

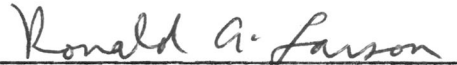
AN ANALYSIS OF THE EXTERNAL  
TRADE AND SERVICE AREAS OF  
GREENVILLE, NORTH CAROLINA

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AN ANALYSIS OF THE EXTERNAL  
TRADE AND SERVICE AREAS OF  
GREENVILLE, NORTH CAROLINA

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by

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James Alexander Woolverton. AN ANALYSIS OF THE EXTERNAL TRADE AND SERVICE AREAS OF GREENVILLE, NORTH CAROLINA. (Under the direction of Ronald A. Larson) Department of Geography, May 1969.

The purpose of this study is to analyze the spatial relationships between the city of Greenville, North Carolina, and its external area. The study determines the important functions of Greenville which serve the immediate surrounding area, and maps the contiguous area of support for each particular function. Each function has its own unique area of support. The size and shape of each external area differs somewhat, yet a remarkable similarity among many is noted.

The functions included in the study are farm marketing facilities; retail and wholesale firms; services such as political, post office, hospital, telephone, radio, and television broadcasting, newspaper circulation, and educational services of East Carolina University; labor shed; traffic flow; and a gravitational model base on population and distance. The areas of support for each of the functions was determined by the sampling of ledgers of the individual firms, acquiring of field data, and by empirical observations. Maps present the areal extent of these functions, and their size and configuration is analysed.

The functions used in this study basically reflect the area's agricultural importance to Greenville, but its economic, political, and social services are portrayed as well. Upon spatial analysis, it becomes apparent that there are two broad types of associated external areas; these are (1) for those functions that are largely county-wide in areal extent, and (2) for those functions having an areal extent over eastern North Carolina or farther.

## PREFACE

Functional analysis of the external relations of intermediate size urban centers has, over the years, been a problem of some concern for geographers. One problem has been in the gathering of verifiable data before any analysis is made. Large centers have readily available publications concerning their city functions. Small centers do not present great difficulties in gathering data either. Intermediate size centers such as Greenville, on the other hand, do not have publications available as do large centers, and yet the intermediate center is large enough to make house-to-house interviewing impractical.

The analysis of Greenville, North Carolina's trade and service areas is achieved from the gathering of field data that are verifiable, thus eliminating general notions and guesswork. The data consisted of addresses derived from ledgers of the businesses of the trade and service activities involved. Representative samples of each activity's ledgers would be recorded to use in the analysis. In turn, the data were plotted on maps according to customer address so that spatial analysis could be made.

This method allowed some accuracy in delimiting the area of support for each function, and provides the information needed to analyze the spatial relations between Greenville and its surrounding area, which is the purpose of this study. The functions used were chosen in a subjective manner, but they are important, meaningful, and do provide a measurement of the spatial relations of the town.

Obviously, this method needed a great deal of cooperation from those interviewed, but the necessity for eliminating guesswork was just as



apparent too. It is the assistance of those persons interviewed that made the study a reality, and appreciation is extended to them.

## ACKNOWLEDGMENT PAGE

Grateful acknowledgment is made to Dr. Ronald A. Larson of the East Carolina University faculty for his untiring efforts in supervising this thesis. His guidance and constructive suggestions have made the completion of this thesis possible.

Appreciation is also expressed to Professor Robert E. Cramer, Chairman of the Department of Geography, and Professor Ennis L. Chestang for their wisdom and guidance in the preparation of the thesis in its final form.

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## TABLE OF CONTENTS

### LIST OF TABLES

### LIST OF ILLUSTRATIONS

### CHAPTER

I. INTRODUCTION.....	1
II. GREENVILLE IN ITS REGIONAL SETTING.....	11
III. THE FARM MARKETING AREA OF GREENVILLE.....	19
IV. THE RETAIL TRADE AREA OF GREENVILLE.....	26
V. THE WHOLESALE TRADE AREA OF GREENVILLE.....	32
VI. SERVICE FUNCTIONS OF GREENVILLE IN RELATION TO ITS EXTERNAL AREA.....	37
VII. THE DELIMITATION OF TRAFFIC CONVERGENCE ON GREENVILLE.....	53
VIII. CONCLUSIONS.....	60
SOURCES CONSULTED.....	65

## LIST OF ILLUSTRATIONS

Map	Page
1. Location Base Map.....	12
2. Population Distribution in the Greenville Surroundings.....	13
3. Greenville Tobacco Marketing Area 1967.....	21
4. Greenville Grain Marketing Area 1967.....	24
5. Composite Retail Trade Area of Greenville 1968.....	28
6. Greenville Wholesale Trade Areas 1968.....	33
7. Greenville, North Carolina Post Office Rural Routes.....	39
8. Service Areas for Newspaper, Telephone, and Hospital.....	41
9. Radio and Television Broadcasting.....	44
10. E.C.U. Summer Theatre Customer Area 1968.....	47
11. Origin of East Carolina University Student Body Fall 1967.....	48
12. Location of East Carolina University Extension Classes 1967-68.....	51
13. Traffic Focus on Greenville.....	55
14. Labor Shed for Greenville.....	58

## LIST OF TABLES

Table	Page
1. Employment in Greenville for 1960.....	17
2. Major Localities Having Out-of-Town License Plates Observed in Greenville.....	56

## CHAPTER I

### INTRODUCTION

The discipline of geography, with its concern with distributions and spatial interaction, has long been interested in the patterns of human settlement over the land and in man's organization of space. The nucleated form of urban settlement is seen as a collection of specialized functions including production, distribution, and the provision of social and political services. The urban businesses which provide these functions require sufficient population and purchasing power for their support. This support is achieved by organizing a wide area of rural countryside into a complex interaction system focusing on the city. This is in addition to the support area provided by the city itself. The city, then, can be viewed not as a self-contained community, but as the core of a wider area, whose boundaries are not visible and obvious, but rather are vague and flexible. The determination of this wider area is an important part of the understanding of how a city functions. "The significant contributions that geography is making to urban studies are defined by its emphasis on the spatial organization of cities on the one hand and on city-external relations on the other."<sup>1</sup>

While a city may perform certain functions, such as manufacturing, for a very distant support area, the immediate contiguous countryside is normally the area of support. The city tends to dominate a

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Philip M. Hauser and Leo F. Schnore, The Study of Urbanization (New York: John Wiley and Sons, Inc., 1965), p. 101.

a rural region which surrounds it. This dominance is particularly strong in places close to the city, and it diminishes with greater distance as people tend to gravitate toward a closer center having similar functions. Beyond this immediate external area of support, the city may have ties to very distant places, but usually these ties are weak and intermittent. These two types of spatial relationships --- to an immediate dominating area and to a set of distant points more dominated by some other center --- constitute the city's total external interaction.

Most studies have given attention to delimiting and analyzing the immediate contiguous external area, since it is the most important part of a city's regional relationship. In this study of the external interaction of Greenville, North Carolina, only the contiguous area of support in eastern North Carolina is considered. The minor ties between Greenville and distant parts of the country and throughout the world are not examined here. The purpose of the study, then, is to gain a further understanding of the concept of a city's functional relationship with its immediate surrounding area through an examination within the framework of urban geography of specific functions of Greenville, a specimen city. First, a brief mention of some similar studies in the geographic literature will be made.

The terminology used in the various studies of external areas of cities is vague and inconsistent. Some of the terms used include hinterland, trade area, urban field, service area, market area, tributary area, sphere of influence, and umland. These terms do have one aspect in common, however, and that is that they refer to

some area outside the city which is organized by the city. The term that will be used in this study is the external area. This term is used because many of the other terms imply that only one criterion is used in delimiting the area. In delimiting the external area of Greenville, many criteria will be employed.

The study by Chauncy Harris of Salt Lake City<sup>2</sup> is one of the first of its kind based on city-region relations. Moreover, it has similarities to the present study in that several urban functions are examined. Harris used twelve selected services or functions of Salt Lake City to delimit his area. These functions included retail and wholesale trade, the influence of the Mormon Church, the distribution of petroleum products from the city, and others. Harris based part of his study on government publications, on the Audit Bureau of Circulation for newspaper circulation, and on personal interview. Very little, if any, of his work was based on unverifiable data. From the criteria used, Harris was able to construct a composite area which he called the Salt Lake Region. Of course, there are many areas around Salt Lake City that are non-populated. Thus the delimitation was easier than in regions of more continuous settlement. At any rate, the study by Harris is a classic and his work has contributed much to the understanding of urban geography.

Another study that is similar to the one made by Harris is the study by Edward Ullman of Mobile, Alabama.<sup>3</sup> Ullman's technique

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Raymond Murphy, The American City (New York: McGraw-Hill 1966) pp. 53-54, citing Chauncy D. Harris, Salt Lake City: A Regional Capital. (Chicago: University of Chicago Libraries, 1940.)

3

Raymond Murphy, op. cit., p. 54, citing Edward Ullman, Mobile: Industrial Seaport and Trade Center. (Chicago: University of Chicago Libraries, 1943).



was different from that of Harris in that he based his boundaries on field sources and interviews of individual firms located outside of Mobile. He delimited the area where fifty-percent or more of the business was with Mobile firms. For newspaper circulation, a boundary was made for fifty percent Mobile usage and for fifteen percent usage. Ullman was especially concerned with wholesale and retail trade, and bank services.

Certain areas in the United States closely approximate Christaller's ideas about central place theory and the hierarchial order that he developed. One of these areas is in southwestern Wisconsin. There, J.E. Brush observed the hierarchy of central places and the relationships existing between the central place and its external area.<sup>4</sup> His external area was a trade area of these centers delimited by converging areas of traffic flow with the use of county highway maps. It may be noted that his trade area was delimited by only one criterion. Berry also has contributed to the literature with his studies on market centers and the hierarchial nature of consumer travel to them.<sup>5</sup>

An enlightening article on hinterlands, and the factors involved in delimiting the hinterland between competing cities, is the study made by Howard L. Green of New York and Boston.<sup>6</sup> This study, however,

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J.E. Brush, "The hierarchy of central places in southwestern Wisconsin," Geographical Review, XLIII (1953), 380-402.

5

Brian, J. L. Berry, Geography of Market Centers and Retail Distribution, (Englewood Cliffs, New Jersey: Prentice-Hall, 1967).

6

Howard L. Green, "Hinterland boundaries of New York City and Boston in southern New England," Economic Geography, XXXI (1955), 283-300.

uses seven criteria in delimiting the hinterland. These include railroad ticket purchases, estimates of truck movements between New York and Boston, newspaper circulation, long-distance telephone calls, origin of vacationers, business addresses for directors of industrial firms, and correspondence from outlying banks doing business in New York and Boston. In instances such as newspaper circulation or long-distance telephone calls, an area in which Boston dominated would be determined, and an area in which New York dominated would be determined. Finally, a composite area in which New York and Boston dominated would be found from the indicators using a "median boundary" of the selected criteria. Thus a method for reconciling different indicator criteria is developed. It should be pointed out, however, that the particular criteria used by Green are appropriate for large metropolitan cities, but not for smaller ones.

The study of city-external relations is not restricted to American geographers, for much work on this subject has been done by European geographers as well. F.H.W. Green and Robert E. Dickinson are particularly noted in this field. Green's articles deal primarily with cities in Great Britain.<sup>7</sup> He uses the criterion of bus service to delimit service areas.<sup>8</sup> In the early 1950's, buses were used extensively by people living in outlying areas who wished to travel to the city for some particular purpose. Thus, he plotted

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F.H.W. Green, "Urban hinterlands in England and Wales: an analysis of bus services," Geographical Journal, V. CXVI (Sept. 1950), 64-88.

8

F.H.W. Green, "Town and Country in Northern Ireland: from a study of motor-bus services," Geography, No. 164, V. XXXIV (June, 1949), 89-96.

the number of bus trips from a center, and from this information divides or breaks could be determined between neighboring centers. The procedure of determining breaks or divides between cities according to bus travel again uses only one criterion. However, in his study an effort was made to correlate bus service with the number of shops in the center. Later, Green disclosed that "it is questionable if bus travel is as good an index now since it has lost considerable ground to private cars."<sup>9</sup> Dickinson has also worked with the city-external area concept for some time. His book entitled City, Region and Regionalism was first published in 1947 and a later book entitled City and Region was published in 1964.<sup>10</sup> Dickinson feels that the city can be understood better by an examination of the region which he refers to as having some functional association with the city. Interest is focused particularly on the impact of the city on the surrounding region, the effect on land use, commuting, and industrial growth. Dickinson has been one of the forerunners in the analysis of the relationships between city and external area, and his work has had a pronounced effect on sociology and urban geography.

Much of the geographic literature on the subject of city-external areas is concerned with delimiting an area for a center, and then attempting to show how this city-external area fits into a hierarchical order of centers. One method is to delimit the area

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F.H.W. Green, "Urban hinterlands: Fifteen Years On" Geographical Journal, Vol. CXXXIII (June, 1966), p. 263.

10

R. E. Dickinson, City and Region (London: Routledge and Kegan Paul, 1964).

for a very small center, such as a hamlet, or village, and then to see how this area in turn is tributary to and dependent upon a higher order center, such as a town. The external area of the town in turn becomes part of the external area of a neighboring city. Within a region or country, several levels of interlocking areas of increasing size and complexity may be identified. This method is largely due to the efforts of Christaller, Lösch, and others who have written works on central places and the hierarchial order they tend to follow.

Allen K. Philbrick, in his studies of areal functional organization, has used this method of determining hierarchial orders. His study concerning Boswell, Indiana, and the areal functional organization that it follows, is another of the classics regarding the city-external area concept.<sup>11</sup> Philbrick contends that there are seven orders to the hierarchy in the eastern United States, and they range from a simple establishment such as a farm to the highest order, which is New York City. He uses the example of the small village of Boswell, Indiana, and shows that the various functions of this center have external areas of varying sizes and shapes. By detailed field interviews with prominent establishments in Boswell, such as a feed company, a car dealer, a bank, a grocery store, and a poultry and egg company, he determines the extent of Boswell's influence into the surrounding countryside.

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11

A.K. Philbrick, "Principles of areal functional organization in regional human geography," Economic Geography, V. XXIII (Oct. 1957), 299-336.

A recent study by Robert W. Brown<sup>12</sup> concerning the village of Upsala, Minnesota, is similar to Philbrick's study. The establishments in Upsala are of the same nature as those found in Boswell. The trade areas were delimited by two methods. The first method was an estimation of the spread of political, economic, and social functions. From this information, seventy-five, fifty, and twenty-five percent concentration lines were established. The second method was to take an 8.3% sample of the concentration zone established, and interview the people as to their trading habits. From the two methods, a map delineating the service area was made. Brown, like Philbrick, showed how the village has distant external connections with the entire nation as well as with its own immediate area.

From this brief examination of part of the geographic literature, it can be seen that the external areas of cities have been treated in a variety of ways. Some studies have relied on one single criterion, and others have used several. Some studies have dealt with small villages and others have large metropolises. Writers appear to have used those meaningful criteria for which realistic data can be obtained, and these vary from city to city.

In the present study, a variety of important area-serving functions of Greenville will be examined. These include farm marketing activities; retail and wholesale trade; commuting of factory workers; communications media such as newspaper circulation and radio-television broadcasting; activities connected with East Carolina University, such as student draw, outlying towns for extension service, and the location of Summer Theatre

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Robert W. Brown, "The Upsala Community: A Case Study in Rural Dynamics," Annals of The Association of American Geographers, V. LVII, 1967.

customers; social services such as hospital service, telephone exchange, county-level political service, and rural postal delivery; and such traffic-related items as highway traffic focus, out-of-town license plate tabulation, and a theoretical model of retail gravitation. Each criterion will be mapped, and comparisons of their sizes and configurations will be noted. The delimitation of a generalized, all-purpose composite external area is not the purpose of the study. Similarly, it is not the objective to determine sharp divides between the area dominated by Greenville and the areas dominated by other competing centers. The principal interest is to note how far into the surrounding area a significant Greenville influence is felt. No attempt is made to place Greenville into a hierarchy of central places or to note how the Greenville area itself may be tributary to a larger city.

The methods used in this study are somewhat different from the studies examined previously. Many of those studies delimited the external area by estimation or by one criterion, and the results were very general. At the outset of this study, external areas were delimited through estimates made by the people involved in the particular functions. The results were approximate and very unsatisfactory. Store managers and businessmen had grossly distorted mental images of where their customers originate. It became apparent that the information needed would have to be more verifiable than the estimates. It was decided to examine the written ledgers of the various functions being delimited and use a sample of the customers'

addresses that were listed. Obviously this method would take much cooperation from the people that were in charge of these establishments. Many times the writer had to explain that he was not a magazine salesman wanting a list of names upon which to call. Once it was explained that only the addresses were needed, the people were usually more than glad to help. This procedure was used consistently throughout the study.

Before presenting the main body of evidence, however, it would be beneficial for the reader to understand the overall character of the City of Greenville and its surrounding area. This will enable the reader to evaluate more fully the spatial patterns as they emerge in the following chapters.

## CHAPTER II

### GREENVILLE IN ITS REGIONAL SETTING

Greenville is a city with a population of about 30,000 inhabitants in eastern North Carolina. Several cities including Rocky Mount to the northwest, Wilson to the west, Goldsboro and Kinston to the southwest, and New Bern to the southeast of Greenville, have a similar size and are located about thirty to forty miles away (Fig. 1). Greenville is situated near the center of Pitt County with about twenty miles distance to the county's boundary in all directions, and is the county seat. The population of Pitt County numbered 69,942 in 1960 and the population density was 107 per square mile.<sup>1</sup> Furthermore, the area within a fifty mile radius of Greenville has an approximate population of 550,000 persons. The area has a relatively dense population, one in which most of the people live in rural areas, predominatly on farms. The map showing population distribution in the Greenville surroundings (Fig. 2) reveals a highly uniform pattern, particularly in the areas west of Greenville. Population distribution seems to be influenced by terrain features, particularly drainage and elevation. To the east of Greenville, where there are many swamps, density is less than in Pitt County and distribution is spotty, while to the west of Greenville, where swamps are less numerous and level coastal plain is common, population density is greater and distribution is more uniform.

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Richard Lonsdale, Atlas of North Carolina, (Chapel Hill: University of North Carolina Press) 1967, p. 54.



## LOCATION BASE MAP

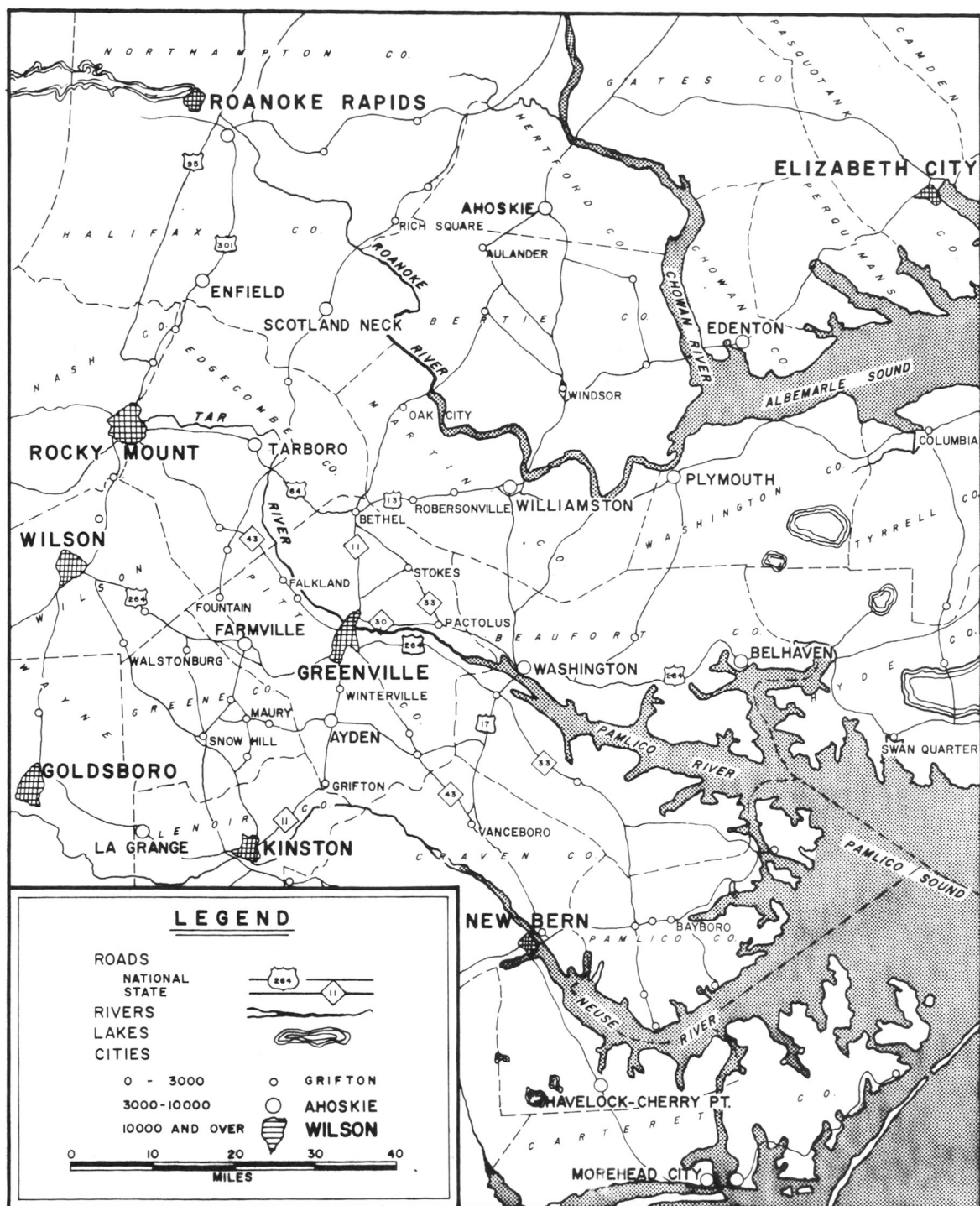


Figure 1.

## POPULATION DISTRIBUTION IN THE GREENVILLE SURROUNDINGS

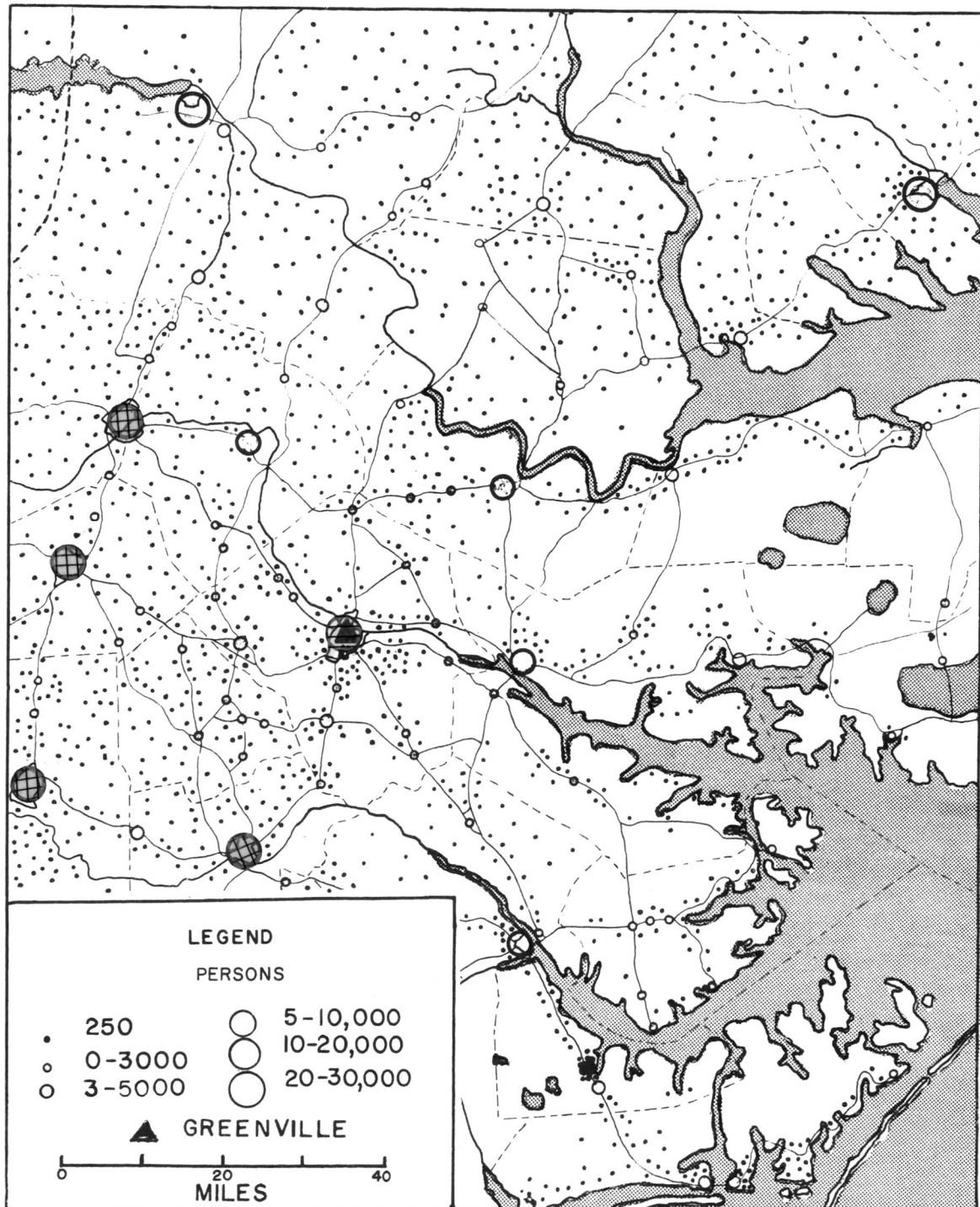


Figure 2.

The dense road network in Pitt County and surrounding counties is an indication of the areas large rural population. There is a great number of roads composed of asphalt or dirt throughout the county, particularly in heavier settled areas, but there are also state and federal highways radiating from Greenville in all directions. Highway 264 runs east-west; Highways 11 and 13 run north-south; Highway 43 runs northwest-southeast; Highway 903 runs northeast from Greenville; and Highway 30 runs east from Greenville. A large rural population would necessarily need an extensive network of roads for accessibility. This enhances Greenville's regional position and enables it to serve its surroundings by easy connections.

The rural nature of the population is one of the major characteristics of the area. The absence of a regional dominating center is another. Cities in the area have similar sizes and functions as Greenville, and instead of having one regional center there are several. As a result, there is spatial competition among the centers.

The major portion of this area is included within the Inner Coastal Plain. This plain is characterized as being low in elevation and in relief with poor drainage in places. Much of the area is forested, but interspersed with relatively small and numerous plots of farm land. This association reveals a patchy agricultural settlement. The area is a significant agricultural region and therein lies much of the economic basis. It is the heart of the flue-cured tobacco belt, and tobacco is the leading cash crop by far. After harvest, tobacco is sold in warehouses located in higher order centers throughout the area. The wholesaling of tobacco becomes a function of the center

which exhibits a strong sense of spatial interaction. Not only is tobacco marketed largely within the region itself, but there are strong tendencies for stemming and redrying plants to be located in the region as well. Many of these processing plants are located in higher order centers such as Greenville. Within this region, Greenville and Pitt County serve as an outstanding example of the tobacco marketing phenomenon. Pitt County is the largest tobacco producing county in the belt, while Greenville is the second leading market. Eight warehouses and two processing plants are in Greenville. Total sales in Greenville for the 1967 growing season amounted to \$31,481,076.<sup>2</sup> Other crops grown and marketed within the area include corn, soybeans, and peanuts. Livestock are clearly secondary in importance to crops and few facilities are available in the region for marketing.

Agriculture has contributed much to the population and population growth of Greenville. This was particularly true in years past because Greenville was geared heavily to a one crop economy of tobacco. The situation remains very similar now, but other factors are stimulating population growth as well. The population for Greenville in 1940 was 12,674. It grew to 16,724 in 1950, and to 22,860 in 1960.<sup>3</sup>

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United States, Department of Agriculture, Flue-Cured Tobacco Market, 1967, Washington, p. 24.

3

City Planning and Zoning Board, Population and Economy of Greenville, North Carolina, 1965, p. 6B.

Estimates of 31,000 in 1967 and 32,000 by 1970 are considered to be reliable.<sup>4</sup>

It may be noted that there has been a rapid increase in the past few years. This increase can be related to the growth of East Carolina University, located in Greenville. The university offers a wide range of disciplines, it is the only major institution in the eastern portion of North Carolina, and as a result, draws many students from a wide area. The enrollment for the college was 1,578 in 1950, 3,654 in 1960,<sup>5</sup> and 9,538 in 1967-68.<sup>6</sup> The impact of the university on population growth is striking as well. Many business establishments depend on student customers heavily and the role of the university may be expected to increase in the future.

Tobacco and the university are the most important aspects of Greenville's economy, but like any city with 30,000 persons there are retail and wholesale firms, a newspaper, radio stations, a television station, a hospital, manufacturing and industrial firms, and other services that people of the city and surrounding area may use. The importance of these services may be reflected by an examination of the persons employed in Greenville.

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Greenville Chamber of Commerce estimate.

5

City Planning and Zoning Board, Population and Economy of Greenville, North Carolina 1965, p. 7.

6

Information provided by Greenville Chamber of Commerce.

TABLE ONE  
EMPLOYMENT IN GREENVILLE FOR 1960<sup>7</sup>

	<u>Numbers</u>	<u>Percent</u>
Agriculture	201	2.46
Manufacturing	1296	15.86
(durable goods)	310	
(non-durable goods)	986	
Construction	547	6.70
Transportation and Communication	248	3.04
Utilities	104	1.27
Commerce	2477	30.32
(retail)	1347	
(wholesale)	387	
(other)	713	
Personal Services	1168	14.30
Professional Services	1906	23.33
(education)	1201	
(other)	705	
All other	222	2.72
Total Employed	8169	100.00

This table reveals a strong concentration in education, which is attributed to the university, and a heavy concentration in commerce, particularly in retail trade, but in wholesale trade also. The table also reveals a relatively low number of people employed in manufacturing. Personal services, including female domestic help, have a relatively large percentage of the total persons employed. While the importance of education may be seen in this table, the importance of tobacco is not. The reason for this is because very few people are needed in the wholesaling of tobacco. Basically, this table reveals a situation characteristic of the area and for the size of the city

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City Planning and Zoning Board, Population and Economy of Greenville, North Carolina, 1965, Appendix I.

involved. Greenville is similar to other equal centers nearby, with the exception of the influence of the university.

Since tobacco and other agricultural crops are the bases for economic activity for Greenville and the entire area as well, it would be appropriate to delimit the farm marketing area for Greenville as a beginning phase of this study. In the following chapter, the area for tobacco, corn, and soybean marketing are delimited, as well as the area involved in supplying tobacco for processing plants in Greenville.

### CHAPTER III

#### THE FARM MARKETING AREA OF GREENVILLE

One of the most basic functions that Greenville provides for a wider area is the marketing of farm products. Its rural surroundings produced such products as tobacco, corn, soybeans, cucumbers, peanuts, and livestock which must be brought to concentrated selling points. The farm income from the disposal of these products can in turn help support other city functions, such as retailing, wholesaling, newspaper, telephone service, etc., which have their areal expression. In part because of the bulk and perishability of farm products, farmers generally desire to bring their products to the nearest satisfactory market. But they may frequently bypass the nearest market for a more distant competing place if subjective evaluation of factors other than distance is strong enough. Particularly is this the case with tobacco, by far the most important of the products in the area. With a non-standard price and sold by auction, tobacco may move unusually long distances to some market towns.

The spatial dimensions of farm marketing will be portrayed by means of a representative sample of customers using Greenville facilities. Since tobacco and grain are the dominant commodities for Greenville, maps of their distributions will be presented as indicative of the overall pattern of farm marketing. Cucumbers are marketed in Greenville in the late spring or early summer, and they probably originate no more than a few miles from the city. Peanuts are brought into town from areas north of Greenville, such as Bertie and Chowan counties, but their dollar value is distinctly secondary. Hogs



and cattle are brought to Greenville for auction, but their pattern is not thought to be radically different from that of tobacco and grain.

The Greenville tobacco market is large. Greenville has eight warehouses. These include Keel's, Cannon's, Harris and Rogers, New Carolina, New Independent, Raynor and Forbes, Star Planters, and Farmer's Market warehouses. Buyers from R. J. Reynolds, American, Liggett and Meyers, Lorillard and Universal, foreign buyers; and local independent buyers are represented in the Greenville market.<sup>1</sup> In 1967, 49,147, 653 pounds of tobacco were sold in Greenville for a sum of \$31,481,076.<sup>2</sup>

In order to obtain information on the areal extent of tobacco marketing which focuses on Greenville, three warehouses were interviewed and a sample of their floor sheets for the 1967 season was taken. For each warehouse, three different selling days were chosen, and the locations of farmers having tobacco on the floor on those days were mapped (Fig. 3). The sampled warehouses were the New Carolina, Farmer's Market, and Raynor and Forbes warehouses. A total of approximately 400 locations resulted.

It is desirable to recognize a concentrated area of very dense customers which surrounds the city and which constitutes the main trade area, and in addition to recognize that some customers may come from scattered and discontinuous places far beyond this area.

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1

Interview, W. L. Whedbee, Chairman of the Greenville Tobacco Board, June 11, 1968.

2

U.S. Department of Agriculture, Flue-Cured Tobacco Market Review, 1967 crop, Washington, March 1968, p. 24.

## GREENVILLE TOBACCO MARKETING AREA 1967

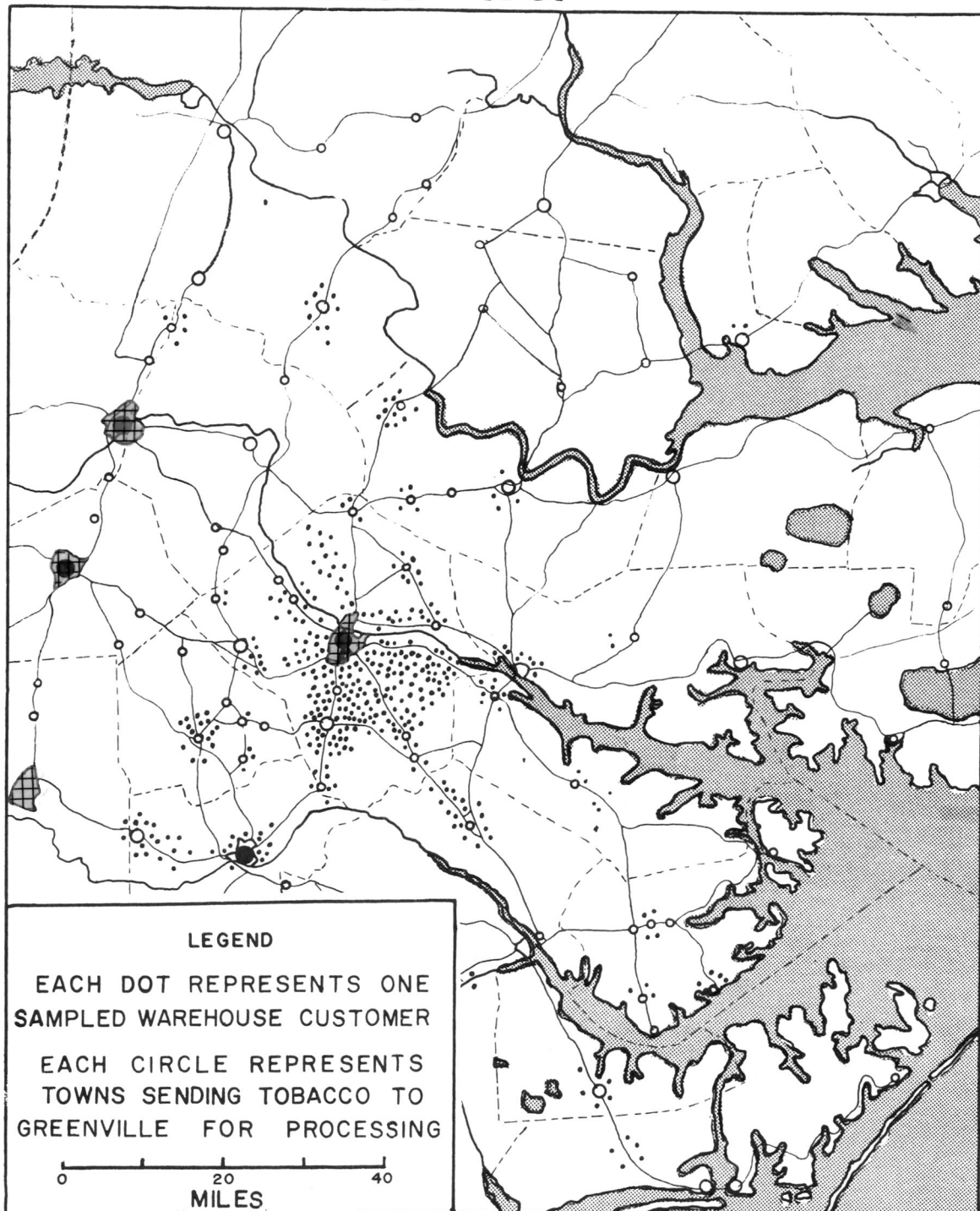


Figure 3.

Just as a city in total may have a contiguous external area and a set of discontinuous points of interaction, a single function may display this type of organization. It is very interesting to note that the sample reveals interaction with stray locations as far away as South Boston, Suffolk, and Emporia, Virginia, over 100 miles away. However, it is more significant to note that the dominant area of concentration is quite local.

The major area of customers is concentrated in Pitt County, particularly south and east of Greenville. There are heavy areas of concentration near Grimesland, Winterville, Ayden, and the area immediately to the southeast of Greenville. This concentration extends about thirty miles to Vanceboro in Craven County, but heavy concentration ends there. Another area of concentration, although not as strong as the previous area, is to the southwest and west of Greenville. This area is in the Snow Hill, Farmville, and Falkland vicinity. Heavy concentration ends at about eleven miles from Greenville on the west. Competing markets in Farmville, Wilson, Kinston, and Goldsboro appear to influence this configuration to the west. On the north, tobacco customers diminish near Bethel, about eleven miles away. Other concentrations appear at La Grange, Kinston, Havelock, and Grantsboro to the south; Washington and Pinetown to the east; and Oak City, Whitakers and Scotland Neck to the north.

Thus, the area of contiguous tobacco marketing is mostly in Pitt County, with adjacent parts of Greene, Lenoir, and Craven counties. Less dense farm settlement to the north of Greenville generates fewer

customers than the major area to the southeast of the city.

After being sold on the warehouse floor, tobacco moves to a relatively few processing plants for stemming and redrying. Greenville has two processing plants, and this interaction represents another pattern, rather different from the warehouse marketing pattern. The area involved in sending tobacco to Greenville to be processed lies predominantly to the west of Greenville (Fig. 3). This is primarily due to the fact that companies are consolidating numerous small plants into fewer large plants. Some plants at Wilson, Rocky Mount, and Kinston have been consolidated into the Carolina Leaf Tobacco Company located in Greenville. As a result, some tobacco from Wilson, Rocky Mount, and Kinston is brought to Greenville. Much tobacco is also brought from the Border Belt, including Mullins, Lake City, and Timmons ville in South Carolina. However, most of the tobacco processed in Greenville comes from the eight warehouses in Greenville itself.

The pattern of corn and soybean marketing was determined by plotting the locations of a sample of customers for 1967 from the Fred Webb Grain Elevator, the only grain facility in Greenville. This pattern is mapped in Figure 4. The area of major concentration is more nearly circular than the tobacco marketing area, but with a disproportionate spread to the south (thirty miles to Kinston) and to the north (thirty-one miles to Tarboro). The greatest area of concentration is again the immediate Greenville area. The Winterville-Ayden area is heavily concentrated. The area from Grifton to La Grange is very well represented. Also, some customers haul grain to Greenville

## GREENVILLE GRAIN MARKETING AREA 1967

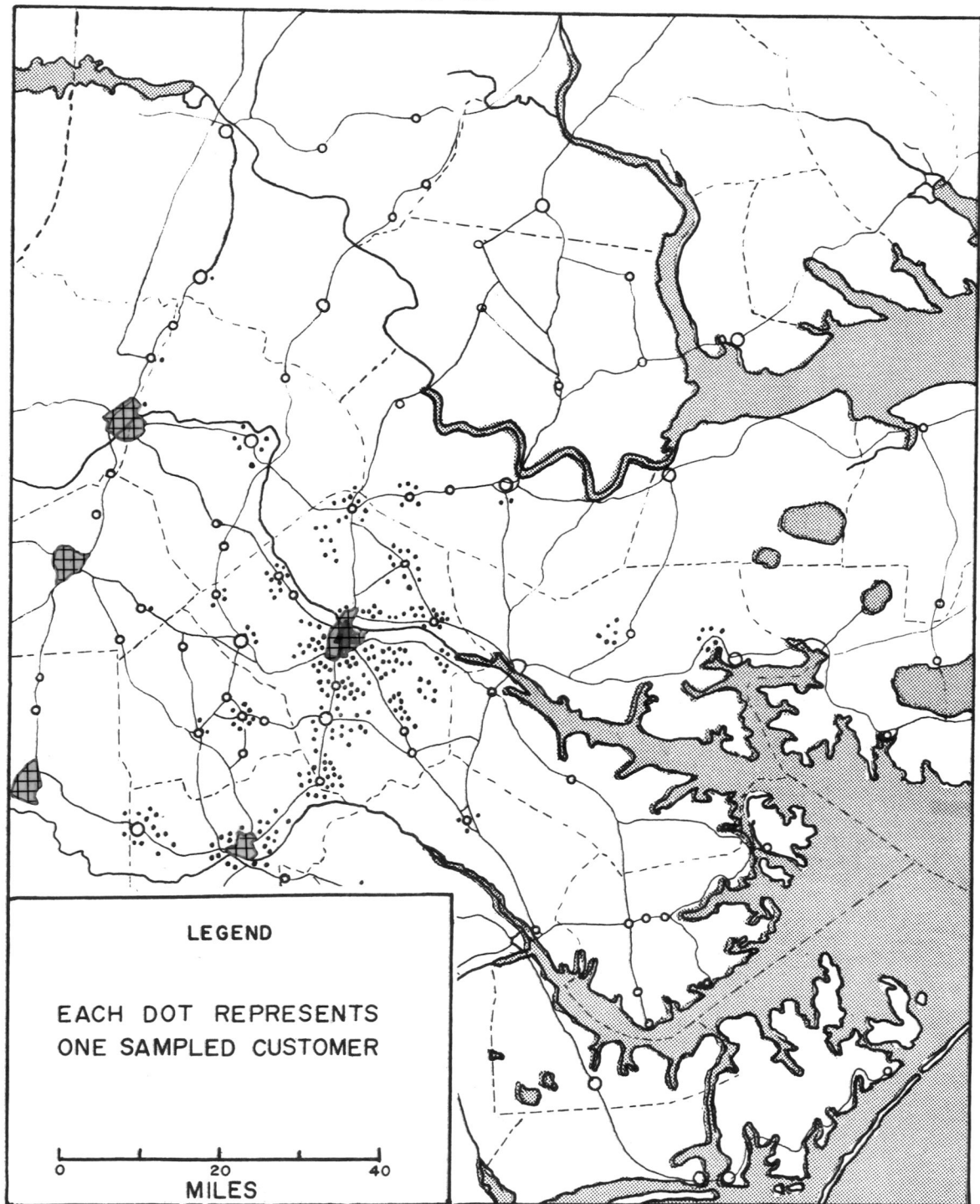


Figure 4.

in preference to Kinston and Washington which are closer. The pattern may be partly due to the fact that facilities allow corn prices to be government supported in Greenville, whereas they are not in Kinston or Washington. Other areas of customer concentration include Bethel, Robersonville, Stokes, Pinetown, Maury, and Falkland.

While the function of farm marketing is very important to Greenville, its spatial pattern is a highly seasonal one. Moreover, not all families in the surrounding area participate, but only those with farm products to be sold. The next chapter will describe the retail businesses of Greenville in their external relations. The retail function is a continuous one throughout the year, it involves a great number of consumer products, and affects virtually all families in the immediate surroundings to some extent.

## CHAPTER IV

### THE RETAIL TRADE AREA OF GREENVILLE

Over the years, urban and economic geographers have been particularly interested in the retail trade area of urban centers. This interest is due to the importance of retailing, for virtually any center regardless of its size has a retail trade area, and almost all of the people in this area are served in some manner. Frequently, urban geographers have used the retail trade area as being indicative of the overall external area of a city. In this study, retail trade is clearly an important indicator in delimiting external areas, but it is only one of several.

Greenville is one of the larger retail centers of eastern North Carolina. In 1967, Greenville had 329 retail establishments, which accounted for \$77,443,787 in total sales.<sup>1</sup> It is a large enough center to offer certain items not found in nearby lower order centers. Thus the potential area of support may be expected to include some of the nearby lower order centers. The potential area of support is limited in extent, however, due to similar order centers located approximately thirty to forty miles away that compete for many of the same customers.

The businesses chosen to delimit the retail trade area of Greenville deal in products which are among the leading items sold in the city. They show the relationship of Greenville to the

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Interview with Mr. Harold Creech, Head of the Greenville Chamber of Commerce, June, 1968.

surrounding countryside, and they reveal the areal extent of retail sales in the immediate contiguous area. The firms included in the study are fuel oil companies, hardware stores, a department store, furniture stores, farm machinery stores, and automobile dealers.

The procedure used in delimiting this immediate retail trade area of Greenville was to take representative samples from customer ledgers of these particular firms. In all instances, cash receipts for actual sales were used for plotting information, except for Belk-Tyler Department Store, in which case charge accounts were used. In all, there were over 1100 sampled customers and their areal patterns are revealed on a composite retail trade area map (Fig. 5).

Fuel oil companies have the smallest area of support of any retail business visited. Fuel oil is particularly important in this area since it is used for heating in the winter months. Because there are fuel oil companies located in several centers throughout Pitt County in addition to Greenville, competition restricts Greenville's area of support. The companies visited for this study include Leon L. Moore, Clark, and Carawan oil companies. The area of concentrated customer usage extends twelve miles to the south, west, and north of Greenville, but only ten miles to the east. The predominate area is a belt extending immediately southeast of Greenville.

Hardware, like fuel oil, is a commodity that is used in great abundance and is available in smaller centers. As a result, it has an area of support only slightly larger than that of fuel oil. The hardware companies that were visited include Glass', Dunn's, Hodges', and Western Auto. The hardware retail area extends twelve



## COMPOSITE RETAIL TRADE AREA OF GREENVILLE 1968

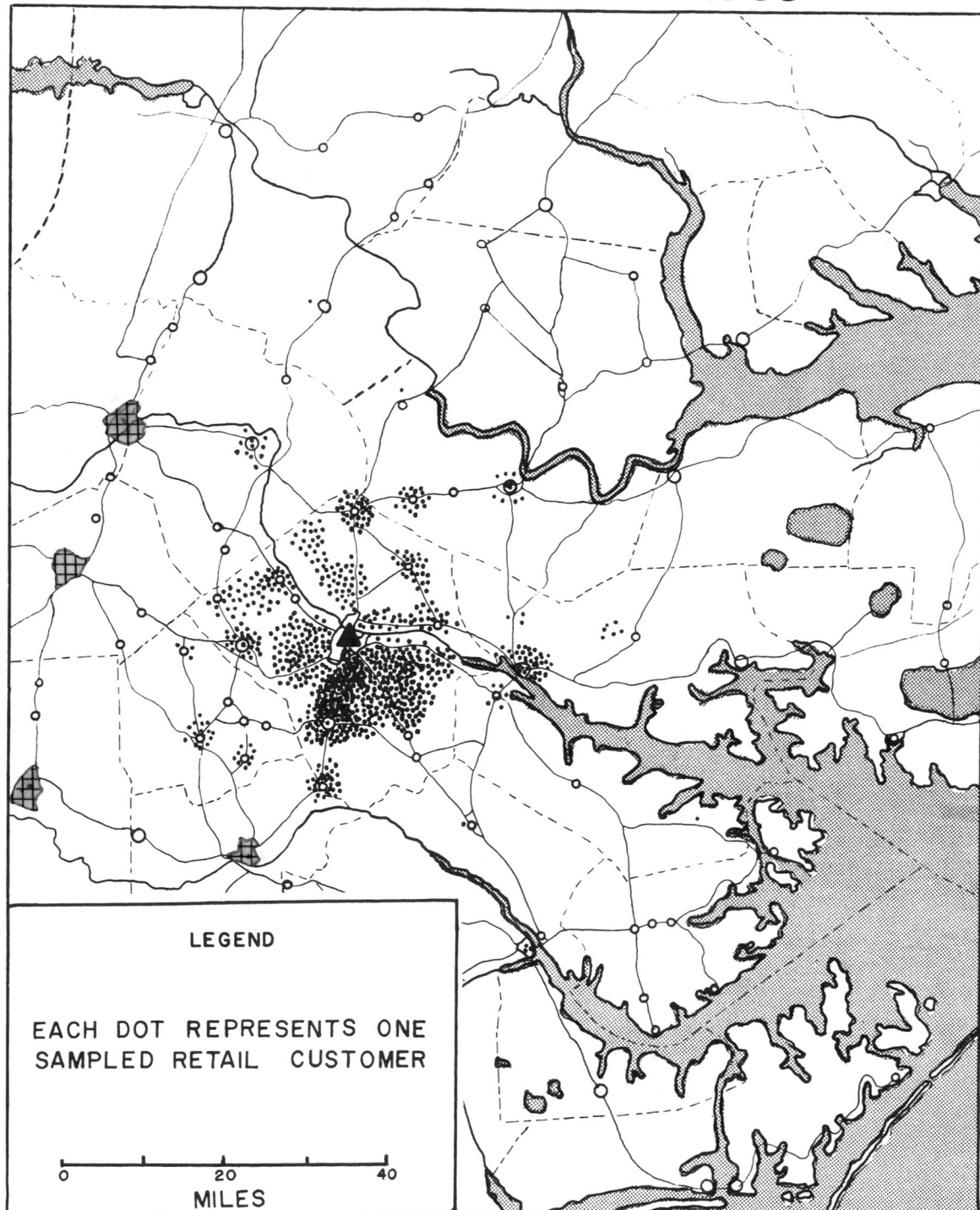


Figure 5.

miles from Greenville in all directions. The area immediately southeast of Greenville is the most heavily concentrated in customer usage. Hardware stores within the county in centers such as Ayden or Farmville, in addition to similar order centers in adjoining counties, limit the areal extent of this commodity.

Furniture stores constitute a retail type that is confined almost completely to higher order centers of this area. This item needs a relatively large area of support, for it not only includes furniture that is low in price but also furniture that is quite expensive. As a result, stores are spaced farther apart than dealers in fuel oil or hardware. The furniture stores visited for this study include Home and Bostic-Sugg stores. This area is not symmetrical at all, but rather it extends twenty-five miles west, ten miles south, twenty miles east, twenty-five miles northeast, and fifteen miles north of Greenville. This off-center projection to the east suggests in part the general predominance of lower order centers to the east of Greenville.

Farm machinery constitutes an item of higher order centers. This is an agricultural area, however, and farm machinery stores may be found in some of the lower order centers also. The companies of Eastern, John Deere, and Hendrix-Barnhill were visited to take samples for this item. Farm machinery does not have one dominant area of concentration, but rather several areas. The area extends twenty miles east, twenty-five miles northeast, fifteen miles north, twenty-five miles west, thirty miles southwest, and seventeen miles south from Greenville. The heaviest area of concentration extends ten miles southeast of Greenville.

The Belk-Tyler Department Store area was obtained in a slightly different manner than for previously mentioned establishments. Charge accounts were used instead of the usual sales receipts. However, the results do not vary greatly from other items found in Greenville. Department stores the size of Belk-Tyler are clearly confined to higher order centers and are representative for this study. The area extends thirty-five miles east, seventeen miles south, thirty miles southwest, eighteen miles west, and fifteen miles north from Greenville. From this plotting of Belk-Tyler customers, the influence of competing stores in nearby higher order centers can be seen. Belk-Tyler has most of its customers south and east of Greenville.

The automobile dealer area constitutes the largest retail area for any of the items sampled. There is a large variety of automobiles that can be bought in Greenville and this accounts for the large area that is served. The dealers that were visited include Phelps Chevrolet, Joe Pecheles Volkswagen, and Bright-Leaf Motors (Plymouth and Chrysler). The area extends thirty-five miles east, seventeen miles south, eighteen miles west, thirty-one miles northwest, and fifteen miles north from Greenville. In certain instances, such as Volkswagen, there are no other similar dealers between Greenville and the coast. As a result, there is a strong degree of interaction between Greenville and the area to the east.

It is apparent that Greenville draws most of its retail trade from within the county. However, there is a continuation of trade into Greene, Beaufort, and Martin counties for a few miles. The composite retail trade area in essence extends twenty-five miles west,

thirty miles southwest, seventeen miles south, thirty-five miles east, thirty-six miles northeast, fifteen miles north, and thirty-one miles northwest from Greenville. There is a very great concentration of retail trade found to the southeast of Greenville. This off-center projection is largely due to the similar order centers located to the east of Greenville. Kinston, Wilson, and Rocky Mount in particular, provide a great deal of competition. There are few centers of similar rank found to the east of Greenville. It is interesting to note that while most of the retail trade is confined to Pitt County, there are special sales made during the year that draw customers from more than one hundred miles away.

The retail trade area that a center serves is normally smaller than the wholesale trade area. This is true because wholesaling by its very nature demands a large area of potential support. In the next chapter, Greenville's role as a wholesale center is examined.

## CHAPTER V

### THE WHOLESALE TRADE AREA OF GREENVILLE

Wholesale trade is a function somewhat different from that of retail trade. Retail firms, such as grocery stores or hardware stores, may be found in communities of only a hundred people, but it is unusual to find a wholesale firm in such a community. Wholesale trade is a function that is largely confined to higher order centers. It involves the distribution of some product to outlying centers for retail sale. In many instances, it is advantageous for a wholesale firm to find a location with adequate sales territory in all directions. A wholesale firm also needs good transportation routes for incoming and outgoing goods.

Greenville is a wholesale center of some extent. It is favorably located with adequate sales territory, and a good highway network radiates from Greenville. In 1967, the wholesale trade in Greenville amounted to \$80,000,000, a sizeable increase over the past year.<sup>1</sup> Several new wholesale firms have located in Greenville in the past few years and its importance as a wholesale center may be expected to increase. Various items sold and distributed by Greenville wholesale firms include meat, magazines, dairy products, groceries, rugs, auto parts, air conditioning and heating equipment, candy, soft drinks, electrical equipment, appliances, cookies, seafood, and hardware.

To delimit the area served by Greenville wholesaling firms, four representative companies were interviewed and their sales territories

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Interview with Mr. Harold Creech, Head of the Greenville Chamber of Commerce, June 25, 1968.

## GREENVILLE WHOLESALE TRADE AREAS 1968

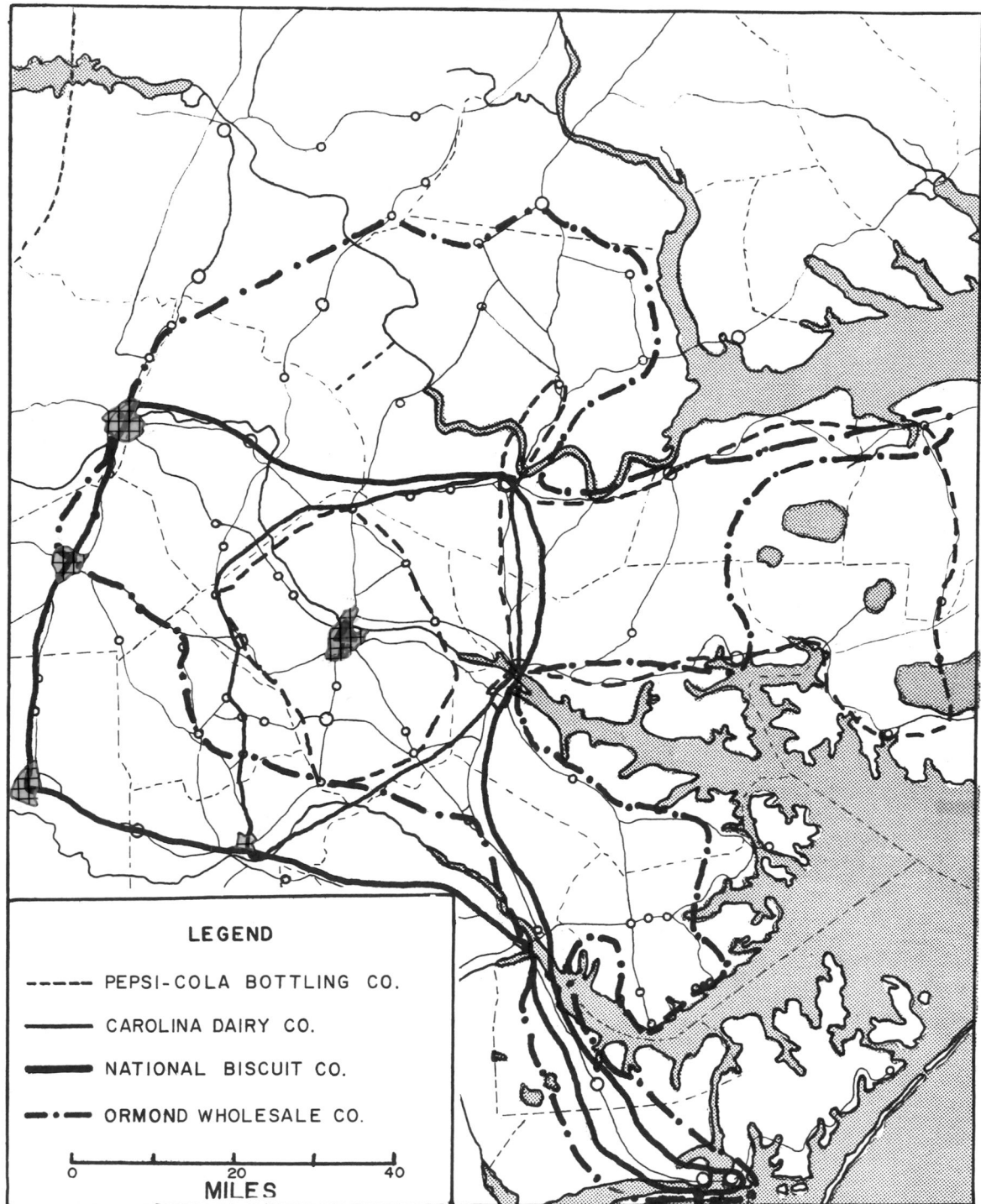


Figure 6.

were mapped (Fig. 6). These companies are Carolina Dairy, National Biscuit Company, Ormond's Wholesale Company (groceries), and the Pepsi-Cola Bottling Company. Since they distribute non-durable food products, these firms may be expected to have more frequent contacts with their outlying customers than firms which distribute durable goods only from time to time. Other wholesale items may perhaps have wider areas of distribution, but the food products may be taken as symbolic of the city's wholesale interaction.

The company having the smallest wholesale trade area of those that were visited is Carolina Dairy. The extent of their business is shown by a line through Washington, Williamston, Conetoe, Snow Hill, and Kinston. On the average, their outer limit of service is about twenty-five miles. Most of the business is centered in Pitt County, but salesmen do business also in towns on the county fringe.

Pepsi-Cola has an unusual and discontinuous distribution area centered in Greenville. Trucks from Greenville bring soft drinks to merchants only within Pitt County, and especially to Farmville, Ayden, Winterville, Grifton, and Bethel. This forms a relatively small continuous area with an average radius of some ten miles, even smaller than Carolina Dairy. But in addition, jobbers from Washington come to Greenville to buy Pepsi-Cola which is then wholesaled in an extensive area to the east, including Washington, Belhaven, Swan Quarter, Columbia, Plymouth, Williamston, and Windsor. This discontinuous portion of the wholesale area brings Greenville products to places about seventy miles east of the city by means of a sub-center at Washington.

The National Biscuit Company is concerned with distributing crackers, cookies, and related products to various retail stores in the area. The area that Nabisco serves fluctuates somewhat from season to season. In the winter months, Nabisco serves an area extending to Rocky Mount, Wilson, Goldsboro, Kinston, New Bern, Washington, Williamston, and Tarboro. In the summer months, Nabisco serves in addition the resort towns of Morehead City and Beaufort on the coast with ice cream cups. Thus Nabisco's normal hauling range of thirty-five miles becomes doubled during the summer season.

The Ormond's Wholesale Company, primarily concerned with grocery distribution, has a large and irregularly shaped trade area. Ormond's supplies groceries for Clover Farm, Foodland, and Best Mart super markets in eastern North Carolina. The extent of the area that Ormond's serves is to Rich Square, Whitakers, Rocky Mount, Wilson, Snow Hill, Vanceboro, New Bern, Morehead City, Beaufort, Oriental, Bayboro, Washington, Belhaven, Columbia, Colerain, Ahoskie, and Aulander. Most towns within this area have at least one store doing business with Ormond's. Many cities, such as Rocky Mount, Wilson, New Bern, Washington, and Farmville, have several stores trading with Ormond's. Ormond's also sells rugs in cities as far away as Wilmington and Swan Quarter, but as these trips are only once a month they are not included on the map.

The wholesale trade area of Greenville is larger than the farm marketing area and the retail trade area. This is understandable, however, for it takes a larger area of potential customers for a wholesale firm to operate. In some instances,



the area served by wholesale firms is the county, plus a few of the nearby cities. In the case of Ormond's Wholesale Company, the area is much larger. The area of wholesale trade differs from the retail trade area in that there was a distinct lack of retail trade to the west of Farmville. Wholesale firms, however, have an active business in Kinston, Goldsboro, Wilson, and Rocky Mount. It may well be that wholesale firms in those cities likewise have an active business in Greenville. Also, retail trade does not penetrate nearly as far to the southeast, east, and north as does wholesaling. Greenville serves an extensive area to the east and may in all probability be the chief wholesale center for that area.

Collecting, dispensing, and moving comprise the areal interchange of a tangible product, and these are trade activities. Service activities are concerned with areal interchange of intangibles and satisfy the needs by the services. The spatial relationships that characterize trade are characteristic of services as well. Production exists at one point, and consumption at another. There is movement between these, and from there spatial interaction develops. In the following chapter, the spatial relations of Greenville's service activities will be examined.

CHAPTER VI  
SERVICE FUNCTIONS OF GREENVILLE IN RELATION TO  
ITS EXTERNAL AREA

Retail and wholesale trade are extremely important for Greenville, but there are other services found in Greenville as well. These services are not as concerned with distributing a product as were the previously mentioned functions, but rather have a social or political emphasis. However, like the previously mentioned functions, there is an organized area of support. Some of the services a city performs have an area of support confined to the city itself, while others have support areas that include the surrounding areas. The latter type of services will be examined in this phase of the study.

Greenville has numerous services available for use. These include communication media, hospital services, other medical services, political and postal services, movie theatres, and repair services of many types. These are similar to services found in neighboring centers such as Kinston, Goldsboro, Wilson, Rocky Mount, or New Bern. As a result, there is considerable spatial competition involving these items. Greenville, however, differs from those centers in that East Carolina University provides an educational service not available in other centers.

The services examined in this study are important and representative for Greenville. They include political and postal services, newspaper circulation, hospital, telephone service, radio, and television coverage, the customer area for the

University Summer Theatre, the student area for East Carolina University, and the extension service area for the university.

The procedure used in this phase of the study varies with the particular service being examined. Much of the work was carried out through the sampling of ledgers, while in some instances the use of empirical observations were used. The methodology used will be presented with the service that is being examined.

Greenville is the county seat of Pitt County, and thus provides a basic political function. Greenville serves the entire county for social, business, and political matters that are county-wide in scope. Thus the external area for this particular function is sharply delimited by the county boundary. Post office rural routes are a service that is included as a function of Greenville. These routes are under the jurisdiction of the federal government, and therefore they might be considered as a type of political service as well. There are six rural routes that extend beyond the city (Fig. 7). Route one extends approximately ten miles west of Greenville. Route two extends west along Highway 264 for about three miles, then back to Greenville along the Highway 264 By-pass to Highway 43. From there, it extends south of Greenville. Route three extends east along Highway 264 eight miles and turns south servicing an area southeast of Greenville. Routes two and three extend fifteen miles southeast of the city. This area has a relatively dense population and two routes are needed for adequate service.

## GREENVILLE, N.C. POST OFFICE RURAL ROUTES

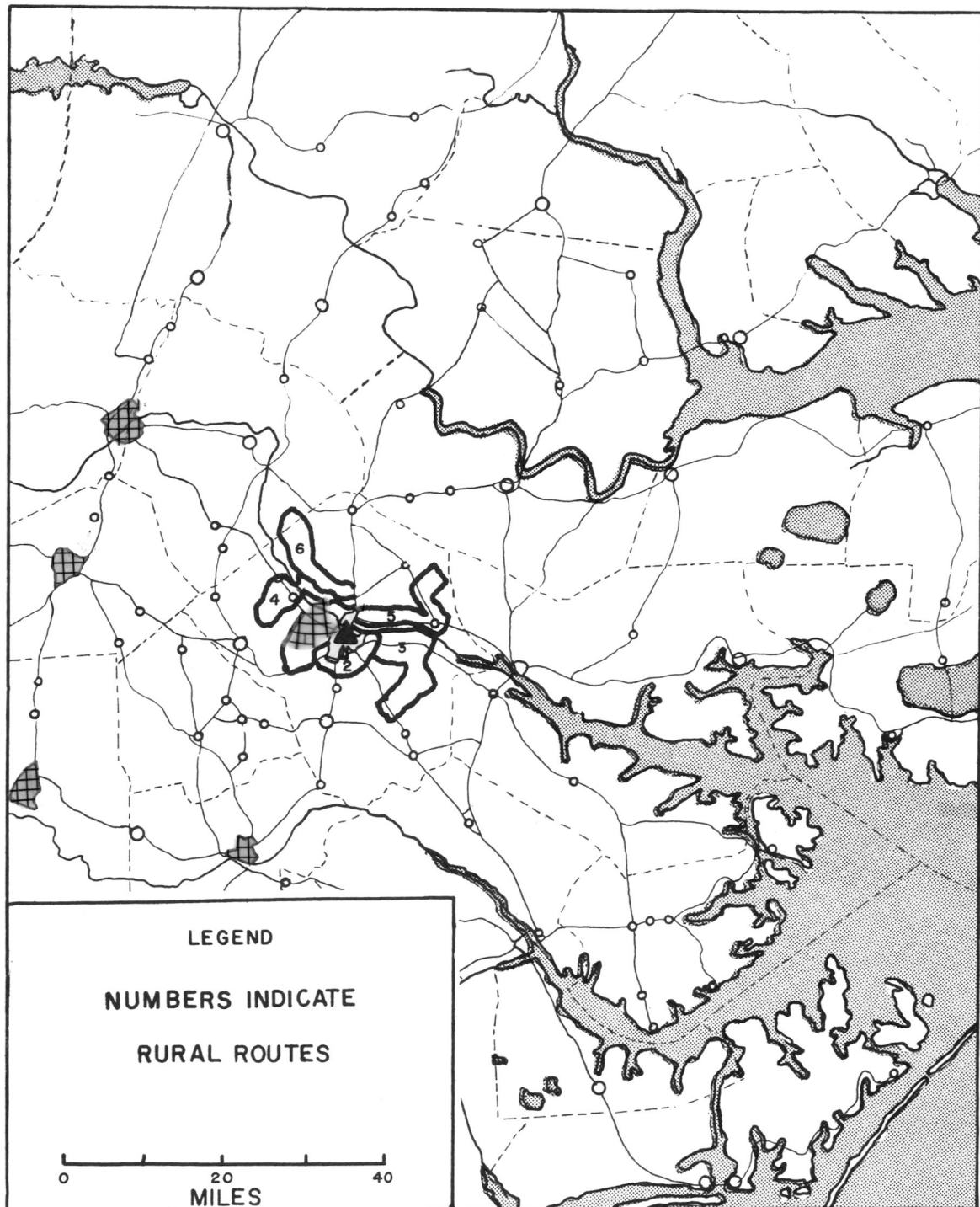


Figure 7.

Route four is located northwest of Greenville and services Bruce and Falkland. Route five extends east six miles along Highway 30 to Pactolus, then to an area about five miles northeast of Pactolus. Route six services the extreme northwestern portion of the county. Because many of the villages have post offices of their own, rural postal delivery from Greenville is relatively restricted in area.

Newspaper circulation is represented by the Greenville Daily Reflector. It is the only daily newspaper published in the city. The circulation area was delimited by two methods. First, an interview with the circulation manager provided information for plotting the rural routes carriers made in distributing the paper. Second, through field observation it was noted that papers were placed in green boxes along roads and these were readily identifiable. From these methods, a circulation area for the Greenville Daily Reflector was determined (Fig. 8.). The circulation area is largely confined to Pitt County. The boundary extends west of Farmville. It closely follows the county boundary to Bethel, to Robersonville in Martin County, back to Bethel and to Stokes. To the east, the circulation area extends to Pactolus and Grimesland. Grifton and Calico receive the paper to the south of Greenville, and Maury, located southwest of Greenville in Greene County, also receives the paper. In terms of distance, most of the circulation falls within twenty miles of Greenville in all directions. There are daily newspapers published in the nearby centers of equal rank and this limits the areal extent of this service. Since most of these competing centers are

## SERVICE AREAS FOR NEWSPAPER, TELEPHONE AND HOSPITAL

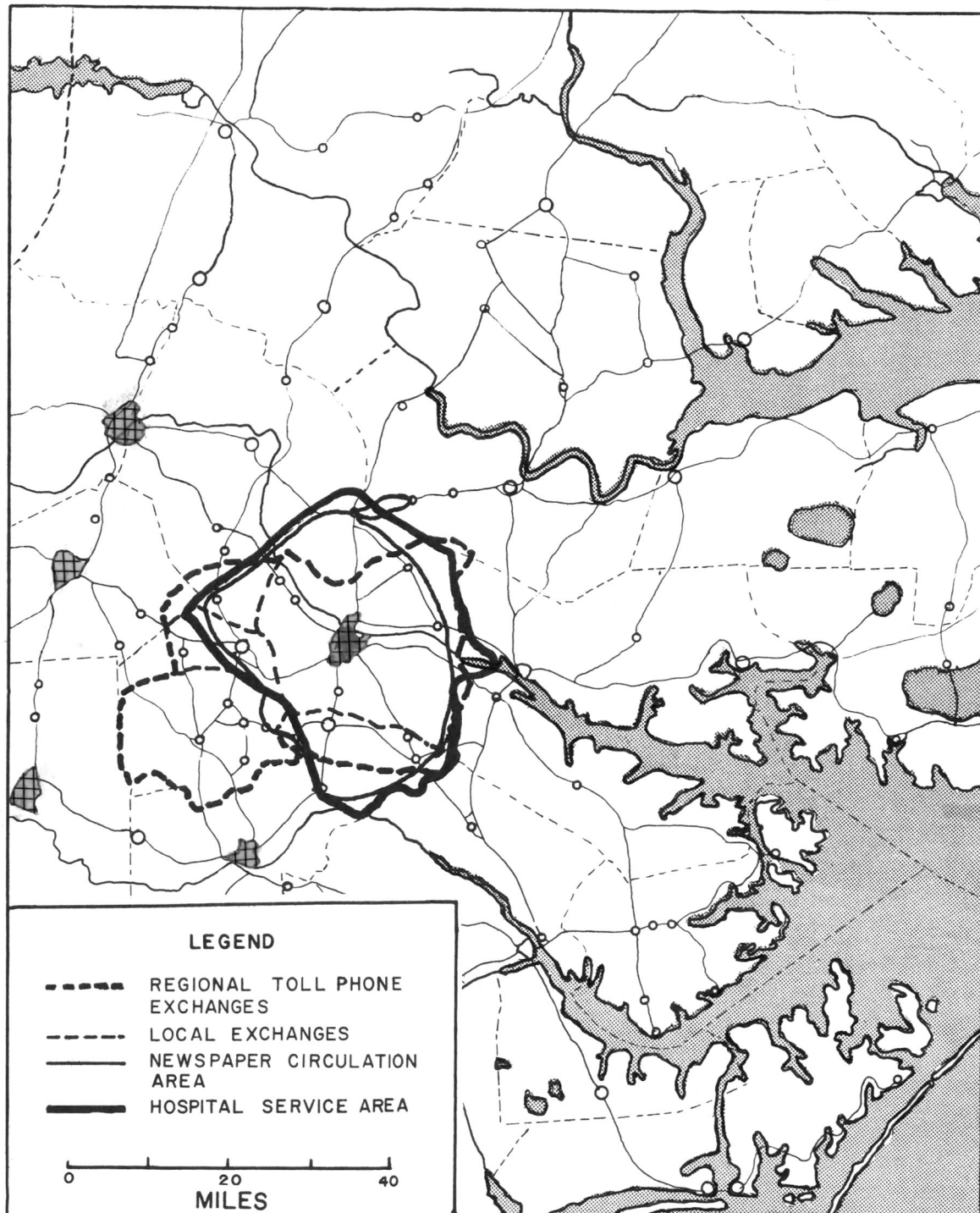


Figure 8.

located generally west of Greenville and because of population distribution factors, there is an intensity of business focused on the areas immediately southeast of Greenville.

Hospital and telephone service are two important functions found in Greenville. Small villages would perhaps have a clinic or some similar facility, but nothing near the magnitude of the facility found in Greenville. In like manner, it is quite common for villages to have local telephone exchanges, but Greenville serves not only as a local exchange but as a regional toll center for other exchanges as well.

The hospital service area was delimited by information provided by personnel in an interview at Pitt Memorial Hospital in Greenville (Fig. 8). The area delimited is through the use of emergency ambulance service to this hospital. Ambulances stationed in Greenville, and rescue units located in several centers throughout Pitt County, act in a subjective manner when their service is needed. Their service area is confined to the county itself, although a person could request ambulance service from outside the county. However, there would be an increased monetary rate for this service.

Telephone service is based on two distinct type areas (Fig. 8). These areas are plotted by information obtained from managing personnel at Carolina Telephone and Telegraph Company in Greenville. The first area includes the local exchange of Greenville itself. This area includes the residential and commercial sections of Greenville, and this area resembles

a map of the built-up city. Local exchange service extends outside the city to service an area ten to fifteen miles from Greenville. People outside the city in this area must pay mileage fees in addition to regular charges. The second area of telephone service organized around Greenville is an area including the local exchange of Greenville plus the local exchanges of Ayden, Snow Hill, Farmville, and Fountain. Any long distance telephone calls involving one of these exchanges is relayed through Greenville before it reaches its destination. In this capacity, Greenville serves as a regional toll center for telephone service.

The delimitation of radio and television broadcasting involves radio stations WOOW and WNCT, and television station WNCT-TV (Fig. 9). Data were plotted using information provided by the particular station or through the use of a car radio to determine areas of reception. WOOW has a smaller area of radio coverage than WNCT. It is largely confined to the immediate Greenville area and reception is poor beyond twenty miles. At night the listening area is considerably less, with reception extending to perhaps ten miles from Greenville. WNCT radio is affiliated with the Columbia Broadcasting System and serves a large area in eastern North Carolina. Its area of coverage has an egg shaped appearance with a northwest-southeast axis and includes portions of twelve counties. Through the use of information published by the broadcasting company, and by using a car radio in the field, the WNCT listening area is plotted. Reception is poor at distances more than forty miles. Like the WOOW station, WNCT has a smaller listening area at night, being largely confined to the



# RADIO AND TELEVISION BROADCASTING

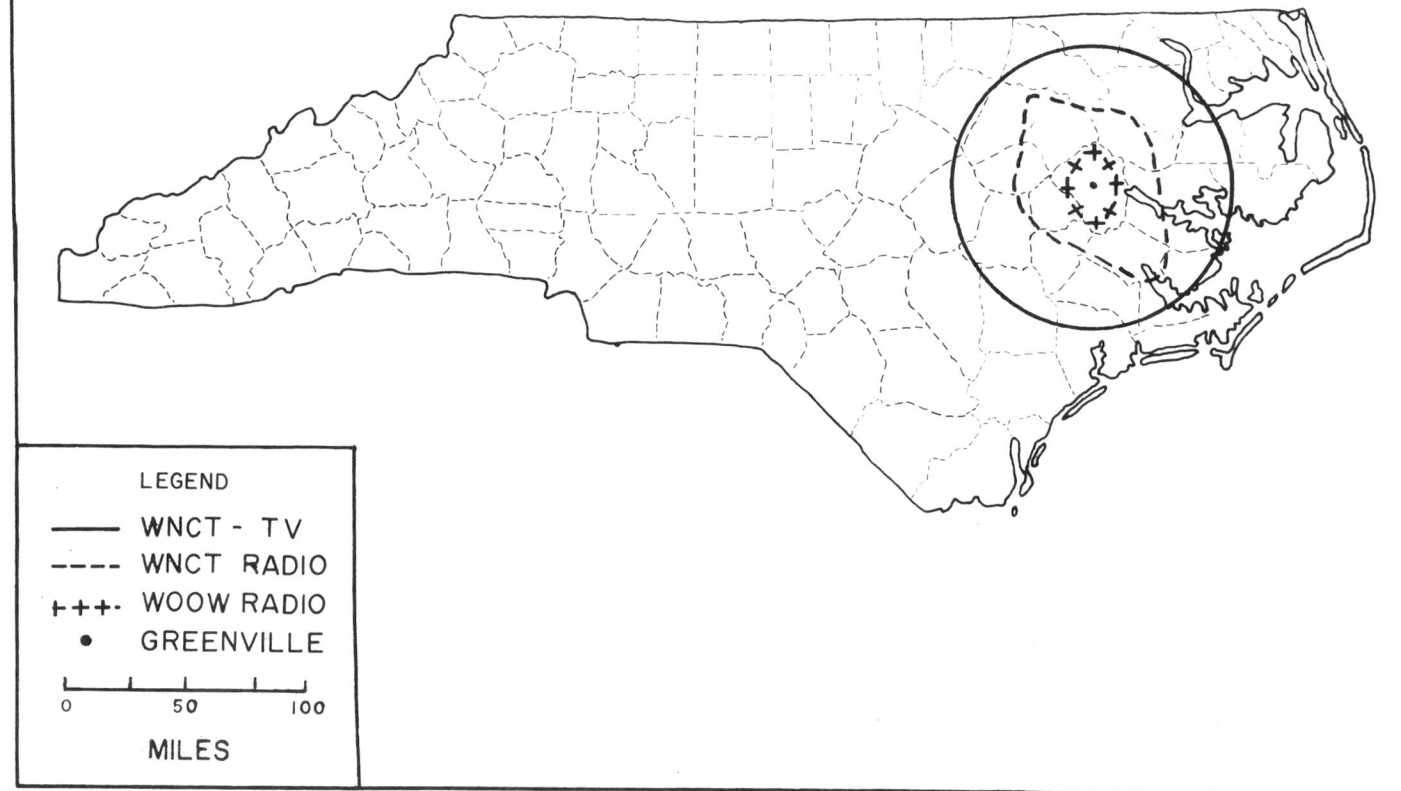


Figure 9.

immediate Greenville area. These stations are required to reduce their transmitting power at night, and this accounts for the smaller areas. WNCT-TV has a wider area of coverage than either of the radio stations. This station is also a CBS affiliate and serves much of eastern North Carolina. The broadcasting area extends sixty-five to seventy miles from Greenville. At various times, this area may be even greater.

Broadcasting is largely local since many of the equal rank higher order centers have similar facilities. The WNCT Broadcasting Company is an exception, for it serves much of eastern North Carolina. It is the only CBS affiliate in the area, but National Broadcasting Company has an affiliate in Washington, and American Broadcasting Company has a similar facility in New Bern. Thus, Greenville is seen as a regional center for a particular type of radio and television broadcasting.

The Summer Theatre located at East Carolina University provides Greenville with a service that is quite different from those previously mentioned. Production numbers are popular, professional in quality, and are performed each night of the season. Similar facilities are not found in nearby centers of equal rank. As a result, people travel from a wide area to enjoy this particular service.

The data used for delimiting the customer area of the theatre came from ledgers for the 1968 season. There is very little variation for this season from those of the past, and in many instances there are repeat customers.

The customer area for the theatre is considerably different from many of the areas previously examined. The differences are in the areas of concentration (Fig. 10). Strongly concentrated areas of customer patronage appear in the nearby urban centers. Rocky Mount, Wilson, Kinston, Washington, New Bern, Tarboro, and some of the lower order centers are well represented. On the other hand, the immediate rural Greenville area, and rural areas in general, do not generate many theatre customers. Whereas the other functions show their most intense development in areas closest to the city, Greenville is surrounded by a near vacuum of theatre customers. It must be pointed out that there are very many people within the City of Greenville that bought tickets, but they are excluded from the pattern in Figure 10.

In terms of extent, the main area of concentration is within forty-five miles distance of Greenville. This is approximately the distance for an hour's driving time. In a few instances, such as Morehead City, people will drive longer distances. It may well be that there is a limit to the extent for this service to the west of Greenville due to competition from Raleigh, but in all likelihood Greenville is the center for theatrical productions in eastern North Carolina.

The area from which East Carolina University draws its students constitutes one of the largest areas that Greenville serves (Fig. 11). East Carolina University is one of the largest universities in the state with 9,538 students in 1968 living on campus or in Greenville. In addition, it is the only institution of this type in eastern North Carolina. As a result, there is little competition from other

## E.C.U. SUMMER THEATRE CUSTOMER AREA - 1968

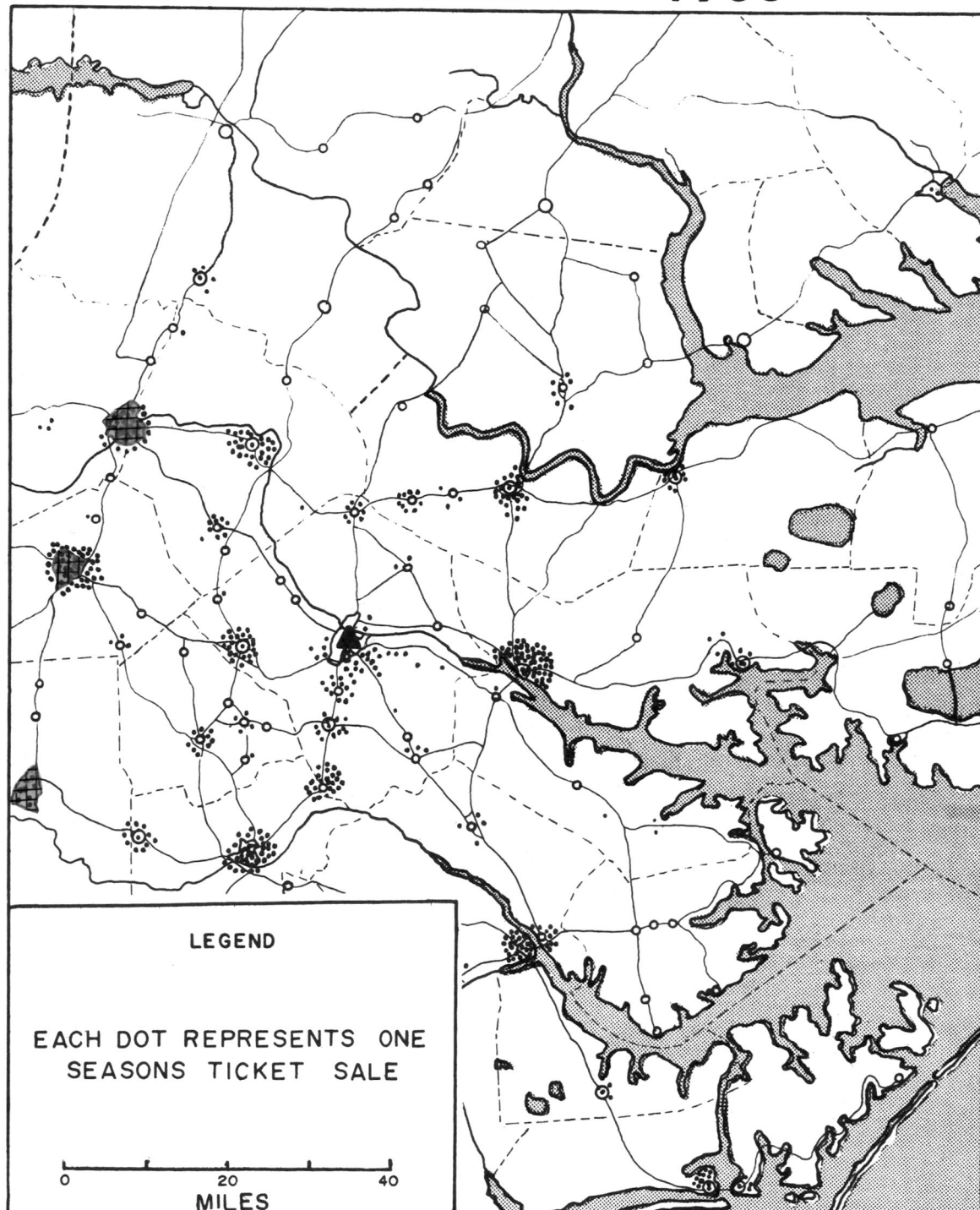


Figure 10.

# ORIGIN OF EAST CAROLINA UNIVERSITY STUDENT BODY FALL 1967

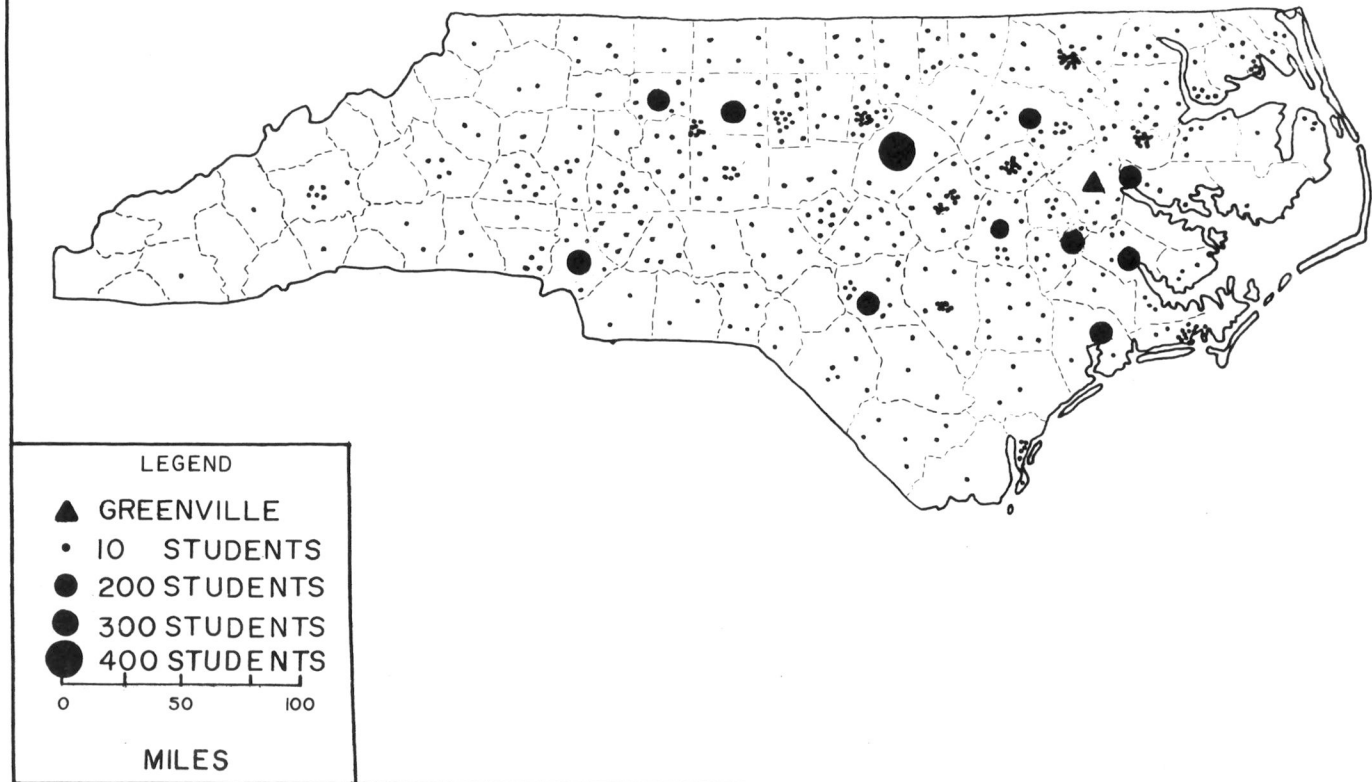


Figure 11.

centers in eastern North Carolina and the area of student origin is quite extensive. Over 7,000 of the total number of students on campus are from North Carolina. Most of the others are from Virginia, Maryland, and New Jersey. Students come from more distant states and some foreign countries, but they are not significant in total numbers.

Data used in plotting the student origin area were supplied by the Registrar for fall quarter of the 1967-68 school year. Students are plotted according to their home county.

Upon examination of the student area, it becomes apparent that there are two significant areas of student concentration. The first area includes many of the counties in eastern North Carolina that adjoin or are near the Greenville-Pitt County area. This is an area within one hundred miles of Greenville. It is thought that many of the students come from the larger towns in the counties of this area. The second area is focused on the piedmont crescent to the west of the coastal plain. The areas of concentration are centered on the counties having a large population. The counties of Wake, Durham, Alamance, Guilford, Forsyth, and Mecklenberg stand out. These counties contain the respective cities of Raleigh, Durham, Burlington, Greensboro, High Point, Winston-Salem, and Charlotte. These cities are the largest in the state, and are from 90 to 225 miles from Greenville.

There is a marked decrease in the amount of student draw west of this piedmont area. Very few students are from the western portion of the state and these are located in the more populated

areas such as Asheville. In addition, there are fewer students located in the southeastern portion of the state, such as the Wilmington area.

From this analysis, it is determined that East Carolina University serves the eastern portion of North Carolina. It serves the immediate coastal plain and the populated centers of the piedmont. These areas are contiguous and there is a marked decrease in student draw as the distance becomes greater moving west and to the southeast portion of North Carolina.

East Carolina University plays an important role in its region by offering extension courses throughout eastern North Carolina (Fig. 12). In many instances, it is not possible for students to come to East Carolina University and so the University goes to them. Cherry Point near New Bern, Seymour Johnson Air Force Base near Goldsboro, and Camp Lejeune at Jacksonville are off-campus centers for numerous extension classes. Courses are taught in other centers as well. Kinston, Roanoke Rapids, Lumberton, and Fayetteville had several courses taught during the past year. In terms of extent, courses may be offered in counties from the coast to the western boundaries of Granville, Wake, Harnett, Cumberland, and Robeson counties. In effect, the extension service area for East Carolina University is the eastern portion of North Carolina.

The service functions that have been delimited for Greenville vary considerably in area. Each function has its own particular organized area of support. Actually, the support areas fall into two general categories. The immediate county-wide area is the first category. This area includes functions that are found in most of

## LOCATION OF EAST CAROLINA UNIVERSITY EXTENSION CLASSES 1967-68

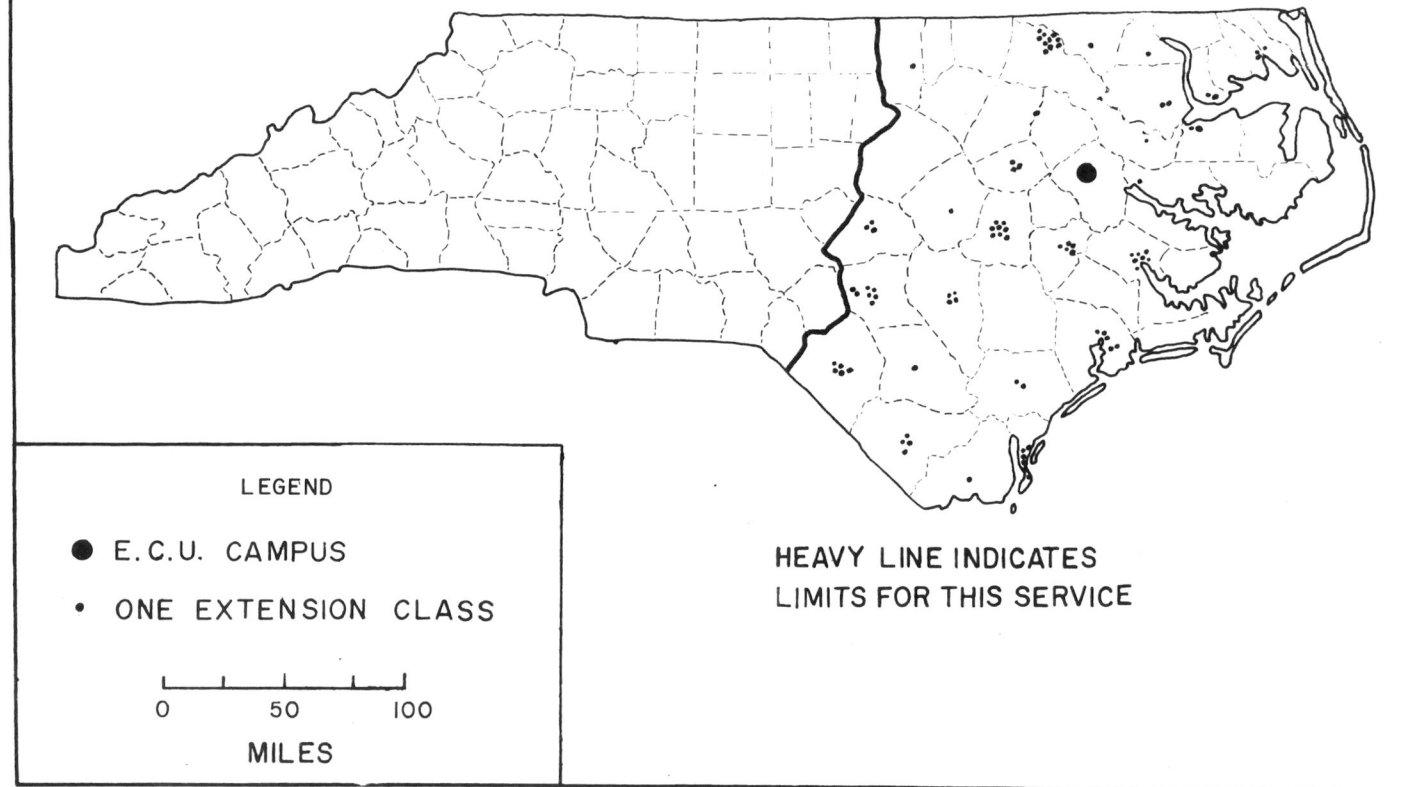


Figure 12.



the similar rank centers of eastern North Carolina, and provide competition for Greenville. The second category is for functions having much larger areas of support, these functions include East Carolina University and the WNCT Broadcasting Company. They are exclusive to Greenville and their service area is much more extensive.

Many of the services mentioned in this phase of the study, as well as many of the previously mentioned functions, are involved with traffic movement in some manner. People are continually driving to and from Greenville for some purpose. In the following chapter, a study is made to determine the breaks of converging and diverging traffic involving Greenville. In addition, the labor shed for Greenville is plotted, and a theoretical model of gravitational attraction is constructed.

## CHAPTER VII

### THE DELIMITATION OF TRAFFIC CONVERGENCE ON GREENVILLE

Traffic flow is a useful and important example of spatial interaction between areas. The relationships that exist between areas may be reflected in part to transportation facilities and traffic flow between them. Many motives are involved in the outgoing and incoming traffic besides passing through. People in the surrounding area use a center for various reasons and many must travel to the center to benefit from it. Therefore, traffic flow can be considered as an important facet in the determination of urban external areas.

The external area of Greenville determined through traffic flow reflects many of the functionally organized areas previously examined, for many of those functions are dependent on focusing transportation. Such functions as farm marketing and retail trade are particularly dependent on people traveling from outside the city to the particular establishment. A traffic count for those establishments would reflect the previously examined areas. Traffic flow by its very nature tends to diminish with increased distance and it is possible to reach a point where the majority of vehicles are no longer converging, but rather diverging from a center. When these breaks occur, it is possible to delimit an area of traffic focus.

The area of traffic focus for Greenville will be delimited by two methods. The first method will be to determine traffic breaks between Greenville and competing centers through information derived from the 1966 North Carolina Traffic Map, which is based on average

daily traffic.<sup>1</sup> The second method is to plot license plates from automobiles according to their out-of-town origin. Many motorists in North Carolina are required to purchase license tags bearing their home town name and these are affixed to the front of the vehicle. In addition, Reilly's theoretical gravitational model for centers based on population and distance is applied to Greenville, and a labor shed for three factories in Greenville is determined. Labor shed is a special form of traffic flow since it involves repetitive trips to and from work.

The area of traffic focus delimited from the major traffic volume is confined within Pitt County (Fig. 13). Breaks occur on Highway 11 about ten miles south of Greenville, twenty-one miles south on Highway 43, eighteen miles east on Highway 264, eleven miles east on Highway 30, eighteen miles east on Highway 903, seventeen miles north on Highway 13 near Bethel, fourteen miles northwest on Highway 43, and twenty miles west on Highway 264 excluding Farmville. This is an area more symmetrical than many of the other organized areas previously examined, since there are many more motives involved in traffic flow which lead to the results shown.

The results from the method of plotting out-of-town license plates are of a different nature to the traffic focus map. Only a general indication of traffic focus was shown on the state map, but from observing the origin of the vehicle one can plot a more precise distribution of interaction. It is conceivable that if one were to record licenses at retail establishments the results would

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North Carolina 1966 Primary Highway System Traffic Map, North Carolina State Highway Commission, Planning and Research Department, Raleigh, North Carolina.

## TRAFFIC FOCUS ON GREENVILLE

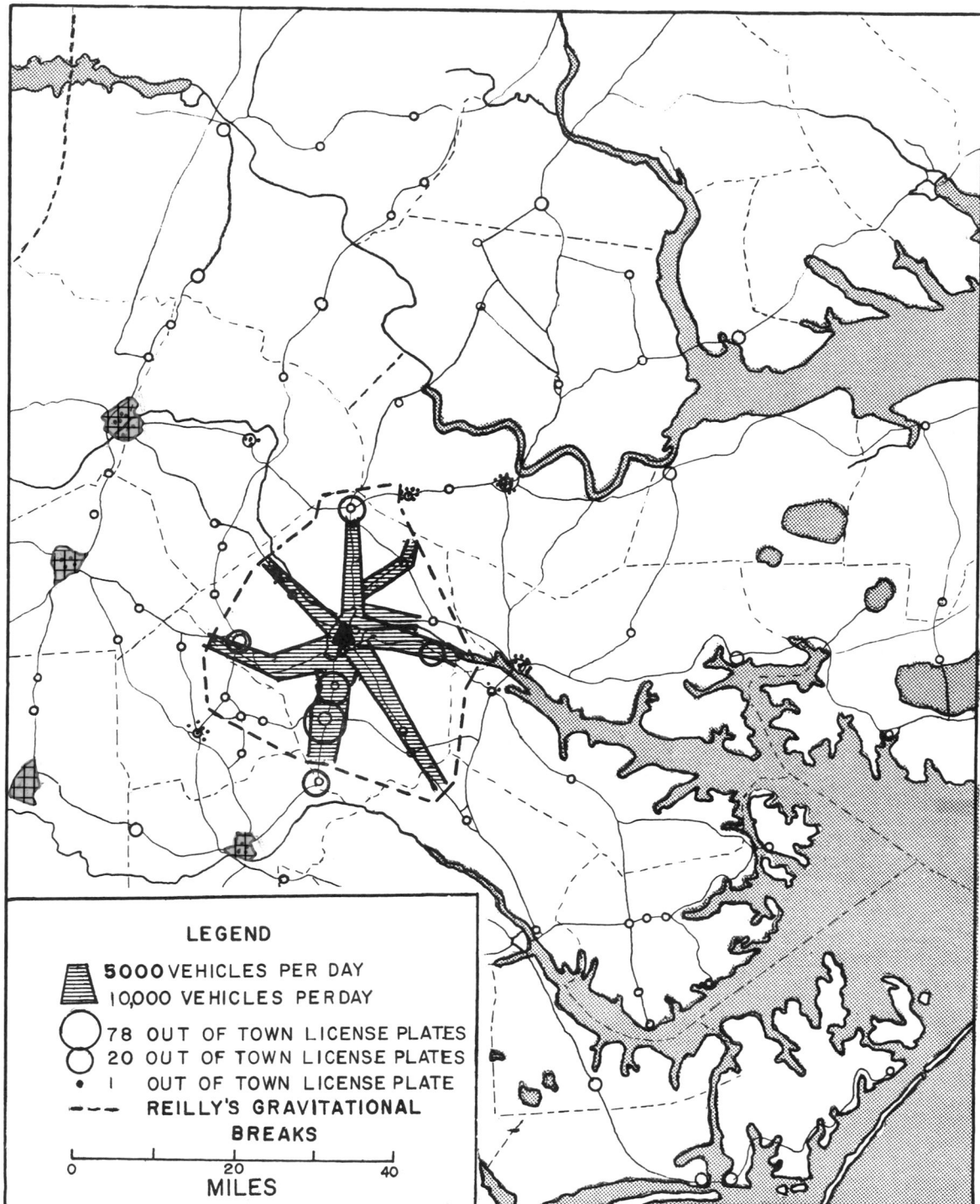


Figure 13.

be very similar to the retail trading area. Taking this into consideration, license plates were recorded in all areas of Greenville near many different establishments. These counts were taken over a long period of time, and for each day of the week.

TABLE TWO  
MAJOR LOCALITIES HAVING OUT-OF-TOWN LICENSE PLATES  
OBSERVED IN GREENVILLE

<u>Locality</u>	<u>Number Observed</u>	<u>Miles from Greenville</u>
Ayden	78	7
Winterville	48	3
Grifton	26	14
Farmville	24	18
Grimesland	20	10
Bethel	16	18
Washington	15	20
Robersonville	6	25
Rocky Mount	6	43
Snow Hill	4	25
Wilson	4	38
Kinston	4	28

There are two significant areas of concentration for this type of delimitation. The first area is the surrounding vicinity with an average radius of eighteen miles from Greenville. Ayden has the greatest concentration by far. Winterville, Grifton, Grimesland, Washington, Williamston, Robersonville, Bethel, and Farmville are well represented. The nearby competing centers of New Bern, Wilson, Rocky Mount, and Kinston are represented slightly and most of these plates were observed in university-oriented activities. The second area is that area served by the university. Much fewer plates were observed from this area, but some cars were noted from Greensboro, Raleigh, Charlotte, Winston-Salem, and Fayetteville as well as cars from South Carolina, Virginia, and Maryland.

The theoretical model of gravitational attraction was devised in 1929 by William Reilly and has been used extensively to this day. The formula is based on population and distance and is stated as follows:

" $B_a/B_b(P_a/P_b)(D_b/d_a)^2$  where  $B_a$  is the business which City A draws from intermediate Town T;  $B_b$  is the business which City B draws from intermediate Town T;  $P_a$  is the population of City A;  $P_b$  is the population of City B;  $d_a$  is the distance of City A from intermediate Town T; and  $D_b$  is the distance of City B from intermediate Town T"<sup>2</sup>

The model postulates that a city's total attractive force is proportional to its population size, and that this attraction is weakened with greater distance from the city. By applying this formula to Greenville, a theoretical external area is determined. The breaks for this model are found twelve miles to the south near Grifton, twenty-five miles southeast near Vanceboro, sixteen miles east near Chocowinity, twenty-five miles northeast to Robersonville, seventeen miles north near Bethel, fifteen miles northwest near Falkland, twenty miles west near Farmville, and twenty-two miles southwest in the vicinity of Snow Hill. These breaks were determined through comparisons with Kinston, New Bern, Washington, Williamston, Tarboro, Rocky Mount, Wilson, and Goldsboro respectively. These centers are of similar rank with Greenville. This area is slightly elongated to the southeast, but it is largely confined to the county. The theoretical area of gravitational attraction shows a strong similarity to the empirically derived traffic areas.

Labor shed is another type of traffic focus for Greenville. It is distinctive in that it involves people driving to Greenville every day

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Raymond Murphy, The American City (New York: McGraw-Hill, 1965), p. 61-62 citing William Reilly, The Law of Retail Gravitation (New York: Phillipsbury Publishers, 1931).

## LABOR SHED FOR GREENVILLE

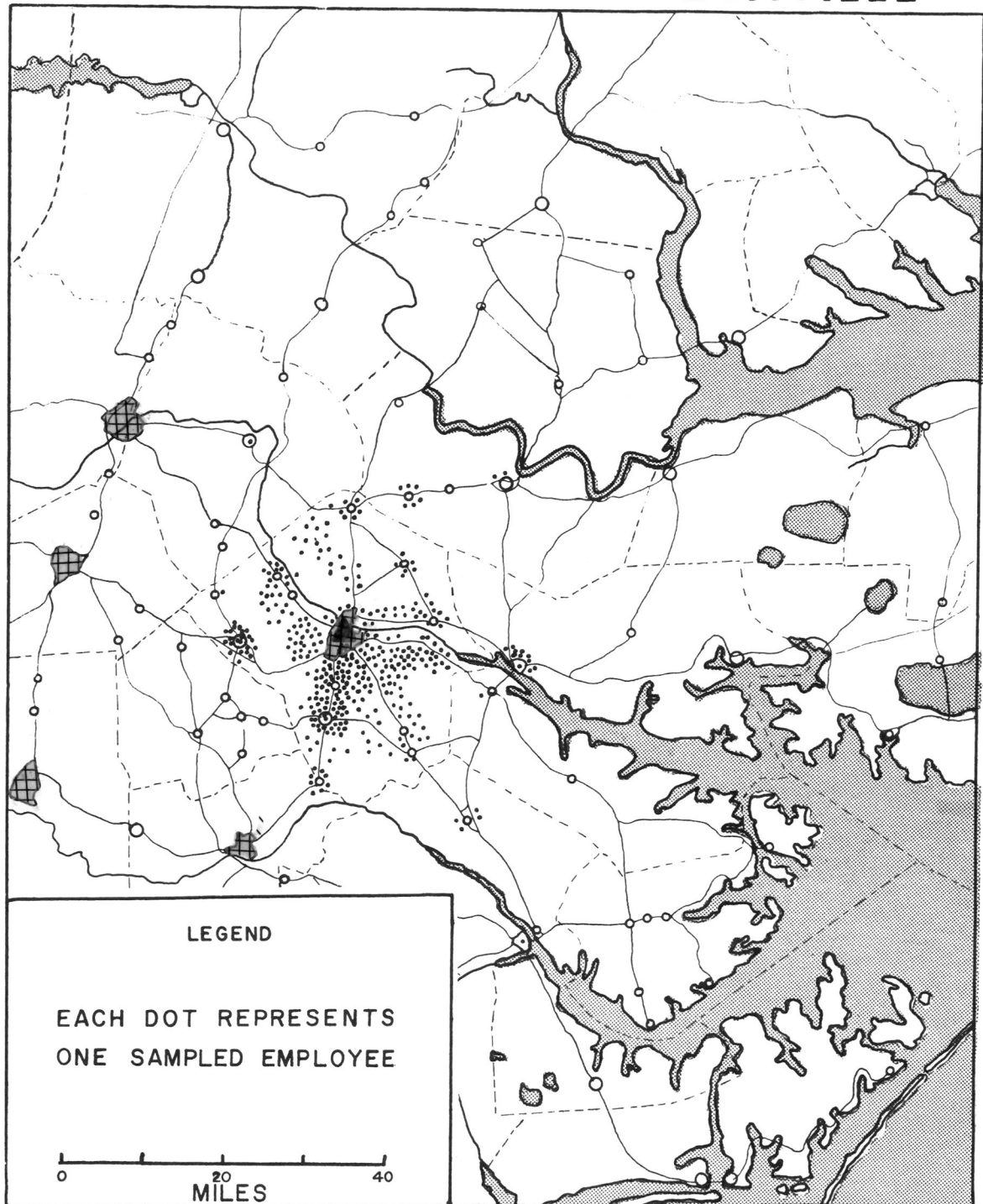


Figure 14.

to work, and then driving home. The labor shed is derived from interviewing the companies of Empire Brush, Union Carbide, and Fieldcrest Mills. They are the largest companies in terms of out-of-town employees, and all of these employees are plotted.

Labor shed is confined largely to the county (Fig. 14). The area extends seventeen miles south, thirty miles southeast, twenty miles east, twenty-five northeast, fifteen miles north, fourteen miles northwest, and eighteen miles west. The area is generally symmetrical with a slight elongation to the southeast. The competition to the west of Greenville, particularly from Rocky Mount, Wilson, and Kinston, and the lack of competition to the east of Greenville have an influence in this configuration. The greater population density to the immediate southeast of Greenville is noteworthy, and therein is another factor in the delimitation of labor shed.

The labor shed of Greenville is vitally integrated with traffic flow, for it involves repetitive traffic each day. Traffic focus and labor shed produce areas very similar in extent. Since traffic reflects the extent of trade and service activities, it would appear that this is an excellent indicator of many functional areas.



## CHAPTER VIII

### CONCLUSIONS

Through this study of the functions of Greenville in relation to its external area, it becomes evident that there are as many external areas as there are functions for the center. Each function that was described varies somewhat in the type of customer it attracts and in the amount of potential customers needed to support it. As a result, the external areas organized by these functions vary in size and shape. However in certain instances, the variation of these external areas may be slight and it would be possible to show some general similarities between them. The external areas fitting this situation may be associated together on this basis and analysed.

The functions used in this study basically reflect the area's agricultural importance to Greenville, but its economic, political, and social services are portrayed as well. Upon spatial analysis, it becomes apparent that there are two broad types of associated external areas. These external areas are: (1) for those functions that are largely county-wide in areal extent, and (2) for those functions having an areal extent over eastern North Carolina or farther. The first area includes county-level political functions, farm marketing, retail and wholesale trade, WOOW Radio, telephone and hospital service, labor shed, traffic focus, and out-of-town license plates. It is significant to note that the county boundary acts as a general break for numerous functions other than political services. The functions within this association of activities have

areal extents closely approximating the county boundary. Most of the tobacco and grain marketed in Greenville comes from an area slightly smaller than the county. Some marketing extends into Greene, Martin, Craven, and Leonir counties for a few miles. Retail trade is largely confined within the county, with minor influence in Greene, Martin, and Beaufort Counties. Wholesale trade, for the most part, barely extends outside the county to serve some of the nearby centers. There are exceptions, such as Ormond's Wholesale Company, which has a large area of support including several counties, or Pepsi-Cola with jobbers in Washington supplying a discontinuous area, but food products are distributed mainly to a county-wide area. Service areas for newspaper, hospital, and telephone are within this area, but with some influence in Greene and Martin counties. The Summer Theatre customer area deviates from this general area slightly in that it extends thirty to fifty miles to include some centers that do not have a similar facility. It is apparent, then, that in general the county serves as a limit to the area of support organized by the particular function both in extent and in concentration.

This county-wide area organized through these associated functions, however, does not assume a symmetrical shape centering on Greenville, but rather it has an off-center shape with a greater extent and concentration to the east of Greenville. There are several factors to be considered in analysing why this is so.

The first factor is that of Greenville's distance from centers of similar rank that could compete for customers. Tarboro, Rocky Mount,

Wilson, Goldsboro, Kinston, and Farmville are centers west of Greenville that have many of the same functions. These centers are located thirty to forty miles away. Since customers between Greenville and these centers are being shared in some instances, the areal extent is limited more than otherwise. On the other hand, few centers of Greenville rank are located to the east. New Bern, Washington, and Williamston are the largest centers to the east, and only New Bern approaches the size of Greenville. In addition, there are fewer important functions in these centers. As a result, Greenville has a greater influence generally to the east of the city.

Population and population distribution are other important factors in the analysis of this area. The heaviest areas of population density lie to the immediate area southeast of Greenville, thus providing the largest amount of potential customers. The fact that this particular area was the heaviest concentrated area for many of the functions included in this association can be attributed to population density, accessibility, and the lack of competing centers.

Tradition, which is very important but difficult to measure, and a special type of county loyalty may also contribute to the shape and size of this area. As a county seat, Greenville may have a psychological attraction to county residents for functions other than political ones.

Reilley's theoretical model and traffic focus on Greenville reflect these observations. The model is based on population and distance, which, in part, implies shopping attraction and accessibility, and

effectively resembles the results found through the empirical field data. The model suggests an area similar in size and shape to the area described for these associated functions. In addition, the traffic breaks obtained from traffic maps and license plate counts enclose an area very similar to the model and the overall county-wide area. These particular criteria serve as an accurate indicator in delimiting the areal extent of the functions listed in this association for Greenville.

The second general area of associated functional organization is involved with East Carolina University, and broadcasting from radio and television. This area extends over most of eastern North Carolina and even farther. These functions are not as strictly bound by the factors limiting the extent of the first area. There is little competition to these functions in other centers of eastern North Carolina. East Carolina University does, however, have competition from universities in the piedmont of central North Carolina, and from universities in other states, particularly Virginia and South Carolina. WNCT-TV and WNCT Radio are the only Columbia Broadcasting System affiliates in eastern North Carolina. However, the National Broadcasting Company has a television and radio station in Washington, and American Broadcasting Company has a similar station in New Bern.

This study of Greenville is clearly a study similar to those examined in the geographic literature, and its theme persists as an important theme of study to this day. This study, however, departs from many of the studies found in the literature in terms of the size of the center being surveyed. There seems to be an emphasis on doing

a study of centers that are very small, such as Boswell, Indiana, or of centers that are very large, such as New York or Boston. Very few studies have been done on intermediate centers, such as Greenville. The reasons for this may be related to the gathering of accurate and verifiable field data. Data are not so difficult to gather for a small village, since it may be rather simple. In like manner, information for large centers could be obtained from various publications. but heavy generalization would necessarily be made. Generalizations for intermediate centers such as Greenville are difficult to make since pertinent information from publications is lacking. It is also very difficult to obtain verifiable data, such as in this study, if there is no cooperation from the public. Through these combination of factors. it appears that the intermediate center has been neglected. It is also evident that many of the studies within the geographic literature are involved with only one facet of a center's external area. Herein lies merit to this study, for it does not attempt to portray only one facet of the external area, but rather it reveals a total picture of a center having spatial interaction with its surrounding area. In many ways, this study may be thought of as a system, whereby one must present the entire spectrum for understanding.

These implications lend to the practicality of such a study. Business and industrial concerns would have a greater knowledge of their support area; thus greater efficiency and focusing of their markets could be attained. Feasibility studies, of any type, would be enhanced by such procedures. However, the most significant contribution this study has lies with the additional insight into city-external area relations of urban geography.

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