GROWING PAINS: PERPETUATING INEQUALITY THROUGH THE PRODUCTION OF LOW-INCOME HOUSING IN THE DALLAS METROPLEX

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Abstract

The geography of opportunity is based on two main premises: first, that where one lives is critical for taking advantage of available opportunities; and second, that households have unequal abilities to live in places with good opportunities. Supply-side housing approaches can combat these trends by facilitating a more equitable redistribution of housing options. In this research, we examine the role of the Low-Income Housing Tax Credit (LIHTC) program in expanding the geography of opportunity in one fast-growing region—The Dallas/Ft. Worth Metroplex.

Findings suggest that although LIHTC developments are penetrating the suburbs, they are not expanding opportunities for these households. Just under half of LIHTC units are found in highly clustered areas that are characterized by high poverty rates, minority concentrations, poor educational opportunity and high crime. Those units that are dispersed enjoy average living conditions. Suggestions are made for altering program guidelines to achieve better dispersal, income-mixing and regional distribution.

Keywords: regional housing, LIHTC, low-income housing, opportunity

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> "Developing communities at the edge of metropolitan regions engage in as restrictive and as low density a pattern of land use practices as their present economic circumstances will bear. Their goals, as have been the goals of virtually all neighborhoods and communities from time immemorial, are both to keep out potentially undesirable residents, such as apartment dwellers, and to build a broad rich tax base which will keep services high and taxes low…. [O]n the other side of the region, in the blue-collar, middle-class sector, the middle-income communities, struggling to duplicate this pattern, end up developing only modest homes, apartment buildings, trailer parks, and few businesses. These communities often develop without sufficient resources to adequately support public services such as schools" (Orfield, 1999, p. 36-37).

INTRODUCTION

Regional development patterns favor some communities and undermine others. Sprawl, concentrated poverty, and segregation have shaped metropolitan areas in ways that exacerbate existing economic and social inequalities (Squires and Kubrin, 2005). Over the past century, these forces have consistently and progressively favored suburban areas as households with means have left the city, leaving those without means in urban areas and decimating the flow of resources needed to maintain the quality of life there. Influential books by writers including Jonathan Kozol (1991), Myron Orfield (1997), and

Gregory Squires (2006) lament disparities between central city and suburban resources, particularly relative to schools, jobs, and neighborhood quality. Orfield (1997) claims that the forces of suburbanization have created a "push-pull" of regional polarization. The polarization that Orfield describes results in affluent outer suburbs that garner the bulk of metropolitan resources to build "privileged places," as Squires and Kubrin (2005) call them. Central cities and inner suburbs are left as the least able to resist, and the "residual category for those without choices" (Rusk, 1993 as quoted in Orfield 1997: 74). The result is a new socio-spatial structure of domination and subordination where both economic forces and land use practices reinforce one another to produce a system of distribution of public goods and services that favors some areas and harm others (Squires and Kubrin, 2005).

New regional growth may perpetuate existing inequalities, or may reverse these trends by expanding housing options in suburban areas to help lower-income households access areas that offer better social and educational opportunities. Supply-side housing approaches can facilitate this redistribution. In this research, we examine the role of one such initiative, the Low Income Housing Tax Credit (LIHTC) program, in expanding the geography of opportunity through the distribution of housing options within one fast-growing region—The Dallas/Ft. Worth Metroplex. By assessing the contribution of the LIHTC to the regional distribution of housing, we consider whether the program is helping to overcome the inequalities imposed by uneven urban development.

Uneven urban development and the geography of opportunity

The uneven distribution of opportunities is made problematic by inequalities in access or mobility by households with particular characteristics. Segregation by race, ethnicity, and income characterizes the socio-spatial structure of our metropolitan areas. Racial segregation has declined over the past forty years, but it is still significant, especially for African Americans (Farley, 1991; Massey and Denton, 1993; Farley and Frey, 1994; Massey, 2001; Glaeser and Vigdor, 2001; Fischer, 2003). While other racial groups including Hispanics and Asians experience much lower levels of segregation, in areas with large populations of these ethnic groups, segregation appears to be increasing (Massey, 2001).

Income segregation, on the other hand, has been increasing since 1970 (Massey and Eggers, 1993; Abramson, et al., 1995; Fischer, 2003). Data from the 2000 Census, however, indicates that while income segregation persists, it has become less clustered (Berube and Kneebone, 2006; Dawkins, 2007). Further, the concentration of poverty in inner-city areas declined significantly (Jargowsky, 2003; Kingsley and Pettit, 2003; Jargowsky and Yang, 2006). While apparently good news, Galster (2005) indicates that although the number of concentrated poverty tracts declined during the 1990s, the shares with lower, but still high, levels of poverty increased, putting more neighborhoods at risk of reaching a threshold point at which deleterious external effects are accelerated (Krivo and Peterson, 1996; Vartanian, 1999; Galster, Quercia, and Cortes, 2000; Galster, 2002).

The causes of segregation include housing market discrimination, exclusionary or overly-regulated land use practices, and racial preferences, both by majority and minority

groups. Discriminatory policies in the housing market include a range of practices and policies such as racial steering by real estate rental and sales agents, redlining, discrimination in mortgage lending and insurance, predatory lending and even in the suppressed appreciation (and valuation) of home values in minority neighborhoods (Smith and DeLair, 1999; Turner et al., 2002a, 2002b; Denton, 2006; Squires and Chadwick, 2006; Squires, 2007). These practices have not only denied credit-worthy households a chance at homeownership, but have restricted locational options and forced minority, and particularly African American, households into isolated and often distressed or disadvantaged neighborhoods.

Although these patterns of racial/ethnic and economic segregation and isolation are abundantly documented, the role that the distribution of housing plays in facilitating such segregation is often overlooked (Galster and Cutsinger, 2007). Land use practices exacerbate housing segregation both by limiting the construction of a variety of housing options, and by increasing the costs of construction, making housing unaffordable for lower-income population groups. Even zoning originated in part to protect whites from blacks (Weiss, 1987; Silver, 1997). Exclusionary practices today are less explicit but similarly effective. Zoning regulations sometimes fail to provide adequate area for affordable housing options or provide it in inappropriate or less-desirable locations (Pendall, 2000; Pendall, et al., 2006). So-called "smart growth" initiatives, including growth management and urban containment efforts, may restrict supply so much that the prices even of smaller, denser housing options become unaffordable to lower-income households who are more often minorities (Ihlanfeldt, 2004; Nelson, et al., 2004). Even governmental fragmentation has been shown to lead to more segregated metropolitan

areas by encouraging the sorting of households by their preferences for specific bundles of good and services offered by individual jurisdictions (Dawkins, 2005).

The resulting polarization creates both pockets of problems and pockets of privilege—concentrated areas that either host opportunity or are mostly devoid of it. While pockets of poverty are associated with low-performing schools, social isolation, crime, unemployment, and low levels of educational attainment, privileged areas are associated with high-quality schools, low crime, proximity to services such as health care and banking, and healthier physical and social conditions (for a review, see Squires and Kubrin, 2005). The spatial distribution of need and resources forms what is sometimes called the "geography of opportunity." This term refers to what social scientists have recognized since the 1950s—that where people lives shapes their life chances (Abrams, 1955). The geography of opportunity is based on two main premises: first, that where one lives is critical for taking advantage of available opportunities; and second, that households have unequal abilities to live in places with good opportunities (Galster and Killen, 1995; Briggs, 2005).

Regional Housing Initiatives

Regional housing initiatives have traditionally been the vehicle used to address these inequalities (Goetz, 2000). The driving force behind these efforts has been the deconcentration of poverty (Goering, 2005; Goetz, 2000, 2003). Early efforts to address regional housing issues focused on eliminating discrimination and led to the passage of the 1968 Fair Housing Act, as well as the Mt. Laurel decision and public housing desegregation cases like Gautreaux (Saltman, 1978; Popkin et al., 2003). Early federal

support for the creation of councils of government and funding for infrastructure improvements to support community development declined however, and attempts at regionalism diminished (Goetz, 2000; Keating, 1994).

Interest in regional housing arose again in the 1990s, responding to renewed interest in the inequalities perpetuated by the distribution of jobs, goods, and services in our metropolitan regions, as well as interest in metropolitan governance and interdependency issues (Goetz, 2000). Spatial inequalities captured in concepts like John Kain's (1968) "spatial mismatch" of job growth became the focus of policy discussions and led to broader discussions of social and economic segregation that was observed in most metropolitan regions (Goetz, 2000; see also Hughes, 1987; Cervero, 1989; Ihlanfeldt, 1994; Squires 1994). Studies of regional interdependence found that suburban growth depended on central city health, and that neither area can survive without the other (Hill et al., 1995; Savitch et al., 1993; Rusk, 1993). Together, this scholarship led to an understanding of the need for a regional approach to providing housing that facilitated access for lower-income households to areas of opportunity.

Regional housing programs seek to either increase the volume of affordable housing throughout a region, or spatially redistribute the existing affordable housing supply within a region (Goetz, 2000). Approaches may be classified as unit-based or household-based. Household-based approaches aim to increase the choices of lower-income households by assisting them in accessing existing units on the private market, through Housing Choice Vouchers, or the Moving To Opportunity (MTO) program, for example. Settlements in housing desegregation cases have resulted in special allocations of Housing Choice Vouchers combined with mobility counseling to help affected

households find and transition into suburban housing communities (Goetz, 2000; Popkin et al, 2003). Some recent research (Sanbonmatsu, et al., 2006; Comey, et al., 2008) has suggested that the success of these mobility programs is limited, leading to some political pressure to scale them back (National Public Radio, "Researchers Discuss the 'Neighborhood Effect,'" August 16, 2007).

The success of these mobility programs, however, depends at least in part on an adequate supply of affordable housing in suburban communities[1]. Unit-based approaches include programs and incentives designed to increase the number of affordable housing units distributed within and across the communities that make up a metropolitan region. These include fair share programs, inclusionary zoning, and the Low-Income Housing Tax Credit (LIHTC) program (which are not mutually exclusive). Fair share programs may include statewide mandates for the provision of reasonable opportunities for the development of affordable housing (Morgan 1995, Cummins, 1996), or may include inclusionary programs that use mandates or incentives to requires or encourage developers to provide a certain percentage of affordable units in each new development (Calavita, Grimes, and Mallach, 1997; Mallach 1984). The LIHTC program, however, is the most important supply-side program administered by the federal government (HUD 2005).

The LIHTC program

The LIHTC is administered by the U.S. Treasury Department by tax credit allocating agencies at the state level, usually the State Housing Finance Agencies. The

[1] Although voucher holders receive subsidies to help them afford private rents, HUD sets limits on the amount of rent that is acceptable. Further, private landlords may choose not to accept vouchers, but developments holding low-income housing tax credits must accept housing choice vouchers.

process begins with the Internal Revenue Service making an allocation of tax credits to a state allocating agency. The state agency develops a Qualified Allocation Plan (QAP) that prioritizes housing development projects based on (a) state priority housing needs, and (b) set-asides. The state agency then solicits development proposals, which are evaluated, ranked, and selected according to the QAP. State agencies award LIHTCs to housing developers who fund construction by selling the tax credits to investors.

The program has been successful at increasing the supply of affordable multi-family units, but questions remain about whether the tax credit units are addressing unmet needs or facilitating the deconcentration of poverty and access to opportunity. While Malpezzi and Vandell (2002) found that the LIHTC program produces more than a quarter of all new multi-family units, Nelson (1994) found that units were more often priced in a range where there was already a surplus, and were not meeting the needs of low-income, unassisted renters. McClure (2006) argues that the program is not intended to serve the poorest of the poor, and indeed it does not. The program serves households whose incomes are below 60 percent of the area median, and most developments charge rents that are at or near the maximum allowable (McClure, 2006).

Further, the program does little to promote income mixing. While the program was expected to facilitate the development of a fraction of low-income units within a development of moderately-priced units, in practice, more than 80 percent of all units developed through 2002 are low-income (HUD, 2005). By setting minimum percentages for low-income units rather than maximums, the result is that developments are almost entirely low-income (McClure, 2006). This does little to deconcentrate poverty within the development and has led to calls for changes to the regulations (Freeman, 2004).

Income mixing could occur if developments were placed in neighborhoods of households with higher incomes. Project-based assistance, including LIHTC, has not been terribly successful at achieving this, however. Rohe and Freeman (2001) found that across all project-based assistance programs, units are often placed in neighborhoods with low-value homes and high concentrations of poverty (see also Newman and Schnare, 1997). Other researchers have found that LIHTC does better than other programs at placing units in lower poverty neighborhoods and the suburbs. Freeman (2004) found that LIHTC projects are better able to penetrate suburban areas, although still in neighborhoods that have higher poverty levels than the population as a whole. McClure's (2006) findings suggest that LIHTC units are more likely than other rental units to be located in high-poverty tracts, but are less likely than renters below the poverty line to be in high-poverty tracts. Oakley (2008) finds that the LIHTC program is more successful than other programs at locating developments in less disadvantaged neighborhoods based on income levels and minority concentrations, but not as successful at avoiding geographic clustering. An Abt study (2006) study concluded that in large metropolitan areas LIHTC units are likely to be in high growth and in areas where the poverty rate is increasing, but that the majority of LIHTC units were located in moderate poverty neighborhoods.

As the preeminent supply-side housing program, the LIHTC program should be an important tool for achieving regional housing equity by changing the supply and distribution of affordable housing within a metropolitan region. But previous research has not evaluated the program on these terms. Further, while evaluations of the LIHTC program have examined the spatial distribution of units and projects, they have not

assessed the degree to which these locations expose households to positive or negative social conditions (beyond minority concentrations and poverty levels). In this research, we examine the LIHTC program's role in expanding the geography of opportunity through the distribution of housing options within one fast-growing region—The Dallas Metroplex. By assessing the contribution of the LIHTC to the regional distribution of housing, we consider whether the program is helping to overcome the inequalities imposed by uneven urban development.

THE STUDY AREA: THE DALLAS METROPLEX

The Dallas Metroplex is one of the most rapidly growing regions in the United States. It includes twelve counties and more than130 municipalities, including nine cities which have populations exceeding 100,000 (See Figure 1). In 2000, the Consolidated Metropolitan Statistical Area (CMSA) had a total population of over 5.2 million, making it the 9th largest metropolitan area in the United States. In 2007, the region experienced more growth than any other metropolitan area, increasing its population by 162,250, according to a CNN report (Clifford, March 27, 2008). Much of the region's growth has happened since 1980. From 1980 to 2000, the Metroplex increased the number of housing units by 42 percent, from 1,162,448 to 1,997,960, according to U.S. Decennial Censuses (Neighborhood Change Database). Further, the Dallas area ranks poorly along several different dimensions of urban sprawl, including having very low residential densities (Galster et al., 2001).

INSERT FIGURE 1

The rapid growth of the Dallas Metroplex coincides with the implementation of the LIHTC program, which began in 1987. Although examining a single region limits

the generalizability of the research, it allows a more in-depth look at the distribution of housing across the region, as well as the assemblage of other data sources that allow us to assess the impact of the spatial distribution of housing on exposure to educational and social opportunities. By focusing on a single region, we are able to shed additional insight into the nature of the LIHTC's penetration into the suburbs to determine whether the program is facilitating a regional distribution of affordable housing options and the benefits presumed to accompany suburban location.

DATA AND METHODS

Data on the Low Income Housing Tax Credit projects in the Dallas Metroplex relies on the Department of Housing and Urban Development's national database of LIHTC units. This database identifies each LIHTC project by street address, zip code, county, and geographic coordinates. It also provides data on the total number of units, the number of low-income units, and the year placed in service. We limit our analysis to the twelve counties presently comprising the Dallas-Fort Worth Consolidated Metropolitan Area (CMSA). Although McClure (2006) reports that the national database has about 10 percent of the cases that are missing a geographic location, our subset is nearly complete. All 344 projects contain at least a zip code and county, only 18 of the cases (about 5 percent) are missing the precise geographic coordinates.

Our analysis proceeds in three steps. We first look at the share of new multi-family growth represented by the LIHTC program across the region, since its inception in 1987. We use data from the Texas Real Estate Center on the number of single-family and multi-family building permits granted annually, available at the county level. We use

a share-of-growth technique to assess each metropolitan county's share of the region's multifamily housing stock, as well as the share of multifamily units that are produced by the LIHTC. The share-of-growth is a simple ratio that captures the proportion of new growth that is attributable to each county, weighted by the number of units produced. It is calculated by dividing the county's proportion of specified housing units by the region's proportion of those types of housing units. Values below 1.0 indicate that compared to the region as a whole, a county has an underrepresentation of multifamily or LIHTC housing, while values above 1.0 indicate an overrepresentation.

Second, we examine the current (2007) spatial distribution of the LIHTC projects and units within the region to determine if they exhibit any spatial clustering at the county and ZCTA (zip code) levels. Spatial dependence in this case exists when particular characteristics of LIHTC projects like number of units or number of low-income units are spatially associated with similar values in neighboring LIHTC projects in other geographic areas. Local Indicators of Spatial Association (LISA) quantify the measures for examining the extent of significant spatial clustering.

This study uses nearest-neighbor analysis and more specifically Moran's I statistic to examine clustering of LIHTC projects. The nearest neighbor index is expressed as the ratio of the observed distance between LIHTC projects divided by the expected distance. The expected distance is the average distance between observations in a hypothetical random distribution and values less than 1 indicate clustering that can also be tested for significance. Moran's I measures spatial autocorrelation based not only on the variable values but also on the location of the observation and thus is influenced by the distance between the observations (Anselin, 1995). A Moran's I value ranges from +1 to -1 with

the former indicating clustering and latter indicating dispersion; values near zero typically indicate random spatial distribution. Additionally, we also use the Getis-Ord Gi* statistic to test if zip codes with higher or lower number of units per LIHTC projects tend to cluster in order to locate 'hot spots' or 'cold spots' respectively. Larger statistically significant positive values of Gi* statistic (z-score) indicate clustering of LIHTC projects with higher number of units and vice versa for negative values. These tests in addition to other graphical measures using ArcGIS mapping tools help us examine not only indications of spatial clustering but also locations of such clusters within the Dallas Metroplex.

Finally, we assess the relationship between geographic clustering and exposure to variables intended to capture exposure to social, and educational conditions that are most commonly associated with opportunity. We use correlations to assess the relationship between the geographic clustering of LIHTC units and minority population, poverty, safety, and education. T-tests are used to indicate differences between ZCTAs with highly clustered LIHTC projects and those without. While other studies have examined the minority population and poverty levels associated with LIHTC location (Rohe and Freeman, 2001; Freeman 2004; Oakley, 2008, Newman and Schnare, 1997), none have examined how this translates to access to education and safety.

Minority population and poverty levels are taken from tract-level 2000 Census data. We aggregate this data to the ZCTA (zip code) level as a compromise between the finer grain of the tract and the larger grain of school districts and municipal jurisdictions. It allows us to extrapolate school-district-level educational data from the Texas Education Agency's Academic Excellence Indicator System (AEIS) and municipal-level crime data

from the FBI Crime Reports. Our approach to matching was to use the Melissa Data zip code lookup to identify which ZCTAs comprised the area school districts and municipalities. Where the boundaries overlapped, we visually compared boundary maps to determine which ZCTA code should be attributed to which jurisdiction or district based on where the majority of the ZCTA lay.

Variables representing education and safety are indices developed by combining several indicators. Educational quality is measured by SAT participation (an indicator of the proportion of students who are college-bound), student-to-teacher ratio, and the school accountability rating given by the Texas Education Agency, which is based on student achievement on standardized tests and completion rates. Safety is the measured as 1 minus the number of property and violent crimes per 100 population. Each of the variables was coded in the same direction, so that a higher value represents a more positive interpretation. Then, to standardize the measures, z-scores were calculated for each. The z-score is simply the number of standard deviations from the distribution mean, thus a negative z-score represents a value below the mean for all the areas, and so on. Educational and safety indices were formed by summing indicator scores for each dimension.

RESULTS AND DISCUSSION

Regional shares of multi-family and LIHTC growth

In our first analysis, we examine the regional distribution of multi-family housing in the Dallas Metroplex. Table 1 shows the growth of the single-family and multi-family housing stock in each metropolitan county from 1980 to 2007, with 1.25 million housing

units being added during that time, including nearly 50,000 units constructed with the LIHTC (since 1987). While Dallas and Tarrant Counties (home to the cities of Dallas and Ft. Worth, respectively) were home to 83 percent the housing stock in 1980. While these counties continued to grow, by 2007, their share had declined to 68 percent. Growth since 1980 has been particularly rapid in the northern suburban counties of Collin, Denton and Rockwall (Table 1, Column I). Collin County's housing stock has quadrupled in size and Denton has doubled. Although still a small part of the region, Rockwall has tripled in size. These high-growth counties are highly correlated with higher household incomes and higher housing values (see Table 2). The remaining counties—Delta, Ellis, Hunt, Johnson, Kaufman, Parker and Wise—are more exurban in nature, as suggested by their outlying locations (Figure 1), lower growth rates (Table 1, Column I) and very low population densities (Table 2).

TABLE 1 HERE

TABLE 2 HERE

Columns D and E show the growth in multi-family housing stock in the Dallas Metroplex. Overall, 38% of the region's housing stock is multi-family. Column E provides a regional share index that captures how far above or below the regional average each county is, weighted by the number of total housing units produced. Values below 1.0 indicate that compared to the region as a whole, a county has an underrepresentation of multi-family units, while values above 1.0 indicate an overrepresentation. Given the urban nature of Dallas and Tarrant Counties, it is not surprising that much of their growth has been in multi-family housing (52% and 35%, respectively). Dallas is bearing the

burden of multi-family growth, with a regional share index of 1.38. Tarrant is just below average, with an index of 0.93. While the suburbanizing counties of Collin and Denton also added substantial numbers of multi-family housing—22% and 26% of their growth, respectively, these proportions fall well below the regional average, with regional indices of 0.59 for Collin County and 0.70 for Denton County. The other suburban county, Rockwall, has seen very little growth in its multi-family housing stock—only 8%, which gives it a regional share index of 0.20, the lowest of all the regional counties.

The exurban counties exhibit varying growth in their multi-family housing stock—about 10-20% of the added housing stock has been multi-family, with one exception. Hunt County has added 2,000 multi-family units to its stock, 44% of the new units, giving it a regional share index of 1.18—it is the only county other than Dallas County to bear a higher than equal regional share of multi-family housing. What constitutes a "regional fair share," varies by location and should be locally-defined (Listokin, 1976). Yet, given the rapid growth of Collin, Denton, and Rockwall Counties, the inequalities indicated by their regional share indices suggest that the more affluent suburban counties are not adequately meeting regional housing needs.

The number of new units that are funded by the LIHTC is also shown in Table 1, Columns F and G. Overall, about 10% of multi-family units in the Metroplex are LIHTC units (Column F). These are perfectly represented in both of the urban counties, Dallas and Tarrant, giving them regional indices of right at 1.00 (Column G). Denton and Ellis counties also have near average proportions, with regional shares just above 1.0. The more affluent suburban counties, particularly Collin and Rockwall, however, have substantially lower proportions of multi-family units funded by the LIHTC (6% and 3%,

respectively), giving them regional share indices of 0.63 and 0.24 respectively. Yet the exurban counties have substantially higher proportions of LIHTC units among their multi-family stock (all of Wise County's multi-family growth appears to have been funded by the LIHTC). Their regional share indices are all well above 1.0, ranging from 2.09 in Parker County to 9.75 in Wise County.

These findings initially suggest that while affluent suburban counties are resisting low-income units, exurban or fringe counties are depending on the tax credit to fund large proportions of their multi-family stock. Whether these counties need it or not is a question beyond the scope of this analysis, but it may be that these more exurban counties are taking advantage of the tax credit to subsidize the construction of rental units in areas where there is little demand or need. This is an interesting addition to the multi-metro and national studies that have shown that the LIHTC is doing a better job of penetrating the suburbs (McClure, 2006; Oakley, 2008; Freeman, 2004). In the Dallas Metroplex, indeed low-income units are being constructed in non-urban areas; however, these non-urban areas may not necessarily be the more affluent, presumably higher-opportunity suburbs.

Geographic clustering of LIHTC projects and units

In this analysis, we examine whether LIHTC projects and units are geographically clustered. The nearest-neighbor analysis relies on geocoded point data, so our analysis is limited to 326 of our 344 LIHTC projects distributed within the 12-county region. Except for Delta county, each of the counties has at least one LIHTC project, with the majority of the projects lying in Dallas (153) and Tarrant (86) followed by Denton (23),

Collin (19), Johnson (12), and Kaufman (11). The remaining counties have fewer than 10 LIHTC projects, making it difficult to look for spatial clustering at the county level. Overall, the average nearest-neighbor distance analysis for LIHTC projects indicates significant spatial clustering within the metro region. Since most of the LIHTC projects are concentrated in Dallas and Tarrant counties (see Figure 2), we focus on these counties for detailed spatial analysis. The average nearest-neighbor distance index for Dallas County Tarrant County also indicate significant spatial clustering (See Table 3)

INSERT FIGURE 2 HERE

INSERT TABLE 3 HERE

In order to calculate Moran's I statistic for examining spatial clustering, we look at characteristics of number of units in each LIHTC project as well as number of low-income units per project. Overall in the metro region, we get a Moran's I value of 0.35 with a z-score of 4.17 standard deviations, indicating significant spatial clustering of LIHTC projects based on number of units per project. Thus, number of units in a LIHTC project are spatially correlated which implies that projects are more likely to be located around other LIHTC projects with similar number of units per projects (see Figure 2).

Since Moran's I statistic calculation requires at least 30 observations, we can calculate values that are testable for statistical significance only for Dallas and Tarrant counties. Within Dallas County, the Moran's I value with respect to the number of units per project (0.09) is closer to zero indicating neither clustering nor dispersion of LIHTC projects. On the other hand, for Tarrant County, the Moran's I value (0.77) indicates strong evidence of spatial clustering. By combining Dallas and Tarrant counties, we

examine spatial clustering for urban counties. The Moran's I value (0.24) although lower than Tarrant and higher than Dallas is highly significant indicating spatial clustering of LIHTC projects based on number of units and low-income units in urban counties. Due to lack of adequate number of observations in the suburban counties, we cannot test Moran's I values for significance in examining spatial clustering.

To examine the location of the LIHTC at a ZCTA level, we employ hot spot analysis to determine clustering of projects. Where nearest-neighbor analysis depends on point data to assess the clustering of projects, hot spot analysis uses polygons (ZCTAs), allowing us to provide a finer grain of detail and assess clustering of units rather than the projects, which vary greatly in size. The hot spot analysis calculates a Getis-Ord Gi* statistic that identifies clusters of such projects weighted by number of units per project. Measured by z-score for each feature, Figure 3 shows the distribution and statistical significance of clustering of LIHTC projects weighted by number of units. Only the darkest ZCTAs (positive z-scores) have statistically significant clusters of LIHTC units; 2 of these ZCTAs are in Tarrant County, 2 are in Collin County, and 12 are in Dallas County. These represent significant clustering of LIHTC projects with higher number of units per project, although we fail to see statistical clustering of zipcodes with lower numbers of units (negative z-scores) per LIHTC project with similar LIHTC projects with lower number of units.

These results are consistent with what Oakley (2008) found in four other metropolitan regions (Atlanta, Chicago, Los Angeles and New York City). In the Dallas Metroplex, LIHTC projects and units are highly spatially clustered. These clusters are

concentrated in the urban counties of Dallas and Tarrant, but are also seen in the high-growth, affluent Collin County.

Examining the differences between the ZCTAs with clustered LIHTC and those with dispersed LIHTC projects is insightful (Table 4). Of the 331 projects examined, 117 projects are found in the 16 ZCTAs with significant clustering, representing 21,046 (44%) units. The remaining 26,416 (56%) units are dispersed in 214 projects over 113 ZCTAs. Worth noting is that the average number of units per project is significantly smaller than that of the projects found in ZCTAs with clustered LIHTC units. Dispersed projects are about two-thirds the size of clustered projects. Further, the size of the project is significantly correlated with the Gi* clustering statistic, suggesting that larger projects are more likely to be spatially clustered with one another.

TABLE 4 HERE

Social and Educational Conditions

In this analysis, we assess whether these clusters are associated with social and educational conditions that suggest an expansion of opportunity for the lower-income households served by the LIHTC program. We first correlate the Gi* Statistic with poverty levels and the percentage of minorities found in the ZCTA, as well as with indices composed of indicators of school quality and safety. Table 5 shows these correlations, as well as difference in the means of ZCTAs with dispersed projects and those with clustered projects.

TABLE 5 HERE

In Table 5, we see correlations of ZCTA characteristics with spatial clustering. Increased spatial clustering of LIHTC units is associated with higher minority populations (r=.483), higher poverty levels (r=.359), and lower household incomes (r=-.202). Correlations between the clustering statistic and social conditions indicate that higher clustering is significantly associated with lower safety levels (r=-.350) and lower educational quality (r=-.263).

To examine differences between areas where LIHTC is clustered and where they are dispersed, we divide the sample based on a significant level of clustering (>1.96). We compare means between these groups, as well as between each group and a regional average. ZCTAs in which LIHTC units are clustered feature social conditions and opportunities that are significantly poorer than those in which LIHTCs are not clustered. While non-clustered ZCTAs have a mean poverty level of 10%, those in which LIHTCs are clustered have poverty levels nearly twice that (see Figure 4). Minority levels are also double those seen in non-clustered areas, and incomes are also significantly lower (see Figure 5). Dispersed LIHTC areas, in contrast, are very similar to regional averages. While their characteristics are nominally slightly worse, only household incomes are significantly lower than the regional average.

TABLE 6 HERE

Perhaps most importantly, the areas in which LIHTC units are clustered represent some of the most dangerous areas in the region (see Figure 6). Further, they have significantly poorer educational opportunities than those areas in which LIHTC units are not clustered (See Figure 7). Yet, more than half of regional LIHTC units are in ZCTAs

that do not exhibit significant spatial clustering. These areas offer educational and safety environments that are just below the mean, but are not significantly different than zero. In cases where LIHTC units are dispersed, they seem to be offering fairly average opportunities. While perhaps not overcoming disadvantage, they are at least not perpetuating it.

CONCLUSIONS AND IMPLICATIONS

As the major supply-side program for producing units of affordable housing, the Low-Income Housing Tax Credit program is a critical tool for the redistribution of housing in the United States' metropolitan regions to achieve more equitable access to a range of opportunities. Previous research has demonstrated that the LIHTC program is more successful than other affordable housing and mobility programs at locating units in the suburbs, but not at avoiding spatial clustering (Oakley, 2008; McClure, 2006; Freeman, 2004). In the case of the Dallas Metroplex, we find evidence that although LIHTC units are being produced in the non-urban counties of this metropolitan region, these areas may not be affluent suburbs, but rather appear to be less affluent exurbs. These exurban counties seem to be using the LIHTC to underwrite the production of small stocks of rental housing, and are likely not providing income mixing either within the development or within the larger neighborhood. Affluent suburban counties are not providing an equitable share of multi-family, affordable housing growth.

Just under half of LIHTC units produced in the region are in large, highly clustered developments, mostly in urban areas. These clusters are associated with significantly higher levels of disadvantage, including poverty and minority levels, as well

as poorer safety and educational conditions. However, more than half of LIHTC units produced are in areas with social conditions comparable to regional averages, indicating that they are neither perpetuating nor overcoming persistent spatial inequalities.

Although just one of the tools available for the redistribution of housing options, but as a federal program administered by states, the LIHTC perhaps has the most potential to be used more effectively. As a redistributional tool, it needs to do a better job of several interrelated tasks:

- Dispersal of units
- Income-mixing
- Equitable regional distribution

First, the LIHTC needs to do a better job of dispersing, rather than concentrating, units. Part of the problem relates to HUD's use of Qualified Census Tracts (QCTs) to identify Difficult Development Areas. These designations allow bonuses to be given to developers who build affordable units in these areas, which are defined by low incomes and high percentages of minorities. While they are put in place to encourage development in areas where the market might not normally support it, Oakley (2008) finds that QCTs are a strong predictor of the clustering of LIHTC developments. For LIHTC to work as a dispersal tool, it needs to also encourage the development of affordable units in unaffordable markets.

Also problematic is the high proportion of LIHTC units that are low-income (for households earning 60% or less of the area median). A HUD (2005) publication indicates that about 84 percent of LIHTC developments placed in service through 2002

have 100% low-income units. In our sample, 95% of all units were low-income. So almost by definition, these developments are going to be clusters of disadvantage. While the tax credit rules set minimum percentages of units that must be affordable to different low-income subsets, they do not specify a maximum—an oversight that should be rectified. The size of the projects may also be exacerbating the concentration of units. Particularly in the more dense areas of the Dallas Metroplex, the projects were large—averaging over 190 units in each project, with over 1300 units in the highly clustered ZCTAs[2].

The dispersal and income mixing challenges suggest that tax credit guidelines may require adjustment to encourage the production of units where they are really needed. While depressed markets need new units to upgrade the housing stock, unaffordable markets need to be made more accessible to low-income households. In disadvantaged neighborhoods, LIHTC developments might limit the proportions of units that are low-income to promote income-mixing and deconcentration, while in affluent neighborhoods, developments should be required to include higher proportions of low-income units (see Figure 8) to promote economic integration. Bonuses (higher eligible bases) could be reconfigured to support this relationship.

FIGURE 8 HERE

A program that implemented this relationship (and properly incentivized or regulated it) would likely achieve a considerably more equitable distribution of housing options that is currently seen in the Dallas Metroplex. But further steps may be necessary

[2] McClure (2006) indicates that nationwide, the average size of an LIHTC development is 70 units.

to ensure an equitable distribution of tax credit units both within and across regions. Each state's Qualified Action Plan (QAP) prioritizes development projects based on specified state housing needs. States should evaluate how well their QAPs achieve regional equity in the allocation of tax credits and make adjustments accordingly. This may mean setting limits on the proportion of multi-family units in a given jurisdiction (county or municipality, for example) that may be funded by the LIHTC. It would require consideration of fair-share goals and objectives by both metropolitan and non-metropolitan regions (see Listokin, 1976). In states like Texas, with no state-mandated planning or consistency requirements, this kind of goal-setting is more challenging, but not insurmountable.

REFERENCES

Abrams, C., 1955, *Forbidden Neighbors: A Study of Prejudice in Housing*. New York: Harper and Row.

Abramson, A. J., Tobin, M.S., and VanderGoot M.R., 1995, The Changing Geography of Metropolitan Opportunity: The Segregation of the Poor in U.S. Metropolitan Areas, 1970 to 1990. *Housing Policy Debate* Vol. 6, 45-72.

Abt Associates, Inc., 2006, Are states using the low income housing tax credit to enable families with children to live in low poverty and racially integrated neighborhoods? Cambridge, MA: Report Prepared for the Poverty and Race Research Action Council and the National Fair Housing Alliance.

Anselin, L., 1995, Local Indicators of Spatial Association—LISA. *Geographical Analysis* 27: 93-115.

Berube, A. and Kneebone, E., 2006, *Two Steps Back: City and Suburban Poverty Trends*. Living Cities Census Series. Washington, DC: The Brookings Institution.

Briggs, X.S., 2005. More *Pluribus*, Less *Unum*? The Changing Geography of Race and Opportunity. In *The Geography of Opportunity: Race and Housing Choice in Metropolitan America*. Xavier de Souza Briggs, ed. Washington, DC: The Brookings Institution, pp. 17-44.

Calavita, N., Grimes, K. and Mallach, A., 1997, Inclusionary Housing in California and New Jersey: A Comparative Analysis. *Housing Policy Debate* 8(1): 109-145.

Cervero, R., 1989, Jobs-Housing Balance and Regional Mobility. *Journal of the American Planning Association* 55: 136-150.

Clifford, C., March 27, 2008. Dallas-Fort Worth tops population growth. Retrieved from http://money.cnn.com/2008/3/26/real_estate/Metropolitan_Population/ on June 9, 2008.

Comey, J., Briggs, X.S., and Weismann, G., 2008. Struggling to Stay Out of High-Poverty Neighborhoods: Lessons from the Moving to Opportunity Experiment. Metropolitan Housing and Communities Center Brief No. 6, March 2008. Washington, DC: Urban Institute. Accessed at http://www.urban.org/UploadedPDF/411635_high-poverty_neighborhoods.pdf

Cummins, J.D., 1996. Recasting Fair Share: Toward Effective Housing Law and Principles Social Policy. *Law and Inequality* 14(2): 339-390.

Dawkins, C. J., 2007, Exploring Changes in Income Clustering and Centralization during the 1990s. *Journal of Planning Education and Research* Vol. 26, 404-414.

_____, 2005, Tiebout Choice and Residential Segregation by race in U.S. Metropolitan Areas, 1980-2000. *Regional Science and Urban Economics* 35(6): 734-755.

Denton, N., 2006, Segregation and Discrimination in Housing. in *A Right to Housing: Foundation for a New Social Agenda.* (Bratt et al., eds). Philadelphia: Temple University Press.

Farley, R., 1991, Residential segregation of social and economic groups among blacks. In *The Urban Underclass* (C. Jencks and P. Peterson, eds). Washington, DC: The Brookings Institution.

Farley, R. and Frey, W. H., 1994, Changes in the Segregation of Whites from Blacks During the 1980s: Small Steps Toward a More Integrated Society. *American Sociological Review* Vol. 59, 23-45

Federal Bureau of Investigation. 2000, Uniform Crime Reports. Accessed at http://www.fbi.gov/ucr/ucr.htm.

Fischer, M. J., 2003, The relative importance of income and race in determining residential outcomes in U.S. urban areas, 1970-2000. *Urban Affairs Review* Vol. 38, 669-696.

Freeman, L., 2004, *Siting affordable housing: Location and neighborhood trends of low income housing tax credit developments in the 1990s*. Washington, DC: The Brookings Institution, Census 2000 Survey Series.

Galster, G. C., 2005, Consequences for the redistribution of urban poverty during the 1990s: A cautionary tale. *Economic Development Quarterly* Vol. 19, 119-125.

Galster, G.C., Hanson, R., Ratcliffe, M.R., and Wolman H., 2001, Wrestling Sprawl to the Ground: Defining and Measuring an Elusive Concept. *Housing Policy Debate* 12(4): 681-717.

Galster, G. and Cutsinger, J., 2008, Racial Settlement and Metropolitan Land-Use Patterns: Does Sprawl Abet Black-White Segregation? *Urban Geography* 28(6): 516-553.

Galster, G. C., Quercia, R. G., and Cortes, A., 2000, Identifying Neighborhood Thresholds: An Empirical Exploration. *Housing Policy Debate* Vol. 11, 701-733.

Galster, G. and Killen, S. P., 1995, The Geography of Metropolitan Opportunity: A Reconnaissance and Conceptual Framework. *Housing Policy Debate* Vol. 6, 7-44.

Geolytics, Inc. 2005. Neighborhood Change Database. Accessed through Texas A&M University Libraries.

Glaeser, E. L. and Vigdor, J. L., 2001, Racial Segregation in the 2000 Census: Promising News Census 2000 Series. Washington DC: Center on Urban and Metropolitan Policy. The Brookings Institution.

Goering, J., 2005, Expanding Housing Choice and Integrating Neighborhoods: The MTO Experiment. In *The Geography of Opportunity: Race and Housing Choice in Metropolitan America*. Xavier de Souza Briggs, ed. Washington, DC: The Brookings Institution, pp. 127-149.

Goetz, E. G., 2000, Fair Share or Status Quo? The Twin Cities Livable Communities Act. *Journal of Planning Education and Research* 20: 37-51.

_____, 2003, *Clearing the Way*. Washington, DC: Urban Institute.

Hill, E.W., Wolman, H.L., and Ford III, C.C., 1995, Can Suburbs Survive Without Their Central Cities? Examining the Suburban Dependency Hypothesis. *Urban Affairs Review* 31(2): 147-174.

Hughes, M.A., 1987, Moving Up and Moving Out: Confusing Ends and Means about Ghetto Dispersal. *Urban Studies* 24: 503-517.

Ihlanfeldt, K. R., 2004, Exclusionary land-use regulations within suburban communities: a review of the evidence and policy prescriptions. *Urban Studies* Vol. 41, 261 - 283

_____, 1994, The Spatial Mismatch Between Jobs and Residential Locations within Urban Areas. *Cityscape* 1.

Jargowsky, P. A. and Yang, R., 2006, The "Underclass" Revisited: A Social Problem in Decline. *Journal of Urban Affairs* Vol. 28, 55-70.

Jargowsky, P. A., 2003, *Stunning Progress, Hidden Problems: The Dramatic Decline of Concentrated Poverty in the 1990s*. Living Cities Census Series, Center of Urban and Metropolitan Studies. Washington, DC: The Brookings Institution.

Kozol, J., 1991, *Savage Inequalities*. New York: Crown Publishers.

Kain, J., 1968, Housing Segregation, Negro Employment and Metropolitan Decentralization. *Quarterly Journal of Economics* Vol. 82, 175-197.

Keating, W.D., 1994, *The Suburban Racial Dilemma*. Philadelphia: Temple University Press.

Kingsley, G. T. and Pettit, K. L. S., 2003, *Concentrated Poverty: A Change in Course*. Washington, DC: Urban Institute.

Krivo, L. J. and Peterson, R. D., 1996, Extremely disadvantaged neighborhoods and urban crime. *Social Forces* Vol. 75, 619-650.

Listokin, D., 1976. *Fair Share Housing Allocation*. New Brunswick, NJ: Center for Urban Policy Research, Rutgers University.

Mallach, A., 1984, *Inclusionary Housing Programs: Policies and Practices*. New Brunswick, NJ: Rutgers University, Center for Policy Research.

Malpezzi, S., and Vandell, K., 2002, Does the Low-Income Housing Tax Credit Increase the Supply of Housing? *Journal of Housing Economics* 11(4): 360-380.

Massey, D. S., 2001, Residential Segregation and Neighborhood Conditions in U.S. Metropolitan Areas. In *America Becoming: Racial Trends and Their Consequences*. Washington, DC: National Academy Press, pp. 391-434.

Massey, D. S. and Denton, N., 1993, *American Apartheid: Segregation and the Making of the Underclass*. Cambridge, MA: Harvard University Press.

Massey, D. S., Gross, A. B., and Eggers, M. L., 1993, Segregation, the Concentration of Poverty, and the Life Chances of Individuals. *Social Science Research* Vol. 20, 397-420.

Morgan, J.M., 1995, Zoning for All: Using Inclusionary Zoning Techniques to Promote Affordable Housing. *Emory Law Journal* 44: 359-93.

McClure, K., 2006, The Low-Income Housing Tax Creidt Program Goes Mainstream and Moves to the Suburbs. *Housing Policy Debate* 17(3): 419-446.

National Public Radio, August 16, 2007. Researchers Discuss the "Neighborhood Effect" [Audio Broadcast]. Accessed at http://www.npr.org/templates/story/story.php?storyId=12835137&sc=emaf

Nelson, A. C., Dawkins, C. J., and Sanchez, T. W., 2004, Urban containment and residential segregation: a preliminary investigation. *Urban Studies* Vol. 41, 423-439.

Nelson, K.P., 1994, Whose Shortage of Affordable Housing? *Housing Policy Debate* 5(5): 401-442.

Newman, S.J., and Schnare, A.B., 1997, "…And a Suitable Living Environment": The Failure of Housing Programs to Deliver on Neighborhood Quality. *Housing Policy Debate* 8(4): 703-741.

Pendall, R., 2000, Local Land Use Regulation and the Chain of Exclusion. *Journal of the American Planning Association* Vol. 66, 125-143.

Pendall, R., Puentes, R., and Martin, J., 2006, *From Traditional to Reformed: A Review of the Land Use Regulations in the Nation's 50 Largest Metropolitan Areas*. Research Brief. Washington, DC: the Brookings Institution.

Oakley, D., 2008, Locational Patterns of Low-Income Housing Tax Credit Developments: A Sociospatial Analysis of Four Metropolitan Areas. *Urban Affairs Review* 43(5): 599-628.

Orfield, M., 1999, *Metropolitics: A Regional Agenda for Community and Stability*. Minneapolis, MN: Forum for Social Economics.

_____, 1997, *Metropolitics*. Washington, DC: The Brookings Institution and Cambridge, MA: The Lincoln Land Institute.

Popkin, S., Galster, G. C., Temkin, K., Herbig, C., Levy, D. K., and Richter, E. K., 2003, Obstacles to Desegregating Public Housing: Lessons Learned from Implementing Eight Consent Decrees. *Journal of Policy Analysis and Management* 22 (2): 179-199.

Rohe, W.M. and Freeman, L., 2001, Assisted Housing and Residential Segregation: The Role of Race and Ethnicity in the Siting of Assisted Housing Developments. *Journal of the American Planning Association* 67(3): 279-292.

Rusk, D., 1993, *Cities Without Suburbs*. Washington, DC: Woodrow Wilson Center Press.

Saltman, J., 1978, *Open Housing: Dynamics of a Social Movement*. New York: Praeger.

Savitch, H., Collins, D., Sanders, D., and Markham, J., 1993, Ties the Bind: Central Cities, Suburbs and the New Metropolitan Region. *Economic Development Quarterly* 7(45): 341-357.

Silver, C., 1997, The Racial Origins of Zoning in American Cities. In June Manning Thomas and Marsha Ritzdorf (eds.) *Urban Planning and the African American Community*. Thousand Oaks, CA: Sage.

Sanbonmatsu, L., Kling, J.R., and Duncan, G.J., 2006, Neighborhoods and Academic Achievement: Results from the Moving to Opportunity Experiment. *Journal of Human Resources* 41(4): 649-691.

Smith, R. and DeLair, M., 1999, "New Evidence from Lender Testing: Discrimination at the Pre-Application Stage." Pp. 23-41 in Margery A. Turner and Felicity Skidmore, eds., *Mortgage Lending Discrimination: A Review of Existing Evidence.* Washington, DC: Urban Institute.

Squires, G. D., 2007, Demobilization of the Individualistic Bias: Housing market discrimination as a contributor to labor market and economic inequality. *Annals of the American Academy of Political and Social Science* Vol. 609, 200-214.

_____, 2006. Urban Sprawl: Causes, Consequences and Policy Response. Washington, DC: The Urban Institute.

_____, 1994, *Capital and Communities in Black and White: The Intersections of Race, Class and Uneven Development*. Albany, NY: State University of New York Press.

Squires, G.D. and Chadwick, J., 2006, "Linguistic Profiling: A Continuing Tradition of Discrimination in the Home Insurance Industry." *Urban Affairs Review* Vol. 41, 400-15.

Squires, G. D. and Kubrin, C. E., 2005, Privileged Places: Race, Uneven Development and the Geography of Opportunity in Urban America. *Urban Studies* Vol. 42, 47-68.

Texas Real Estate Center, 2008, *Building Permit Activity County Data*. Accessed at http://recenter.tamu.edu/data/databp.html.

Texas Education Agency, 2002, *Academic Excellence Indicator System Reports*. Accessed at http http://www.tea.state.tx.us/perfreport/aeis/index.html.

Turner, M.A., Freiburg, F., Godfrey, E., Herbig, C., Levy, D.K. and Smith, R.R., 2002, *All Other Things Being Equal: A Paired Testing Study of Mortgage Lending Institutions*. Washington, DC: U.S. Department of Housing and Urban Development/Policy Development and Research.

Turner, M.A., Ross, S.L., Galster, G.C., and Yinger, J., 2002, *Discrimination In Metropolitan Housing Markets: Phase I.* Washington, DC: U.S. Department of Housing and Urban Development/Policy Development and Research.

U.S. Department of Housing and Urban Development, Office of Policy Development and Research, 2005, *New Low-Income Housing Tax Credit Project Data Available. U.S. Housing Market Conditions* (1st Quarter). Washington, DC. May.

_____, Low-Income Housing Tax Credits. World Wide Web page http://www.huduser.org/datasets/lihtc.html.

Vartanian, T. P., 1999, Adolescent neighborhood effects on labor markets and economics conditions. *Social Service Review* Vol. 73, 142-167.

Weiss, M. A., 1987, *The rise of the community builders*. New York: Columbia University Press.

Figure 1. The Dallas Metropolitan Region; cities with populations over 100,000 shown.

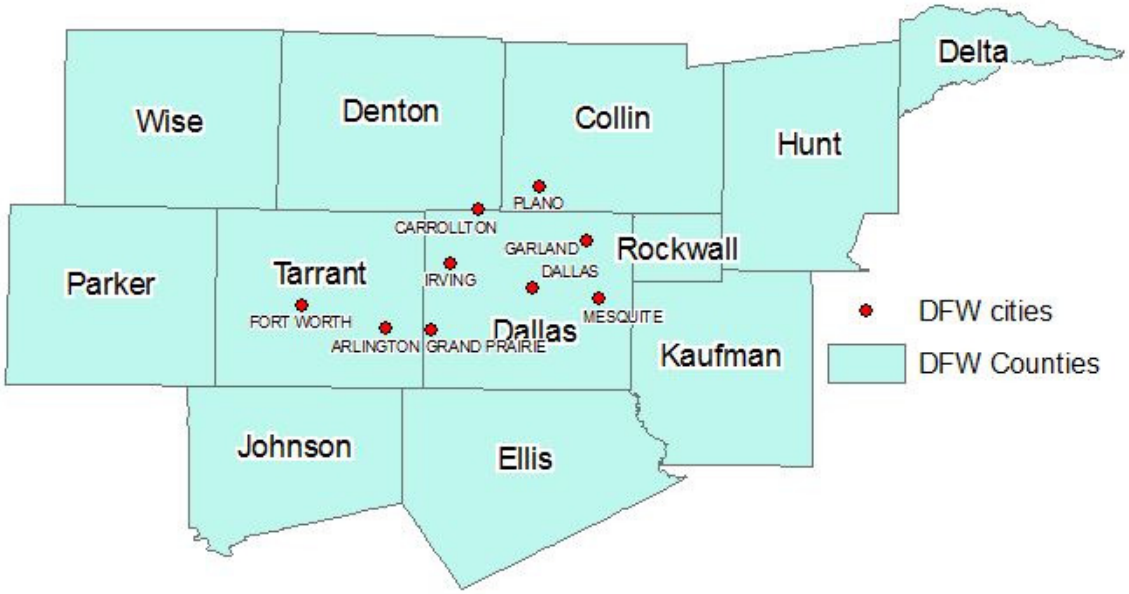

Table 1. Growth of Housing Stock in Dallas Metropolitan Region, 1980-2007.

	A	B	C	D	E	F	G	H	I
	Baseline 1980		Units Added 1980-2007						
County	Total Units	Multi-Family Units	Single-Family	Multi-Family (% of Total Units)	Regional Share of Multi-Family	LIHTC Units (% of Multi-Family Units)	Regional Share of LIHTC	Total	% Growth 1980-2007
Collin	51,029	14%	161,410	45,602 (22%)	0.59	2,932 (6%)	0.63	207,012	405%
Dallas	624,509	41%	236,643	253,217 (52%)	1.38	25,471 (10%)	0.98	489,860	78%
Delta	2,189	--	160	16 (9%)	0.24	0 (0%)	0.00	176	8%
Denton	54,801	20%	85,834	30,554 (26%)	0.70	3,290 (11%)	1.05	116,388	212%
Ellis	21,279	11%	14,945	3,579 (19%)	0.51	389 (11%)	1.06	18,524	87%
Hunt	23,435	--	2,531	2,000 (44%)	1.18	908 (45%)	4.44	4,531	19%
Johnson	24,694	9%	12,867	2,486 (16%)	0.43	568 (23%)	2.24	15,353	62%
Kaufman	14,219	9%	7,208	1,889 (21%)	0.55	836 (44%)	4.33	9,097	64%
Parker	17,065	8%	5,752	1,370 (19%)	0.51	292 (21%)	2.09	7,122	42%
Rockwall	5,515	14%	15,516	1,279 (8%)	0.20	32 (3%)	0.24	16,795	305%
Tarrant	337,541	28%	236,649	127,143 (35%)	0.93	12,969 (10%)	1.00	363,792	108%
Wise	10,797	9%	1,995	277 (12%)	0.32	276 (100%)	9.75	2,272	21%
Total/Avg.	**1,161,449**		**781,510**	**469,412 (38%)**		**47,963 (10%)**		**1,250,922**	**108%**

Sources:

1980 Census Data, Geolytics Neighborhood Change Database

Building Permits Source: Real Estate Center, Texas A&M University (http://recenter.tamu.edu/data/bpc/)

LIHTC Data: HUDUser (http://lihtc.huduser.org/)

Note: Overall, 95% of the LIHTC units are low-income units. Collin County has the lowest percentage of Low-Income units (88%), followed by Denton and Kaufman (92%), Tarrant (94%), Dallas (96%), Johnson (99%), with the remainder having 100% low-income units in their LIHTC developments.

Table 2. Socio-demographic profile of Dallas Metropolitan Counties.

County	2000 Population	2006 Population (est.)	% Non-Hispanic White	Household Income (2004 est.)	Median Housing Value	Population Density (per sq.mi.)
Collin	491,675	698,851	67.8	$75,709	$155,500	579.8
Dallas	2,218,899	2,345,815	36.1	$41,947	$92,700	2521.5
Delta	5,327	5,561	85.8	$31,122	$39,400	19.2
Denton	432,976	584,238	69.2	$62,234	$133,200	487.0
Ellis	111,360	139,300	67.5	$50,439	$91,400	118.5
Hunt	76,596	83,338	77.6	$38,268	$62,000	91.1
Kaufman	71,313	93,241	72.7	$47,575	$85,700	90.7
Johnson	126,811	149,016	79.3	$46,330	$81,900	174
Parker	88,495	106,266	87.1	$49,392	$99,400	97.9
Rockwall	43,080	69,155	77.3	$71,011	$147,100	334.0
Tarrant	1,446,219	1,671,295	55.6	$48,805	$90,300	1675.8
Wise	48,793	57,891	82.9	$46,223	$89,100	53.9
TOTAL	5,161,544	6,003,967	51.9	$49,500	$101,158	574.1

Source: U.S. Census County Profiles.

Figure 2. Size and distribution of LIHTC developments.

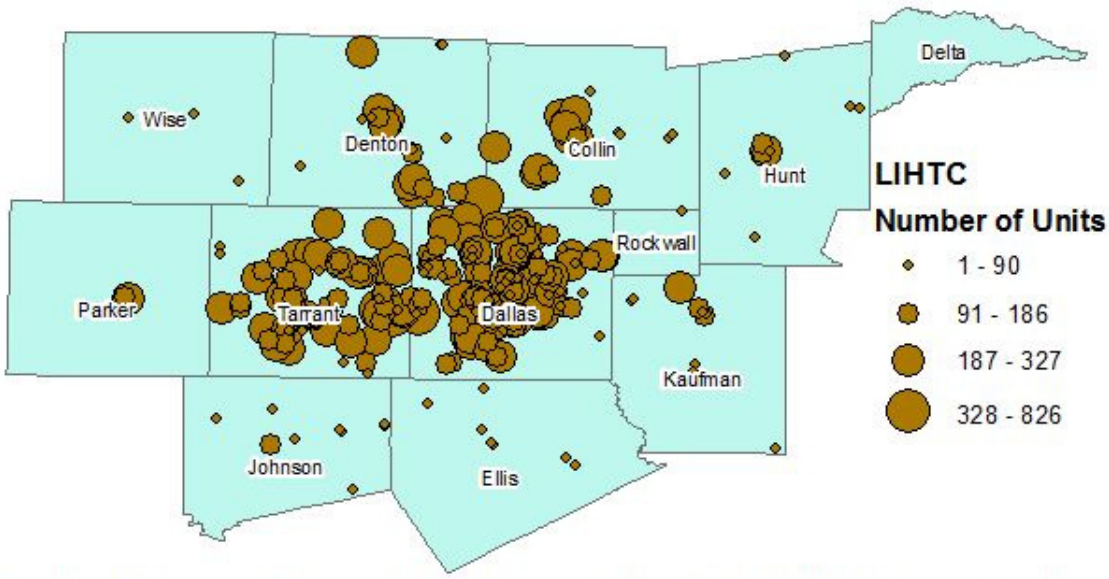

Table 3. Geographic clustering in the Dallas Metroplex

Geographic Unit	**Nearest Neighbor Ratio**	**Z-Score (std.dev)**
Dallas – Fort Worth Metro	0.41	-20.56***
Dallas	0.54	-10.84***
Tarrant	0.72	-5.04***
Denton	0.63	-3.41***
Collin	0.76	-1.99**
Johnson	0.68	-2.11**
Kaufman	0.37	-4.03***

*** significant at the p<0.01 level

** significant at the p< 0.05 level

Table 4. Differences in Project Characteristics in Dispersed vs. Clustered Projects.

	Correlation with Gi* Clustering Statistic	Dispersed LIHTC (N=113)	Clustered LIHTC (N=16)
Total Units	--	26,416	21,046
Average Units per ZCTA	--	234	1315
Average Number of Projects per ZCTA	--	1.89	7.31
Average Units per Project	.479	129	190

All correlations are significant at $p<0.01$.

All differences between dispersed and clustered LIHTC tracts are significant at $p<0.01$, at a minimum.

Figure 3. Spatial clustering of LIHTC units in ZCTAs

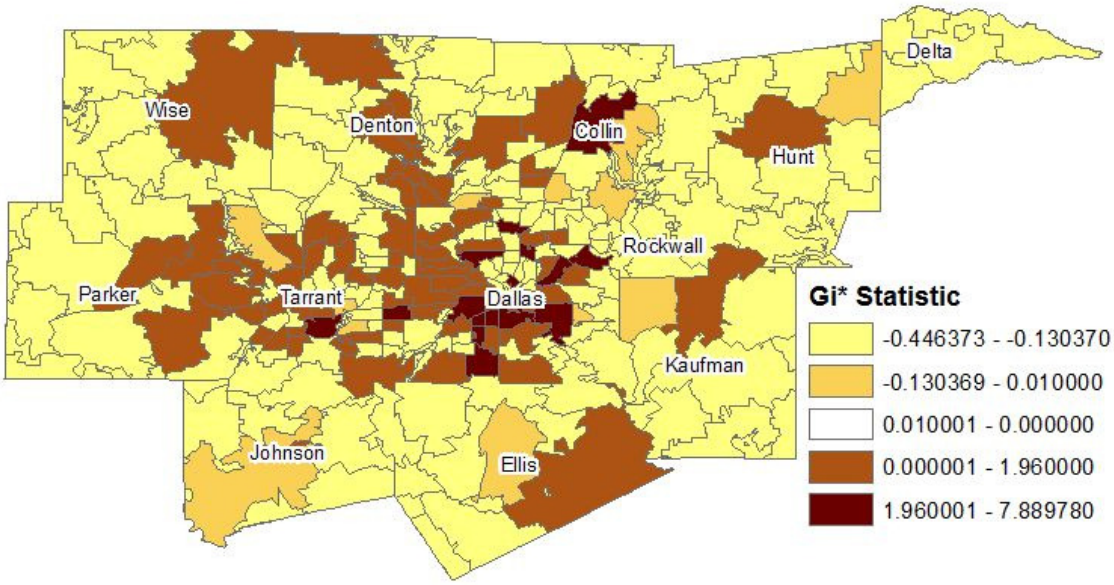

Figure 4. Distribution of LIHTC units by minority percentage.

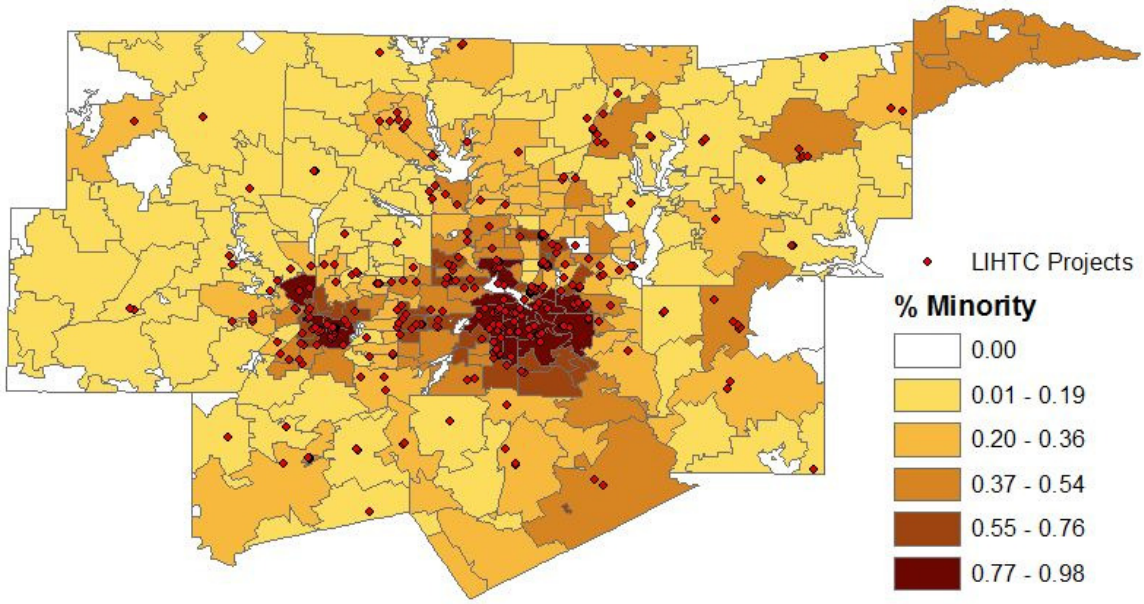

Figure 5. Distribution of LIHTC units by poverty rate.

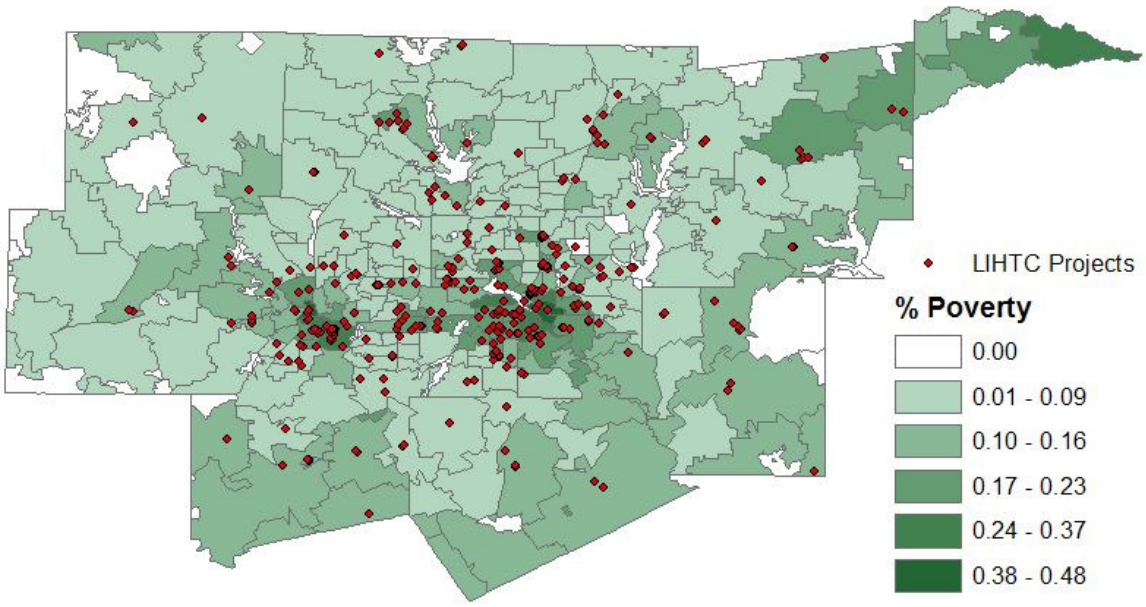

Figure 6. Distribution of LIHTC units by education index.

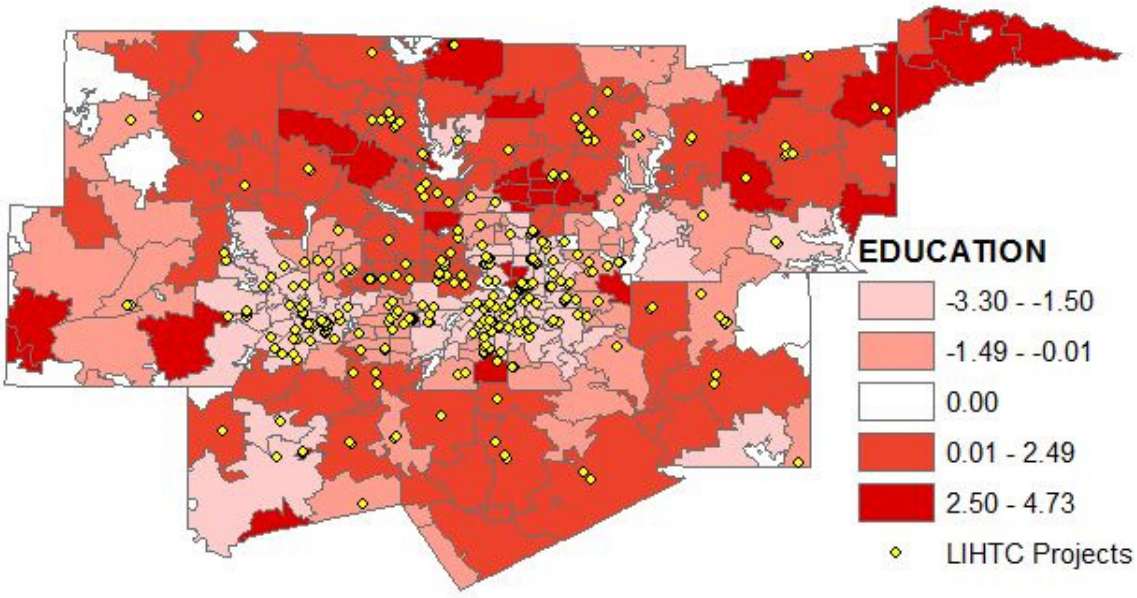

Figure 7. Distribution of LIHTC units by safety index.

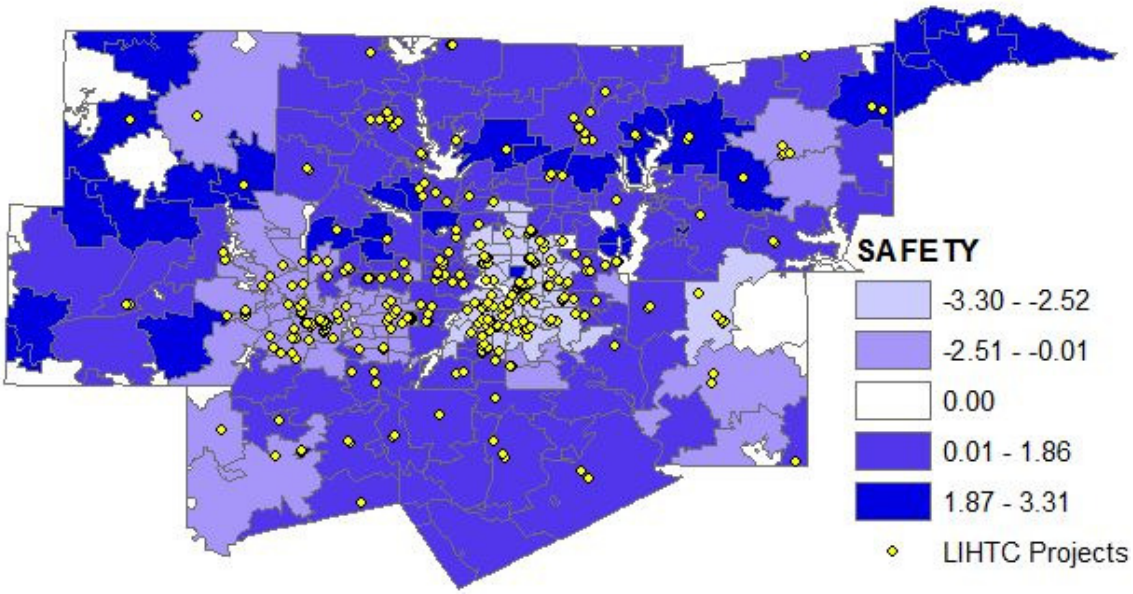

Table 5. Characteristics of ZCTAs in which LIHTC units are clustered or dispersed

	Correlation with Gi* Clustering Statistic	Dispersed LIHTC (N=113)	Clustered LIHTC (N=16)	Regional Average (N=277)
Poverty Rate	.359	11%	19%*	10%
Percent Minority	.483	37%	72%*	35%
Household Income	-.202	46,587**	35,879*	49,999
Safety Index	-.350	-.0227	-2.1857*	0.0
Education Index	-.263	-.2547	-1.4206*	0.0

All correlations are significant at p<0.01.

Dispersed and Clustered LIHTC ZCTAs differences are significant at a minimum of p<.05

ZCTA characteristics that are significantly different from regional averages at p<0.05 or better.

Figure 8. Illustration of desired relationship between area housing prices and LIHTC income-mixing