

UC Riverside

Opolis

Title

Philadelphia's Space In Between: Inner-Ring Suburb Evolution

Permalink

<https://escholarship.org/uc/item/16t4c093>

Journal

Opolis, 1(1)

ISSN

1551-5869

Authors

Green Leigh, Nancey
Lee, Sugie

Publication Date

2005

Peer reviewed

Philadelphia's Space In Between: Inner-Ring Suburb Evolution

Nancey Green Leigh
Georgia Institute of Technology

Sugie Lee
Georgia Institute of Technology

Abstract

Metropolitan regions have evolved into highly diverse areas in their demographic, socioeconomic, and housing patterns. The issue of declining inner-ring suburbs, however, has only recently begun to receive significant attention from urban scholars and policy makers. The fundamental concept of the inner-ring suburb rests on the notion of the space “in between” the inner city and outer-ring suburbs. In this article, we explore intra-metropolitan spatial differentiations and economic disparity between four sub-areas—the downtown, inner city, inner-ring suburbs, and outer-ring suburbs—via a case study of the Philadelphia metropolitan region. Our analysis confirms that inner-ring suburbs are increasingly vulnerable to socioeconomic decline and exhibit symptoms of decline similar to those found in inner cities (white flight, population loss, and increased poverty). Understanding the role and conditions of inner-ring suburbs is essential to creating effective metropolitan smart growth policies.

Keywords: Inner-Ring Suburbs, Suburban Decline, Suburban Differentiation, Philadelphia

Introduction

Suburbanization and central-city decline have been the focus of urban scholars and policy makers for several decades. In contrast, inner-ring suburbs' deterioration, need for revitalization, and role in evolving metropolitan structures has only recently begun to receive significant attention (Lucy and Phillips 2000a; Orfield 1997, 2001; Puentes and Orfield 2002; Smith et al. 2001; Rusk 1999). Yet inner-ring suburbs, with their

excellent access to centers and subcenters in metropolitan areas and existing economic, social, and physical infrastructure, present significant opportunities for a more efficient allocation of metropolitan resources at the same time that they help to reduce suburban sprawl and preserve the natural environment.

The research presented in this article uses time of development and spatial

location characteristics to define the precise boundaries of the inner-ring suburbs and then applies the methodology to a case study of Philadelphia. Using Geographic Information Systems (GIS) techniques and statistical analyses, we compare and contrast inner-ring suburbs with the downtown, inner city, and outer-ring suburbs of the Philadelphia metropolitan region. The primary source of data for our analysis is the decennial censuses of 1970, 1980, 1990, and 2000.

The three objectives of our research are to (1) illustrate a methodology for defining and identifying the spatial pattern of inner-ring suburbs; (2) document demographic, socio-economic, and housing characteristics found in Philadelphia's downtown, inner city, inner-ring suburbs, and outer-ring suburbs; and (3) explore the planning and policy implications stemming from the current status of inner-ring suburbs relative to the central city and outer-ring suburbs within the metropolitan area.

Existing Literature Limitations and a New Approach for Intra-Metropolitan Analysis

Up until the mid-1980s, the issue of suburban decline was under-recognized while priority was given to the revitalization of the central city and inner-city neighborhoods. Bollens (1988) and Jackson (1985) are among the few urban scholars who called attention to the decline of inner-ring suburbs that were showing socio-fiscal problems similar to those found in central cities.

Subsequently, Orfield (1997) provided

the most comprehensive exploration of suburban differentiation. He argued that inner-ring suburbs are declining more rapidly than central cities. He offered evidence of the process of decline spreading from the central city to inner-ring suburbs through his case study of Minneapolis-Saint Paul, Minnesota.

Lucy and Phillips (2000a, 2000b, 2001) also provided evidence of the decline of inner-ring suburbs. They found that an income decline in suburbs occurred as often in areas dominated by middle-age housing built between 1945 and 1970 as in neighborhoods with older housing built before 1945 (Lucy and Phillips 2000b). Recently they also explored growth and decline in terms of population change for the suburbs of the 35 largest metropolitan regions between 1990 and 2000 (Lucy and Phillips 2001). They found that declining suburbs were predominantly located in slow-growing metropolitan regions of the Midwest and Northeast. They also concluded that declining suburbs were found throughout the metropolitan region and were not necessarily adjacent to central cities.

Kotkin (2001), however, provided a different perspective on inner-ring suburbs. Examining selected older suburbs in the fast-growing regions of the South and West, he found many inner-ring suburbs to be prospering and evolving into ethnically diverse cities. According to Kotkin, immigrant movement into inner-ring suburbs is a reflection of a renewal of middle-class aspirations, not a sign of neighborhood decline. Hence, inner-ring suburbs are the emerging melting pots that will generate new economies for the 21st century, just as central cities did for the

20th century (Kotkin 2000, 2001).

There is a limited body of research to help us understand the nature and role of inner-ring suburbs within metropolitan regions, yet we cannot have a robust metro smart growth policy without a fuller understanding. The prevailing approach of examining a central city/suburbs dichotomy, along with aggregating data for analysis by the "official" census definition of the central city and suburbs, is simply inadequate for analyzing metropolitan structure precisely because of the emergence of suburban rings and sub-centers. While Orfield (1997) and Persky and Wiewel (2000) have conducted empirical studies that attempt to account for suburban differentiation, their approaches rely on county and municipal data aggregations that are too crude to identify inner-ring suburbs.

A concrete definition of inner-ring suburbs is essential for developing policy implications that address the needs of these metro subareas. However, the literature contains a confusing array of terms such as old suburbs, inner suburbs, first-ring suburbs, and first suburbs.¹ A more specific approach has been taken recently that defines inner-ring suburbs in terms of their specific time of development. Seaver, Morris, and Rapson (1998) defined the inner- or first-ring suburbs as "post-WWII communities" constructed between 1945 and 1965. Lucy and Phillips (2000b) defined inner-ring suburbs as "middle-aged neighborhoods" that

were built from 1945 to 1970. While their definitions differ slightly, we believe these researchers' foci on post-WWII suburbs and their decline best captures the concerns that have been expressed in the literature, while also offering an operational definition for analysis. A definition of inner-ring suburbs as post-WWII-developed areas means the automobile was the primary mode of transportation while they were forming. Recognizing this distinction from areas that developed earlier and more compactly as streetcar suburbs is fundamental to creating effective Smart Growth policies.

In the research presented here, we have taken the age of the subarea housing stock as the measure for identifying inner-ring suburbs. That is, the construction of the housing stock is a primary characteristic of an area's development, and for inner-ring suburbs in particular, there is a concentration of housing stock built between 1950 and 1969. Thus, inner-ring suburbs in this research are low-density, single-family, residential suburban areas built between 1950 and 1969.

With our definition, this research rejects not only the administrative definitions of the central city and suburbs, but also the traditional approach for analyzing metropolitan areas as a dichotomous structure of central city/suburbs (see Diagram A in Figure 1). We argue that the metropolitan region should be treated as an integrated system of central city

¹ Older suburbs (Persky and Kurban 2001), inner suburbs (Jackson 1985; Bollens 1988; Orfield 1997; Bier 2001), inner-ring suburbs (Downs 1997), sitcom suburbs (Hayden 2000), post-World War II suburbs (Seaver, Morris, and Rapson 1998; Design Center for American Urban Landscape 1999; Lucy and Phillips 2000b), first suburbs (Puentes and Orfield 2002), first-ring suburbs (Fishman 2000), first-tier suburbs (Hudnut 2003).

(downtown and inner city), inner-ring suburbs, outer-ring suburbs, subcenters, and exurbs. The conceptual diagram for this approach is presented in Diagram B in Figure 1.

Inner-ring suburbs, therefore, should be viewed as separate entities, as well as within the context of the whole metropolitan region. Our research focuses on the downtown, inner city, inner-ring suburbs, and outer-ring suburbs to compare their dynamic socioeconomic changes and characteristics, and de-emphasizes the suburban subcenters and exurbs.

Methodology

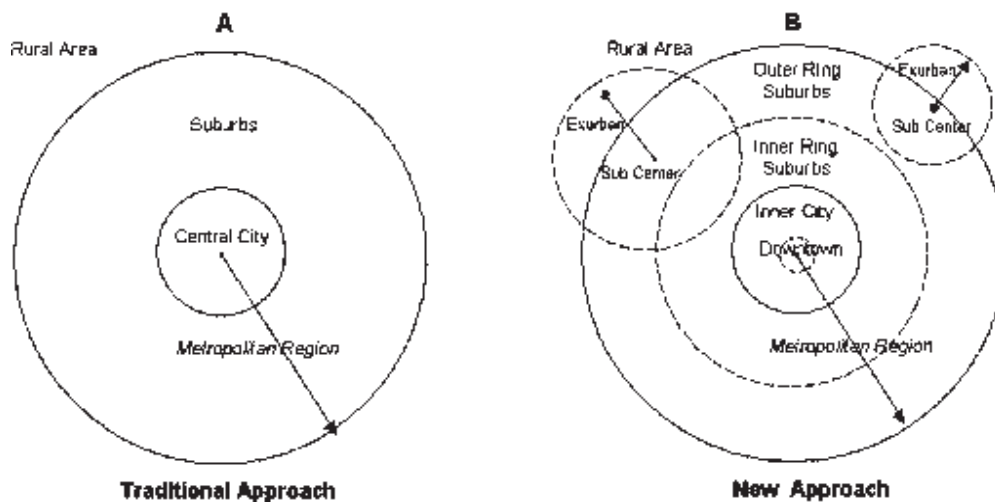
Our study region covers eight counties, excluding Salem County, from the nine-county Pennsylvania-New Jersey Primary Metropolitan Statistical Area (PA-NJ PMSA). Philadelphia County is the central city, as well as the hub, of the PA-NJ PMSA. The Philadelphia

region was ranked as one of the nation's slowest growing large metropolitan areas.

The primary source of data for our analysis is the Neighborhood Change Database (NCDB) produced by GeoLytics.² NCDB contains longitudinal census Long and Short Form data for 1970, 1980, 1990, and 2000. The tract boundaries and data of 1970, 1980, and 1990 have been normalized to 2000, allowing us to compare data over time.

We use GIS techniques to identify spatial patterns of inner-ring suburbs. To test the research hypotheses, we use descriptive analyses and Analysis of Variance (ANOVA) tests with STATA 8.0. The unit of analysis for this research is the census tract, as a proxy for the neighborhood unit. Most existing research on inner-ring suburbs is based on analysis at the municipal level—city and county. Our tract-based

Figure 1. A New Model of Metropolitan Spatial Structure



²<http://www.geolytics.com/USCensus,Neighborhood-Change-Database-1970-2000,Products.asp>.

approach provides a more fine-grained analysis of the inner-ring suburbs relative to the inner city and outer-ring suburbs.

Figure 2 shows the dot density of residential housing units over four different time frames for the Philadelphia metropolitan region. Each dot represents 50 housing units distributed randomly within each census tract by GIS software. It can be seen that metropolitan Philadelphia had dense housing development within the central city by 1950. During the 1950-1969 period, most suburban development occurred within 20 miles of the downtown. Table 1 shows that

631,250 housing units were added during this period, constituting 31.2 percent of the housing units in the region. Subsequently, the suburban neighborhoods that developed between 1950 and 1969 became the inner-ring suburbs. Since 1970, the Philadelphia region has experienced dispersed suburbanization at the fringe of the metro region, or beyond 20 miles of the downtown. During this time period, the study region added 464,096 housing units, or 23 percent of the total regional housing stock.

Since the 2000 census provides the number of housing units built within ten-year intervals, the number of

Figure 2. Spatial Distribution of Housing Units by Built Years for Metropolitan Philadelphia

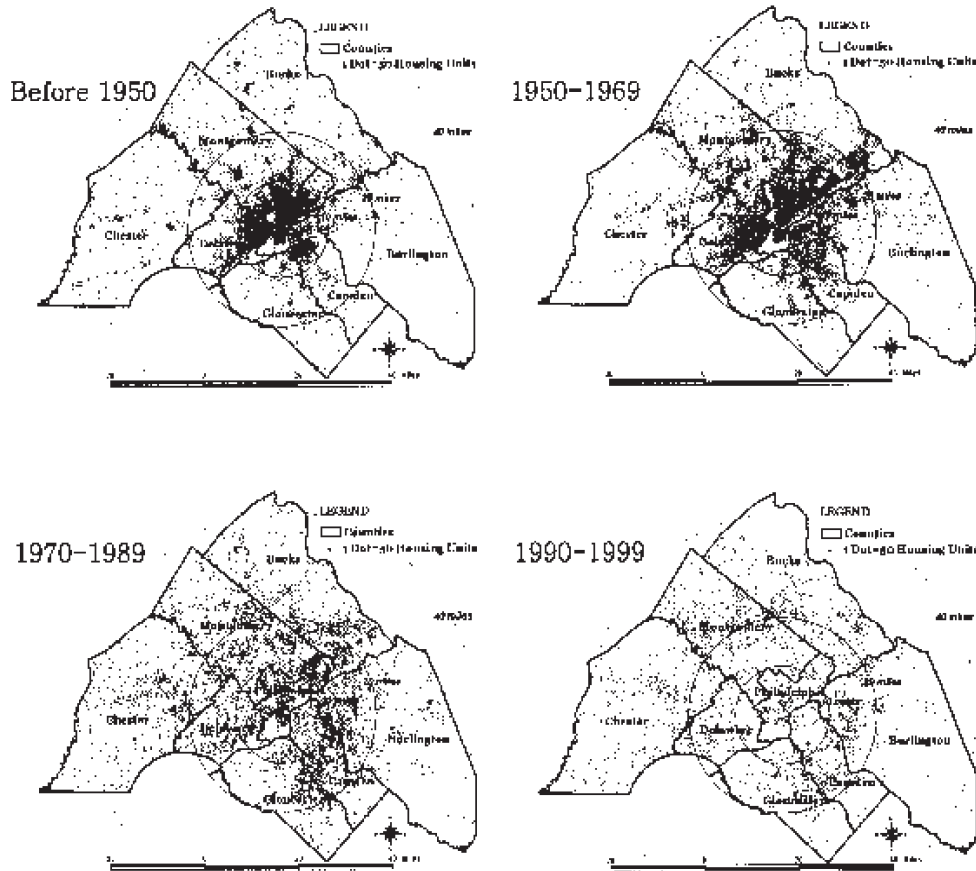


Table 1. Housing Units by Built Year for Metropolitan Philadelphia Region

| | Built Year | Housing Units | Percentage |
|-------------|------------------|------------------|----------------|
| | Pre-1939 | 511,763 | 25.30% |
| Before 1950 | 1940-1949 | 223,972 | 11.10% |
| | Sub-total | 735,735 | 36.40% |
| | 1950-1959 | 349,361 | 17.30% |
| 1950-1969 | 1960-1969 | 281,889 | 13.90% |
| | Sub-total | 631,250 | 31.20% |
| | 1970-1979 | 261,301 | 12.90% |
| 1970-1989 | 1980-1989 | 202,795 | 10.00% |
| | Sub-total | 464,096 | 23.00% |
| | 1990-1999 | 190,604 | 9.40% |
| | Total | 2,021,685 | 100.00% |

residential housing units in each tract can be aggregated into four time periods: before 1950, 1950-1969, 1970-1989, and 1990-1999. In this research we define inner-ring suburbs as those with a “predominance level” (relatively higher percentage) of 1950-1969 housing stock at the census tract level. We also convert the aggregate residential housing units built between 1950 and 1969 to the density and contour maps to help identify the continuity in form of the inner-ring suburbs surrounding the inner city.³ The inner city is defined as the area that has a concentration of housing stock built before 1950. Using the same method applied to inner-ring suburbs, we can obtain the boundary of the inner city. For identifying downtown census tracts, we use tracts predefined as downtown tracts from Sohmer and Lang (2001). The authors’ original source is downtown tracts mapped by the University of Pennsylvania for 24 U.S. central cities.

Figure 3 shows the identification of each subarea in Philadelphia: downtown, inner city, inner-ring suburbs, and outer-ring suburbs.

Analysis and Findings

In this research we explore change in the pattern of demographic, socio-economic, and housing characteristics for each subarea from 1970 to 2000 to address the issue of intra-metropolitan spatial differentiation and suburban decline. We utilize descriptive analyses and ANOVA tests for mean comparisons of multiple sub-areas to explore intra-metropolitan differentiation.

We explore two research hypotheses focusing on intra-metropolitan spatial differentiation and intra-metropolitan economic disparity and divergence. In the first hypothesis, we examine whether there are significant differences in the demographic, socio-

³. Density calculation function of Spatial Analyst in ArcView 3.3: Cell size 100m, Radius 2 miles, Density type of Kernel, and Area units in square miles.

economic, and housing changes found in downtown, inner city, inner-ring suburbs, and outer-ring suburbs. In the second hypothesis, we investigate whether intra-metropolitan disparity and divergence are increasing between the downtown, inner city, inner-ring, and outer-ring suburbs over time.

Demographic Analysis

Population changes are an important indicator of shifts in neighborhood economic conditions. Simmons and Lang (2001) emphasized the importance of population growth to address a city's economic performance because population gains usually induce housing demands as well as other economic activities. As shown in

Table 2, the Philadelphia metro area grew from 4.8 million in 1970 to 5.0 million in 2000, representing a slow growth rate of only 4.6 percent over the past 30 years.

Despite this overall slow growth rate, there were remarkable differences in population growth patterns between subareas of the metro region. The outer-ring suburbs experienced an 83 percent increase in population, reflecting significant decentralization toward the metropolitan fringe. In contrast, the downtown also lost population between 1970 and 2000. However, the loss was concentrated in the 1970s; the downtown gained population in the 1980s and 1990s.

Table 2 also includes data on

Figure 3. Philadelphia's Downtown, Inner City, Inner-Ring Suburbs, and Outer-Ring Suburbs

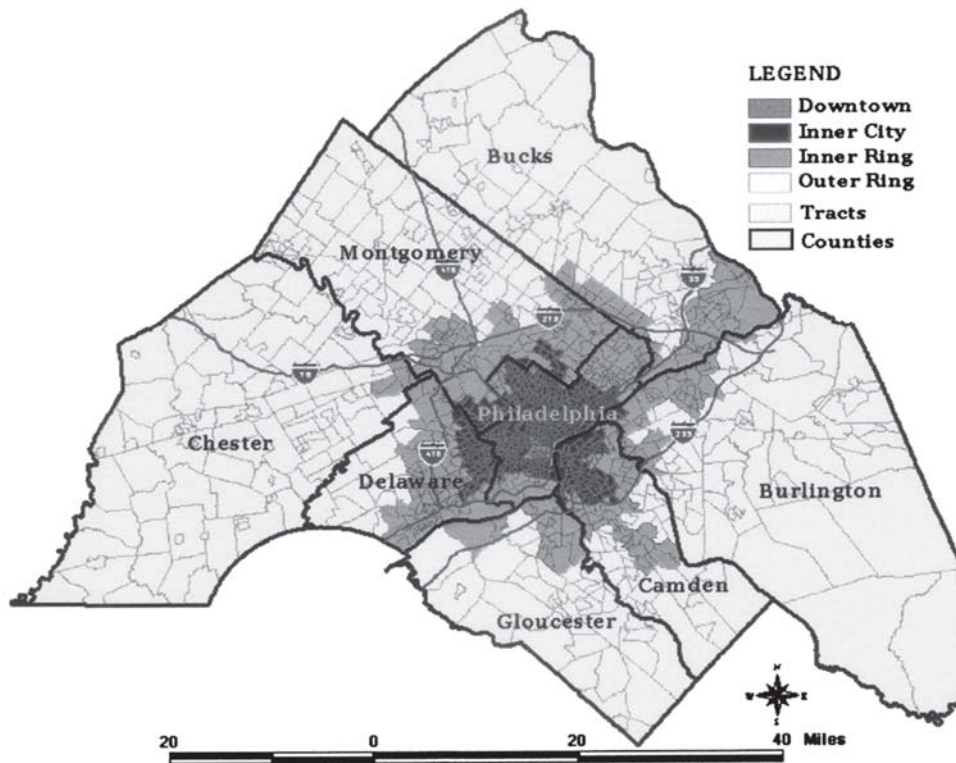
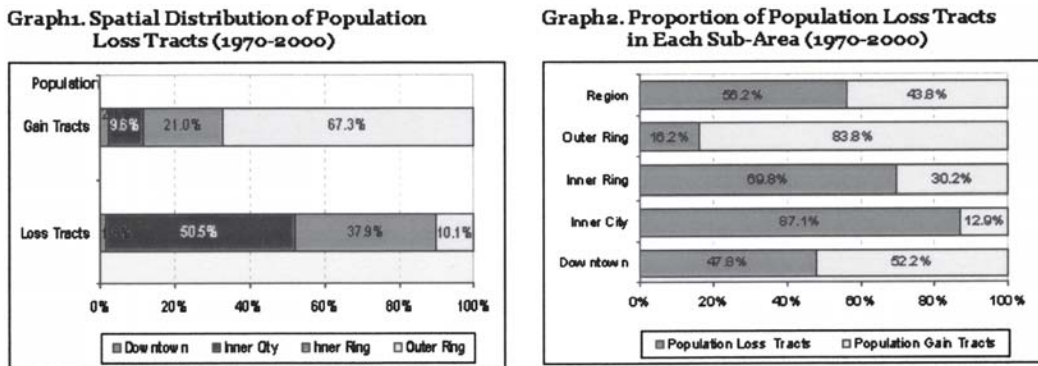


Table 2. Population Change by Race for Each Sub-Area

| | Population | | | | Change Rate (%) | | | | |
|-----------------|------------------|------------------|------------------|------------------|-----------------|-------------|-------------|--------------|-------|
| | 1970 | 1980 | 1990 | 2000 | '70-'80 | '80-'90 | '90-'00 | '70-'00 | |
| Sub-Area | | | | | | | | | |
| White | Downtown | 62,375 | 59,456 | 60,092 | 61,024 | -4.7 | 1.1 | 1.6 | -2.2 |
| | Inner City | 1,460,174 | 1,092,610 | 929,842 | 764,754 | -25.2 | -14.9 | -17.8 | -47.6 |
| | Inner-Ring | 1,469,136 | 1,363,670 | 1,276,534 | 1,179,546 | -7.2 | -6.4 | -7.6 | -19.7 |
| | Outer-Ring | 958,718 | 1,196,758 | 1,452,079 | 1,652,874 | 24.8 | 21.3 | 13.8 | 72.4 |
| Total | 3,950,403 | 3,712,494 | 3,718,547 | 3,658,198 | -6.0 | 0.2 | -1.6 | -7.4 | |
| Black | Downtown | 23,318 | 15,206 | 14,569 | 13,670 | -34.8 | -4.2 | -6.2 | -41.4 |
| | Inner City | 669,282 | 655,661 | 658,729 | 709,031 | -2.0 | 0.5 | 7.6 | 5.9 |
| | Inner-Ring | 95,641 | 137,263 | 160,745 | 198,630 | 43.5 | 17.1 | 23.6 | 107.7 |
| | Outer-Ring | 54,896 | 75,204 | 95,974 | 128,874 | 37.0 | 27.6 | 34.3 | 134.8 |
| Total | 843,137 | 883,334 | 930,017 | 1,050,205 | 4.8 | 5.3 | 12.9 | 24.6 | |
| Hispanic | Downtown | 3,573 | 2,578 | 2,312 | 3,402 | -27.8 | -10.3 | 47.1 | -4.8 |
| | Inner City | 50,807 | 77,712 | 106,753 | 156,208 | 53.0 | 37.4 | 46.3 | 207.5 |
| | Inner-Ring | 16,523 | 17,215 | 26,111 | 44,588 | 4.2 | 51.7 | 70.8 | 169.9 |
| | Outer-Ring | 12,499 | 19,952 | 29,426 | 49,953 | 59.6 | 47.5 | 69.8 | 299.7 |
| Total | 83,402 | 117,457 | 164,602 | 254,151 | 40.8 | 40.1 | 54.4 | 204.7 | |
| Total | Downtown | 87,279 | 77,835 | 79,205 | 82,759 | -10.8 | 1.8 | 4.5 | -5.2 |
| | Inner City | 2,141,506 | 1,820,023 | 1,710,325 | 1,641,247 | -15.0 | -6.0 | -4.0 | -23.4 |
| | Inner-Ring | 1,570,878 | 1,522,607 | 1,477,055 | 1,449,774 | -3.1 | -3.0 | -1.8 | -7.7 |
| | Outer-Ring | 1,017,108 | 1,295,216 | 1,590,380 | 1,862,866 | 27.3 | 22.8 | 17.1 | 83.2 |
| Total | 4,816,771 | 4,715,681 | 4,856,965 | 5,036,646 | -2.1 | 3.0 | 3.7 | 4.6 | |

Figure 4. Tracts with Population Losses



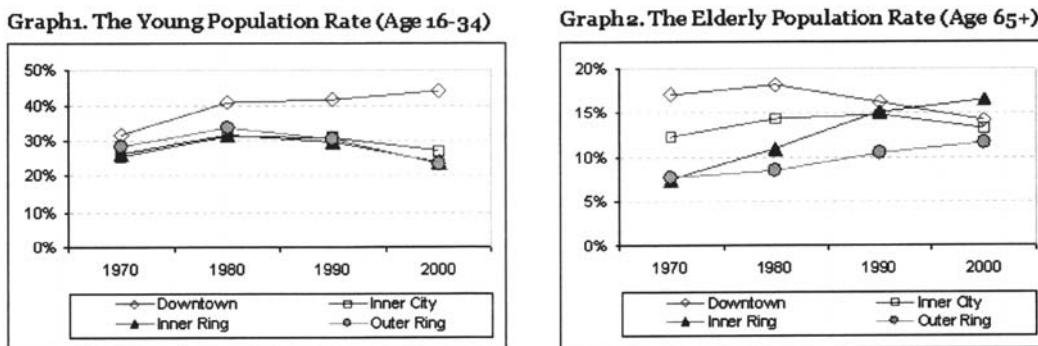
population changes by race. The growth pattern of the white population is similar to the overall population change in the region: a significant increase in the outer-ring suburbs, and a decrease in inner city and inner-ring suburbs. The downtown experienced a decline in white population during the 1970s that was reversed in the following decades.

Overall, however, there was a decrease in white population from 3.9 million in 1970 to 3.6 million in 2000, suggesting white flight from the region. This white flight was strongest in the inner city and inner-ring suburbs. Minority population growth

compensated for the loss of white population in the region. In the 1990s, the black population increased 12.9 percent and the Hispanic population increased 54.4 percent. Although most of the black population lives in the inner city, the growth rates of the black population have been substantial in the inner- and outer-ring suburbs.

Hispanics are Philadelphia's fastest growing minority, increasing over 200 percent between 1970 and 2000. While the majority of the Hispanic population, like the black population, is in the inner city, all subareas (excluding the downtown) experienced very high rates of population growth during the

Figure 5. Changes in Young and Elderly



past decades.

Figure 4 depicts our analysis of the number of growing and declining census tracts by population between 1970 and 2000. Graph 1 within the figure indicates that 51 percent of census tracts in the inner city and 38 percent in the inner-ring suburbs are losing population. Graph 2 provides the percentage of tracts losing population in each subarea (outer-ring, inner-ring, inner city, and downtown) and the region as a whole. In the region, 56 percent of the total tracts lost population during the past 30 years. The tracts losing population were most likely to be located in the inner city and inner-ring suburbs. Seventy percent of inner-ring suburban tracts experienced population loss, compared to 87 percent of the inner city.

We next conducted an age cohort analysis to identify potential economic changes and opportunities for subareas. A subarea that has a growing cohort of young workers and a shrinking cohort of retirees is regarded as one with strong economic potential (Metropolitan Philadelphia Policy Center 2001). Growth in the working-age cohort suggests increased employment, income, and demand for owner-occupied housing. While growth in the elderly cohort may suggest economic stagnation, an increase could provide opportunities for strategic economic development if this group is composed of affluent retirees with high demands for entertainment, recreation, and medical services.

Figure 5 illustrates change in the proportion of young workers and seniors for each subarea. Downtown Philadelphia saw an increase of young

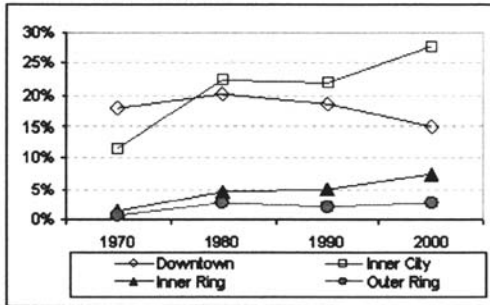
population and a decrease of elderly population, while the reverse pattern occurred in the inner-ring suburbs. In 1970, the inner-ring suburbs had the smallest proportion of elderly population (7.5%), but by 2000, they had the largest (16.5%). Thus, Philadelphia's inner-ring suburban population is aging.

We conducted ANOVA multiple comparison tests to determine the significance of minority population change in each year and population change rate in each decade (see Appendix Tables A and B). We found the mean differences in the proportion of minority population for "Inner City versus Downtown" and "Inner-Ring versus Outer-Ring" pairs became statistically significant over time. That is, the minority population increased in the inner city compared to the downtown and increased in the inner ring compared to the outer ring.

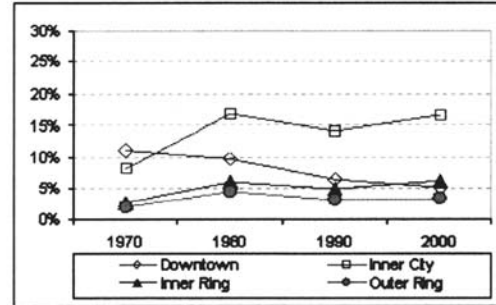
The mean difference ANOVA test of the population change rate for each decade also shows that there exist statistically different growth rates in population for "Inner City versus Downtown" and "Inner-Ring versus Outer-Ring" pairs, while the population growth pattern is similar for "Inner City versus Inner-Ring" (see Appendix Table B). The population growth rate in the downtown has been higher than the inner city and inner-ring suburbs since 1980, and the differences are statistically significant. The population growth rate in the outer ring is significantly higher than in the inner ring, while the mean difference of population growth rate is insignificant between the inner city and inner-ring suburbs.

Figure 6. Change in Underclass Households

Graph1. Proportion of Minority Female-headed Families with Children to Total Families with Children



Graph2. Proportion of Families with Public Assistance Income to Total Families



Socioeconomic Analysis

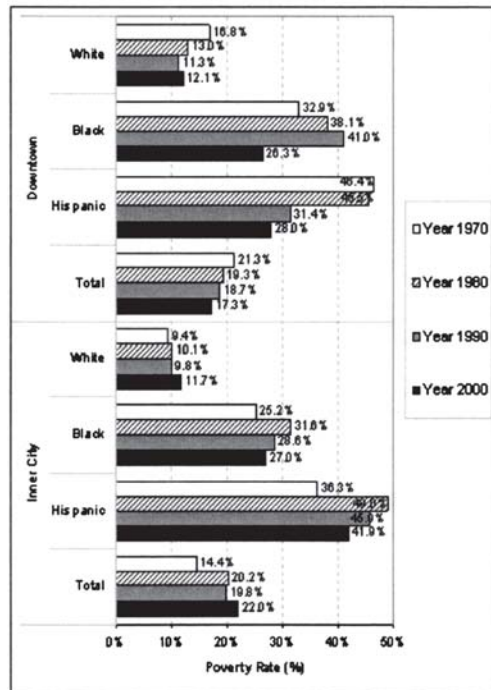
Population change alone is not a sufficient indicator for analyzing the growth and decline of inner-ring suburbs. For example, the population gains associated with the migration of low-income households may be less likely to result in neighborhood revitalization. We therefore examine

changes in the status of underclass households within each of the metropolitan subareas by calculating poverty levels as well as the proportion of female-headed, minority households with children, and of households receiving public assistance.

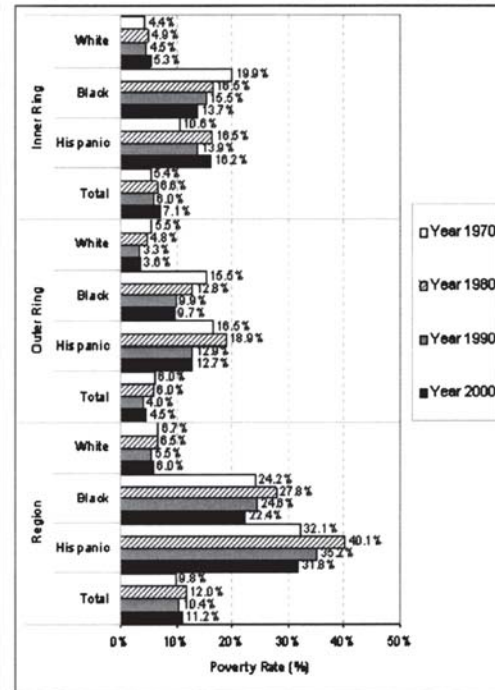
Figure 6 illustrates the change in underclass households for each sub-area. In both graphs it can be seen that

Figure 7. Changes in Poverty Rate for Downtown, Inner City, Inner Ring, Outer Ring, and Region

Graph1. Poverty Rate (Downtown, Inner City)



Graph2. Poverty Rate (Inner Ring, Outer Ring, Region)



the proportion of underclass groups has declined in the downtown and increased in the inner-ring suburbs. Furthermore, there is a widening gap in the proportion of underclass households not only between the downtown and the inner city, but also between the inner ring and outer ring. Although the proportion of underclass households in the inner city is still relatively high and increasing, the inner-ring suburbs also show a significant increase in underclass population over time.

As shown in Figure 7, the overall poverty rate of persons in the metro Philadelphia region increased from 9.8 percent in 1970 to 11.2 percent in 2000 (see Graph 2). Although the poverty rates for the downtown and inner city are still significantly higher than the inner- and outer-ring suburbs for every decade, the downtown shows a continuous decline of poverty from 21.3 percent in 1970 to 17.3 percent in 2000. In contrast, poverty increased 7.6 percent in the inner city and 1.7 percent in the inner-ring suburbs between 1970 and 2000.

With the continual decline of the downtown poverty rate, the poverty gap between the downtown and suburbs is narrowing. At the same time, the poverty gap between the downtown and inner city is widening. In addition, the poverty gap is widening between the inner-ring suburbs and outer-ring suburbs.

In Figure 7, the poverty level of persons by race shows that poverty is highly pervasive among the minority population residing in the downtown and inner city. Hispanics made up a growing percentage of the poverty

population (from 2.9 percent in 1970 to 14.2 percent in 2000), while the percentage of whites and blacks in poverty declined.

Metro Philadelphia's 7.4 percent decrease in white population between 1970 and 2000, combined with an increasing white poverty rate, suggests that white flight beyond the metro boundaries has occurred in the middle- and upper-income households. In contrast, the steady increase of black population and dramatic growth of Hispanic population in the region, accompanied by a decline in poverty, suggests that Philadelphia is becoming a home for more affluent blacks and Hispanics.

Our analysis also examines socio-economic differentiation within the context of intra-metropolitan disparity and divergence. We analyze four sub-areas (downtown, inner city, inner ring, and outer ring) to obtain a better understanding of intra-metropolitan change.

We examine two income variables: the Relative Per Capita Income (RPCI) to the regional average and the GINI coefficient for RPCI. The Per Capita Income (PCI) was calculated as aggregated household income divided by total population in each subarea. We calculated a GINI inequality index using RPCI in each subarea following the method proposed by Flückiger and Silber (1999).

In Table 3, it can be seen that the outer-ring suburbs experienced a constant increase in the RPCI from 1970 to 2000. The RPCI in the outer-ring suburbs was 99.8 percent of the average of the metro region in 1970,

and increased to 120 percent in 2000. In contrast, the inner city and inner ring experienced a continual decline in per capita income from 1970 to 2000. The gap in the RPCI increased more than 15 percent between the outer ring and inner ring in 2000.

The GINI inequality coefficient in the metro region increased significantly from 0.175 in 1970 to 0.249 in 1990, and increased slightly during the 1990s. Overall, the GINI index rose 42.3 percent during the 30-year period (see Table 3). Income inequality is relatively high in the downtown and inner city, compared to the inner- and outer-ring suburbs. In particular, the dynamic change of the GINI coefficient in the downtown and the inner city is correlated with the population changes in Table 2, and is suggestive of gentrification. That is, gentrification by upper-class households moving into the poor neighborhoods of the downtown and inner city is most likely increasing the GINI inequality coefficient for these sub-areas.

The ANOVA multiple comparison

analysis for socioeconomic variables also confirms the intra-metropolitan spatial differentiation and increased economic inequalities. The explored socioeconomic variables are two static variables (poverty rate and RPCI) for each year and one dynamic variable (PCI change) for each decade.

The mean differences in poverty rate were statistically significant for most comparison group pairs in each year. The mean difference in poverty rate of "Inner City versus Downtown" became insignificant over time only because the downtown experienced dramatic declines in poverty for each decade. We also analyzed trends in income differentiation between subareas over time. In particular, the RPCI of the inner-ring suburbs was 10.7 percent higher than the outer-ring suburbs in 1970, but was 11.7 percent lower than the outer-ring suburbs in 2000 (see Appendix Table A). That is, the inner-ring suburbs have experienced a significant income decline relative to the outer-ring suburbs. The mean difference of the average PCI change for each decade supports significant

Table 3. Intra-Metropolitan Income Disparity and Divergence

| | Subarea | 1970 | 1980 | 1990 | 2000 | Change (70-00) |
|--|---------------|---------|---------|---------|---------|----------------|
| Relative Per Capita Income (RPCI) to Regional Average | Downtown | 140.80% | 159.70% | 163.10% | 152.40% | 11.60% |
| | Inner City | 92.00% | 82.30% | 75.10% | 70.60% | 21.40% |
| | Inner Ring | 109.00% | 111.20% | 108.20% | 104.60% | -4.40% |
| | Outer Ring | 99.80% | 108.20% | 115.90% | 120.00% | 20.40% |
| GINI Coefficient for the RPCI | Downtown | 0.289 | 0.232 | 0.252 | 0.286 | -0.003 |
| | Inner City | 0.226 | 0.251 | 0.300 | 0.311 | 0.085 |
| | Inner Ring | 0.154 | 0.153 | 0.196 | 0.190 | 0.036 |
| | Outer Ring | 0.119 | 0.142 | 0.179 | 0.180 | 0.061 |
| | Region | 0.175 | 0.194 | 0.241 | 0.249 | 0.075 |

income growth in the outer-ring suburbs relative to the inner-ring suburbs. The difference of the PCI change rate is statistically significant between the inner ring and outer ring for all decades, while it has become insignificant between the downtown and inner city over time (see Appendix Table B).

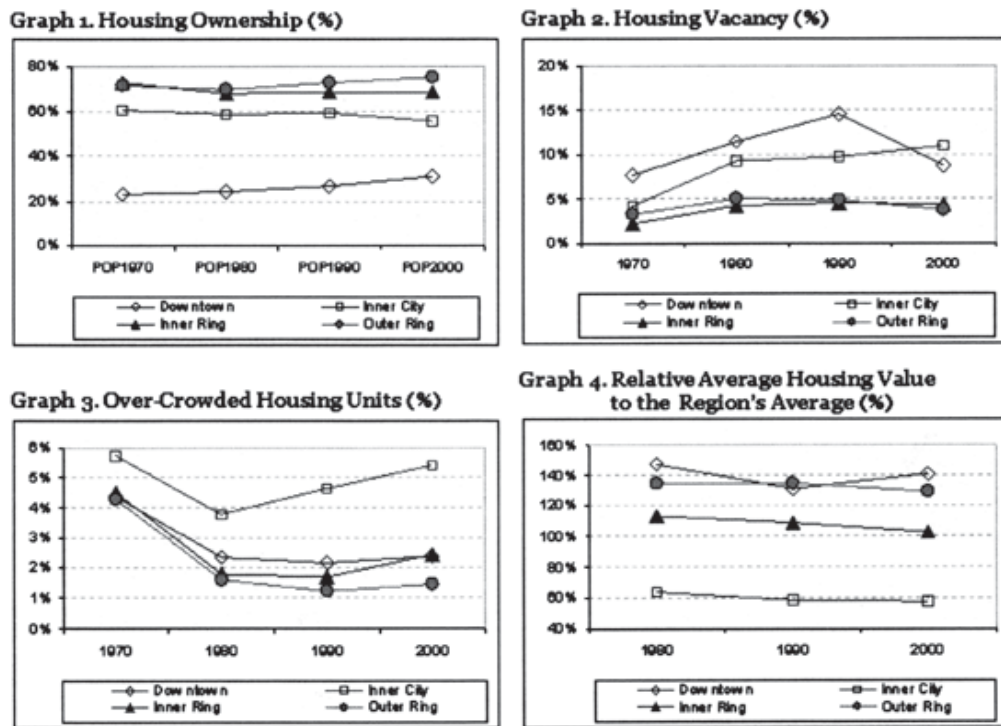
Housing Analysis

The number of housing units in the Philadelphia eight-county metro region increased from 1.5 million in 1970 to 2.0 million in 2000. During the last decade, however, only the outer-ring suburbs experienced a substantial increase in total housing units, while the downtown and inner city experienced decreases in the absolute number of total housing units.

The decrease of total housing stock in the downtown and inner city is due to the demolition of vacant housing units. However, the significant decrease of vacant housing stock in the downtown in the 1990s is correlated with increasing demands for downtown housing because the downtown experienced increases in the number of owner-occupied housing as well as renter-occupied housing units in the 1990s.

Owner-occupied housing units were 1.32 million or 65.3 percent of the region in 2000, an increase of just 0.2 percent from 1970. However, homeownership grew 8.3 percent in the downtown, and 4 percent in the outer-ring suburbs from 1970 to 2000. During the same period, it declined 5 percent in the inner city and 4.5 percent in the

Figure 8. Change in Housing Characteristics for Downtown, Inner City, Inner Ring, and Outer Ring



inner-ring suburbs. This may suggest that the neighborhood structure of the inner city and the inner-ring suburbs has become less stable.

As shown in Graph 2 of Figure 8, vacant housing units decreased in the downtown dramatically in the 1990s, after experiencing a steady increase between 1970 and 1990. Over the same period, the inner city had a 6.7 percent increase and the inner-ring suburbs had a 2.1 percent increase in empty housing units.

Analyzing changes in housing deficiencies as indicated by a lack of complete kitchen facilities and over-crowded housing for the 30-year period, we found increases in housing units that lack complete kitchen facilities and are over-crowded. This suggests a gradual deterioration in housing stock in the inner city and inner-ring suburbs relative to the downtown and outer-ring suburbs. While there was a significant drop in over-crowded housing units from 1970 to 1980 in the inner city and inner-ring, this trend was reversed between 1980 and 2000. In particular, there has been a dramatic increase in the problem of over-crowded housing in the inner city (see Graph 3 in Figure 8).

Our analysis of housing stock demonstrates significant intra-metropolitan spatial differentiation over time in housing values trends. In Graph 4 of Figure 8, we depict changes in average housing value relative to the region's average for each subarea. It can be seen that the outer-ring suburbs have relatively higher housing values compared to the inner-ring suburbs. While the average housing value in the downtown rebounded in the 1990s, it

declined in the other three subareas. Particularly noteworthy is that the average housing value in the inner-ring suburbs relative to that of the region dropped 11 percent between 1980 and 2000 (from 113 percent to 102 percent).

We tested mean differences for housing ownership and average housing value between subareas using the ANOVA analysis. As shown in Appendix Table A, the mean differences of homeownership were statistically significant for the "Downtown versus Inner City" and "Inner City versus Inner Ring" pairs for each year. Although the housing ownership rate was insignificant for the "Inner Ring versus Outer Ring" pair from 1970 and 1990, it became significant in 2000. The average housing value as a percentage of regional average also shows significant differences between subareas.

Our ANOVA analysis for the housing value change in each decade indicates that there was a relatively lower increase in housing value for the inner-ring suburbs compared to the inner city and the outer ring. In particular, the increase of housing value in the inner city in the 1990s exceeded that of the inner-ring suburbs as well as the outer-ring suburbs (see Appendix Table B).

Conclusion and Policy Implications

While the revitalization of central cities and inner cities has been a major concern to planners and policy makers for several decades, the need to revitalize the inner-ring suburbs has only recently begun to receive significant recognition. In this article,

we have examined earlier work that seeks to explain suburban differentiation and decline, and provided our own empirical insight into the status of inner-ring suburbs through an analysis of the metropolitan Philadelphia region. The important findings are as follows:

First, we have demonstrated that the dichotomous approach of central city versus the suburbs as a whole is not appropriate for intra-metropolitan analysis. Indeed, the different growth patterns between the inner-ring suburbs and outer-ring suburbs we have identified in Philadelphia in terms of population composition, income levels, and housing stock illustrate the fallacy of treating suburbs as a homogeneous area for analytical and planning purposes. These suburban types are not alike. Therefore, research and policy development at the metropolitan level should distinguish between suburban rings (inner and outer, for example) in addition to the well-defined central city.

Second, our analysis has confirmed that there is an increased intra-metropolitan economic disparity and divergence between metropolitan sub-areas. The gap in economic prosperity between the inner- and outer-ring suburbs is widening over time. Computation of the GINI inequality index also showed an increase in income inequality for the region.

Third, we showed that Philadelphia's inner-ring suburbs exhibit symptoms of decline typically associated with inner cities such as white flight, decrease in population, increase in minority and low-income households, and rising poverty levels. Although the total

population in the inner-ring suburbs exhibited slight growth, many tracts lost population in the 1990s. In particular, the inner-ring suburbs showed significant white flight, while the central city gained white population in its core. Furthermore, the poverty rate of the inner-ring suburbs increased during the 1990s.

Last, our research validates our concern that the inner-ring suburbs are increasingly vulnerable to economic decline in the Philadelphia metropolitan region. The downtown showed significant increases in white population and decreases in poverty population, and the outer-ring suburbs attracted significant population and housing development. In contrast, the inner-ring suburbs are declining overall. The early signs of blight in Philadelphia's inner-ring suburbs (the area between its inner city and outer-ring suburbs) should be seen as a potential threat to long-term metropolitan prosperity and smart growth efforts.

There is a need to stem the deterioration of the inner-ring suburbs, documented in our case study of Philadelphia, as well as to stem further sprawl-contributing greenfield development on the metropolitan fringe. This suggests that strategic policy approaches should favor the revitalization and enhancement of existing, inner-ring physical infrastructure over new infrastructure creation in the outer-ring suburbs.

The research method and analysis offered in this paper are intended to form the beginnings of a model approach for analyzing inner-ring suburbs in other metropolitan areas.

We believe from our survey of the field that the urban and regional planning research community is in need of a shared platform to analyze and plan for preserving and strengthening inner-ring suburbs, the essential "in-between space" of the metropolitan area. Attention to this space will strengthen the logic and effectiveness of Smart Growth policies.

Authors

Nancey Green Leigh is a professor in the College of Architecture at the Georgia Institute of Technology and the author of *Economic Revitalization: Cases and Strategies for City and Suburb*. Sugie Lee is a doctoral candidate in City and Regional Planning at Georgia Tech.

References

- Bier, Thomas. 2001. *Moving Up, Filtering Down: Metropolitan Housing Dynamics and Public Policy*. Washington, DC: The Brookings Institution.
- Bollens, S. A. 1988. Municipal Decline and Inequality in American Suburban Rings, 1960-1980. *Regional Studies* 22, 4:277-285.
- Design Center for American Urban Landscape. 1999. *Reframing the 1945-1965 Suburb: A National Conference on Contemporary Public Policy, and Scholarship. Conference Proceedings*, University of Minnesota, January 21-23, 1999. Retrieved October 26, 2001, from www1.umn.edu/dcaul.
- Downs, Anthony. 1997. *The Challenge of our Declining Big Cities*. *Housing Policy Debate* 8(2): 359-408.
- Fishman, Robert. 2000. The American Metropolis at Century's End: Past and Future Influences. *Housing Policy Debate* 11(1): 199-213.
- Flückiger, Yves and Jacques Silber. 1999. *The Measurement of Segregation in the Labor Force*. New York: Physica-Verlag.
- Hayden, Dolores. 2000. *Building Suburbia: Green Fields and Urban Growth 1820-2000*. New York: Pantheon Books.
- Hudnut, William H. 2003. *Halfway to Everywhere: A Portrait of America's First-Tier Suburbs*. Washington, DC: Urban Land Institute.
- Jackson, Kenneth T. 1985. *Crabgrass Frontier: The Suburbanization of the United States*. New York: Oxford University Press.
- Kotkin, Joel. 2000. *The New Geography: How the Digital Revolution is Reshaping the American Landscape*. New York: Random House.
- Kotkin, Joel. 2001. *Inner-ring Suburbs: Crabgrass Slums or New Urban Frontier?* Reason Public Policy Institute, Policy Study 285.
- Lucy, W., and D. Phillips. 2000a. *Confronting Suburban Decline, Strategic Planning for Metropolitan Renewal*. Washington, DC: Island Press

- Lucy, W., and D. Phillips. 2000b. *Suburban Decline: The Next Urban Crisis, Issues in Science and Technology*, Fall.
- Lucy, W., and D. Phillips. 2001. *Suburbs and the Census: Patterns of Growth and Decline*. Washington, DC: The Brookings Institution.
- Metropolitan Philadelphia Policy Center. 2001. *Flight? Or Fight! Metropolitan Philadelphia and Its Future*. Regional Report 2001.
- Orfield, Myron. 1997. *Metropolitics: A Regional Agenda for Community Stability*. Washington, DC: The Brookings Institution.
- Orfield, Myron. 2001. *American Metropolitics: Social Segregation and Sprawl*. Washington, DC: The Brookings Institution.
- Persky, Joseph and Wim Wiewel. 2000. *When Corporations Leave Town: The Costs and Benefits of Metropolitan Job Sprawl*. Detroit: Wayne State University Press.
- Persky, Joseph and Haydar Kurban. 2001. *Do Federal Funds Better Support Cities or Suburbs? A Spatial Analysis of Federal Spending in the Chicago Metropolis*. Washington, DC: Center on Urban and Metropolitan Policy, The Brookings Institution.
- Puentes, Robert and Myron Orfield. 2002. *Valuing America's First Suburbs: A Policy Agenda for Older Suburbs in the Midwest*. Washington, DC: The Brookings Institution.
- Rusk, David. 1999. *Inside Game/Outside Game, Winning Strategies for Saving Urban America*. Washington, DC: The Brookings Institution.
- Seaver, Darcy, Bill Morris, and Rip Rapson. 1998. Old Suburbs in New Times: Repositioning Post-WWII Suburbia. *The Commissioner*, Summer.
- Simmons, Patrick A. and Robert E. Lang. 2001. The Urban Turnaround: A Decade-by-decade Report Card on Postwar Population Change in Older Industrial Cities. Washington, DC: The Fannie Mae Foundation.
- Smith, Neil, Paul Caris, and Elvin Wyly. 2001. The "Camden syndrome" and the menace of suburban decline: Residential disinvestments and its discounts in Camden county, New Jersey. *Urban Affairs Review* 35, 4: 497-531.
- Sohmer, Rebecca R., and Robert E. Lang. 2001. Downtown Rebound. Washington, DC: The Fannie Mae Foundation and The Brookings Institution.

Appendix

Table A. ANOVA Multiple Comparison Analysis for Mean Differences

| Variables | ANOVA Multiple Comparison Groups | Mean Differences (%) | | | |
|---|----------------------------------|----------------------|---------|---------|---------|
| | | 1970 | 1980 | 1990 | 2000 |
| Minority Population Rate | Inner City - Downtown | -2.9 | 9.7 | 14.9 | 20.9* |
| | Inner Ring - Downtown | -22.5** | -14.2 | -11.8 | -8.5 |
| | Inner Ring - Inner City | -19.6** | -23.9** | -26.8** | -29.4** |
| | Inner Ring - Outer Ring | 1.8 | 4.2 | 5.9* | 9.0** |
| | Outer Ring - Inner City | -21.4** | -28.1** | -32.7** | -38.4** |
| | Outer Ring - Downtown | -24.3** | -18.3** | -17.7* | -17.5* |
| Poverty Rate | Inner City - Downtown | -9.9** | -1.4 | -2.0 | 1.2 |
| | Inner Ring - Downtown | -17.8** | -13.2** | -14.3** | -12.3** |
| | Inner Ring - Inner City | -7.9** | -11.9** | -12.4** | -13.5** |
| | Inner Ring - Outer Ring | -0.4 | -0.8 | -2.0 | -2.3* |
| | Outer Ring - Inner City | -7.5** | -12.7** | -14.3** | -15.8** |
| | Outer Ring - Downtown | -17.4** | -14.1** | -16.3** | -14.6** |
| Percentage of Average Per Capita Income to Region's Average | Inner City - Downtown | -36.7** | -54.0** | -64.7** | -66.5** |
| | Inner Ring - Downtown | -26.2** | -32.0** | -39.6** | -40.0** |
| | Inner Ring - Inner City | 10.4** | 22.0** | 25.1** | 26.5** |
| | Inner Ring - Outer Ring | 10.7** | 3.2 | -5.0 | -11.7** |
| | Outer Ring - Inner City | -0.2 | 18.8** | 30.1** | 38.2** |
| | Outer Ring - Downtown | -36.9** | -35.2** | -34.7* | -28.2* |
| Housing Ownership Rate | Inner City - Downtown | 32.1** | 36.7** | 34.9** | 24.9** |
| | Inner Ring - Downtown | 44.2** | 47.1** | 45.1** | 39.1** |
| | Inner Ring - Inner City | 12.2** | 10.4** | 10.3** | 14.2** |
| | Inner Ring - Outer Ring | 1.6 | -0.6 | -2.6 | -4.8** |
| | Outer Ring - Inner City | 10.6** | 11.0** | 12.8** | 19.0** |
| | Outer Ring - Downtown | 42.7** | 47.7** | 47.7** | 43.9** |
| Percentage of Average Housing Value to Region's Average | Inner City - Downtown | - | -92.7** | -72.7** | -68.0** |
| | Inner Ring - Downtown | - | -49.4** | -30.6 | -33.0 |
| | Inner Ring - Inner City | 11.4** | 43.3** | 42.1** | 35.0** |
| | Inner Ring - Outer Ring | -3.6** | -20.1** | -23.8** | -23.4** |
| | Outer Ring - Inner City | 15.0** | 63.4** | 65.9** | 58.3** |
| | Outer Ring - Downtown | - | -29.3 | -6.8 | -9.6 |

* p < .05; ** p < .01

Table B. ANOVA Multiple Comparison Analysis for Change Rates

| Variables | ANOVA Multiple Comparison Groups | Average Change Rate Differences (%) | | |
|-----------------------|----------------------------------|-------------------------------------|-------------|-------------|
| | | 1970 - 1980 | 1980 - 1990 | 1990 - 2000 |
| Population | Inner City - Downtown | -20.7 | -38.1** | -19.0* |
| | Inner Ring - Downtown | 18.6 | -36.2** | -19.6* |
| | Inner Ring - Inner City | 39.3 | 1.9 | -0.6 |
| | Inner Ring - Outer Ring | -18.6 | -32.1** | -21.6** |
| | Outer Ring - Inner City | 57.9** | 34.0** | 21.1** |
| | Outer Ring - Downtown | 37.2 | -4.1 | 2.0 |
| Per Capita Income | Inner City - Downtown | -55.9* | -35.0** | -4.9 |
| | Inner Ring - Downtown | -29.9* | -21.4** | -0.7 |
| | Inner Ring - Inner City | 26.0** | 13.7 | 4.1 |
| | Inner Ring - Outer Ring | -16.4** | -15.1** | -8.3** |
| | Outer Ring - Inner City | 42.3** | 38.8 | 12.4** |
| | Outer Ring - Downtown | -13.5 | -6.3** | 7.5 |
| Average Housing Value | Inner City - Downtown | - | -36.6** | 7.7 |
| | Inner Ring - Downtown | - | -21.1 | -6.6 |
| | Inner Ring - Inner City | 22.6** | 15.5** | -14.2** |
| | Inner Ring - Outer Ring | -35.0** | -12.3** | -2.5 |
| | Outer Ring - Inner City | 57.6** | 27.9** | -11.7** |
| | Outer Ring - Downtown | - | -8.7 | -4.1 |

* p < .05; ** p < .01