

JUL 10 1991

A COMPARISON OF NEW YORK CITY'S
WORKING CLASS SETTLEMENT IN 1940
TO BURGESS' CONCENTRIC ZONE THEORY

BY

KAREN ANN MARADIN

~~URBAN DOCUMENTATION CENTRE
RESEARCH UNIT FOR URBAN STUDIES
McMASTER UNIVERSITY
HAMILTON, ONTARIO~~

A Research Paper

Submitted to the Department of Geography
in Fulfilment of the Requirements
of Geography 4C6

McMaster University

April 1990

~~008174~~

ABSTRACT

The patterns of working class settlement for New York City were established using occupation statistics found within the 1940 census. The health areas of the city's boroughs were shaded based on location quotients. Location quotients were calculated for craftsmen, operatives and labourers individually and then as a group, defining the term "total working class". The urban structure of New York City, presented in the four maps of working class settlement, failed to show the existence of five distinct concentric areas which Burgess identified in Chicago in 1925. The complicated topography, peripheral location of manufacturing industries, and lack of evenly dispersed transportation modes and bridges have contributed to the unique arrangement of settlement in New York City.

ACKNOWLEDGEMENTS

I would like to express my deepest gratitude and appreciation to Dr. Richard Harris for his advice and guidance throughout the production of this paper. I would especially like to thank him for suggesting this topic, for it has resulted in a very rewarding research endeavour.

Richard Hamilton also deserves many thanks for his assistance and patience in the seemingly endless task of producing the final maps that were vital to my study.

To my friends and family, your patience and constant support has been greatly appreciated. I would especially like to thank Steve Keech for being so understanding and supportive throughout this academic year. He helped me to realize that this accomplishment could be achieved.

TABLE OF CONTENTS

ABSTRACT.....	ii
ACKNOWLEDGEMENTS.....	iii
TABLE OF CONTENTS.....	iv
LIST OF FIGURES.....	v

CHAPTER

1	INTRODUCTION	1
2	LITERATURE REVIEW	5
3	METHODS AND DATA	19
4	RESULTS	23
	4.1 Description of Maps.....	23
	4.2 Discussion of Patterns.....	36
5	CONCLUSION	43

LIST OF REFERENCES

APPENDIX

LIST OF FIGURES

FIGURE

1.1	New York City.....	4
4.1	Settlement of Craftsmen, NYC, 1940.....	24
4.2	Settlement of Operatives, NYC, 1940.....	27
4.3	Settlement of Labourers, NYC, 1940.....	30

CHAPTER 1

INTRODUCTION

The purpose of this research paper is to establish the settlement patterns of the working class population in New York City and to compare this pattern to the theory of concentric zones introduced by Burgess. Many geographers are familiar with Burgess' concentric zone theory for it is a well known model for describing the urban structure of cities. The majority of research previously done on New York City's settlement has focused on ethnicity and race. A settlement study of New York City based on occupational groups, and specifically the working class, has never been done. This paper not only introduces a new facet of research on the city of New York but will also test whether the Burgess concentric ring model can be used to describe the urban structure of one of the largest and most vital cities ever to emerge in North America.

Burgess introduced his concentric zone theory in 1925. He described Chicago as being made up of concentric zones, each containing a distinct part of the social structure. The reason for the development of the

concentric zones is due to the peoples' ability to get to and from the central business district or CBD. The more affluent a person is, the further away they can reside from the CBD. Thus, the definition of a metropolitan area is no longer dependent on physical contiguous regions but the transportation network that brings people to and from the CBD (Burgess 1925).

Burgess' model identified five distinct zones. The innermost zone is the central business district which consists of the majority of business establishments which are found in the metropolitan area. The next circular region is the transitional zone which results from the CBD expanding into the tertiary zone. The tertiary zone is the zone where the working class population resides, a key zone which will hopefully be identified in New York City. The working class may also be found living in the zone of transition because it is a typical low income area of the city. The fourth zone contains the elite residents who can more easily afford private modes of transportation. The fifth and final zone contains the commuters who can afford private modes of transportation but cannot afford to live in the elite residential zone.

This research study will test for the existence of

five distinct zones in New York City. New York City will be defined as all five boroughs; Bronx, Brooklyn, Queens, Manhattan and Staten Island (Richmond). Figure 1 has been included to identify the names of the boroughs and other areas of the city. The term "working class" will be defined as skilled and unskilled blue collar workers, however only the occupations of craftsmen, operatives and labourers will be included in the term "total working class". Each occupation represents a different type of labour; skilled, semi-skilled and unskilled respectively. The 1940 census is adequate for testing Burgess' 1925 model because there was not much change occurring in the 1930s.

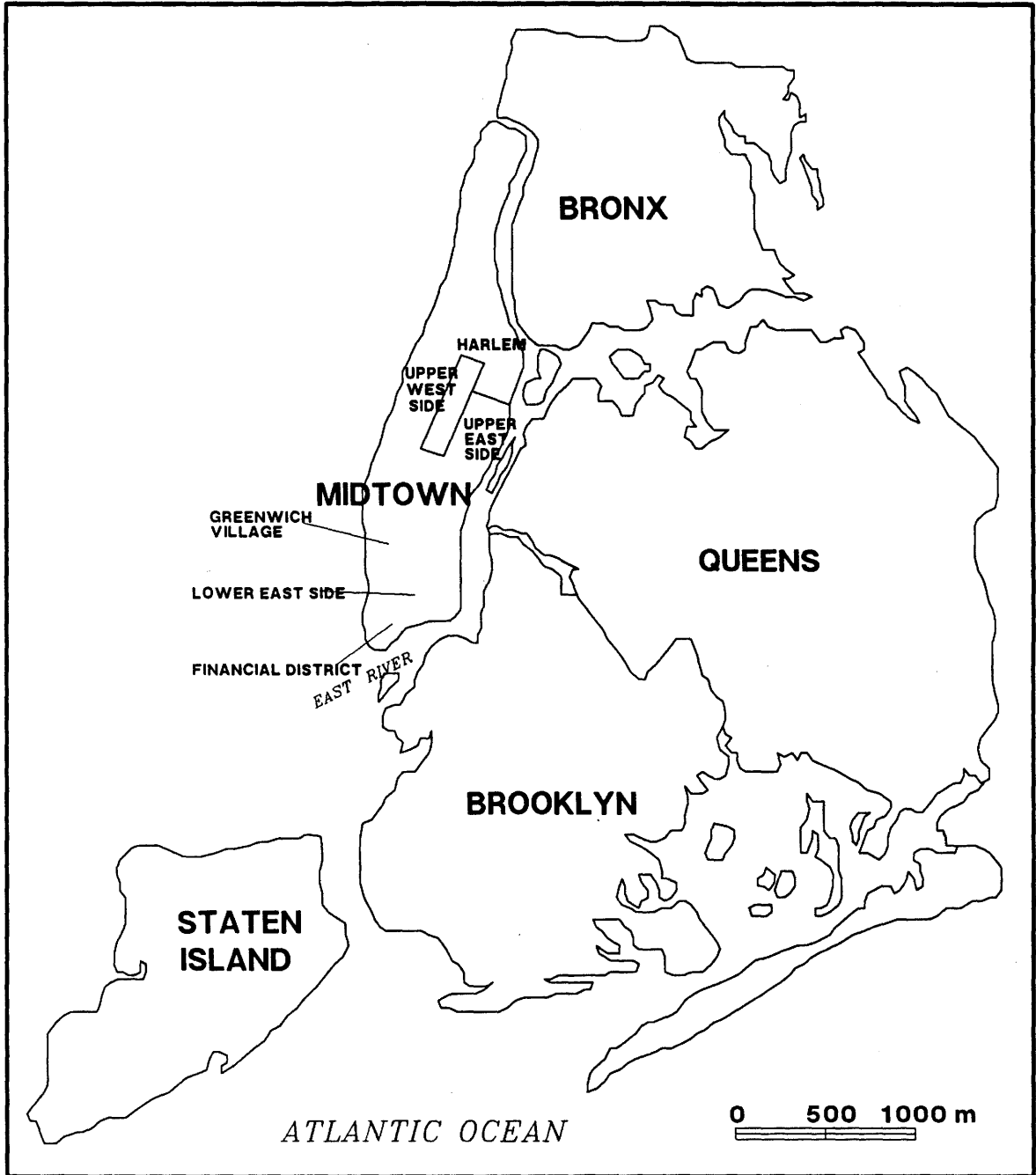


Figure 1.1 New York City

CHAPTER 2

LITERATURE REVIEW

It is necessary to review and evaluate literature pertinent to the topic of working class settlement in New York City in the 1940s. This evaluation will discuss literature regarding New York City as well as investigate general material on North American cities during the 1940s. An underlying theme through this chapter will be to investigate whether the literature agrees or disagrees with what Burgess believed to be true about the urban structure of cities.

Burgess (1925) described the growth of the city or the process of urban extension as being related to the appearance of successive concentric zones, which contained residential areas of ascending hierarchy around the central business district. Various authors including James Ford, Thomas Adams, Edgar Hoover and Raymond Vernon and Edward Bergman have contributed relevant literature that provides varying degrees of support to Burgess' views of settlement organization.

Ford (1936) provides an informative discussion on

housing conditions in the New York City region. Ford explains that the well-to-do could more freely choose, within narrow limitations their residential location, however the remainder of the population usually had to be content with locations abandoned by their original owners (Ford,1936:257). Ford also states that New York City, like others cities, had experienced a more rapid growth at the outskirts than in the central area, a phenomenon he calls "rotting of the core" (Ford, 1936:290). Ford's comments suggest that the arrangement of New York City may have been similar to Burgess' concentric zone model if the lower class citizens or working class were forced to settle in the deteriorating core while the affluent located on the outskirts.

Hoover and Vernon (1956) introduce a broad urban model of New York City, similar to Burgess, which groups certain counties in accordance to population density. "The core" contains the five most highly populated counties, the "inner ring" contains the next most densely populated counties and finally the "outer ring" contains the lowest populated counties.

The core area contains Manhattan's central business district along with similar core activities that Burgess

discussed. The inner ring, which encircles the core, represents suburbia which is home to the middle and upper class groups. Finally the outer ring, which encircles the inner ring, has attributes of rural living. Hoover and Vernon devote discussion to housing conditions for the high, middle and low classes however it is important to note that they use 1950 census data. Their article does suggest however that the metropolis of New York City can be considered as areas forming a concentric zone pattern.

The concentric-like structuring introduced by Hoover and Vernon was also used by Edward Bergman in his discussions of New York City. His use of the terms "core", "inner ring" and "outer ring", are virtually equivalent in meaning and contain a similar array of areas. The discussion by Bergman offered interesting trends in mass transit, prior to and following the 1940. The arrangement of New York City's rapid transit network was found to intersect at two nodes of the city, the primary node being Manhattan and the secondary node being downtown Brooklyn. These areas are both considered to be a part of the "core". Since mass transit was centrally located and typically used by the lower socio-economic groups, this piece of literature supports

the presence of working class groups near the CBD.

The examination of tenure distribution and in New York City with specific observations for each borough was made by Adams (1931). Adams found that between 1913 - 1928 Manhattan had experienced a decrease in single family housing, Brooklyn had strong increases in single family housing, warehouses and office buildings, and Staten Island, due to large unbuilt areas, had substantial increases in one and two-family dwellings. In the Bronx, there was a striking increase in stables and garages, which indicates ownership of private modes of transportation. This kind of information supports Burgess' theory that the more affluent move their family dwellings away from the C.B.D. (Adams, 1931:231-2)

The literature presented by Ford, Hoover and Vernon, Bergman and Adams expresses agreement that certain patterns of settlement based on social or economic classes exist in New York City, however their views on how the urban structure is arranged do not entirely correspond with Burgess' concentric zone theory.

Ford, in his search for an adequate definition for the term "slum", referred to the following excerpt from

the work of Burgess, Park and McKenzie. They authors explained, "studies of urban growth reveal that the city grows outward from its central business district in a series of expanding zones. There is a zone of transition encircling the downtown area. This is the area of deterioration, the so-called "slum", created in large part by the invasion of business and light manufacturing. A third area is inhabited by workers in industry who have escaped from the area of deterioration and who desire to live within easy access of their work. Beyond this zone is the "residential area" of high class apartment buildings or of exclusive "restricted" districts of single family dwellings. Still farther out beyond the city limits is the "commuter zone" of suburban areas or satellite cities within a sixty minute ride of the central business district." (Ford, 1936:5). Ford criticized this statement because he felt it over simplified the urban pattern. He explained that there are slums which give no evidence of transition and that slums are scattered through the outlying areas of all large cities and in many of their suburbs.

Ford makes this criticism about the concentric urban model, however, in a later chapter of his book, he investigates density dispersal of New York City between 1900-1930 using several maps with faintly drawn

concentric rings. (Figure 54-57; Ford, 1936:292-5). From studying the maps he comments that "instead of spreading out uniformly over the area of the city, the population has tended to clot in particular sections leaving much sparsely settled space within the limits of the largest city in the country." (Ford, 1936:290).

In the process of population dispersal, Manhattan was seen as a point from which the city had spread. Congestion in the centre was relieved by construction of elevated railroads to the north and then by the construction of bridges to the Long Island communities. Brooklyn was seen as an independent community containing private homes, but gained a slum problem as a result partly of migration from Manhattan and partly of the growth of manufacturing and shipping. Staten Island which was not adequately provided with rapid transit remained largely unbuilt. (Ford, 1936:284). Thus Ford suggests that the location of jobs and the construction of transportation networks were factors which may have caused uneven population dispersal.

Adams felt that the extension of rapid transit lines should be promoted in the directions that would lead to a well balanced development. The best directions were toward the open areas where healthful

and economic expansion could take place. He found that "in the 97 square miles that have transit lines in New York City there was in 1925 a total of 86 percent of the population, whereas in the other 200 square miles there was only 14 percent". (Adams, 1931:68) Thus overcrowded buildings was a result of ill-balanced distribution and arrangement of transit facilities.

Hoover and Vernon, Bergman and Ford each used concentric zone models to describe New York City in their research studies, however their concentric patterns were much more broader than the model used by Burgess. As Ford studied population density of New York City, his innermost zone contained the southern half of Manhattan, the northwest portion of Brooklyn and a southwest section of Queens. Hoover and Vernon's "core" encompassed an even larger area, which included four of the five boroughs; Bronx, Brooklyn, Manhattan, and Queens, along with Hudson County which is located in New Jersey. The reason for the broadness of regions in Hoover and Vernon's study may be due to their use of 1950 census data. By 1950, there would have been much more urban sprawl into New York City's periphery.

Homer Hoyt, Richard Harris and Chauncy Harris provide varying degrees of disagreement with the

existence of concentric zone modeling based on social and economic classes. It is their views that may prove most useful in explaining anomalies or deviations of settlement patterns from Burgess' model.

Homer Hoyt (1939) argues that the retail shopping center represents the central point in most cities, not the financial center. Specifically in cities where the financial and retail shopping areas are separated, it is the retail shopping district that lies closest to the converging transportation lines that bring people from the periphery to the center.

Hoyt explains that in New York City there are several areas that are met by converging routes of commuter traffic for example Grand Central Station and Wall Street. This does not suggest the existence of concentric zones with one central core, but rather a multi-nucleated settlement pattern. Geographer, John Paterson, expressed that there existed two nodes of an extensive central business district within the city. "The Lower Manhattan node began as the original C.B.D. of the eighteenth century city at the southern tip of Manhattan, opposite the separate C.B.D. of Brooklyn on Long Island. Both districts were clustered around the early hub of port activity in the entrance of the East

River." (Paterson, 1984:205).

Hoyt discusses New York City's pattern of heavy industry as being shaped by unique topographical features such as the curves of rivers, rather than conforming to a pattern of concentric circles. Hoyt concludes that if the factories do not conform to concentric circles around the C.B.D., then neither do the workingmen's homes. Hoyt states that the configuration of settled areas is also influenced by topography. The land occupied by buildings in New York City does not extend evenly in all directions from the office building and financial centers of Manhattan. There are also great tracts of vacant land in Staten Island, and in low lying areas of Brooklyn and Queens. (Hoyt,1939:11). Hoyt's arguments will be extremely valuable if anomalies in working class settlement occur in various regions of the city.

Richard Harris (1988) discusses the existence of industrial satellite cities at the urban fringe where large numbers of blue collar workers were living as early as 1910 and 1920. In New York City by 1911, large manufacturing plants were forming small industrial communities in the suburbs. Factory jobs within Manhattan declined as industrial decentralization along

transportation routes took place, which then enabled workers to live in the suburbs and commute to work. Harris' discussion of American suburbs provides strong reason for disputing Burgess' model and provides an alternate view in explaining working class settlement. Chauncy Harris (1943) makes similar reference to the existence of many industrial suburbs, especially in diversified cities such as New York.

Harris (1989a) disagrees with those who assume that only affluent families could afford to commute to work from suburban owner-occupied homes. Harris' paper on suburban home ownership in Toronto, argues that the growth of suburban home ownership was shared more or less equally by all social classes. Harris further criticizes writers from Burgess to Jackson for making narrow assumptions for example, that all jobs were centrally located and that houses were purchased from wage income. Another argument made by Harris is that suburbanization of a wide range of people depended on changing household work strategies as well as changes in industry, wage incomes and transportation expansion. The idea that the lower income groups could be located in the suburbs and not the central core clearly disagrees with Burgess' concentric zone model and brings one to question the model's validity. If working class

settlement in New York City shows examples of working class suburbs then Harris' arguments will be very useful.

One may assume that working class individuals are completely incapable of acquiring home ownership. However, Harris (1989b), in discussing working class home ownership in the American metropolis, states "that in 1940, the ownership level among skilled workers (42 %) was higher than that of middle class professionals and semi-professionals (40 %). (Harris,1989:3) Harris adds that workers were generally concentrated within the inner city where housing was deteriorated but cheap. Living in the cheaper town districts may have compensated for lower incomes making home ownership affordable. This argument tends to agree with Burgess. Harris found that the pattern of housing occupancy, revealed in the 1940 census data, supported the view that working class workers valued ownership very highly. This is true due to the working class phenomenon of substituting unpaid domestic work, self building and "sweat equity" for wage income. However this phenomenon would be of greater influence in Toronto than in large cities like New York City.

Harris states that ownership rates in urban centers

varied greatly from place to place with New York City being the least affordable. In New York City for example, 40.2% of all skilled workers lived in suburban areas outside of city boundaries while the equivalent proportion for professionals (39.6%) was actually a little lower. Harris found that in 3 of the 6 largest metropolitan areas in 1940, New York, Los Angeles and Detroit, skilled workers were more suburbanized than professionals. Harris' conclusion is that wage incomes, housing prices and social geography of the city play important roles in determining the housing situation of blue collar workers.

The study of the suburban trend by Douglass (1925), traces the movement toward decentralization in the larger American urban communities. This sociologist discusses suburbs as being the habitat of the well to do as Burgess' model describes. Douglass further discusses differences between the city and suburbs as residential areas. For example, he expresses that cities are economical whereas suburbs are costly. With regards to the process of decentralization, Douglass feels that the working class represents an element of the city that rarely decentralizes due to greater costs of the suburbs. This argument further agrees with Burgess because it says that the working class remains centrally

located.

Jackson (1985) notes that many models were developed to explain the residential patterns in relationship to the two most important factors: the quality and cost of housing and the convenience, speed and cost of transportation. Jackson elaborates by stating that the lower income groups live near the center in U.S. cities because the factors of centrality and cost are more important than the quality of housing. For the upper and middle classes, the importance of centrality decreases because of transportation costs being less important. Jackson describes the scene in 1900; "the center of the city had become an area of office and commercial uses that was almost devoid of residences. Nearby were the grimy factories, and just beyond them the first tenement districts of the poor, the recent immigrants and the unskilled, persons unable to afford even the streetcar fare and forced to compete for housing space where real estate was the most expensive and housing the least desirable." (Jackson, 1985, 137).

The literature discussed in this chapter has provided many interesting ideas explaining the structure and distribution of the urban landscape. Whether the

authors have agreed or disagreed with Burgess' concentric zone theory, their differing arguments will be useful in analyzing the 1940 settlement patterns of the working class in New York City.

CHAPTER 3

METHODS AND DATA

To begin this research endeavor it was necessary to consult 1940 census data for New York City since 1940 was the first year for which occupational data were reported for areas within the boroughs. The census data contain statistics on each occupational group living in each health area. Health areas, which are considerably larger than census tracts, are defined as small sections, having an average population of about 25,000, into which the city of New York has been subdivided for statistical and administrative purposes. (1940 census data: 1)

Consulting census data based on health areas proved to be more manageable than that of census tracts, due to the enormous size of New York City.

The 1940 census data contains various statistics for New York City. The specific statistics utilized in this study were contained in the section titled "Major Occupation Group." A variety of occupations such as professional, clerical and domestic workers were listed within this section, however for the purpose of studying

working class settlement only the occupations of craftsmen, labourers and operatives were used.

This section provided the total number of employed for each health area along with the total number of employed for each borough. The totals for each occupational group in each health area and for each borough were also given.

These totals constitute the raw data which were manipulated to produce location quotients. Location quotients were calculated for each health area in each of the five boroughs using the database; dBase III. A location quotient takes the proportion of a specific group in a particular health area and divides it by the group's proportion in the entire borough. For example, if one was to calculate the location quotient for total blue collar for health area 4 in Manhattan, the procedure would involve taking the total number of blue collar workers in health area 4 and dividing it by the total number of employed in health area 4. This quotient would be further divided by the result of dividing the total blue collar in the borough of Manhattan by the total number of employed in Manhattan.

Once the location quotients for total working class were calculated further data manipulation involved

isolating the working class groups, thus calculating location quotients for the individual occupations of craftsmen, operatives and labourers.

Included in the 1940 census data were maps of the various boroughs, displayed in sections, that show the demarcation of health areas. Using the calculated location quotients for each category, sets of these maps were shaded to illustrate where the total working class and the individual occupational groups were under-represented or over-represented.

The shading of health areas was based on whether the location quotients were less than 0.5, greater than 0.5 but less than 1, greater than 1 but less than 2 or greater than 2. Hence, the shading represents strong under-representation, slight under-representation, slight over-representation and strong over-representation of the working class respectively. Once the initial shading of health areas was completed for all categories, the sectional maps were arranged with their complementary borough counterparts and then the boroughs were positioned to produce an overall map of New York City.

Difficulties arose when the sectional maps, obtained from the census data, failed to have an ideal

fit. The scales of the sections were not the same in all cases. Another concern was the substantial size of the overall maps as an outcome of assembling the boroughs collectively. Much time and effort was subsequently put into the process of re-scaling and reducing the maps. The original shading of health areas was done in colour, thus the maps had to be re-shaded before they could be considered complete, and suitable for final presentation.

The completed maps, which reveal the settlement of New York City's working class in 1940, are the tools for comparing Burgess' concentric zone theory. It will be possible to observe where blue collar workers resided and also whether particular occupational groups had unique settlement patterns in the city.

CHAPTER 4

RESULTS

4.1 Description of Maps

The patterns of working class settlement based on location quotients will be examined in this chapter. Four maps have been produced which illustrate the settlement of craftsmen, operatives and labourers, and the summation of the three groups, total working class.

Figure 4.1 illustrates the settlement of craftsmen. Craftsmen are found to be strongly over-represented at the southern tip of Manhattan and in the area of East Harlem. Additional areas of strong over-representation are in Brooklyn, occurring in an unusual peripheral pattern at opposite ends of the borough. Areas that have slight over-representation of craftsmen are found in the eastern half of the Bronx, predominantly in Staten Island, in scattered parts of Manhattan and in a substantial area of Long Island, especially in the southern region of Queens and the northern area of Brooklyn. The southwest area of Brooklyn also has

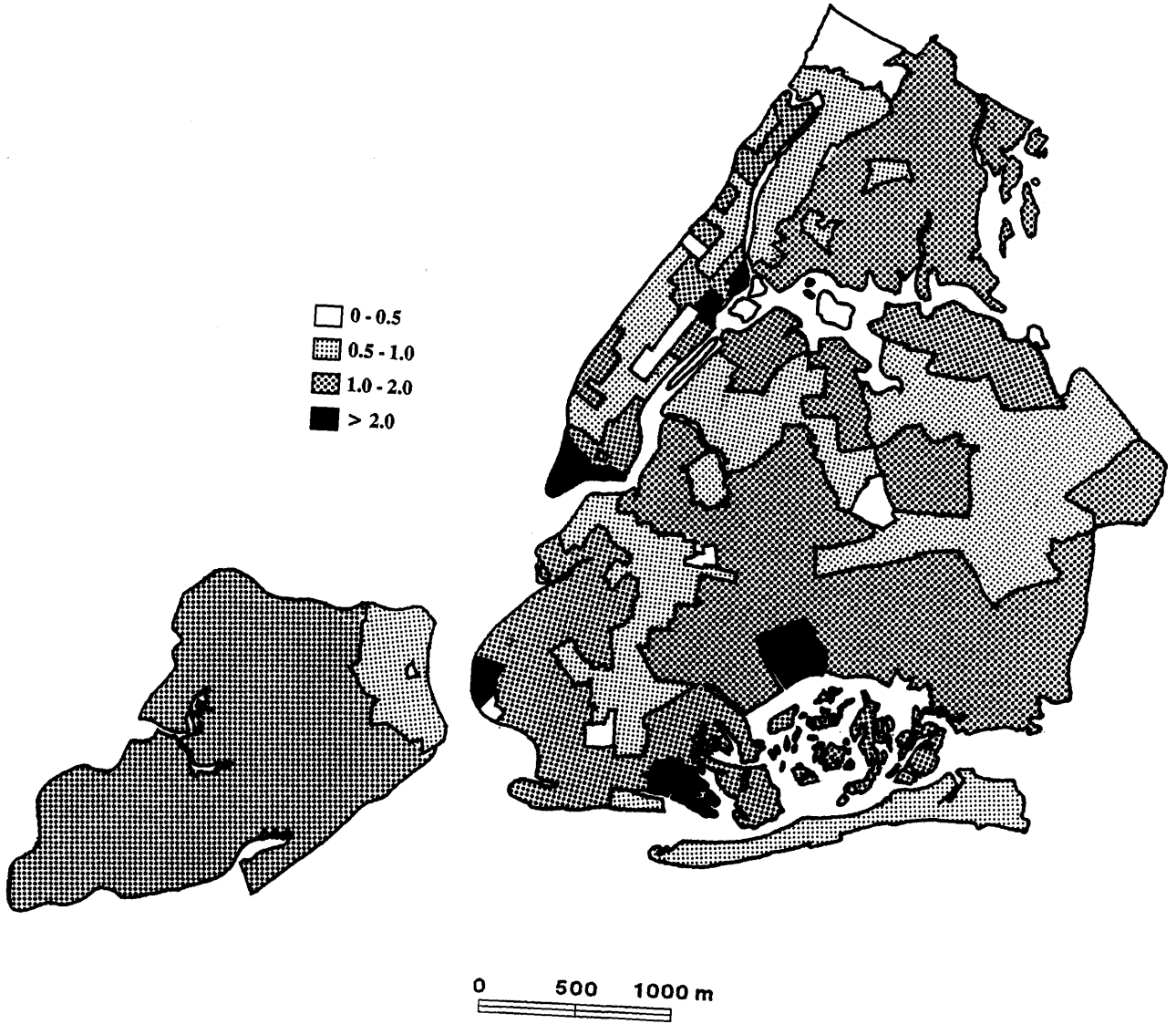


Figure 4.2 Settlement Patterns of Craftsmen, NYC, 1940.

slight over-representation of craftsmen.

Areas with slight under-representation are in the eastern portion of the Bronx, at the northeast point of Staten Island, scattered through the west side of Manhattan, in the central portion of Brooklyn, along an east-west section of northern Queens and in its southernmost extension along the ocean. Areas that have strong under-representation are found in northwest Bronx and dispersed in very small areas of Queens, Brooklyn and Manhattan.

Comparing figure 4.1 with Burgess' concentric ring model, the southern tip of Manhattan could be referred to the "innermost zone" since both areas contain the central business district. Examining figure 4.1 with this observation in mind, there appears to be a broad, semi-circular arrangement of craftsmen in the outlying boroughs around the CBD, especially in East Harlem and across the East River into Brooklyn. There are also several areas in the peripheral regions of the city that have strong under-representation.

Although these observations show support for the concentric model, further observations regarding figure 4.1 can be made that disagree with Burgess. For example

figure 4.1 identifies a large area within the CBD that has both a slight and strong over-representation of craftsmen. Such areas were also found way out in the periphery. According to Burgess, the workingmen's homes were outside the CBD within walking distance, thus these over-representations in New York City present anomalies for his model.

The existence of under-represented areas around the CBD is another inconsistency in figure 4.1 because according to Burgess areas containing non-blue collar workers were found further away from the core. The large area of strong under-representation in the centre of Manhattan, just outside the CBD, is not seen as an inconsistency to the Burgess model because this area, known as Central Park, represents non-residential space.

Although a broad semi-circular arrangement of craftsmen was identified outside the CBD, the areas fail to form a continuous band or ring similar to Burgess' findings.

The settlement of operatives, illustrated in figure 4.2, reveals strong over-representation near the southern tip of Manhattan, in the area of East Harlem and in north Brooklyn, just east of Manhattan's C.B.D. Areas that have slight over-representation of operatives are found in the southeast and western portions of the

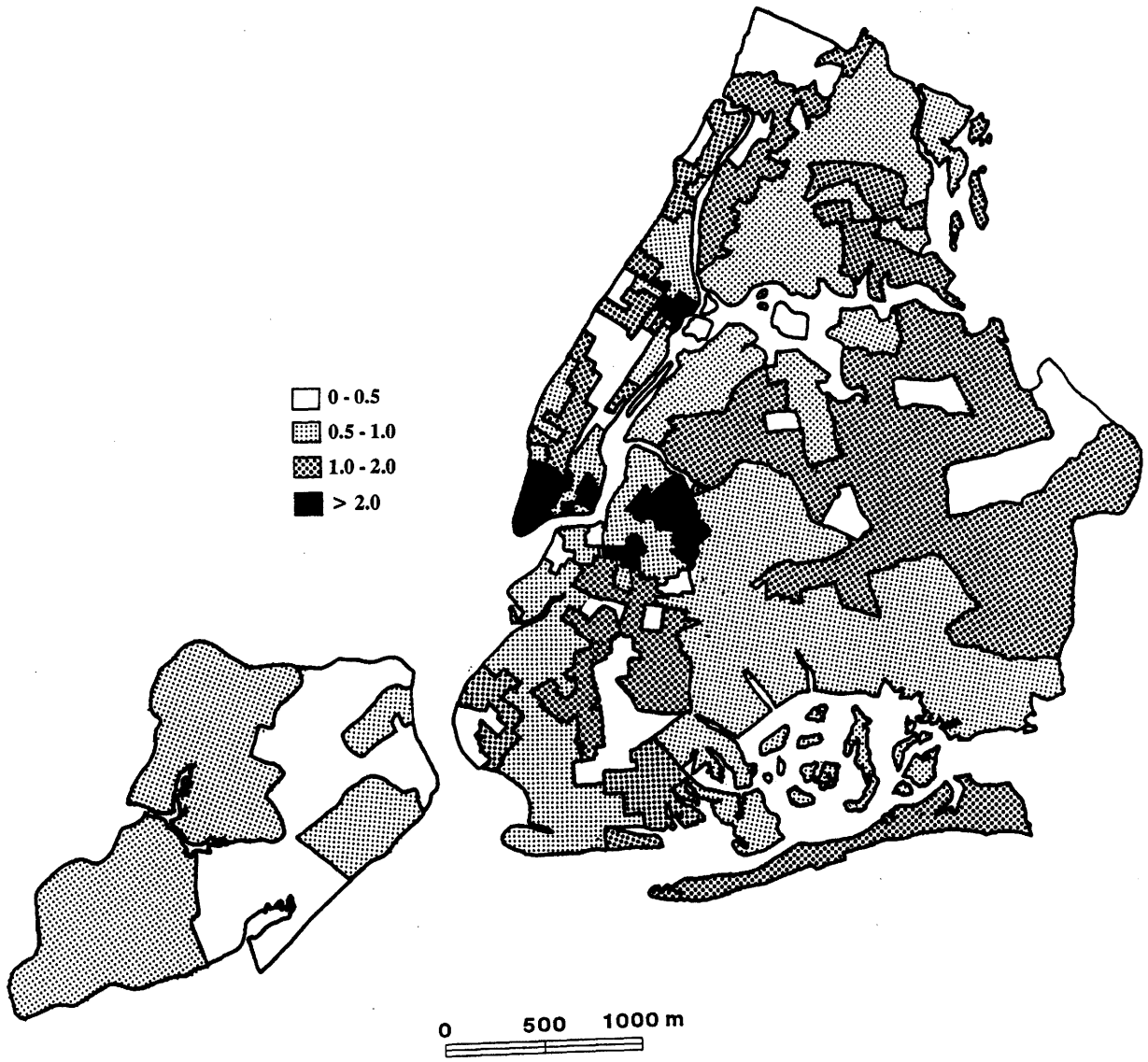


Figure 4.2 Settlement of Operatives, NYC, 1940.

Bronx, in the northeast half of Queens, in a relatively central part of Brooklyn and scattered in Manhattan. Slight under-representation of operatives is found predominantly in Staten Island, in the south and eastern areas of Queens, in northwest Brooklyn, in the central part of the Bronx. Slightly under-represented areas are also found scattered in Manhattan. Areas with strong under-representation are found in the center of Manhattan, in Staten Island, in the southeast portion of Queens and in scattered areas of Brooklyn.

Comparing the settlement patterns of operatives, illustrated in figure 4.2, to the concentric model it is first evident that the areas of strong over-representation seem to be less dispersed over the entire city and closer to the CBD. Although this observation is supportive to the ideas of Burgess, strong over-representation is still seen within the CBD, which is inconsistent. Also, areas of slight over-representation are fewer in number near the CBD and there is a much greater dispersal of this group towards the periphery. The areas of under-representation are more noticeable in the periphery, however there are also more areas of strong under-representation closer to the CBD and to the west of Central Park. In figure 4.2, it is almost as if the Burgess model is inverted to some extent.

Figure 4.3, illustrating the settlement of labourers, has a more dispersed pattern of strongly over-represented areas among the five boroughs. Strong over-representation occurs near the southern tip of Manhattan, in East Harlem, and in a small area of the mid west side. Additional areas include the southern end of the Bronx, in northwest areas of Brooklyn, in a section of Staten Island and in scattered areas of Queens. Areas with slight over-representation are found in the west portion of the Bronx, in a northeast part of Queens, dispersed in Brooklyn and Manhattan, and in a small northern part of Staten Island. Slight under-representation of labourers is widely dispersed through all the boroughs. Strong under-representation is seen in central areas of Brooklyn, Queens and Manhattan and in a fair portions of Staten Island and the northern Bronx.

When comparing figure 4.3 to Burgess' concentric model there is evidence of a semi-circular arrangement of labourers around the CBD. These areas of strong over-representation are found in northern Brooklyn and in the western sections of Queens, clustered along the East River. There are still a few areas of strong over-representation that don't comply to Burgess. These

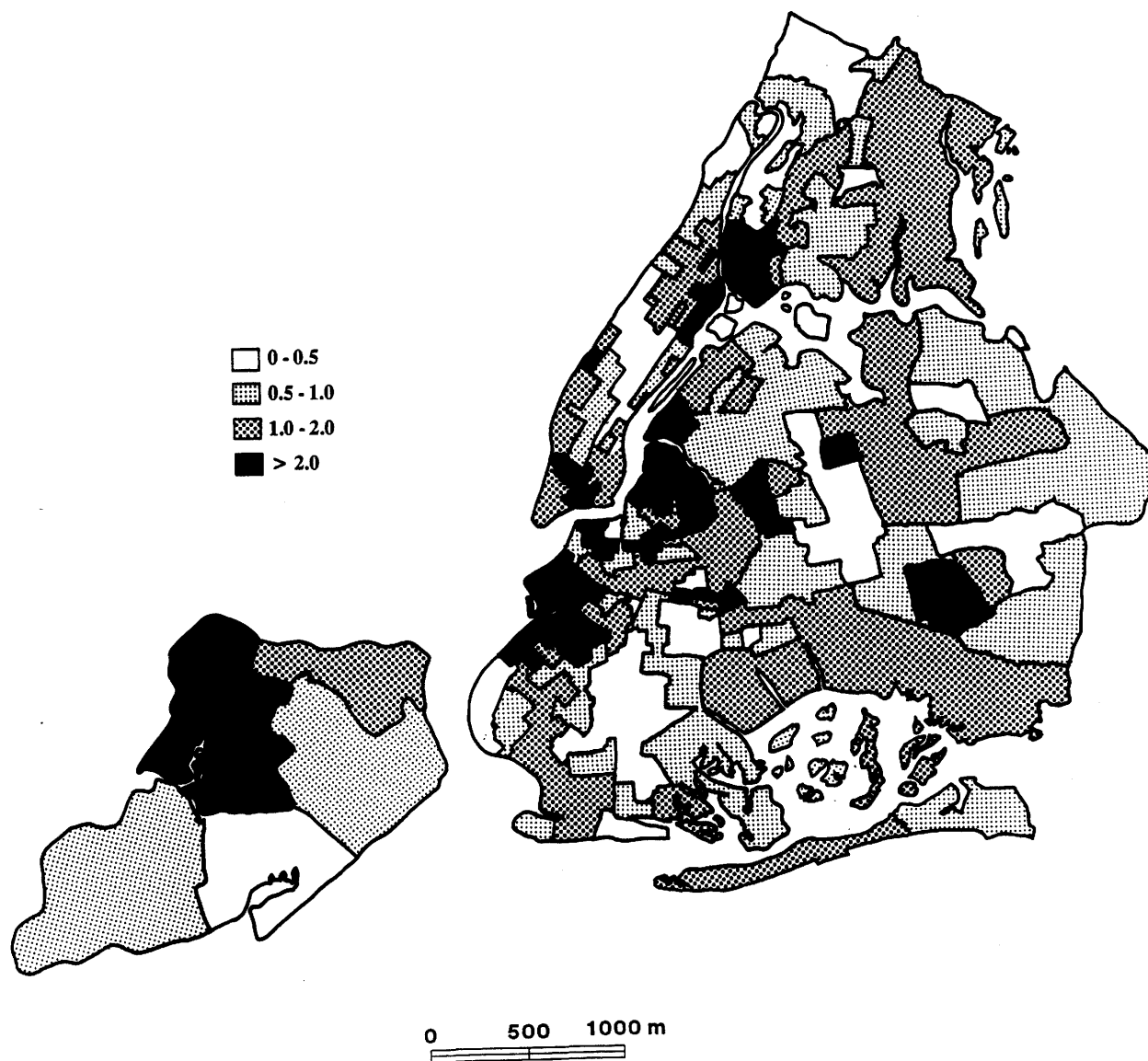


Figure 4.3 Settlement Patterns of Labourers, NYC, 1940.

areas occur within the CBD and also in the peripheral regions of Queens and the Bronx. Areas with a slight and strong under-representation of labourers are extremely scattered throughout both the central and peripheral sections of the city.

Observing figure 4.4, the map created from the location quotients for total working class, there is a definite mixture within the boroughs of under-represented and over-represented areas. Blue collar workers are strongly over-represented in three small areas of Manhattan. These areas are in the central business district, near the southern tip of the island; in East Harlem; and on the Mid West Side. Slightly over-represented areas are more numerous and have a larger distribution among the five boroughs of the city. These areas are found along the east side and southern

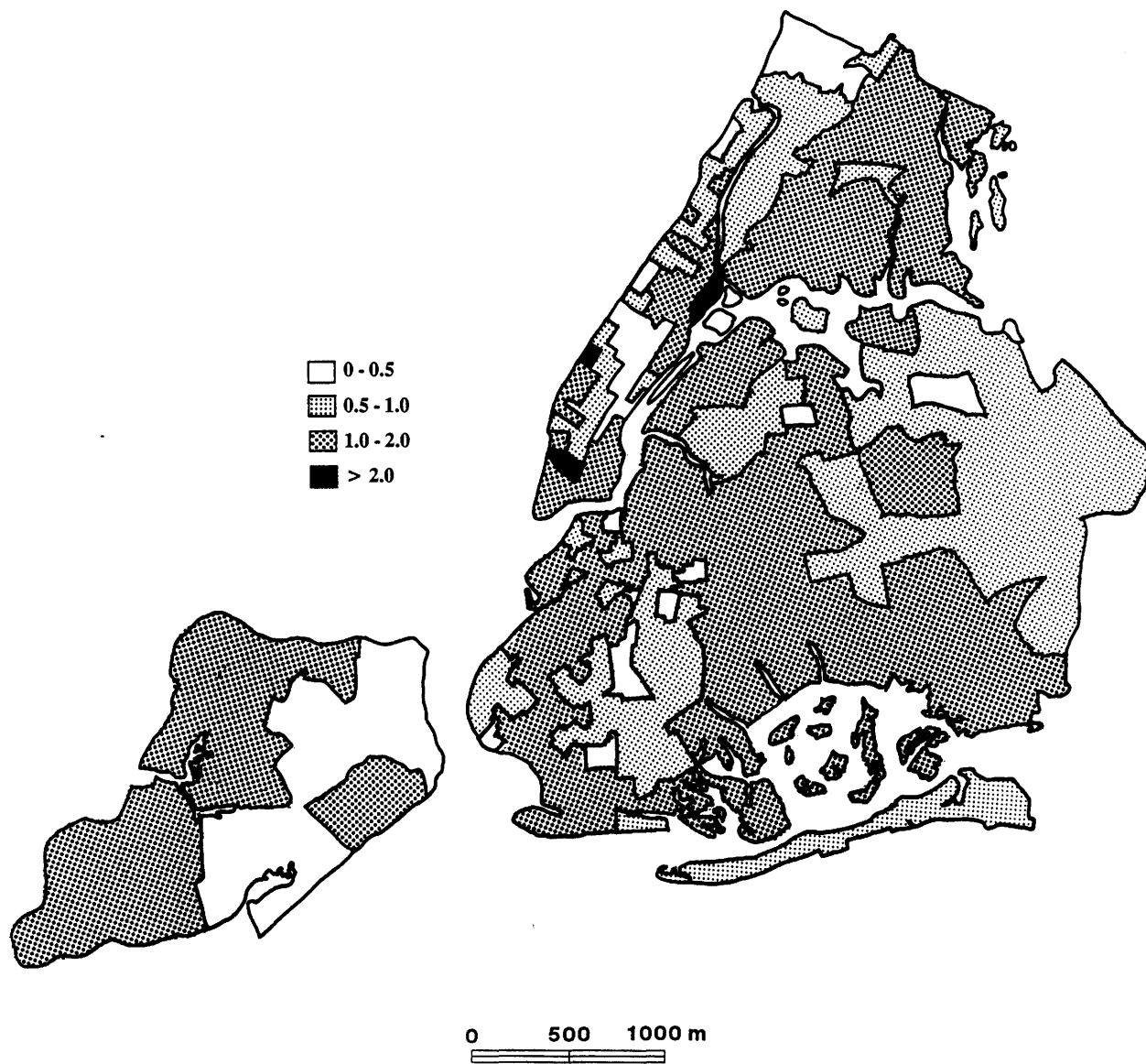


Figure 4.4 Total Working Class Settlement, NYC, 1940.

areas of Manhattan, in the eastern half of the Bronx, along the southwest portion of Queens and along the peripheral health areas in the boroughs of Brooklyn and in Staten Island to some extent.

Slight under-representation of blue collar workers is found in the western half of the Bronx, along the northwest section of Manhattan and in the central health areas of Brooklyn. A fairly large area where total blue collar is slightly under-represented is found in the northeast half of Queens and along the borough's southern boundary that rests on the Atlantic Ocean. Areas where the working class are strongly under-represented appear in the centre of Manhattan island, in the northwest region of the Bronx, centrally in the borough of Brooklyn, in a few scattered areas of Queens and in a fair portion of Staten Island.

Comparing this final map, figure 4.4, with the Burgess model over-representation of working class residents is found surrounding the CBD. This observation, along with the fact that there is a great deal of under-representation in the northeast half of Queens, tends support the ideas of Burgess, that the working class occupations were located outside the CBD and that non-working class occupations were located

towards the periphery. The inconsistencies with Burgess' model shown in figure 5, are the over-representations of working class in northeast Bronx, southeast Queens, on Staten Island and within the CBD. There is also strong under-representation in the Manhattan west of Central Park.

The maps discussed in this section have provided patterns with varying degrees of similarity to one another and to Burgess' concentric ring model. Overall, figure 4.1 contains a few large geographic areas with a high level of craftsmen in relation to the rest of the population; yet there are limited areas that don't have any craftsmen. In figure 4.2, the areas of high concentration of operatives are smaller in number and smaller in geographic size when compared to the patterns of the craftsmen population. There exists substantially more areas under-representation by operatives than areas under-represented by craftsmen. Moving to figure 4.3, there are many smaller and more densely populated areas of labourers. The labourer population is less evenly dispersed which causes the pattern of over-represented areas to be mixed with numerous under-represented areas.

When comparing the New York City maps to Burgess'

concentric ring model one must look at the maps with an open mind in order to fully accept the similarities. If this is done, the existence of a very broad concentric ring model can be seen. However, it seems that the inconsistencies discussed within this section outweigh the similarities, thus discounting the use of Burgess' concentric ring model as being representative for New York City.

4.2 Discussion of Patterns

Some of the locational processes at work in New York City correspond to those identified by Burgess. According to Ford (1936), the 1930 census revealed that 32% of workers in the city were employed in manufacturing or mechanical industries. He concluded that a considerable portion of the city's population thus had its place of residence determined in large part by the location of the city's industries. Ford further described an example which saw a high concentration of employees residences in the Lower East Side and middle West Side, in the vicinity of a large food manufacturing plant on the West Side of the city. Ford felt that the urban location of a plant was an ideal solution since the accessibility of a worker's place of employment was important when choosing his place of residence and much time was consumed in transit by the wage-earner. If the location of industries were located in areas such as the West Side of the city, then the appearance of working class settlement, for example the over-representation of labourers on the mid West Side, can be explained.

Adams stated that "the greatest difficulty of a

manufacturer in moving to a new district is usually that of obtaining housing accommodations of his workers. Often a factory owner would be glad to get away from an overbuilt district to an open area but for this difficulty." (Adams,1931:132). This statement identifies the existence of both industry and working class settlement within the central city area.

Contrary to Burgess' assumptions; however, a good deal of industry had moved to the suburbs. For example Ford (1936), discussed that prior to restrictive health and zoning legislation, which first occurred in 1916, owners of factories and workshops traditionally were allowed to locate wherever they pleased. However, certain types of industry were becoming recognized as dangerous to neighbouring properties because of risk of fires and explosions, or because of menace to health or comfort. Industries that were excluded from downtown areas sought locations in the unbuilt northern areas, however as increased residential land uses overtook them, they were pushed toward the periphery of the city.

For example, metal plants were increasing in northern areas of Manhattan, becoming more dispersed in Brooklyn and much more concentrated in Queens. Chemical plants were increasing in southern Manhattan but were

also showing increases in other boroughs. (Ford, 1936:465). This discussion of industrial decentralization could be used to explain the patterns of over-representation of operatives and labourers occurring in figures 4.2 and 4.3 respectively. Referring to these maps, the specific areas of over-representation occur in the Bronx, in areas of Brooklyn moving southeast; away from the East River, and in the north and south sections of East Queens.

With more noxious industries locating in the periphery it seems possible, as Harris has suggested, that "drab and dirty" areas would arise at the edge of the city where land was cheap. These industrial suburbs would offer significant new housing opportunities to the working people and thus explain greater blue collar representation arising on the outskirts of the city. (Harris, 1988:100). The occurrence of working class settlement in the periphery identifies a pattern that is completely opposite to the Burgess model.

Writing about New York in the 1950's, Hoover and Vernon made several observations about the movement of industry to the periphery. First, they found that as plants modernized their land requirement increased. For example "pre-1922 plants stand on 1040 square feet of

plot space per worker, while plants built from 1922 to 1945 occupy 2000 square feet and those built after 1945 occupy 4550 square feet of plot space per worker." (Hoover and Vernon, 1956:31). This would mean that the shape and size of city block grids would have become a powerful restraint on factory location. In order for factories to achieve expansion, they required suburban locations with a lot more space.

An interesting point that Hoover and Vernon identify is the requirement of transportation modes for manufacturers to distribute their goods. Prior to the turn of the century the Manhattan shores of the Hudson River and the East River were lined up with shipbuilding, soap-making plants, and iron works. The Brooklyn shore of the East River was also becoming crowded with chemical and paint factories and later with petroleum refineries. This point may be a reason why there is such strong over-representation of labours along the East River and on Staten Island. Perhaps such factories moved away from Manhattan but still required a location on the water.

Moving away from the topic of industrial decentralization, an interesting discussion was offered by Deborah Dash Moore regarding the gradual migration

of the Jewish population from Manhattan to the peripheral areas of the city. At the turn of the century, the Lower East Side represented an immigrant colony where the Jews constructed a vibrant and visible Yiddish working class culture. In the mid 1920s these Jewish immigrants were beginning to leave the Lower East Side to go to Brooklyn and the Bronx. Dash-Moore stated, "in searching for new homes, Jews found their choices limited initially by transportation facilities. A person needs to be able to reach his job, and investing in a modern home did not include laying out more than a dime a day in subway or elevated fares." (Dash Moore, 1946:33).

The Lower East Side Jews discovered Brownsville and Williamsburg in Brooklyn with the aid of the Williamsburg and Manhattan bridges. These bridges were completed in 1903 and 1909 respectively. The construction of rapid transit facilities in New York between 1914 and 1921 brought large areas of Brooklyn and the Bronx within reach of Manhattan and its jobs and thus speeded the transition of Jews from their homes in Manhattan and transplanted them across the river.

"Not only has the multiplication of rapid transit routes serving the inner zone facilitated the dispersal

of the residential population to outer sections, but it has also aided the trend toward concentration of business uses, which have virtually driven out residences over large areas." (Regional Survey of New York, 4:40,99)

In Brooklyn and the Bronx, Jews rapidly became predominant in apartment house construction. Contractors usually employed Jewish workers especially in the "Jewish" trades. Jews predominated as painters, rough carpenters and sheet metal workers. In 1936, estimates suggested that there were 18,000 Jewish carpenters and 8,000 Jewish painters in the city. The construction industry was the second largest employer of Jews. The Jewish builders of Brooklyn and the Bronx owned and managed the houses they built and attempted to attract Jewish tenants to live in them.

Brownsville and Williamsburg are areas of Brooklyn that show strong over-representation of labourers and operatives in the 1940 maps. It seems that the appearance of transportation networks, bridges and employment opportunities in Brooklyn have all contributed to the emigration and settlement of Jewish citizens to this suburban.

Although the construction of bridges and the extension of transit systems facilitated settlement in peripheral areas of Brooklyn, the "ill-balanced distribution and arrangement of transit facilities" failed to allow the development of other areas of the city. According to Bergman, not all directions away from Manhattan were equally well served by radial transit lines. The number of radial lines extending to Bronx and Brooklyn was much greater than the number on lines to Queens. No lines reached out to Staten Island at the beginning of the century. The areas of Staten Island and Queens remained unconnected to Manhattan by any form of mass transit until the development of the subway. (Bergman,1975). Referring back to figure 4.4, it seems understandable that there is slight and strong under-representation of blue collar in the northeast area of Queens and to some degree in Staten Island.

Conclusion

The complicated topography of New York City, with its striking landscape of islands and waterways, makes Burgess' model difficult to apply. The fact that Manhattan is completely surrounded by water, would have made New York City's core area inaccessible to certain areas of the boroughs that were without a bridge or elevated railroad. The need for more transportation links would have been a necessity in 1940, in order to achieve continuous rings of settlement around the central business district. Even with better transport, industrial decentralization has caused non-conforming patterns of working class settlement to arise in New York City. Due to the restrictive size Manhattan's CBD, many industries required spacious locations in the periphery and thus attracted their employees.

Although Burgess' concentric zone model is not an ideal representation of New York City, it does not become discredited or invaluable as an urban model. Some broad similarities were observed, however too many factors and processes have made the urban structure of New York City unique.

REFERENCES

Adams, Thomas. 1931. "Buildings. Their Uses and Spaces About Them". Regional Survey of New York. Volume 6. New York: Regional Plan Association.

Bergman, Edward F. 1975. A Geography of the New York Metropolitan Region. Dubuque, Iowa Kendall/Hunt Publishing Company.

Burgess, E.W. 1925. "The Growth of the City" in R.E. Park, E.W. Burgess and R. McKenzie, The City. Chicago: University Press.

Dash Moore, Deborah. 1946. At Home in America. Second Generation New York Jews. New York: Columbia University Press.

Douglass, Harlan P. 1925. The Suburban Trend. New York: Century.

Ford, J. 1936. Slums and Housing. Cambridge, Mass. Harvard University Press.

Harris, Chauncy. 1943. "Suburbs" American Journal of Sociology. 49: 1-13.

Harris, Richard. 1988. "American Suburbs. A Sketch of a New Interpretation". Journal of Urban History. 15,1: 98-103.

Harris, Richard. 1989. "Household Work Strategies and Suburban Home Ownership in Toronto, 1899-1913. Manuscript.

Harris, Richard. 1989. "Working-Class Home Ownership in the American Metropolis".

Hoover E. and Raymond Vernon. 1956. Anatomy of a Metropolis. New York: Anchor.

Hoyt, Homer. 1939. The Structure and Growth of Residential Areas in American Cities. Washington D.C.: Federal Housing Administration.

Jackson, K.T. 1985. Crabgrass Frontier. The Suburbanization of the United States. New York: Oxford University Press.

APPENDIX

Health Area	Blue Collar Location Quotient	Crafts-men Location Quotient	Oper-atives Location Quotient	Labours Location Quotient
-------------	-------------------------------	------------------------------	-------------------------------	---------------------------

** Data & Results for Bronx

0.00	0.3428	0.4485	0.2582	0.4808
2.00	0.6460	0.7302	0.5699	0.8214
3.10	0.8014	0.9054	0.7716	0.5371
3.20	0.5100	0.6429	0.4521	0.3213
4.10	0.6255	0.7129	0.6139	0.3037
4.20	0.5783	0.6864	0.4994	0.6631
5.10	0.8246	1.1045	0.6513	0.8114
5.20	1.2103	1.3910	1.0786	1.3500
6.10	1.2692	1.2218	1.2086	1.9453
6.20	1.3019	1.3001	1.2370	1.7957
7.10	1.3426	1.7193	1.0445	1.8103
7.20	0.9892	1.3741	0.7626	0.8841
8.10	1.3235	1.2476	1.4700	0.5828
8.20	1.2438	1.4411	1.0934	1.4469
9.00	0.6432	0.7587	0.5935	0.4753
10.00	1.1174	1.1091	1.0680	1.5257
11.00	1.5935	1.4316	1.6435	1.9759
12.10	0.8626	0.9683	0.8735	0.2864
12.20	1.2659	1.3825	1.1584	1.5248
13.10	1.0573	1.2702	0.9358	0.9707
13.20	1.2059	1.3272	1.1238	1.2531
14.10	0.9417	1.0606	0.7789	1.6034
14.20	1.2015	1.5356	0.9902	1.2188
15.10	0.5014	0.6095	0.4587	0.3154
15.20	0.7661	0.8422	0.7532	0.5059
16.00	0.6992	0.7666	0.7045	0.3446
17.00	0.9904	1.0282	0.9542	1.0847
18.00	1.2686	1.1119	1.3176	1.6349
19.00	1.2624	1.2080	1.3439	0.9068
20.00	1.2239	1.1583	1.3562	0.5406
21.10	1.2629	1.0821	1.4667	0.5849
21.20	1.2389	1.0694	1.4229	0.6551
22.10	0.6876	0.7530	0.6932	0.3392
22.20	0.7302	0.7902	0.7359	0.4064
23.10	0.7423	0.7674	0.7850	0.3050
23.20	0.6612	0.6197	0.7461	0.2209
24.00	1.3467	1.0244	1.5422	1.3919
25.00	0.9799	0.9342	1.0650	0.5569
26.00	1.2134	1.0699	1.2825	1.3683
27.00	1.2374	1.0705	1.3916	0.8642
28.00	1.2112	1.0179	1.3134	1.3500
29.00	1.2845	1.1469	1.4327	0.8198
30.10	1.0847	1.1463	1.0956	0.7147
30.20	1.1023	1.1743	1.1098	0.7099
30.30	1.2431	1.4604	1.0282	1.8347
31.00	1.0992	1.3100	0.9560	1.1846
32.10	1.3001	1.5357	1.0883	1.7831
32.20	1.1329	1.6616	0.7974	1.1693
33.10	0.6139	0.7353	0.5452	0.5598

Health Area	Blue Collar Location Quotient	Crafts-men Location Quotient	Oper-atives Location Quotient	Labours Location Quotient
33.20	0.6205	0.6813	0.6140	0.3848
34.00	1.2150	1.1416	1.1385	2.1299
35.00	1.1063	0.9874	1.1231	1.5365
36.00	1.2351	0.9784	1.4071	1.1488
37.00	1.1892	0.9512	1.3728	0.9293
38.00	0.8271	0.6733	0.7448	2.1622
39.00	1.3876	1.2344	1.2832	2.8856
40.00	1.2594	1.0556	1.2857	2.0155
41.00	1.1943	1.0920	1.1803	1.7776
42.00	1.2129	1.0392	1.3629	0.9030
43.00	1.1393	1.1733	1.1810	0.6681
44.00	1.2184	1.0642	1.1479	2.4672
45.00	1.0616	0.9028	1.0250	2.0793
46.00	1.1870	0.8737	1.1604	2.8522
47.00	1.2784	1.0545	1.1995	2.9165
48.00	0.1363	0.3833	0.0000	0.0000

Health Area	Blue Collar Location Quotient	Crafts-men Location Quotient	Oper-atives Location Quotient	Labours Location Quotient
-------------	-------------------------------	------------------------------	-------------------------------	---------------------------

** Data & Results for Brooklyn

1.00	1.5366	1.0651	1.5047	2.9162
2.00	1.7259	1.1557	1.6499	3.5819
3.00	1.7135	1.1459	1.6049	3.7268
4.00	1.7859	1.0791	1.7006	4.0420
5.00	1.1636	1.0331	1.3033	0.7999
6.00	1.6971	1.9174	1.7162	1.0314
7.00	1.8708	1.2330	2.1191	2.2747
8.00	1.8136	1.2366	2.0927	1.9057
9.00	1.7851	0.9417	2.0267	2.7546
10.00	1.5982	0.9028	1.6488	3.1428
11.00	1.4225	0.9532	1.4789	2.3533
12.00	0.8489	0.9621	0.7910	0.8467
13.00	1.0164	0.8101	1.0187	1.5383
14.00	1.8062	1.0277	2.0639	2.5270
15.00	1.6057	1.1431	1.8323	1.6656
16.00	1.6463	1.2334	1.7365	2.2618
17.00	1.7464	1.2910	1.9729	1.7882
18.00	1.3077	1.1498	1.4754	0.8749
19.00	1.2638	1.1253	1.4083	0.8973
20.00	1.1510	0.9552	1.1292	1.7668
21.00	1.1829	1.1759	1.1744	1.2440
22.00	1.9881	1.3043	2.3724	1.8286
23.00	0.5316	0.5284	0.4970	0.7137
24.00	1.2103	1.0906	1.1431	1.8573
25.00	1.7312	1.0848	1.5148	4.4883
26.00	1.0413	1.2081	0.8820	1.4087
27.10	1.0551	0.9575	0.9400	1.8852
27.20	0.4326	0.5516	0.3839	0.3689
28.00	0.9441	0.8333	0.8716	1.5947
29.00	0.6051	0.7009	0.5443	0.6622
30.00	0.2513	0.2226	0.2557	0.3036
31.00	1.3381	1.2995	1.3263	1.4970
32.00	1.7007	1.2032	2.0260	1.3553
33.00	1.6930	1.4441	1.8575	1.5115
34.00	1.4109	1.3728	1.5057	1.0340
35.00	1.3198	1.4525	1.2662	1.2456
36.00	1.2936	0.9636	1.2568	2.3317
37.00	1.7996	1.3716	1.8456	2.6761
38.00	1.1179	1.2402	1.0932	0.9256
39.00	1.0855	1.5398	0.9121	0.7802
40.00	1.9593	0.8576	1.6066	6.5783
41.00	1.8858	1.1980	1.6677	4.7590
42.00	1.5531	1.1683	1.6611	2.0070
43.00	1.6971	1.2657	1.5512	3.5445
44.00	1.7778	1.1791	1.6489	3.9728
45.00	0.5427	0.7282	0.4385	0.5851
46.00	1.0541	1.1273	0.9622	1.3257
47.00	1.3283	1.2690	1.2160	2.0450
48.00	0.6605	0.7562	0.6332	0.5497

Health Area	Blue Collar Location Quotient	Crafts-men Location Quotient	Oper-atives Location Quotient	Labours Location Quotient
49.00	0.4776	0.6238	0.4528	0.2244
50.00	0.8035	0.9260	0.8275	0.3660
50.20	0.8923	1.0683	0.9365	0.2154
51.00	1.2887	1.2907	1.4221	0.6144
52.00	1.4604	1.2242	1.5298	1.7232
53.10	0.8596	1.0224	0.8007	0.7341
53.20	0.3417	0.5061	0.3029	0.1113
54.00	0.5867	0.8157	0.4945	0.4572
55.10	0.8324	1.0612	0.7948	0.4295
55.20	0.8791	1.2052	0.7808	0.5288
56.00	1.3740	1.3575	1.5572	0.4976
57.00	1.4379	1.2012	1.5462	1.5063
58.10	1.0716	1.2898	1.1326	0.2010
58.20	1.2276	1.2773	1.3839	0.3148
59.00	1.4490	1.1827	1.6413	1.1734
60.00	1.4774	1.3365	1.6526	0.9628
61.00	1.3903	1.3271	1.4746	1.1308
62.00	1.5543	1.4175	1.6999	1.1778
63.00	1.3730	1.2627	1.6186	0.4262
64.10	1.6501	1.6557	1.6656	1.5579
64.20	1.3643	1.3388	1.4972	0.7634
64.30	1.9459	2.9128	1.5016	1.6742
65.00	1.4228	1.7457	1.1321	2.0464
66.00	1.3326	1.7776	1.0682	1.5077
67.00	1.2923	1.7734	1.1310	0.8575
68.00	0.7714	0.8174	0.8356	0.3305
69.00	1.3490	1.3050	1.4777	0.8169
70.00	0.7831	1.0585	0.7147	0.4137
71.10	0.8495	0.9830	0.8312	0.5964
71.20	0.6627	0.8582	0.6228	0.3572
72.10	0.3276	0.5203	0.2665	0.1356
72.20	0.3682	0.6193	0.2819	0.1518
73.10	0.5088	0.6772	0.4859	0.1875
73.20	0.5103	0.6545	0.4953	0.2130
74.10	0.6755	1.1281	0.5031	0.3701
74.20	0.9194	1.2660	0.8012	0.6161
75.10	1.4732	1.5238	1.5216	1.0994
75.20	1.5939	1.5785	1.6813	1.1953
76.00	0.7109	1.1898	0.5089	0.4857
77.00	1.0900	1.4658	0.8431	1.3568
78.10	0.6031	0.9661	0.4501	0.4321
78.20	1.0579	1.3698	0.9090	0.9988
79.10	0.7008	1.1887	0.4870	0.5114
79.20	0.9918	1.4168	0.8322	0.6928
80.10	1.5507	1.3805	1.6736	1.3747
80.20	1.5698	1.6132	1.5778	1.4173
81.10	1.3175	1.2411	1.4626	0.7875
81.20	1.4894	1.2974	1.6183	1.3390
82.00	1.7225	1.3983	1.9869	1.2346
83.00	0.9728	1.0605	1.0689	0.2641

Health Area	Blue Collar Location Quotient	Crafts-men Location Quotient	Oper-atives Location Quotient	Labours Location Quotient
84.00	1.1620	1.1225	1.2050	1.0482
85.10	0.0892	0.1075	0.0907	0.0348
85.21	0.9963	1.0691	1.1017	0.2792
85.22	1.3666	1.2201	1.5823	0.6633
86.10	1.5460	1.4418	1.6766	1.1597
86.20	1.6330	1.3232	1.8523	1.3340
87.10	0.7338	0.9682	0.7019	0.2873
87.21	1.1447	1.3035	1.0967	0.9748
87.22	0.8252	1.1517	0.7416	0.3998
88.10	0.5630	0.8960	0.4420	0.3085
88.21	0.8191	1.3779	0.5856	0.5451
88.22	1.1907	1.6299	1.0043	0.9894
89.00	1.3596	2.0116	0.9975	1.4902
90.10	1.1268	1.2704	1.1540	0.6194
90.20	1.3541	1.3063	1.4333	1.0805
91.10	1.1516	1.0791	1.3744	0.2212
91.20	0.7794	0.8688	0.8662	0.1124
92.00	0.0128	0.0284	0.0073	0.0000
93.00	0.3084	1.0260	0.0000	0.0000

Health Area	Blue Collar Location Quotient	Crafts-men Location Quotient	Oper-atives Location Quotient	Labours Location Quotient
-------------	-------------------------------	------------------------------	-------------------------------	---------------------------

** Data & Results for Manhattan

1.10	0.8102	1.2930	0.6818	0.4431
1.20	0.9980	1.5056	0.8857	0.5153
2.10	0.9968	1.4536	0.9428	0.3613
2.21	0.9178	1.3898	0.8464	0.3278
2.22	0.4039	0.6698	0.3542	0.1123
3.00	0.7516	1.0319	0.7543	0.2088
4.00	1.0562	1.3779	1.0152	0.6212
5.00	0.8708	0.9845	0.8984	0.5379
6.10	0.8139	1.0312	0.7887	0.5093
6.20	1.0196	1.2280	1.0123	0.6562
7.10	0.9441	0.6207	1.0779	0.9864
7.20	0.9662	0.6838	1.0585	1.1077
8.00	1.1066	0.6048	1.2053	1.6367
9.00	0.9744	0.9706	1.0366	0.7167
10.00	0.9678	0.5215	1.0794	1.3376
11.00	1.2807	1.1883	1.2039	1.7831
12.00	1.0121	0.5457	1.0487	1.7396
13.00	1.0854	0.5957	1.0739	2.0620
14.00	0.9822	1.0672	0.9167	1.1004
15.00	0.9846	0.5849	1.0651	1.3984
16.00	1.3806	1.7662	1.1288	1.7234
17.00	2.1000	2.3547	1.9761	2.1458
18.00	0.5460	0.4234	0.5884	0.5975
19.00	1.1214	0.5550	1.2688	1.5660
20.00	1.6347	1.1750	1.7229	2.1295
21.00	2.3310	1.8166	2.3241	3.3351
22.00	2.3053	2.2213	2.3058	2.4624
23.10	0.3991	0.5288	0.4048	0.1288
23.20	1.0886	1.0057	1.1212	1.1070
24.00	1.1586	0.7410	1.3559	1.1088
25.00	1.7302	1.3094	2.0023	1.3671
26.00	2.2995	1.8845	2.4236	2.5567
27.10	0.3394	0.5173	0.3032	0.1564
27.20	1.0173	1.1101	0.9576	1.0964
28.00	1.1375	1.5660	1.0535	0.6842
29.00	1.2020	2.2948	0.7125	1.2189
30.00	1.6702	4.0761	0.4278	2.4088
31.10	0.4900	0.9979	0.3344	0.1913
31.20	0.5851	0.6648	0.6715	0.0657
32.10	0.7449	1.6125	0.3544	0.7658
32.20	0.6086	0.7924	0.5683	0.4321
33.00	1.6201	2.0197	1.4371	1.6433
34.00	0.3590	0.5005	0.3421	0.1626
35.00	0.4838	0.6965	0.4437	0.2518
36.00	0.2739	0.3747	0.2612	0.1370
37.00	1.2534	1.8393	1.0640	0.9508
38.00	1.1973	1.6121	1.0784	0.9184
39.00	0.7567	0.7109	0.6668	1.2271
40.00	0.4642	0.6027	0.4082	0.4411

Health Area	Blue Collar Location Quotient	Crafts-men Location Quotient	Oper-atives Location Quotient	Labours Location Quotient
41.00	0.1749	0.2214	0.1759	0.0826
42.00	1.0740	1.1154	1.0777	0.9798
43.00	1.4042	1.7902	1.2951	1.1378
44.00	1.0958	1.2958	1.0742	0.8089
45.00	2.0197	1.3237	1.7433	4.5162
46.00	0.7659	0.7350	0.7297	0.9790
47.00	0.7423	0.7461	0.7014	0.9093
48.00	0.2140	0.3319	0.1969	0.0635
49.00	0.7656	0.7719	0.7707	0.7324
50.00	0.7757	0.8735	0.7293	0.7883
51.00	1.2871	1.1566	1.2197	1.8221
52.00	0.7348	0.8510	0.6737	0.7754
53.00	0.4787	0.6814	0.4270	0.3152
54.00	0.4583	0.5903	0.4173	0.3833
55.00	1.3171	1.0886	1.2884	1.8725
56.00	1.1983	1.0664	1.0740	1.9782
57.00	0.6532	0.6624	0.6621	0.5980
58.00	1.3389	1.3740	1.3639	1.1661
59.00	1.0205	1.0396	1.0477	0.8686
60.00	1.3550	1.2463	1.3872	1.4240
61.00	0.6224	0.5953	0.5429	1.0126
62.00	1.6422	1.3809	1.8176	1.3898
63.00	1.8358	1.5911	1.9084	1.9898
64.00	1.2536	0.9411	1.2715	1.7695
65.00	1.6335	1.5786	1.8127	0.9736
66.00	1.4965	1.5382	1.5421	1.2234
67.00	1.8219	1.5835	2.0123	1.4619
68.00	2.1042	1.0747	2.4500	2.5798
69.00	2.2571	1.3457	2.4715	3.0693
70.00	1.9647	1.2179	2.1202	2.7161
71.00	1.6060	1.1172	1.8833	1.3500
72.00	1.7530	1.3020	2.0811	1.2089
73.00	1.8979	1.6089	2.2253	1.0497
74.00	1.6114	0.8966	1.8669	1.8763
75.00	1.6927	1.2466	1.7300	2.3787
76.00	1.8441	1.4553	2.0558	1.6782
77.00	1.7397	0.5459	2.2352	1.8888
78.00	1.5766	1.0682	1.4907	2.9059
79.00	1.8879	1.4976	2.0167	2.0784
80.00	1.7239	1.4298	1.8907	1.5699
81.00	0.0123	0.0078	0.0173	0.0000
82.00	0.0688	0.1857	0.0330	0.0000
83.00	0.0671	0.0975	0.0520	0.0739
84.00	0.3395	0.6579	0.2339	0.1869
85.00	2.4589	0.6345	3.7189	0.5438

Health Area	Blue Collar Location Quotient	Crafts-men Location Quotient	Oper-atives Location Quotient	Labours Location Quotient
-------------	-------------------------------	------------------------------	-------------------------------	---------------------------

** Data & Results for Queens

1.10	1.2564	1.1732	1.3644	1.0601
1.20	1.1656	1.1857	1.1986	0.9242
2.10	1.4491	1.2334	1.6286	1.4314
2.20	0.9197	1.0616	0.7949	0.9641
3.00	1.3032	1.0133	1.4182	1.8971
4.00	1.1094	1.0326	1.2023	0.9609
5.00	1.2633	1.1723	1.3676	1.1159
6.10	1.2172	1.1324	1.3314	0.9973
6.20	0.8253	0.8406	0.8550	0.6189
7.10	1.3631	0.9180	1.7139	1.4233
7.20	1.4896	0.7814	1.8311	2.6452
8.00	0.7750	0.7490	0.7825	0.8421
9.10	0.7552	0.7222	0.7774	0.7783
9.20	0.8797	0.9274	0.8809	0.6837
10.10	0.3718	0.4364	0.3547	0.1973
10.20	0.7457	0.7636	0.7731	0.5402
11.00	1.3132	1.0749	1.5500	1.1057
12.00	0.8745	0.8134	0.8421	1.2773
13.10	0.4634	0.6391	0.3644	0.2470
13.20	0.7442	0.8810	0.6407	0.7045
14.10	1.0155	1.1085	0.9831	0.8035
14.20	0.6180	0.6783	0.6223	0.3567
15.00	1.7553	1.1517	1.9062	3.4251
16.00	1.5570	1.1961	1.8523	1.5527
17.00	1.4951	1.1886	1.6207	2.1034
18.10	1.1372	1.1062	1.2150	0.8801
18.21	1.4627	1.2371	1.6359	1.5152
18.22	1.1220	1.2320	1.0769	0.9035
19.10	0.6388	0.7220	0.6154	0.4216
19.20	0.2287	0.2930	0.2044	0.0909
20.00	1.0839	1.2489	0.9328	1.1644
21.11	0.8165	1.0017	0.6732	0.7786
21.12	0.8392	0.9795	0.6801	1.0575
21.21	0.5658	0.7712	0.4080	0.5185
21.22	0.9149	1.2270	0.7117	0.6634
22.00	1.3904	1.3174	1.5260	1.0188
23.00	1.3377	1.3315	1.3797	1.1567
24.00	1.2737	1.2950	1.3191	0.9670
25.00	0.8174	0.9871	0.7436	0.5008
26.00	0.6448	0.7701	0.5914	0.4060
27.00	0.7365	0.8332	0.6820	0.6172
28.10	0.5727	0.6976	0.5028	0.4164
28.20	0.7459	0.9464	0.6438	0.4454
29.10	0.7126	0.9584	0.5803	0.3790
29.20	0.8641	1.0906	0.7505	0.5161
30.00	1.3664	1.1631	1.4720	1.6609
31.00	0.9955	1.0921	0.9457	0.8537
32.00	1.1435	1.3080	1.0677	0.8579
33.00	1.4848	1.3715	1.3727	2.4851

Health Area	Blue Collar Location Quotient	Crafts-men Location Quotient	Oper-atives Location Quotient	Labours Location Quotient
34.00	1.3076	1.1648	1.1388	2.7031
35.10	0.9130	0.9694	0.8051	1.2162
35.20	0.7360	0.9613	0.6323	0.3446
35.31	0.8799	1.1543	0.7238	0.5486
35.32	1.0954	1.4211	0.8780	0.8597
36.11	1.3283	1.4125	1.2615	1.3190
36.12	1.4914	1.5433	1.3722	1.8675
36.20	1.2920	1.4506	1.1354	1.4255
37.00	0.6808	0.7646	0.5183	1.1408
38.00	0.6543	0.7286	0.5667	0.7867
39.00	0.0040	0.0050	0.0040	0.0000

Health Area	Blue Collar Location Quotient	Crafts-men Location Quotient	Oper-atives Location Quotient	Labours Location Quotient
-------------	-------------------------------	------------------------------	-------------------------------	---------------------------

** Data & Results for Staten Island

1.00	1.4659	1.2472	1.3705	2.1206
2.00	1.3987	1.4019	1.4150	1.3545
3.00	1.0106	1.0676	0.9563	1.0231
4.00	0.8159	0.6843	0.7865	1.1449
5.00	0.9565	0.8713	1.0003	1.0245
6.00	0.8777	1.1155	0.8242	0.5298
7.00	0.7999	0.6704	0.8444	0.9538
8.00	1.1278	1.1897	1.1702	0.9071
9.10	1.1316	1.0678	1.2980	0.8733
9.20	0.7720	1.0372	0.6820	0.4542
10.00	0.6814	0.4626	0.8843	0.6465

Health Area	Total Employed	Blue Collar	Total Craftsmen	Total Operatives	Total Labourers
-------------	----------------	-------------	-----------------	------------------	-----------------

** Data & Results for Bronx

0.00	3686	488	227	209	52
2.00	5186	1294	520	649	125
3.10	7360	2278	915	1247	116
3.20	9651	1901	852	958	91
4.10	13576	3280	1329	1830	121
4.20	12849	2870	1211	1409	250
5.10	6468	2060	981	925	154
5.20	8204	3835	1567	1943	325
6.10	8339	4088	1399	2213	476
6.20	6016	3025	1074	1634	317
7.10	1186	615	280	272	63
7.20	1272	486	240	213	33
8.10	10233	5231	1753	3303	175
8.20	3957	1901	783	950	168
9.00	15271	3794	1591	1990	213
10.00	9560	4126	1456	2242	428
11.00	6847	4214	1346	2471	397
12.10	9161	3052	1218	1757	77
12.20	7733	3781	1468	1967	346
13.10	6565	2681	1145	1349	187
13.20	4324	2014	788	1067	159
14.10	1339	487	195	229	63
14.20	8081	3750	1704	1757	289
15.10	7456	1444	624	751	69
15.20	9970	2950	1153	1649	148
16.00	14933	4033	1572	2310	151
17.00	8577	3281	1211	1797	273
18.00	5482	2686	837	1586	263
19.00	9658	4709	1602	2850	257
20.00	11474	5424	1825	3417	182
21.10	8682	4235	1290	2796	149
21.20	6190	2962	909	1934	119
22.10	12660	3362	1309	1927	126
22.20	14506	4091	1574	2344	173
23.10	12403	3556	1307	2138	111
23.20	8485	2167	722	1390	55
24.00	5460	2840	768	1849	223
25.00	13829	5234	1774	3234	226
26.00	7372	3455	1083	2076	296
27.00	8715	4165	1281	2663	221
28.00	6210	2905	868	1791	246
29.00	10725	5321	1689	3374	258
30.10	8488	3556	1336	2042	178
30.20	10177	4333	1641	2480	212
30.30	2972	1427	596	671	160
31.00	5926	2516	1066	1244	206
32.10	4415	2217	931	1055	231
32.20	2827	1237	645	495	97
33.10	9983	2367	1008	1195	164

Health Area	Total Employed	Blue Collar	Total Collar	Total Craftsmen	Total Operatives	Total Labourers
33.20	15851		3799	1483	2137	179
34.00	5888		2763	923	1472	368
35.00	9160		3914	1242	2259	413
36.00	8247		3934	1108	2548	278
37.00	8728		4009	1140	2631	238
38.00	6793		2170	628	1111	431
39.00	6342		3399	1075	1787	537
40.00	7913		3849	1147	2234	468
41.00	7956		3670	1193	2062	415
42.00	8227		3854	1174	2462	218
43.00	5611		2469	904	1455	110
44.00	7459		3510	1090	1880	540
45.00	6736		2762	835	1516	411
46.00	4851		2224	582	1236	406
47.00	6485		3202	939	1708	555
48.00	19		1	1	0	0
** Subtotal **	510705		197253	70127	112140	14986
** Data & Results for Brooklyn						
1.00	7113		4012	836	2291	885
2.00	8186		5186	1044	2891	1251
3.00	6113		3845	773	2100	972
4.00	6483		4250	772	2360	1118
5.00	10929		4668	1246	3049	373
6.00	11362		7078	2404	4174	500
7.00	7996		5491	1088	3627	776
8.00	5965		3971	814	2672	485
9.00	5735		3758	596	2488	674
10.00	4236		2485	422	1495	568
11.00	3974		2075	418	1258	399
12.00	9993		3114	1061	1692	361
13.00	8837		3297	790	1927	580
14.00	7689		5098	872	3397	829
15.00	5446		3210	687	2136	387
16.00	4342		2624	591	1614	419
17.00	6121		3924	872	2585	467
18.00	6912		3318	877	2183	258
19.00	7497		3478	931	2260	287
20.00	8026		3391	846	1940	605
21.00	6142		2667	797	1544	326
22.00	6524		4761	939	3313	509
23.00	14646		2858	854	1558	446
24.00	6739		2994	811	1649	534
25.00	4444		2824	532	1441	851
26.00	8236		3148	1098	1555	495
27.10	7609		2947	804	1531	612
27.20	7179		1140	437	590	113
28.00	10538		3652	969	1966	717
29.00	14016		3113	1084	1633	396

Health Area	Total Employed	Blue Collar	Total Craftsmen	Total Operatives	Total Labourers	
30.00	40064		3696	984	2193	519
31.00	8940		4391	1282	2538	571
32.00	8993		5614	1194	3900	520
33.00	10498		6524	1673	4174	677
34.00	10608		5494	1607	3419	468
35.00	9427		4567	1511	2555	501
36.00	5981		2840	636	1609	595
37.00	4169		2754	631	1647	476
38.00	8483		3481	1161	1985	335
39.00	9163		3651	1557	1789	305
40.00	7386		5312	699	2540	2073
41.00	8737		6048	1155	3119	1774
42.00	6283		3582	810	2234	538
43.00	4933		3073	689	1638	746
44.00	6525		4258	849	2303	1106
45.00	11697		2330	940	1098	292
46.00	10201		3947	1269	2101	577
47.00	9662		4711	1353	2515	843
48.00	14284		3463	1192	1936	335
49.00	12639		2216	870	1225	121
50.00	9541		2814	975	1690	149
50.20	6964		2281	821	1396	64
51.00	8088		3826	1152	2462	212
52.00	4434		2377	599	1452	326
53.10	8110		2559	915	1390	254
53.20	15793		1981	882	1024	75
54.00	12764		2749	1149	1351	249
55.10	9769		2985	1144	1662	179
55.20	12188		3933	1621	2037	275
56.00	7677		3872	1150	2559	163
57.00	6224		3285	825	2060	400
58.10	10609		4173	1510	2572	91
58.20	8861		3993	1249	2625	119
59.00	6911		3676	902	2428	346
60.00	6889		3736	1016	2437	283
61.00	8788		4485	1287	2774	424
62.00	10229		5836	1600	3722	514
63.00	10119		5100	1410	3506	184
64.10	5747		3481	1050	2049	382
64.20	8075		4044	1193	2588	263
64.30	28		20	9	9	2
65.00	10102		5276	1946	2448	882
66.00	11939		5840	2342	2730	768
67.00	13557		6431	2653	3282	496
68.00	13049		3695	1177	2334	184
69.00	8694		4305	1252	2750	303
70.00	12576		3615	1469	1924	222
71.10	5227		1630	567	930	133
71.20	10696		2602	1013	1426	163
72.10	16423		1975	943	937	95

Health Area	Total Employed	Blue Collar	Total Craftsmen	Total Operatives	Total Labourers	
72.20	7258		981	496	438	47
73.10	12123		2264	906	1261	97
73.20	10564		1979	763	1120	96
74.10	10893		2701	1356	1173	172
74.20	4717		1592	659	809	124
75.10	5287		2859	889	1722	248
75.20	5471		3201	953	1969	279
76.00	12788		3337	1679	1393	265
77.00	8810		3525	1425	1590	510
78.10	11500		2546	1226	1108	212
78.20	4975		1932	752	968	212
79.10	7837		2016	1028	817	171
79.20	7477		2722	1169	1332	221
80.10	7280		4144	1109	2608	427
80.20	5904		3402	1051	1994	357
81.10	7024		3397	962	2199	236
81.20	8822		4823	1263	3056	504
82.00	11808		7466	1822	5022	622
83.00	12425		4437	1454	2843	140
84.00	11359		4845	1407	2930	508
85.10	107025		3506	1270	2077	159
85.21	7722		2824	911	1821	92
85.22	6714		3368	904	2274	190
86.10	7498		4255	1193	2691	371
86.20	8328		4992	1216	3302	474
87.10	8892		2395	950	1336	109
87.21	6973		2930	1003	1637	290
87.22	6507		1971	827	1033	111
88.10	11246		2324	1112	1064	148
88.21	9030		2715	1373	1132	210
88.22	6633		2899	1193	1426	280
89.00	2721		1358	604	581	173
90.10	6206		2567	870	1533	164
90.20	6486		3224	935	1990	299
91.10	8263		3493	984	2431	78
91.20	5841		1671	560	1083	28
92.00	1275		6	4	2	0
93.00	1263		143	143	0	0
** Subtotal **	1110717		407714	122569	237756	47389
** Data & Results for Manhattan						
1.10	9252		2055	868	1030	157
1.20	9273		2537	1013	1341	183
2.10	10913		2982	1151	1680	151
2.21	10115		2545	1020	1398	127
2.22	7902		875	384	457	34
3.00	13129		2705	983	1617	105
4.00	14164		4101	1416	2348	337
5.00	13300		3175	950	1951	274

Health Area	Total Employed	Blue Collar	Total Craftsmen	Total Operatives	Total Labourers	
6.10	7485		1670	560	964	146
6.20	8833		2469	787	1460	222
7.10	6750		1747	304	1188	255
7.20	9876		2616	490	1707	419
8.00	12124		3678	532	2386	760
9.00	12496		3338	880	2115	343
10.00	12766		3387	483	2250	654
11.00	8200		2879	707	1612	560
12.00	9396		2607	372	1609	626
13.00	8560		2547	370	1501	676
14.00	7142		1923	553	1069	301
15.00	10344		2792	439	1799	554
16.00	8545		3234	1095	1575	564
17.00	4782		2753	817	1543	393
18.00	12761		1910	392	1226	292
19.00	9287		2855	374	1924	557
20.00	6768		3033	577	1904	552
21.00	2701		1726	356	1025	345
22.00	5429		3431	875	2044	512
23.10	11754		1286	451	777	58
23.20	6085		1816	444	1114	258
24.00	9914		3149	533	2195	421
25.00	7105		3370	675	2323	372
26.00	3942		2485	539	1560	386
27.10	5009		466	188	248	30
27.20	10764		3002	867	1683	452
28.00	9197		2868	1045	1582	241
29.00	8054		2654	1341	937	376
30.00	2634		1206	779	184	243
31.10	11464		1540	830	626	84
31.20	11920		1912	575	1307	30
32.10	6342		1295	742	367	186
32.20	12749		2127	733	1183	211
33.00	6435		2858	943	1510	405
34.00	15090		1485	548	843	94
35.00	16385		2173	828	1187	158
36.00	17911		1345	487	764	94
37.00	9584		3293	1279	1665	349
38.00	9353		3070	1094	1647	329
39.00	8937		1854	461	973	420
40.00	16100		2049	704	1073	272
41.00	12325		591	198	354	39
42.00	9700		2856	785	1707	364
43.00	8261		3180	1073	1747	360
44.00	6488		1949	610	1138	201
45.00	2301		1274	221	655	398
46.00	7201		1512	384	858	270
47.00	15333		3120	830	1756	534
48.00	15614		916	376	502	38
49.00	10410		2185	583	1310	292

Health Area	Total Employed	Blue Collar	Total Craftsmen	Total Operatives	Total Labourers	
50.00	7684		1634	487	915	232
51.00	6864		2422	576	1367	479
52.00	14917		3005	921	1641	443
53.00	12176		1598	602	849	147
54.00	9129		1147	391	622	134
55.00	7976		2880	630	1678	572
56.00	12420		4080	961	2178	941
57.00	13274		2377	638	1435	304
58.00	8195		3008	817	1825	366
59.00	8657		2422	653	1481	288
60.00	5629		2091	509	1275	307
61.00	8844		1509	382	784	343
62.00	10051		4525	1007	2983	535
63.00	3976		2001	459	1239	303
64.00	9768		3357	667	2028	662
65.00	6007		2690	688	1778	224
66.00	5421		2224	605	1365	254
67.00	6519		3256	749	2142	365
68.00	3937		2271	307	1575	389
69.00	6227		3853	608	2513	732
70.00	3576		1926	316	1238	372
71.00	4429		1950	359	1362	229
72.00	3758		1806	355	1277	174
73.00	2587		1346	302	940	104
74.00	3966		1752	258	1209	285
75.00	6103		2832	552	1724	556
76.00	3703		1872	391	1243	238
77.00	8861		4226	351	3234	641
78.00	7251		3134	562	1765	807
79.00	3304		1710	359	1088	263
80.00	3210		1517	333	991	193
81.00	3550		12	2	10	0
82.00	371		7	5	2	0
83.00	1413		26	10	12	4
84.00	419		39	20	16	3
85.00	2737		1845	126	1662	57
** Subtotal **	783563		214806	56852	127944	30010
** Data & Results for Queens						
1.10	8179		3806	1435	2046	325
1.20	8978		3876	1592	1973	311
2.10	5107		2741	942	1525	274
2.20	5839		1989	927	851	211
3.00	10941		5281	1658	2845	778
4.00	16603		6822	2564	3660	598
5.00	13125		6141	2301	3291	549
6.10	7517		3389	1273	1835	281
6.20	8535		2609	1073	1338	198
7.10	7685		3880	1055	2415	410

Health Area	Total Employed	Blue Collar	Total Craftsmen	Total Operatives	Total Labourers	
7.20	6949		3834	812	2333	689
8.00	10392		2983	1164	1491	328
9.10	9324		2608	1007	1329	272
9.20	7102		2314	985	1147	182
10.10	12441		1713	812	809	92
10.20	13976		3860	1596	1981	283
11.00	11123		5410	1788	3161	461
12.00	8919		2889	1085	1377	427
13.10	8966		1539	857	599	83
13.20	7347		2025	968	863	194
14.10	4283		1611	710	772	129
14.20	9799		2243	994	1118	131
15.00	5359		3484	923	1873	688
16.00	6787		3914	1214	2305	395
17.00	12354		6841	2196	3671	974
18.10	8215		3460	1359	1830	271
18.21	5881		3186	1088	1764	334
18.22	6437		2675	1186	1271	218
19.10	9049		2141	977	1021	143
19.20	10566		895	463	396	36
20.00	7057		2833	1318	1207	308
21.11	4626		1399	693	571	135
21.12	6055		1882	887	755	240
21.21	5454		1143	629	408	106
21.22	5188		1758	952	677	129
22.00	8903		4585	1754	2491	340
23.00	9341		4628	1860	2363	405
24.00	10291		4855	1993	2489	373
25.00	10547		3193	1557	1438	198
26.00	10975		2621	1264	1190	167
27.00	13443		3667	1675	1681	311
28.10	8330		1767	869	768	130
28.20	6769		1870	958	799	113
29.10	6335		1672	908	674	90
29.20	6824		2184	1113	939	132
30.00	11308		5723	1967	3052	704
31.00	12001		4425	1960	2081	384
32.00	12781		5413	2500	2502	411
33.00	8610		4735	1766	2167	802
34.00	9248		4479	1611	1931	937
35.10	6822		2307	989	1007	311
35.20	8980		2448	1291	1041	116
35.31	7392		2409	1276	981	152
35.32	7510		3047	1596	1209	242
36.11	5785		2846	1222	1338	286
36.12	5000		2762	1154	1258	350
36.20	3425		1639	743	713	183
37.00	6314		1592	722	600	270
38.00	7122		1726	776	740	210
39.00	1348		2	1	1	0

Health Area	Total Employed	Total Blue Collar	Total Craftsmen	Total Operatives	Total Labourers
** Subtotal **	501562	185769	75008	91961	18800
** Data & Results for Staten Island					
1.00	3111	1757	560	717	480
2.00	6484	3494	1312	1543	639
3.00	6529	2542	1006	1050	486
4.00	9760	3068	964	1291	813
5.00	4803	1770	604	808	358
6.00	7186	2430	1157	996	277
7.00	6211	1914	601	882	431
8.00	5061	2199	869	996	334
9.10	4769	2079	735	1041	303
9.20	4569	1359	684	524	151
10.00	659	173	44	98	31
** Subtotal **	59142	22785	8536	9946	4303
*** Total ***	2965689	1028327	333092	579747	115488