, compared to $58,600 in the Metropolitan Area. Median gross rent was $29 less than the Metropolitan Area average in 1990. The population is more stable than in many census tracts. Twenty-seven percent of the

households in 1990 had lived in the tract since before 1960. Married couples are a smaller portion of households, while females head a greater percent than in the Metropolitan Area. Many census tracts of the mature suburb zone are left behind, but the few affluent tracts reveal increased polarity since 1970.

New Suburbs

The new suburb zone developed after 1970, and the Metropolitan Area's professional elite increasingly moved to it during the economic transition. However, the new suburb zone is not home exclusively to affluent professionals. This zone includes areas with diverse and transitory populations. A low percentage of blacks is characteristic of most census tracts.

To assess the nature of the professional population, census tracts 129.03 in Vestavia Hills and 129.08 in Hoover are examined (Figure 6.7). In 1990, the 2,050 households in census tract 129.03 contained 6,341 people, 99 percent of whom were white. One percent was Asian; there were no blacks. Most of the households are in the prime working and family rearing years. In 1990, twenty-eight percent of the population was between 35 and 49, and 26 percent was under 15. Only nine percent was between ages 25 and 34, and another nine percent was over 65. Married couples with children (43%) and without children under 18 (38%) account for most of the households. The adults are established professionals who can afford to live in new housing.

The employment and income structure reveal the affluent, professional nature of tract 129.03's population (Figure 6.8). The professional location quotient (1.84) is among the highest in the Metropolitan Area. Service workers (0.86) are slightly below

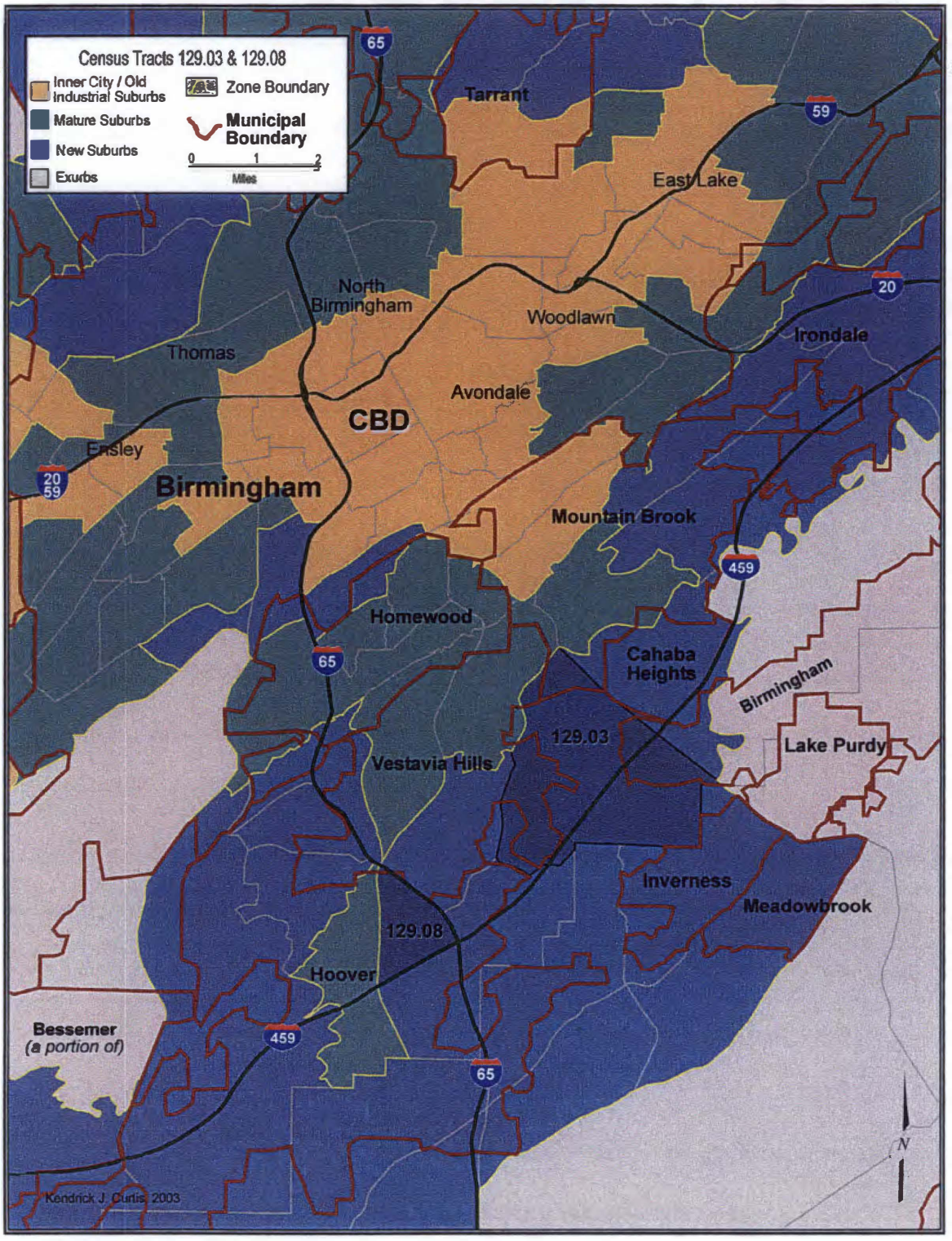

Figure 6.7. Case studies in the new suburbs (tracts 129.03 and 129.08). Source: U.S. Census, 1990

Example 1

Example 2

Figure 6.8. New suburbs housing, census tract 129.03. Kendrick J. Curtis, 2003.

the Metropolitan Area average, indicated by a value of 1.0, and manufacturing/craft workers (0.30) are far below. Fifty-two percent of the labor force is employed in managerial and professional specialty occupations. Other leading occupations included sales (21%) and administrative support and clerical (11%). The tract's affluent nature is reflected in the 90 percent of the workforce, versus 81 percent in the Metropolitan Area, that commutes alone. Forty percent commutes between 10 and 19 minutes, while 45 percent commutes between 20 and 34 minutes. High salaries for professional occupations enable high standards of living and amenities. Per capita income was $26,999 in 1989, and the median household income was $66,120, which exceeded the Metropolitan Area average. Census tract 129.03 has one of the top five median income ratios (2.42) in the Metropolitan Area. Education attainment levels are high. Thirty-eight percent of the population has a bachelor's degree, and 20 percent has a graduate or professional degree. Eight percent of the population attend college, and 23 percent are in kindergarten through the twelfth grade.

Commercial development accompanied the increase in the affluent population. In Hoover near the intersection of Interstate Highways 459 and 65 is census tract 129.08, a residential area with commercial development (Figure 6.7). Various landuses in the tract serve the city of Hoover. The Hoover Municipal Center Complex, including a library and park around Howard Lake, attracts people beyond the immediate area. The tract also has large churches, automotive dealerships, grocery stores, and various other commercial establishments. The Riverchase Galleria, a regional shopping mall, is located on the edge of the tract.

Of the 4,531 people in tract 129.08 in 1990, 55 percent were female, 93 percent were white, and three percent were black. No age group is noticeably dominant. The percentage of nonfamily households is higher than in other new suburban tracts. Forty-six percent of households are nonfamily, contrasted to 27 percent in the Metropolitan Area. A much lower percentage of households are married couples with children under 18 (16%). The percent of people who were never married (25%) is higher than in the Metropolitan Area (20%).

Fragmented by roads and congestion, census tract 129.08 is less desirable than other new suburb tracts. Housing stock reveals much about the neighborhood (Figures 6.7 and 6.9). The tract, the old residential core of Hoover, is a neighborhood of small houses started during the late 1960s and built out in the 1970s. The fragmented nature of development discouraged the building of large suburban homes. Apartments were built to capitalize on the centrality of the location and to fit the high density, small housing character. Contrary to the nature of adjacent new residential census tracts, renters largely dominate tract 129.08. In 1990 sixty-seven percent of the occupied housing was rental property. The older housing stock provides affordable dwellings for persons who are unable to live in new subdivisions. For young people beginning their careers, tract 129.08 is an area in which to live until becoming established. It also offers affordable suburban housing for elderly people. Fifty-two percent of census tract 129.08's workforce is employed outside the city of Birmingham. The means of transportation to work is overwhelmingly single-passengers in motor vehicles (91%). The commute times are slightly shorter than in other new suburb tracts. Forty-two percent travel between 10 and 19 minutes, while 41 percent travel between 20 and 34 minutes.

Example 1

Example 2

Figure 6.9. New suburbs housing, census tract 129.08. Kendrick J. Curtis, 2003.

Example 3

Figure 6.9. Continued.

The education level of tract 129.08 is higher than the Metropolitan Area average. However, it is lower than affluent new suburb tracts. Thirty-two percent of the population in tract 129.08 has a bachelor's or higher degree, compared to 18 percent in the Metropolitan Area. The occupational structure differs from other new suburb tracts. A principal difference is fewer managers and professionals and more persons in sales, administrative support, and clerical occupations. In 1989 per capita income was $18,467 in tract 129.08 compared to $26,959 in the more affluent tract 129.03.

To evaluate the middle class segment of the new suburb zone's population, census tract 111.06, encompassing much of the city of Trussville, was selected for study (Figures 6.10 and 6.11). In 1990, ninety-six percent of the 5,449 people in tract 111.06 were white and four percent were black. The occupation structure varies only one percentage point from the Metropolitan Area average in seven of ten occupational categories. The location quotients for professionals (1.18), service workers (0.92), and manufacturing/craft workers (0.92) are close to 1.0. Thirty-two percent of the labor force is managerial and professional. The middle class composition of tract 111.06 is also reflected in means of transportation to work. In the tract and the Metropolitan Area 81 percent commute to work alone, while 14 percent carpool. For half the tract's labor force the commute is a trip of 20 to 34 minutes and a drive of 35 to 59 minutes for another 10 percent.

Census tract 111.06 exceeds the Metropolitan Area median income ratio. The ratio for the tract is 1.31. Per capita income was $16,299 for whites and $10,220 for blacks in 1989. The percent of households with income from wages or salaries, interest, dividends, and rent surpasses the Metropolitan Area. A smaller percentage of households receive income from public assistance and social security than on average in the

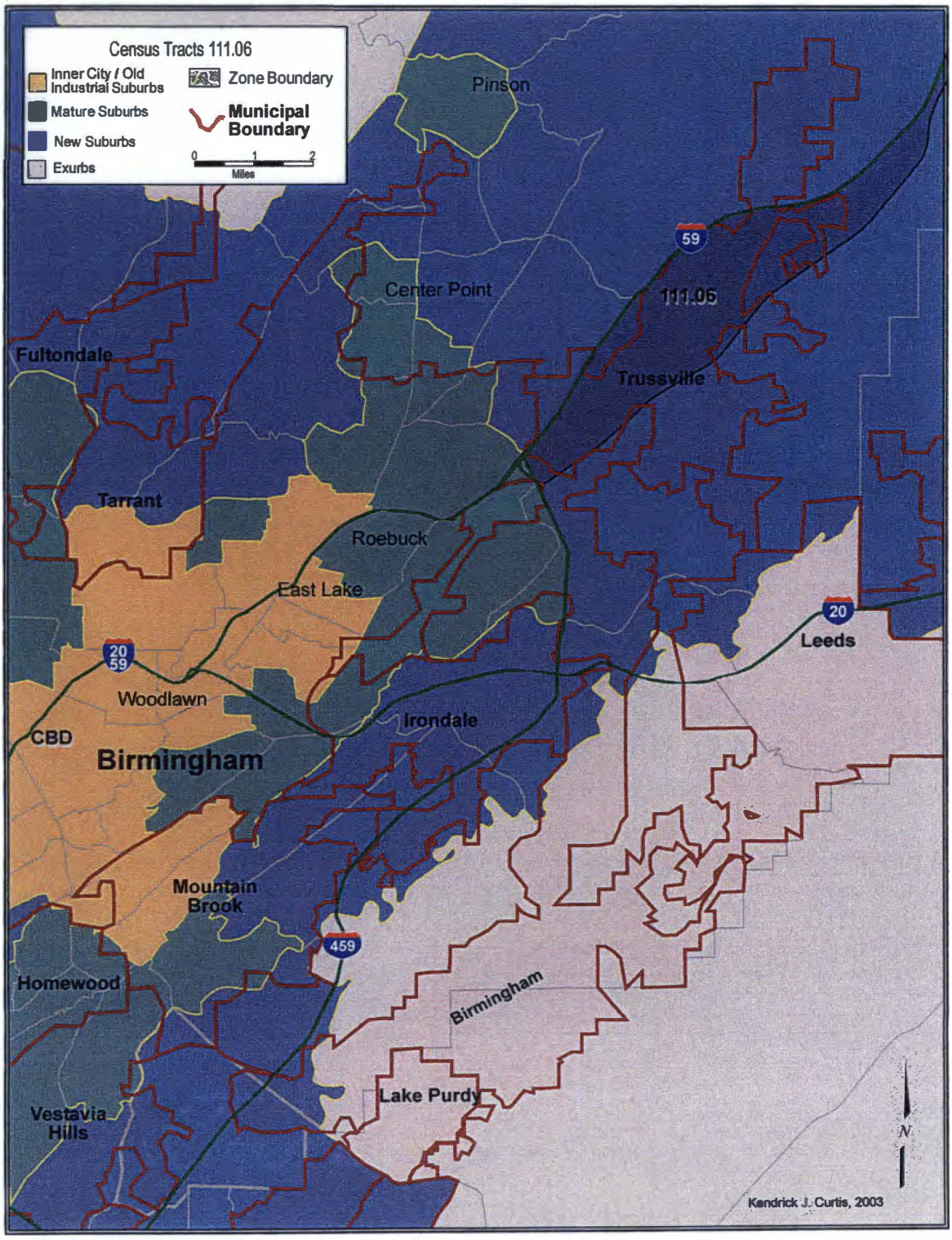

Figure 6.10. Case studies in the new suburbs (tract 111.06).
Source: U.S. Census, 1990

Figure 6.11. New suburbs housing, census tract 111.06. Kendrick J. Curtis, 2003.

Metropolitan Area. That tract 111.06 is home to a middle class population is reflected in the value of homes and rental rates. The median value of a home was $86,900 in 1990, and the median rent was $411. The median home value was $58,600 and rent was $358 in the Metropolitan Area. Tract 111.06's age structure approximates that of the Metropolitan Area. There is a large concentration of parents with children. However, the tract does not have as large a percentage of young adults as tract 129.08. In tract 111.06, only four percent of households are headed by single mothers, compared to seven percent in the Metropolitan Area and 11 percent in Brighton. Amenities, prestige, and high standards of living associated with professionals in "over the mountain" census tracts are not found in tract 111.06. People with lower incomes, including young professionals, are relegated to less desirable new suburb areas where the market allows them to acquire housing.

Exurbs

The remainder of the Birmingham Metropolitan Area is in the exurb zone. The zone consists partially of census tracts on the fringe of the new suburbs, where people search for large acreages on which to build homes. The large acreages are often farm partitions, which are fragmented from larger landholdings (Williams 1982). Wealthy professionals are among those who move to the exurbs. The remainder of the exurb zone consists of undeveloped rural character areas and tracts containing small municipalities whose populations largely function without direct influence of Birmingham. Jasper is an example of a small city in the exurbs. Jasper, the county seat of Walker County, is 42

miles northwest of Birmingham. The 1990 population was 13,553. While tied economically to Birmingham, its inhabitants are not part of the urbanized area.

Census tracts in the exurb zone generally have median income ratios below 1.0. However, in 1990 there were twelve exurb tracts with income ratios of 1.08 or higher. Two were in small cities, one in Jasper and one in Pell City. One was just to the north of Pleasant Grove and another northwest of Gardendale. The principal concentration of wealthy exurb census tracts was in Shelby County south of the new suburb zone. An affluent census tract on the development fringe and a rural tract are examined to analyze differences in the population of the exurb zone (Figure 6.12).

Census tract 303.07 in Shelby County is on the development fringe; tract 219 in Walker County is rural. Census tract 303.07 lies east of Pelham and south of new suburb tracts in Shelby County. Tract 219 is a rural tract which contains the unincorporated communities of Coon Creek, Gravlee Junction, Empire, and Creel. In 1990 the population of tract 303.07 was 3,017 and that of tract 219 was 2,442. Tract 303.07 was 97 percent white, two percent black, and one percent Asian. Tract 219 was 95 percent white and 5 percent black. The tracts have the same gender composition, 49 percent male and 51 percent female.

Major differences between the two census tracts are in economic and educational characteristics of the populations. A larger percent of tract 303.07's population is in their prime working years, while tract 219 has greater shares of older and younger people. Twenty- nine percent of the population in tract 219 belong to married families with children. The population in census tract 303.07 is similar to the new suburbs of the professional elite, who can afford to purchase land and displace the rural inhabitants.

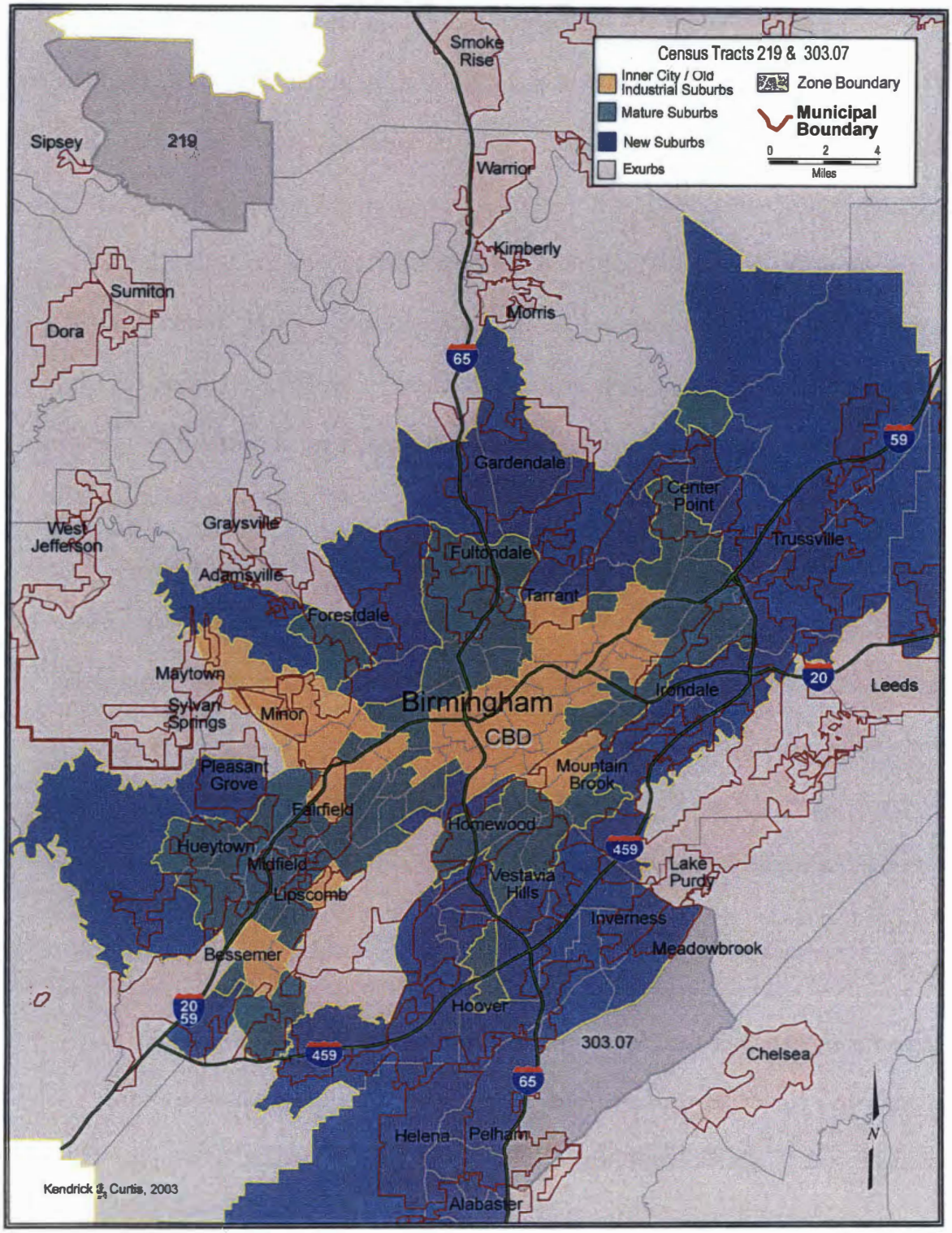

Figure 6.12. Case studies in the exurbs.
Source: U.S. Census, 1990

People in tract 303.07 are well-educated and hold professional jobs, while the inhabitants of tract 219 are employed primarily in manufacturing, mining, and farming. The location quotient for professionals in tract 219 is 0.25, and for service workers it is 0.72. The prominence of manufacturing/craft workers is evident in the location quotient 2.28. The reverse is true for tract 303.07, where the professional location quotient is 1.30, the service worker location quotient is 0.93, and the manufacturing/craft worker location quotient is 0.78. Commuting alone in a motor vehicle is the dominant means of transportation to work in both tracts. The more affluent nature of tract 303.07 is revealed in that a greater percentage of the workforce (88% versus 77%) utilized this method of commuting. Fifty-three percent of tract 219's labor force commute more than 35 minutes; 44 percent of tract 303.07's workforce drives between 20 and 34 minutes. Enrollment in private schools is higher in tract 303.07, and the population has a higher level of education. Thirty percent of persons over 25 in tract 303.07 have a bachelor's degree or higher, while only six people in tract 219 has this level of education. Tract 219 had a median household income of $16,927 in 1989; in tract 303.07 the median income was $39,105.

The exurb zone is a complex section of the Birmingham Metropolitan Area. Over the economic transition the degree of development varied and created diverse populations. The majority of the exurb zone is home to a rural population and populations in small municipalities. Economic restructuring pushed development further out as increasing numbers of affluent professionals wanted homes on relatively large acreages. The chief result is changes in the nature of rural census tracts in the wake of development.

CHAPTER VII

CONCLUSIONS

This research assesses alterations to the spatial distribution of income, occupation, and race in the Birmingham, Alabama Metropolitan Area between 1970 and 1990. The thesis that increased sociospatial inequality and polarization is linked to post-industrial economic restructuring in middle tier urban areas is shown to occur in Birmingham. This research confirms that intraurban social disparity is related to changes in employment.

The employment structure of a post-industrial economy has income implications. Manufacturing economies provide significant numbers of middle-income jobs. Increasing service sector employment bifurcates the workforce between high-wage professional, managerial, and technical jobs and low-wage clerical, custodial, and sales jobs (Preseton and McLafferty 1992, 224). The Birmingham Metropolitan Area trends toward decline in manufacturing and an increase in service industry employment. Income is increasingly segregated as the occupation groups separate. Poor neighborhoods of the Metropolitan Area experience declines in income level while incomes in wealthier neighborhoods increase. Increasing disparity in the inner city/old industrial suburbs and mature suburb zones is revealed by the index of dissimilarity and neighborhood disparity index. Income is more evenly distributed through the new suburb and exurb zones.

Statistical measures reveal segregation of occupations increased between 1970 and 1990. Polarization increased between the older and newer sections of the Metropolitan Area. The older industrial areas absorbed the poor, low-wage workers. Professionals largely vacated the undesirable older sections for new suburb census tracts

and also consolidated in a few prestigious inner city/old industrial suburbs and mature suburb tracts. Professionals are the least spatially segregated group in the new suburbs, and most segregated in the inner city/old industrial suburbs. While manufacturing/craft occupations declined throughout the Metropolitan Area, their chief concentrations are in the census tracts of the inner city/old industrial suburbs and mature suburb zones.

Racial segregation existed in the Birmingham Metropolitan Area before the economic transition and intensified between 1970 and 1990. Blacks can afford to inhabit a few census tracts in the new suburbs. However, they are largely relegated to the less desirable sections of the inner city/old industrial suburbs and mature suburb zones. In 1990, new suburban census tracts were predominantly white, while inner city/old industrial suburbs and mature suburb tracts were largely black.

The mature suburb zone experienced increased levels of occupation and income segregation. In 1990, this zone contained some of the poorest and wealthiest tracts in the Metropolitan Area and had a level of dissimilarity comparable to the inner city/old industrial suburbs zone. Between 1970 and 1990 the income ratio declined. A diminished presence of professionals yielded falling income levels. Professionals who remained in the mature suburb zone concentrated to the south and southeast of the CBD in an affluent area of south-central Jefferson and north Shelby counties. Manufacturing/craft workers declined in all zones, but dropped the least in the mature suburb zone.

The new suburb zone developed during the economic transition. Census tracts in this zone are the most homogenous tracts among the zones in income, occupation, and race. The new suburb zone has high levels of professionals, high levels of income, low

levels of manufacturing/craft workers, low levels of occupation segregation, and low levels of neighborhood disparity. The population of the new suburbs is predominantly white. However, the few blacks living in new suburban neighborhoods are often as wealthy as their white neighbors.

To understand macro trends of sociospatial redistribution between 1970 and 1990, synthesis of each zone's population is useful. The case study analysis reveals similar population characteristics exist in some census tracts regardless of the zone. Census tracts with location quotients over 1.20 for professionals and median income ratios over 1.20 exist in every zone (Figure 7.1). Of the 32 census tracts that meet these criteria, 20 are in the new suburb zone, seven in the mature suburb zone, three in the inner city/old industrial suburbs zone, and two in the exurbs.

There are also census tracts with concentrations of professionals with low incomes. Eighteen census tracts with location quotients for professionals over 1.20 and income ratios less than 1.19 are identified (Figure 7.2). Of the eighteen, six are in the new suburb zone, six in the mature suburb zone, five in the inner city/old industrial suburbs zone, and one in the exurbs. The 18 census tracts are located adjacent to affluent, professional tracts. The majority are in the affluent area of south-central Jefferson and north Shelby Counties. Affordable housing offers convenience to new suburb amenities for people who can not afford nearby affluent neighborhoods. There is demand for housing by low income individuals who may have college degrees but earn low salaries because of their short tenure in the workplace.

Service workers are concentrated in the less desirable sections of the Birmingham Metropolitan Area where housing is less expensive. There are 31 tracts with location

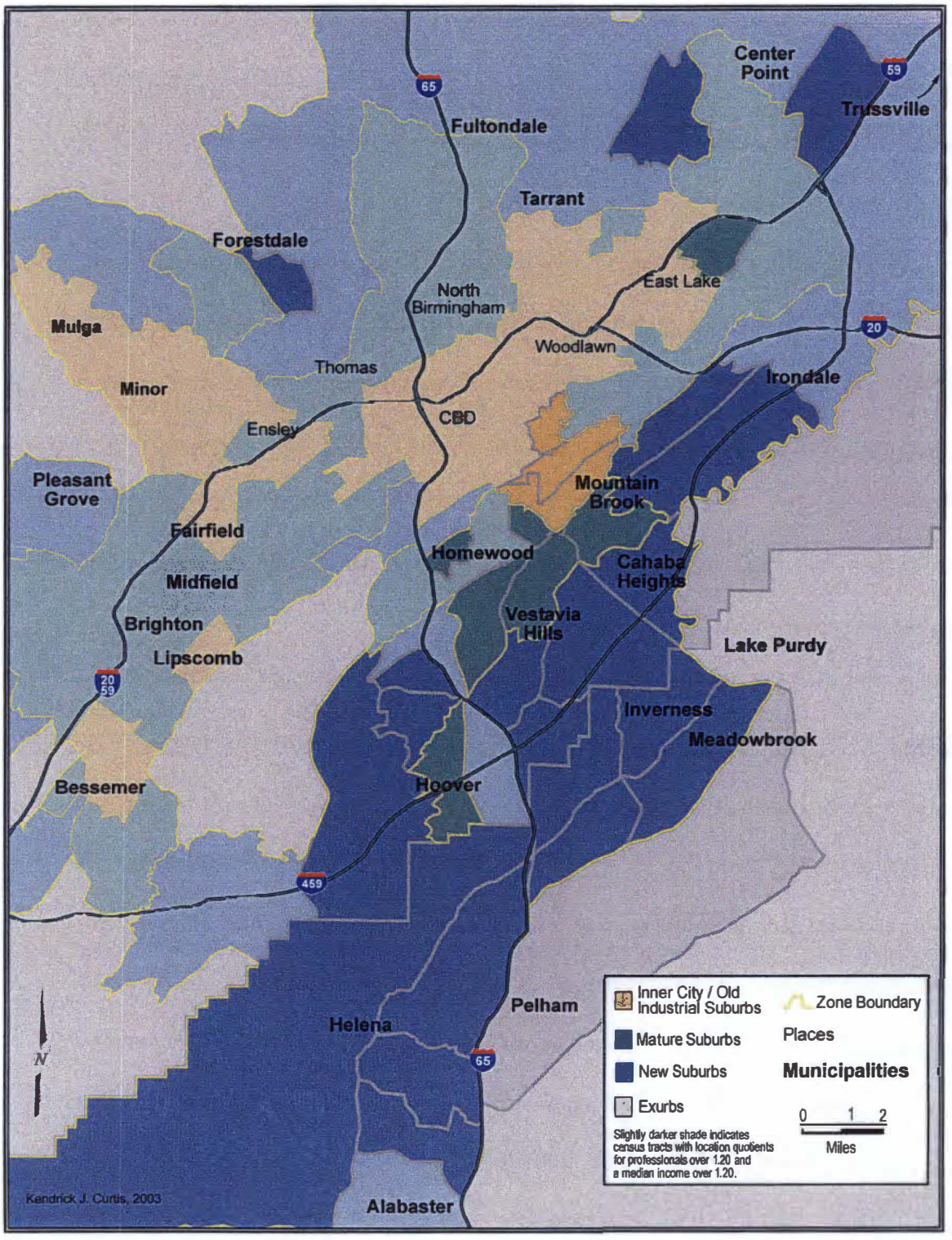

Figure 7.1. Census tracts with location quotients for professionals over 1.20 and median income ratios over 1.20.
Source: U.S. Census, 1990.

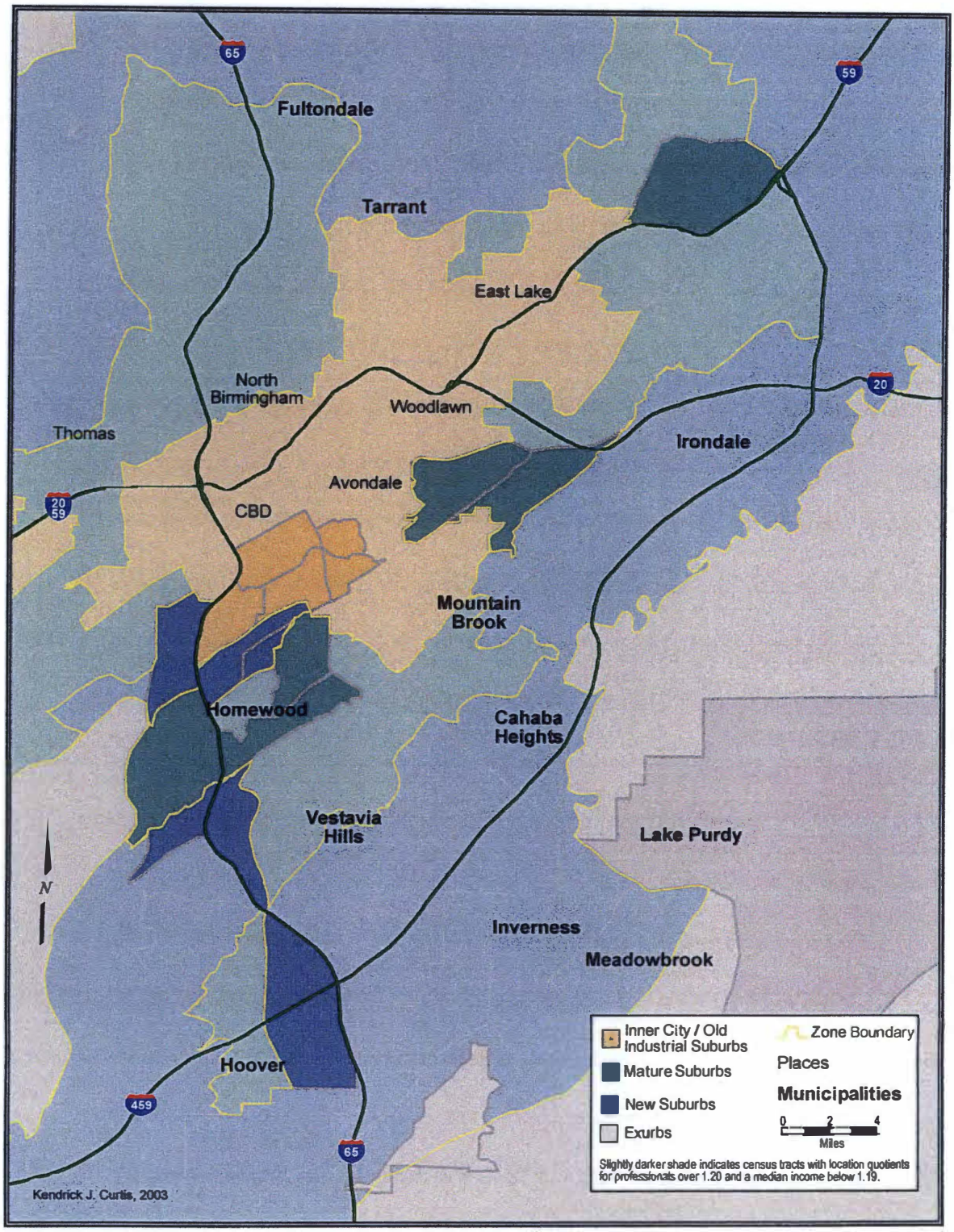

Figure 7.2. Census tracts with location quotients for professionals over 1.20 and median income ratios below 1.19.
Source: U.S. Census, 1990.

quotients over 1.20 for service workers (Figure 7.3). Fifteen are inner city/old industrial suburbs tracts, and 16 are mature suburb tracts. Census tracts with strongest concentrations of service workers have the lowest income ratios. Only two of the 31 tracts have income ratios over 1.0. The remainder are below 0.80.

A middle class, mixed occupation population is another component of the post-industrial city. Thirty-five census tracts have location quotients between 0.80 and 1.20 for manufacturing/craft workers, service workers, and professionals (Figure 7.4). The census tracts are scattered across all zones of the Metropolitan Area. Twenty-three of the 35 are in the new suburb zone, but only four are in the affluent area of south-central Jefferson and north Shelby Counties. The middle class, mixed occupation tracts are located in the less affluent municipalities to the north of Birmingham. The only tracts to the south are in Alabaster. The income ratios of the middle class mixed occupation census tracts range from 0.45 in the inner city/old industrial suburbs to 1.58 in the new suburbs. The tracts are home to high wage manufacturing workers and low income professionals.

Middle class, mixed occupation tracts are racially segregated. Location quotients for blacks in the 35 tracts are extremely low or high. Eight tracts have location quotients for blacks above 1.68, and 26 tracts have quotients below 0.78. Of the 35, only two tracts have location quotients for whites near the Metropolitan Area average. Due to the relationship between income and occupation and the nature of the post-industrial economy, large numbers of middle class, mixed occupation census tracts can not continue to exist. Such tracts are in the midst of change in occupation structure, a manifestation of the economic transition.

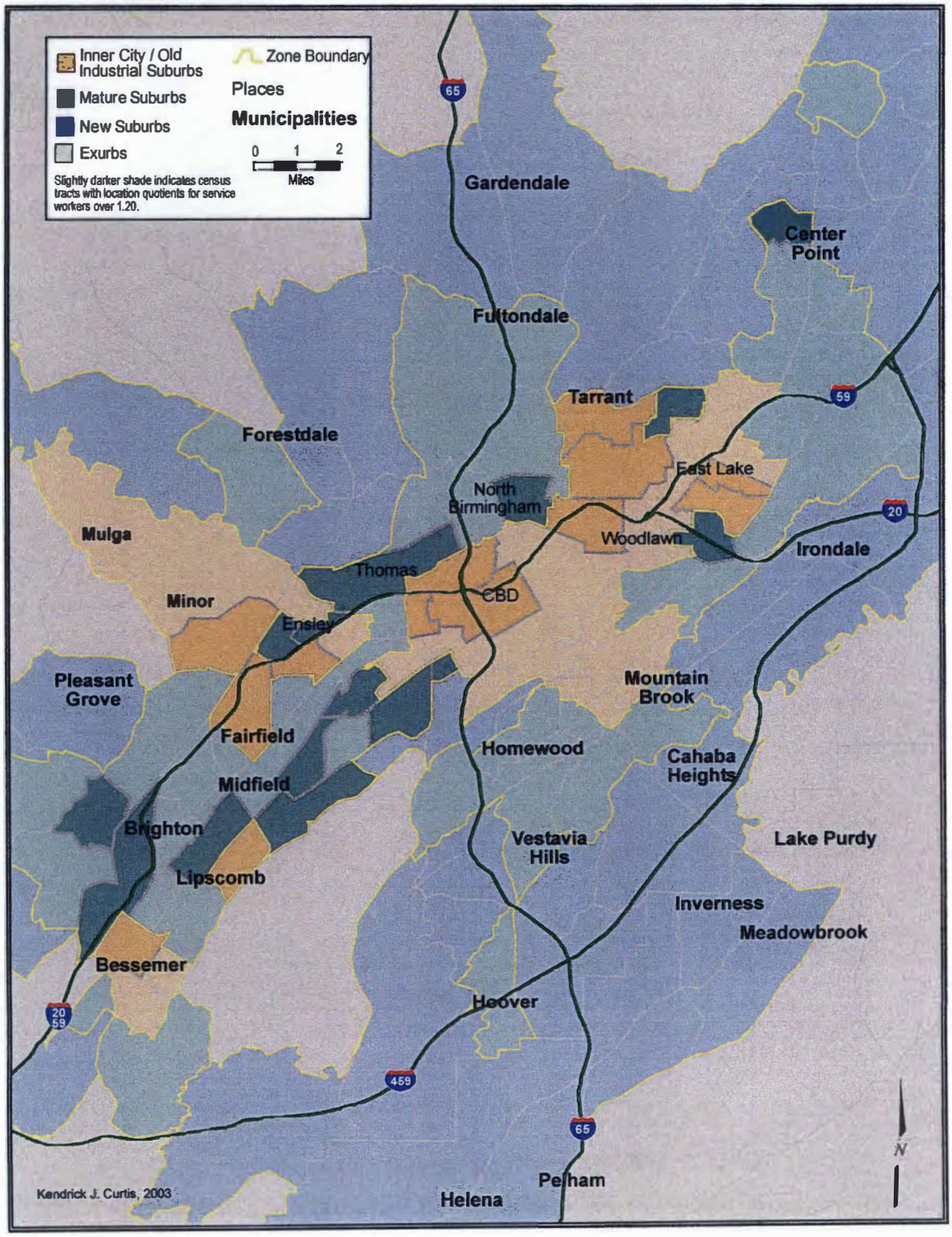

Figure 7.3. Census tracts with location quotients for service workers over 1.20. Source: U.S. Census, 1990.

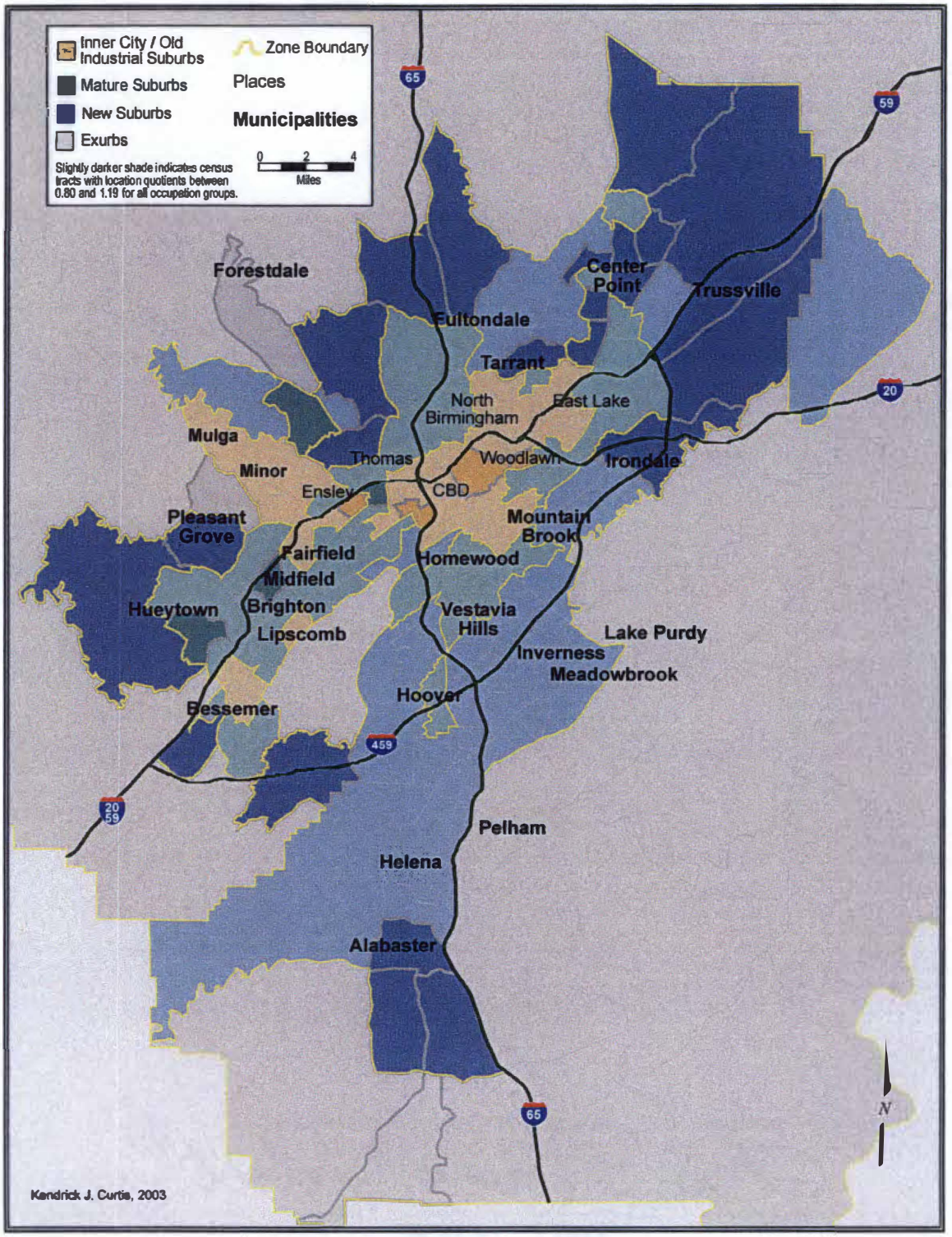

Figure 7.4. Census tracts with location quotients between 0.80 and 1.19 for all occupation groups.
Source: U.S. Census, 1990.

Future Research

The economic base of employment is a factor in the myriad influences affecting social structure of a metropolitan area. As manufacturing continues to locate abroad and post-industrial economies arise in the United States, the social nature of cities will be affected. To understand impact on metropolitan areas, research should expose the changes inherent in the shift to post-industrial economies. Understanding income, occupation, and race relationships in post-industrial metropolitan areas is the beginning of the process.

Additional statistical analysis could refine the aggregate structural analysis of this research. Cluster analysis and discriminant analysis offer means of assessing relationships between the variables employed. A potential extension is to use cluster analysis to test patterns observed for occupation, income, and race in the zones. Considering these variables simultaneously, census tracts could be clustered to minimize variance within the zone, while maximizing variance between zones. This would refine the relationship existing between the three variables for each of the zones. Discriminant analysis could be used to confirm the general trends observed such as increasing disparity in the mature suburbs as well as the professionalization of the new suburbs. Discriminant analysis could also be utilized to determine deviant observations from the general patterns. This would contribute to the findings of complexity within a zone, such as revealed in the case studies. Identifying tracts which deviate from trends observed for their zone could aid in further hypotheses to account for the deviance.

The affect family structure has on spatial distributions of persons in post-industrial cities holds potential for further research. The number employed in a

household and their occupations are important. Do occupations of single persons and families with children vary? Another focus is the relationship between age, place of residence, and occupation. Are people of certain ages restricted in their places of residence? Are there zones of a city where younger generations are more or less likely to escape depressed conditions as they desire higher standards of living and seek them through higher paying occupations? Another factor is the role gender plays in sociospatial inequality. A better understanding is needed of the relationship between the employment of women in a post-industrial workforce and their occupations. Changes in education levels of women are vital to research regarding gender characteristics. Understanding the relationships among family structure, marital status, age, gender, and their distributions within metropolitan area should contribute to a better understanding of sociospatial inequality.

High correlations among educational attainment, income level, and occupation is to be expected. As people achieve increased income from higher paying occupations, they desire more costly things for which they are willing to pay. Affluent people who desire quality educational opportunities for their children are more willing to support increased property taxes. Affluent people locate in areas with appreciating property values and improving schools. Housing stock's age and value are variables that should be further considered. A question to be answered is, "What are the affects of appreciating or deteriorating housing stock in a community, and how are they related to occupations?" Another issue is how are sociospatial population distributions of metropolitan areas in the southern United States affected by the influx of Hispanic

immigrants. Analysis of relationships among the distribution of immigrants, income, and occupation should reveal internal sociospatial complexities of metropolitan areas.

A fundamental question further research should answer is whether or not post-industrial economies have benefited society as a whole. Key variables to consider are immigration, age, education, family structure, and gender. Essential to furthering this research is the analysis of the nature and distribution of income, occupation, and race in other medium size metropolitan areas. Additional research in middle tier metropolitan areas will further understanding of how economic restructuring affects social inequality and sociospatial polarization in post-industrial cities.

BIBLIOGRAPHY

Beiman, Irving. "Foreign Iron, Steel Imports take 1,000 Alabamians' Jobs." *Birmingham News*, 13 February 1960.

_____."Imports are Posing Threat to South's Steel Industry." *Birmingham News*, 1 April 1968.

_____. "State's Steel Nearly Doubles in a Decade." *Birmingham News*, 14 April 1957.

_____. "Three plants to weld rails to locate here." *Birmingham News*, 14 April 1960.

_____. "Where will Pig Iron Come From? Up North? Overseas?." *Birmingham News*, 29 September 1972.

Birmingham Regional Planning Commission. *Population and Employment, Estimates and Projections for Counties in the Birmingham Region*. Birmingham: Birmingham Regional Planning Commission, 1991.

Blau, Peter M. "Implications of Growth in Services for Social Structure." *Social Science Quarterly* 61 (June 1980) : 3-22.

Blumenfeld, Hans. "The Economic Base of the Metropolis." *Journal of the American Institute of Planners* 21 (Fall 1955) : 114-132.

Bourne, L. S. "Close Together and Worlds Apart: An Analysis of Changes in the Ecology of Income in Canadian Cities." *Urban Studies* 30 (1993) : 1293-1317.

Brown, James R. *An Analysis of the Birmingham Economy*. Tuscalloosa: Bureau of Business Research, School of Commerce and Business Administration, University of Alabama, 1959.

Browning, Harley L. and Joachim Singelmann. "The Transformation of the U.S. Labor Force: The Interaction of Industry and Occupation." *Politics and Society* 8 (1978) : 481-509.

Burns, Leland S. "The Urban Income Distribution." *Regional Science and Urban Economics* 5 (December 1975) : 465-482.

Burritt, Chris. "Steel Back in 'Magic City' Picture." *Atlanta Journal Constitution*, 26 April 1987.

Cell, John W. *The Highest Stage of White Supremacy, The Origins of Segregation in South Africa and the American South*. Cambridge: Cambridge University Press, 1982.

Center for Business and Economic Research. *Economic Abstract of Alabama 1977.* Tuscalloosa: College of Commerce and Business Administration, University of Alabama, 1977.

Chakravort, Sanjoy. "A Measure of Spatial Disparity: The Case of Income Inequality." *Urban Studies* 33 (1996) : 1671-1686.

Christopherson, Susan. "Flexibility in the US Service Economy and the Emerging Spatial Division of Labor." *Transactions, Institute of British Geographers* 14 (February 1989) :131-143.

Department of Planning, Engineering, and Permits. *City of Birmingham Demographic Characteristics 1970-1998.* Birmingham: City of Birmingham, 1999.

Coffey, William J. and Antoine S. Bailly. "Producer Services and Flexible Production: An Exploratory Analysis." *Growth and Change* 22 (Summer 1991) : 95-117.

Cummins, Don. "Rail Weld Plant Planned for Ensley." *Birmingham Post Herald,* 4 February 1960.

Daniels, P.W. "Service Industries: Supporting Role or Center Stage?." *Area* 15 (1983) : 301-309.

_____. *Service Industries: A Geographical Appraisal.* London: Methuen, 1985.

Daniels, P.W., ed. *Services and Metropolitan Development: International Perspectives.* London: Routledge, 1991.

Daniels, P.W. and Frank Moulaert, eds. *The Changing Geography of Advanced Producer Services: Theoretical and Empirical Perspectives.* London: Belhaven Press, 1991.

Birmingham Regional Planning Commission. *Economic Atlas.* Birmingham: Birmingham Regional Planning Commission, 1973.

Filion, Pierre, Trudi E. Bunting, and Kevin Curtis, ed. *TheDynamics of the Dispersed City: Geographic and Planning Perspectives on Waterloo Region.* Waterloo: Department of Geography University of Waterloo, 1996.

Francis, David R. " Molten Steel Oozes Into Shape." *Christian Science Monitor*, 1964.

Gershuny, J. *After Industrial Society: The Emerging Self-Service Economy.* London: Macmillan, 1978.

Goe, W.R. "Producer Services, Trade and the Social Division of Labor." *Regional Studies* 24 (February 1990) : 327-342.

Gottmann, Jean. *The Coming of the Transactional City*. College Park, Maryland: Institute for Urban Studies, 1983.

Growth Strategies Organization. *Birmingham Area Economic Development Strategy.* Vail, CO: Growth Strategies Organization, Inc, 1998.

Hamnett, C. "Social Polarization in Global Cities: Theory and Evidence." *Urban Studies* 31 (1994) : 401-424.

Hamnett, C. "Social Polarization, Economic Restructuring and Welfare State Regimes." *Urban Studies* 33 (March 1996) : 1407-1430.

Hogan, Ben. " Jeffco's History Mirrors Growth of Steel Industry." *Birmingham News,* 1969.

Holtzer, H. J. "The Spatial Mismatch Hypothesis: What Has the Evidence Shown?." *Urban Studies* 28 (1991) : 105-122.

Huddleston, George, Jr. "Steel's First Big Century." *Birmingham News*, 11 August 1957.

Kincey, Robert W. "A Red Glow Against our Town's Sky Means Pig Iron is Flowing." *Birmingham News,* 13 August 1950.

Kirn, Thomas J. "Growth and Change in the Service Sector of the U.S.: A Spatial Perspective." *Annals of the Association of American Geographers* 77 (September 1987) : 353-372.

Lewis, David. *Sloss Furnaces and the Rise of the Birmingham District, An Industrial Epic*. Tuscaloosa, Alabama: The University of Alabama Press, 1994.

MacLachlan, Ian and Ryo Sawada. "Measures of Income Inequality and Social Polarization in Canadian Metropolitan Areas." *Canadian Geographer* 41 (Winter 1997) : 377-397.

Madden, J. F. "Changes in the Distribution of Poverty Across and Within US Metropolitan Areas." *Urban Studies* 33 (1996) : 1581-1600.

Massey, Doreen. *Spatial Divisions of Labor: Social Structures and the Geography of Production.* London: Macmillan, 1995.

Morris, Philip A. and Marjorie L. White. *Birmingham Bound, An Atlas of the South's Premier Industrial Region.* Birmingham: Birmingham Historical Society, 1997.

Nelson, Joel L. and Jon Lorence. "Employment in Service Activities and Inequality in Metropolitan Areas." *Urban Affairs Quarterly* 21 (September 1985) : 106-125.

_____. "Metropolitan Earnings Inequality and Service Sector Employment." *Social Forces* 67 (December 1988) : 492-511.

Nord, Stephen, John Phelps, and Robert Sheets. "An Analysis of the Economic Impact of the Service Sector on Underemployment in Major Metropolitan Areas in the United States." *Urban Studies* 25 (October 1988) : 418-432.

O'Donnell, Joe. *Birmingham, Magic for the New Millennium.* Montgomery, AL: Community Communications, Inc., 1998.

O'Huallachain, Breandan. "Agglomeration of Services in American Metropolitan Areas." *Growth and Change* 20 (Summer 1989) : 34-49.

O'Shea, Brian. "Vulcan Now Signifies Past, Not Future." *Anniston Star,* 8 August 1982.

Office of Economic Development. *Community Profile*. Birmingham: City of Birmingham and Metropolitan Development Board, 1998.

Pinch, S. "Social Polarization: A Comparison of Evidence from Britain and the United States." *Environment and Planning A* 25 (1993) : 779-795.

Porter, Sylvia. " Steel Industry Future Bright." *Birmingham News*, 5 December 1961.

Price, D.G. and A.M. Blair. *The Changing Geography of the Service Sector.* London: Belhaven Press, 1989.

Preston, Valerie and Sara McLafferty. "Income Disparities and Employment and Occupational Changes in New York." *Regional Studies* 27 (1992) : 223-235.

Reeves, Garland. "Weld Tube Wants to Locate in Birmingham." *Birmingham News,* June 27, 1974.

Research and Resource Development Division. *Birmingham Area Profile.* Birmingham: Birmingham Area Chamber of Commerce, 1981.

Sassen, Saskia. "Economic Restructuring and the American City." *Annual Review of Sociology* 16 (1990) : 465-490.

Scott, Allen J. *Metropolis: From the Division of Labor to Urban Form*, Berkeley: University of California Press, 1988.

_____. "The Spatial Organization of a Local Labor Market: Employment and Residential Patterns in a Cohort of Engineering and Scientific Workers." *Growth and Change* 22 (Fall 1991) : 94-115.

Sheets, Robert G., Stephen Nord, and John J. Phelps. *The Impact of Service Industries on Underemployment in Metropolitan Economies.* Lexington: Massachusetts: Lexington Books, 1987.

Shook, Phil H. "Study Finds Birmingham Suited to Research, Development Park." *Birmingham News*, 30 August 1981.

Silver, Hilary, and Regina Bures. "Dual Cities? Sectoral Shifts and Metropolitan Income Inequality,1980-1990." *The Service Industries Journal* 17 (January 1997) : 69-90.

Small, John and Michael Witherick. *A Modern Dictionary of Geography.* London: Edward Arnold, 1989.

Sociometrics Corporation. *Contextual Data Archive: Census Tracts/Block Numbering Areas.* Los Altos, California.

Staff. "State Steel Capacity Up by 376,000 Tons." *Birmingham News*, 25 April 1954.

Stanback, Thomas M. Jr. *Understanding the Service Economy: Employment, Productivity, and Location.* Baltimore: The Johns Hopkins University Press, 1979.

Strernlieb, George, and James Hughes. "The Uncertain Future of the Central City." *Urban Affairs Quarterly* 18 (1983) : 455-472.

U.S Bureau of the Census. *1954 Census of Manufactures, Geographic Area Statistics: Alabama.* Washington, D.C.

_____. *1963 Census of Manufactures, Geographic Area Statistics: Alabama.* Washington, D.C.

_____. *1982 Census of Manufactures, Geographic Area Series: Alabama.* Washington, D.C.

_____. *1992 Census of Manufactures, Geographic Area Series: Alabama.* Washington, D.C.

_____. *1997 Economic Census, Geographic Area Series: Alabama.* Washington, D.C.

_____. *Census of Population, 1950, Alabama.* Washington, D.C.

_____. *Census of Population and Housing, 1970.* Washington, D.C.

_____. *Census of Population and Housing, 1990.* Washington, D.C.

USX US Steel webpage: http://www.usx.com/corp/ussteel/facilities/fairfield/vision.htm

Walks, R. Alan. "The Social Ecology of the Post-Fordist/Global City? Economic Restructuring and Socio-Spatial Polarization in the Toronto Urban Region." *Urban Studies* 38 (March 2001) : 407-447.

Warf, Barney and John Grimes. "Southern Services in the Late Twentieth Century." *Southeastern Geographer* 37 (November 1997) : 251-267.

Wheeler, James O. "Residential Location by Occupational Status." *Urban Studies* 5 (February 1968) : 24-32.

White, Marjorie Longenecker. *The Birmingham District, An Industrial History and Guide.* Birmingham: Birmingham Publishing Company, 1981.

White, Michael J. *American Neighborhoods and Residential Differentiation.* New York: Russell Sage Foundation, 1987.

Williams, David Kelley. "Rural Residential Subdivisions in Loudon County, Tennessee." M.S. Thesis, University of Tennessee, Knoxville, 1982.

Wilson, Bobby M. *America's Johannesburg, Industrialization and Racial Transformation in Birmingham.* Lanham, Maryland: Rowman and Littlefield Publishers, Inc., 2000.

_____. Interview by author, 15 February 2001. E-mail.

Worley, Lillian Estelle. "The Urban Geography of Birmingham, Alabama." Ph.D. diss., University of North Carolina Chapel Hill, 1948.

Wynn, Tor and Charles Mueller. "Production Characteristics, Human Capital, and Labor Market Segments: Services and the Distribution of Rewards in Labor Market Transactions." *Sociology Quarterly* 39 (1998) : 597-622.

APPENDIXES

APPENDIX I

- The **location quotient** is represented in this research as the formula:

$$LQ_i = (O_i / \sum_{i=1}^{n} O_i) / (P_i / \sum_{i=1}^{n} P_i)$$

In this formula i is the census tract in question, O is the number of people employed in the particular occupational grouping or in the racial group, and P is the total employment or population in the tract.

- The **coefficient of localization** is calculated in this research using the formula:

$$CL_g = \sum_{i=1}^{n} | T_i - B_i | / 2$$

This value is calculated by subtracting the percentage share of the target variable from the percentage share of the base variable for each census tract, summing the absolute value of the differences and dividing by two. In this formula g is the occupation grouping variable in question; n is the number of census tracts; T is the percentage share of the target occupation variable; and B is the percentage share of the total workforce or population.

- The **index of dissimilarity** as used in this research can be represented by the following formula:

$$ID_x = \sum_{a=1}^{n} | SI_a - SP_a | / 2$$

In this formula, ID is the index of dissimilarity value for income measure x; while SI is the share of income held; and SP is the share of the population of census tracts for decile group a.

- Individual **neighborhood disparity values** were calculated as a component in calculating the **neighborhood disparity index (NDI)**. The individual **neighborhood disparity values** were calculated using the following formula:

$$ND_i = (|IN_i - \sum_{i=1}^{n} IN_c / n|) / IN_i$$

ND is the neighborhood disparity statistic for census tract *i*; while *n* represents the number of neighboring tracts *c*; and *IN* is the income level in either the target or neighboring tracts

- The **neighborhood disparity index (NDI)** was calculated using the formula:

$$NDI = \sum_{i=1}^{n} ND_i / 2_n$$

NDI is the neighborhood disparity index for *n* number of census tracts i; while ND_i represents the individual *ND* values for each tract.

APPENDIX II

This Avenue script was written to calculate the Neighbor Disparity value for each tract. This value had to be determined in order to calculate the Neighbor Disparity Index. The script performs three major tasks. It begins for each tract by finding all its adjacent tracts. It then sums the income value for the neighboring tracts. This value is then divided by the number of neighboring tracts to get the value to assign the center tract for which the script is currently working. There are other minor tasks the script performs in order to accomplish these three tasks. The ability of using the Geographic Information System to find the neighbors of a particular tract is what allowed this calculation to be possible.

The script is as follows:

```
'Creates a table in which the adjacenct polygons' ID number will be stored for
'each polygon in the theme, and a sum will be calculated
' To run this script, the theme you want to analyse must be the first theme (0)

theView=av.GetactiveDoc
theTheme=theView.GetActiveThemes.Get(0)
theFTab=theTheme.GetFTab
theFields=theFTab.GetFields
theFTab.SetEditable (true)

'check if NbrAverage field exists
NbrAver_exists=(theFTab.FindField("NbrAver")=nil).not
if(NbrAver_exists) then
  if (MsgBox.YesNo("Overwrite existing fields?","NbrAver_exists",false))then
    if (NbrAver_exists)then
      theFTab.RemoveFields({theFTab.FindField("NbrAver")})
    end
  else
    exit
  end
end
NbrAverfield = field.make ("NbrAver",#FIELD_DECIMAL,12,2)
theFTab.addFields({NbrAverfield})
```

```
'check if NDIids field exists
NDIids_exists=(theFTab.FindField("NDIids")=nil).not
if(NDIids_exists) then
  if (MsgBox.YesNo("Overwrite existing fields?","NDIids Exists",false))then
    if (NDIids_exists)then
      theFTab.RemoveFields({theFTab.FindField("NDIids")})
    end
  else
    exit
  end
end
NDIidsfield = field.make ("NDIids",#FIELD_VCHAR,40,0)
theFTab.addFields({NDIidsfield})

'check if NDIsum field exists
NDIsum_exists=(theFTab.FindField("NDIsum")=nil).not
if(NDIsum_exists) then
  if (MsgBox.YesNo("Overwrite existing fields?","NDIsum Exists",false))then
    if (NDIsum_exists)then
      theFTab.RemoveFields({theFTab.FindField("NDIsum")})
    end
   else
    exit
  end
end
NDIsumfield = field.make ("NDIsum",#FIELD_DECIMAL,8,0)
theFTab.addFields({NDIsumfield})

fieldshp = theFTab.FindField("Shape")
fieldno = theFTab.FindField("Tracts")
nlist = list.make
valueList = list.make
tractSum = 0
TractIDstring = ""
Tractabrfield = theFTab.FindField("TractAbr")

For each x in theFTab
  k = 0
  'msgbox.info (x.asstring,"this is x, ie.. the present record of the FTab")

  'if (x = 1) then
  '  break
  'else

  xshape1 = theFTab.ReturnValue(fieldshp,x)
```

```
  id1 = theFTab.ReturnValue(fieldno,x)
  'MsgBox.Info (id1.asstring, "Tract ID for selected record")

  ' clearing our values
  tractIDstring = {}
  tractSum = 0
  nbrAver = 0
  nList = {}

  For each y in theFTab
    If (y = x) then
      continue
    end
    xshape2 = theFTab.ReturnValue(fieldshp,y)

    If (xshape1.Intersects(xshape2)) then 'true if the present plg is adjacent to the plg under
analysis

      neighbor = theFTab.ReturnValue(fieldno,y)
      'msgbox.info (xshape2.asstring, "xshape2 - should be the selected one as 2nd shape")

      'msgbox.info (neighbor.asstring,"is neighbor")

' making the IDlist
      nlist.Add (neighbor)
      countList = nlist.Count
      'msgbox.info( countList.AsString, "Number in NeighborList" )
      'choices = MsgBox.MultiListAsString( nlist, "Select some", "Neighboring Tracts in
List" )

' setting the IDlist into the NDIids field
      neighbor = theFTab.ReturnValue(Tractabrfield,y)
      TractIDstring = neighbor.asstring + "," + TractIDstring.asstring
      'msgbox.info (tractIDstring.asstring, "Tractid")
      theFTab.SetValue (NDIidsfield, x, TractIDstring)

' making the valueList
      MeanHHinc = theFTab.FindField("Mean_hh_in")
      tractValue = theFTab.ReturnValue(MeanHHinc,y)
      valueList.add (tractValue)
      'choices = 'MsgBox.MultiListAsString( valueList, "Select some", "Neighboring
Tracts Values" )

' getting the sum of neighboring values
      tractSum = tractSum + tractValue
```

```
      'MsgBox.info (tractSum.Asstring, "Sum of tracts")
      theFTab.SetValue (NDIsumfield, x, tractSum)
      end

' calculating the NbrAverfield:
   nbrAver = tractSum / countList
   theFTab.SetValue (NbrAverfield, x, nbrAver)
    end
end
theFTab.SetEditable (false)
```

APPENDIX III

Tract Characteristics for Case Studies

	Metropolitan Area	Inner City			Mature Suburbs			New Suburbs			Exurbs	
Case Study Census Tracts		47.02	49	5	107.02	107.03	136.01	129.03	129.08	111.06	303.07	219
Households	344,912	1,685	3,164	2,449	2,084	956	1,737	2,052	2,205	1,940	1,149	851
Population	907,810	3,263	5,056	6,624	4,550	2,299	5,053	6,341	4,531	5,449	3,017	2,442
Male	47%	46%	56%	44%	44%	44%	48%	51%	45%	48%	49%	49%
Female	53%	54%	44%	56%	56%	56%	52%	49%	55%	52%	51%	51%
White	72.2%	97%	71%	4%	84%	99%	23%	99%	93%	96%	97%	95%
Black	27.0%	2%	26%	96%	15%	0%	76%	0%	3%	4%	2%	5%
Asian	0.5%	1%	3%	0%	1%	1%	0%	1%	2%	0%	1%	0%
Other	0.3%	0%	1%	0%	0%	0%	1%	0%	1%	0%	0%	0%
15 and under	23%	15%	8%	27%	19%	21%	26%	26%	16%	23%	20%	25%
16-24	13%	10%	19%	14%	9%	8%	10%	11%	15%	11%	14%	15%
25-29	8%	11%	23%	9%	8%	8%	8%	3%	11%	5%	10%	10%
30-34	9%	9%	16%	6%	13%	8%	11%	6%	11%	9%	10%	6%
35-49	21%	26%	19%	18%	21%	22%	15%	28%	20%	24%	25%	20%
50-64	14%	14%	5%	13%	12%	9%	15%	17%	15%	14%	16%	15%
Over 65	13%	16%	10%	13%	19%	24%	16%	9%	12%	15%	7%	10%
Married couple with children	26%	14%	7%	10%	20%	25%	18%	43%	16%	33%	30%	29%
Married couple with no children	31%	25%	12%	15%	22%	37%	23%	38%	27%	38%	40%	30%
Male, no wife, with children	1%	1%	0%	2%	1%	0%	2%	1%	1%	0%	0%	4%
Male, no wife, with no children	2%	2%	2%	2%	2%	1%	3%	1%	1%	1%	1%	2%
Female, no husband, with children	7%	1%	3%	20%	6%	4%	11%	2%	4%	4%	2%	4%
Female, no husband, with no children	7%	3%	3%	17%	9%	6%	17%	2%	6%	6%	3%	9%
Nonfamily households	27%	54%	74%	34%	41%	27%	26%	12%	46%	18%	24%	21%
Never Married	20%	27%	40%	31%	21%	17%	24%	14%	25%	10%	22%	13%
Ever Married	80%	73%	60%	69%	79%	83%	76%	86%	75%	90%	78%	87%
Worked in place of residence	28%	76%	71%	74%	19%	29%	4%	6%	18%	14%	7%	0%
Worked outside of place of residence	48%	24%	29%	26%	80%	71%	94%	36%	79%	75%	27%	0%
Not living in a place	24%	0%	0%	0%	0%	0%	2%	58%	3%	11%	67%	100%
Worked in Central City of MSA	52%	77%	72%	76%	59%	55%	57%	47%	45%	51%	41%	31%
Worked in remainder of MSA	44%	20%	24%	24%	39%	45%	40%	51%	52%	47%	52%	62%

* Children are individuals under the age of 18

Source: U.S. Census, 1990.

Tract Characteristics for Case Studies (Continued)

	Metropolitan Area	Inner City			Mature Suburbs			New Suburbs			Exurbs	
Case Study Census Tracts		47.02	49	5	107.02	107.03	136.01	129.03	129.08	111.06	303.07	219
Transport to work – Car alone	81%	89%	74%	62%	85%	88%	74%	90%	91%	81%	88%	77%
Transport to work – Carpooled	14%	7%	13%	30%	10%	11%	21%	4%	6%	14%	10%	22%
Transport to work – Bus	1%	1%	1%	6%	1%	0%	2%	0%	0%	1%	0%	0%
Transport to work – Bicycle	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Transport to work – Walked	1%	1%	7%	1%	1%	1%	2%	0%	1%	1%	1%	0%
Worked at Home	2%	2%	2%	0%	3%	1%	1%	4%	2%	1%	1%	0%
Less 5 minutes – Travel Time to Work	2%	4%	7%	1%	4%	5%	0%	3%	4%	2%	2%	1%
5 to 9 minutes - Travel Time to Work	9%	19%	19%	13%	16%	22%	9%	9%	6%	10%	8%	6%
10 to 34 minutes – Travel Time to Work	31%	55%	46%	40%	50%	52%	29%	40%	42%	26%	29%	12%
20 to 34 minutes – Travel Time to Work	42%	20%	24%	41%	23%	18%	46%	45%	41%	50%	44%	29%
35 to 59 minutes – Travel Time to Work	12%	2%	2%	4%	7%	2%	11%	2%	5%	10%	13%	27%
More 60 minutes – Travel Time to Work	4%	0%	2%	1%	1%	1%	4%	1%	2%	2%	4%	25%
Public preprimary school enrollment	1%	1%	0%	2%	0%	1%	1%	1%	1%	1%	1%	1%
Private preprimary school enrollment	1%	0%	0%	0%	1%	2%	0%	3%	1%	1%	1%	0%
Public K-12 school enrollment	17%	6%	3%	22%	11%	14%	21%	18%	9%	18%	13%	22%
Private K-12 school enrollment	2%	6%	1%	1%	2%	1%	1%	5%	2%	2%	5%	0%
Public College enrollment	5%	8%	20%	3%	6%	7%	4%	6%	8%	3%	6%	3%
Private College enrollment	1%	2%	1%	1%	2%	1%	1%	2%	2%	1%	1%	0%
Less than 9th grade – attainment	11%	1%	2%	16%	6%	2%	14%	1%	1%	6%	7%	25%
9th to 12th, no diploma – attainment	18%	5%	11%	33%	8%	8%	25%	2%	5%	14%	12%	33%
High School Graduate – attainment	29%	12%	18%	26%	20%	18%	31%	14%	26%	33%	27%	32%
Some college, no degree – attainment	19%	21%	24%	14%	21%	22%	20%	20%	27%	24%	20%	7%
Associate Degree – attainment	5%	3%	8%	6%	3%	4%	5%	5%	8%	6%	3%	3%
Bachelor's Degree – attainment	12%	29%	20%	4%	25%	29%	2%	38%	23%	12%	22%	0%
Graduate or Professional Degree – attainment	6%	29%	18%	0%	17%	16%	3%	20%	9%	6%	8%	0%
INDUSTRY												
Agriculture, Forestry, Fisheries	1%	1%	1%	2%	1%	1%	1%	2%	2%	2%	1%	8%
Mining	1%	1%	0%	0%	0%	0%	1%	0%	5%	0%	0%	7%
Construction	7%	3%	6%	4%	4%	5%	8%	7%	1%	11%	13%	10%
Manufacturing – durable goods	5%	1%	4%	4%	6%	3%	3%	4%	6%	4%	5%	7%
Manufacturing – nondurable goods	9%	0%	3%	14%	4%	3%	11%	3%	6%	10%	9%	15%
Transportation	4%	2%	3%	4%	1%	4%	4%	2%	21%	4%	2%	9%
Communications and Public Utilities	5%	2%	5%	2%	6%	7%	4%	8%	13%	6%	9%	0%
Wholesale Trade	5%	6%	4%	6%	5%	4%	3%	8%	5%	7%	6%	4%
Retail Trade	16%	9%	19%	24%	13%	18%	17%	12%	4%	12%	13%	17%
Finance, Insurance, Real Estate	8%	9%	5%	3%	13%	11%	10%	9%	2%	10%	11%	2%
Business and Repair Services	5%	5%	5%	4%	6%	7%	4%	6%	12%	5%	5%	7%
Personal Services	3%	3%	5%	6%	4%	2%	3%	1%	6%	2%	2%	2%

Source: U.S. Census, 1990.

Tract Characteristics for Case Studies (Continued)

	Metropolitan Area	Inner City			Mature Suburbs			New Suburbs			Exurbs	
Case Study Census Tracts		47.02	49	5	107.02	107.03	136.01	129.03	129.08	111.06	303.07	219
Entertainment and Recreation Services	1%	3%	3%	1%	2%	0%	1%	2%	9%	1%	2%	0%
Health Services	11%	21%	15%	14%	13%	13%	15%	10%	3%	7%	7%	6%
Education Services	7%	14%	11%	5%	12%	6%	9%	12%	34%	8%	8%	4%
Other Professional Services	7%	16%	7%	2%	10%	13%	2%	12%	20%	6%	7%	1%
Public Administration	4%	3%	5%	5%	2%	3%	3%	2%	15%	4%	0%	1%
OCCUPATION												
Managerial & Professional Specialty	26%	59%	36%	7%	44%	52%	10%	52%	34%	32%	35%	5%
Technicians & Related Support	4%	5%	11%	3%	3%	1%	3%	3%	5%	3%	4%	1%
Sales	14%	11%	11%	8%	14%	19%	8%	21%	23%	14%	16%	9%
Administrative Support / Clerical	17%	13%	15%	10%	16%	15%	16%	11%	23%	18%	22%	11%
Service Occupations	12%	4%	12%	33%	9%	6%	21%	4%	5%	7%	1%	8%
Farming, Forestry, Fishing	1%	0%	0%	4%	1%	0%	1%	1%	1%	1%	1%	9%
Production, Craft, and Repair	12%	4%	6%	8%	4%	4%	15%	5%	5%	13%	13%	22%
Machine Operators, Assemblers, Inspectors	6%	1%	4%	15%	3%	2%	10%	1%	1%	6%	3%	16%
Transportation Occupations	5%	1%	3%	6%	2%	1%	6%	1%	1%	3%	2%	12%
Handlers, Equipment Cleaners, Laborers	4%	0%	4%	8%	3%	0%	10%	1%	2%	2%	3%	7%
Median Household Income (1989$)	$26,151	$34,821	$18,406	$9,638	$28,520	$43,617	$18,418	$66,120	$29,595	$35,895	$39,105	$16,927
Per Capita Income (1989$)	$13,082	$29,175	$15,551	$5,506	$17,146	$23,006	$7,354	$26,959	$18,467	$16,058	$17,772	$7,601
Per Capita Income – White (1989$)	$15,230	$29,292	$17,613	$5,839	$18,708	$23,229	$9,590	$26,999	$18,836	$16,299	$17,692	$7,741
Per Capita Income – Black (1989$)	$7,407	$26,691	$9,922	$5,501	$8,444	$ -	$6,672	$ -	$16,115	$10,220	$17,231	$4,841
Per Capita Income – Asian (1989$)	$12,327	$23,438	$16,906	$ -	$5,751	$9,480	$ -	$19,155	$13,173	$ -	$26,599	$ -
With earnings	78%	84%	87%	67%	76%	75%	72%	88%	87%	82%	91%	72%
Without earnings	22%	16%	13%	33%	24%	25%	28%	12%	13%	18%	9%	28%
With wage or salary income	76%	79%	85%	66%	75%	72%	68%	85%	86%	81%	89%	71%
Without wage or salary income	24%	21%	15%	34%	25%	28%	32%	15%	14%	19%	11%	29%
With interest, dividend, or rental income	32%	56%	27%	7%	54%	60%	9%	72%	47%	46%	40%	15%
Without interest, dividend, or rental income	68%	44%	73%	93%	46%	40%	91%	28%	53%	54%	60%	85%
With social security income	29%	21%	14%	35%	31%	36%	41%	22%	20%	27%	17%	37%
Without social security income	71%	79%	86%	65%	69%	64%	59%	78%	80%	73%	83%	63%
With public assistance income	7%	2%	2%	21%	5%	2%	19%	1%	2%	4%	2%	12%
Without public assistance income	93%	98%	98%	79%	95%	98%	81%	99%	98%	96%	98%	88%
With retirement income	16%	13%	6%	10%	17%	19%	21%	12%	14%	17%	12%	21%
Without retirement income	84%	87%	94%	90%	83%	81%	79%	88%	86%	83%	88%	79%
Owner occupied housing unit	69%	61%	16%	39%	61%	84%	70%	92%	33%	84%	78%	81%
Renter occupied housing unit	31%	39%	84%	61%	39%	16%	30%	8%	67%	16%	22%	19%
Median gross rent	$358	$346	$329	$235	$371	$409	$329	$656	$442	$411	$489	$279
Median value	$58,600	$116,200	$68,300	$31,500	$90,500	$119,300	$29,700	$157,900	$91,800	$86,900	$99,100	$29,900

Source: U.S. Census, 1990.

Tract Characteristics for Case Studies (Continued)

Case Study Census Tracts	Metropolitan Area	Inner City			Mature Suburbs			New Suburbs			Exurbs	
		47.02	49	5	107.02	107.03	136.01	129.03	129.08	111.06	303.07	219
YEAR HOUSHOLDER MOVED IN												
1989 – 1990	19%	23%	50%	20%	18%	14%	13%	12%	28%	19%	19%	1%
1985 – 1988	27%	35%	34%	24%	33%	21%	21%	38%	35%	33%	33%	21%
1980 – 1984	13%	12%	8%	14%	10%	15%	7%	14%	15%	11%	13%	8%
1970 – 1979	19%	12%	3%	21%	16%	17%	17%	21%	14%	20%	24%	26%
1960 – 1969	11%	11%	3%	13%	9%	13%	16%	9%	7%	7%	6%	14%
1959 or earlier	11%	8%	2%	9%	13%	20%	27%	6%	1%	10%	5%	31%

Source: U.S. Census, 1970 and 1990.

VITA

Kendrick James Curtis was born January 17, 1978 in Montgomery, Alabama. The youngest child of Bert and Ruth Curtis, he spent his childhood growing up on his family's peanut and cattle farm in southeast Alabama. Upon graduating from Pike Liberal Arts School, he was selected as a People to People Student Ambassador to Southern Europe. This afforded Kendrick the rich opportunities of international travel and homestays in Germany and Spain. In the fall of 1996 he enrolled in Troy State University where he studied for two years, after which he transferred to the University of North Alabama. A love of geography was stirred at UNA by being challenged in both the traditional theory of the discipline and the technical aspects of GIS and cartography. He graduated summa cum laude with a Bachelor of Science, major in Geography, from the University of North Alabama in the spring of 2000.

Upon graduation Kendrick spent the summer of 2000 as a Pioneer Farm Intern at George Washington's Historic Mount Vernon. In August of 2000 he moved to Knoxville, Tennessee where he enrolled in the University of Tennessee. He pursued course work in rural and urban geography as well as GIS. Serving as both a graduate teaching and research assistant enabled him to experience both of these integral aspects of a university. The valuable experience gained during the summer of 2002 as he served as the assistant to the director of a National Endowment for Humanities funded 'Cultural Diversity of the American South Institute' broadened his understanding of the American South. Currently Kendrick is employed as a Community Planner for the Tennessee Department of Economic and Community Development, Local Planning Assistance Office.