urban science

MDPI

Article

A Neighborhood-Level Analysis of Low-Income Housing Tax Credit Developments in the State of California and Los Angeles County

Victoria Basolo [1], Edith Huarita [2] and Jongho Won [3,*]

[1] Department of Urban Planning and Public Policy, University of California, Irvine, CA 92697, USA; basolo@uci.edu
[2] Civic Solutions, San Juan Capistrano, CA 92675, USA; edithdmedina@gmail.com
[3] Population Studies and Training Center, Brown University, Providence, RI 02912, USA
* Correspondence: jongho_won@brown.edu

Abstract: Some housing researchers have criticized the United States housing subsidy scheme referred to as the Low-Income Housing Tax Credit (LIHTC) program for failing to promote better opportunities for low-income persons. In this study, therefore, we examine the socio-economic and built-environment characteristics of LIHTC developments at the neighborhood level. Specifically, we aim to investigate the characteristics associated with LIHTC developments compared to neighborhoods without this kind of development. We focus on California statewide initially and then narrow our focus to examine LIHTC developments in Los Angeles County (LAC). We then compare the results from the two levels of government. We compiled data from several sources including the U.S. Census Bureau, the State of California, the Southern California Association of Governments, and other secondary sources; used Geographic Information Systems (GIS) to aid in creating several location-based indicators; and employed logistic regression for analyses. Our results show that LIHTC developments at the statewide and county levels tend to be in racially/ethnically diverse neighborhoods with higher levels of economic hardship, lower rents, a higher percentage of renters, and spatial clustering of LIHTC developments. With LAC removed from the state-level analysis, economic hardship is not more likely to occur in LIHTC neighborhoods. This finding suggests, except for in LAC, state policies may be having some level of success in locating LIHTC housing outside of hardship areas. Finally, in examining additional built-environment variables in LAC, we find LIHTC developments were more likely to be in a neighborhood with a park than other neighborhoods in the county. We discuss these results further and conclude with a brief recap of results, policy recommendations, and suggestions for future research.

Keywords: LIHTC; low-income housing; neighborhoods

Citation: Basolo, V.; Huarita, E.; Won, J. A Neighborhood-Level Analysis of Low-Income Housing Tax Credit Developments in the State of California and Los Angeles County. *Urban Sci.* **2022**, *6*, 39. https://doi.org/10.3390/urbansci6020039

Academic Editor: Paul C. Sutton

Received: 4 March 2022
Accepted: 26 May 2022
Published: 6 June 2022

1. Introduction

The need for affordable housing has become a tremendous problem in many countries in the last decade. In the United States, this need has been long standing, with lower-income households, in particular, struggling to find decent, affordable housing. In many U.S. metropolitan regions, housing units affordable to lower-income households are dramatically under-supplied and rent has reached extremely high levels. These conditions are especially visible in California, where the cost of land in many areas, particularly the coastal regions, makes the development of lower-income housing without significant subsidies an unrealistic endeavor.

The federal Low-Income Housing Tax Credit (LIHTC) is the largest production side-subsidy for lower-income housing in the United States [1,2]. Over the last two decades, the addition of LIHTC units to the housing stock has substantially increased, and the total number of units credited to the program is approaching three million [3–5]. Clearly, LIHTC

has become a critical source of capital for the production of rental housing for households with lower incomes. Given the importance of the LIHTC program to lower-income housing development, researchers and policy makers have been interested in the operation of and outcomes associated with the program [1].

Research about the LIHTC program has proliferated as this program has grown from a relatively small, temporary effort to a large, permanent program. Housing policy scholars and housing practitioners came to realize that public housing was shrinking and its trajectory was unlikely to change [6]. While it was initially criticized as inefficient, the LIHTC program gained momentum as a result of programmatic improvements to eliminate some inefficiencies and the emergence of a reliable structure of participants in the process (i.e., investors, intermediaries, developers). Moreover, the political environment favored LIHTC-subsidized housing developed by for profit and nonprofit developers compared to housing produced by the government [7]. On the last point, the LIHTC presented attractive features to liberal and conservative leaders alike in Congress. For liberal-minded policy makers, the program produced much needed housing for lower-income households and, for conservatives, it removed the government from the direct development of housing; the latter was viewed as a smaller government goal for many conservatives. Other features of the program that were likely attractive to liberals and conservatives include the allocation of credits to every state, a substantial level of discretion at the state level in shaping the program objectives, more flexibility for state and local governments, and the status of the program as "off budget", distancing it from the line item budget arguments that impact many programs [8–11].

Many policymakers, researchers, and housing practitioners recognize the value of this program for generating capital for the production of lower-income housing. That being said, there has been concern about the location of LIHTC developments with respect to the concentration of minorities and poverty and the degree of access to services, as well as the presence or absence of other neighborhood characteristics. Research on the location of LIHTC units has increased in the last few years; however, there is far less research on the LIHTC program compared to contributions on public housing [8]. For this reason, in this article, we focus on the quality of LIHTC neighborhoods by investigating demographic, economic, housing, and built-environment characteristics in LIHTC neighborhoods versus non-LIHTC neighborhoods. Specifically, our central research question asks, "Which characteristics are associated with neighborhoods that contain a LIHTC development?" We look at several types of characteristics at multiple geographic levels. First, we consider all neighborhoods in California as a whole. Second, we narrow our focus to the highly urbanized County of Los Angeles. Our purposes are to determine if there are differences in select characteristics between LIHTC and non-LIHTC neighborhoods and to determine if differences change across geographic scales in California.

This research is significant, because it provides vital information about the quality of living environments for LIHTC residents. Given the popularity of this program, it is likely to survive the political roller coaster and divisions in the U.S., and, therefore, it must be fully understood to ensure program policies deliver the best possible outcomes. Moreover, this research offers valuable results for policymakers in other countries with appropriate tax structures who are looking for a production side program that can work within their tax framework.

The remainder of this article is organized into five sections. The first of these sections provides an overview of the LIHTC program and briefly reviews the literature on the program by time period. The second section presents the study area, research question, data, and methods used in the analysis. The next section provides descriptive statistics and the analytical results based on regression analyses. The analyses are followed by a discussion of the results. The last section concludes with policy recommendations and suggestions for future research.

2. The LIHTC Program and Existing Literature

The LIHTC program came into existence over 30 years ago through the Tax Reform Act of 1986. This legislation changed the tax rules on multi-family housing in response to the potential overbuilding of luxury or higher-cost units. The less favorable rules were intended to eliminate a perceived tax shelter abuse, but some members of Congress were concerned that the legislation would also negatively impact the lower-cost, multi-family markets. The LIHTC was developed to counter this negative impact. Although the LIHTC was initially adopted as a temporary program, it has been amended over time and eventually was made permanent by Congress [1,5,12]. An example of an amendment to the program was the 1989 inclusion of a financial benefit for a LIHTC development located in a Qualified Census Tract (a QCT is a census tract where 50% or more of the households' incomes are less than 60% of the Area Median Gross Income) or in a Difficult Development Area (a DDA is an area with high construction, land, and utility costs compared to the Area Median Gross Income) [13].

The LIHTC is not contained in government housing regulations, but rather appears in the Internal Revenue Code (IRC). It is referred to as a tax expenditure or "off budget" program. The federal government distributes LIHTCs to states on a per capita basis, and the states provide these credits to housing developers. According to the IRC, a state must develop a Qualified Allocation Plan (QAP), which serves as the policy guidance document for the state allocation of credits to eligible developments. States set their own priorities for the geographic distribution of credits, as well as develop a point system reflecting a range of policy goals to evaluate the merits of development proposals submitted to the state. For example, a state might give points for green building or transit-efficient locations. While the federal government offers a base framework for the LIHTC program, the states have a good degree of flexibility in setting the income limits, period of affordability, and the goals for building and location-based features [14–16].

Developers compete for tax credits and, if successful, receive an allotment of these credits from the state to sell to investors. The investors apply the tax credits against their federal tax liabilities, and the capital raised from the sale of the credits covers some of the development costs of a lower-income housing project. LIHTCs are typically one of many sources of financing for a development. They tend to be the largest contribution to the total cost of production (land cost excluded), but bank loans, direct subsidies from local government and foundations, and other sources are important as well [17–19].

LIHTC utilization has grown over time, and this growth is paralleled by an increase in LIHTC research and contributions to the scholarly, policy, and practice literature. Moreover, the focus and substance of the LIHTC literature has changed over the years, reflecting larger housing policy concerns and the interdisciplinary interest in housing research. Table 1 is a summary of the themes in LIHTC research literature over time, beginning at the start of the program and continuing through 2018. We divided the literature into eight-year intervals for convenience and to highlight the increase in scholarly production over time. This table is based on a search of two databases: Google Scholar and the Web of Science, using the topic "Low-Income Housing Tax Credit". We reviewed the search results and chose relevant citations to include in our compilation. In some cases, we only had titles or abstracts to review, especially for older publications. Moreover, some of the articles retained in our compilation are not entirely focused on the LIHTC, but rather are comparative analyses across a range of housing programs of which the LIHTC is only one. While this search is qualitative, based on our assessment of content, and not exhaustive, it achieves our goal of providing a good snapshot of the literature, including changes in themes over time.

Table 1. Sample of Contributions to the LIHTC Literature Over Time.

Publication Period	Major Themes	Number of Articles Reviewed	Sample Citations
1987–1994	• Description and Critique [1]	12	• [12,20–22]
1995–2002	• Description and Critique [1] • Legal Issues/Analysis • Financial and Production Analyses • Locational Analyses and Neighborhood Effects [2]	15	• [18] • [23] • [10,24] • [25–27]
2003–2010	• Risk of Inventory Loss • Legal Issues/Analysis • Financial and Production Analyses • Locational Analyses and Neighborhood Effects [2]	21	• [28] • [29] • [30,31] • [32–35]
2011–2018	• Tenant Rent Savings and Rent Burden • Financial and Production Analyses • Qualified Allocation Plan and LIHTC Siting • Locational Analyses and Neighborhood Effects [2]	40	• [36–38] • [39,40] • [41,42] • [2,3,43–47]

[1] As the LIHTC program aged, the description and critique tended to be integrated into papers with empirical analyses focused on other themes; when presented, authors may have provided direct or indirect critiques of the program. [2] Locational analyses include the concepts of disadvantaged and low-quality neighborhoods. These concepts are measured in multiple ways in the literature and may involve a range of indicators (single- and multi-indicator measures) such as race/ethnicity, poverty, QCT status, access to employment, crime, school quality, crime, walkability, and others (see main text for an overview of some of these contributions). We also included property value/price impacts of LIHTC developments in the locational analysis category.

Early research on the LIHTC program (1987–1994) tended to be published in taxation journals and focused on descriptions of the program and the relationship between real estate investment and the associated tax credits. However, also during the early period of the program, critiques of the approach to low-income housing financing, as well as one article aimed at helping local governments working with LIHTC-related proposals (see [21] for the latter), appeared in academic journals. The main critique emerging from policy scholars concerned the complexity of the program and the inefficiencies resulting from the program design [22]. As the LIHTC moved from a temporary to permanent program, legislative/administrative changes would ease criticisms of the program and, over time, further study of its operations would continue to produce recommended changes [48,49]. Interestingly, it should be noted that the LIHTC, as part of the tax code, is subject not only to direct changes to tax law, but also to indirect changes that could affect its operation [50].

The next phase of publications (1995–2002) was a transition period ushering in new and different topics. While descriptive analyses and qualitative criticisms continued during this time, they were joined by the exploration of legal issues associated with the LIHTC and the emergence of data-driven outcome analyses; these analyses are likely due to the availability of sufficient program-related data for analysis. Examples from this period of LIHTC research include the prediction of total LIHTC development costs using location and characteristics [10], consideration of a substitution effect of LIHTC units for non-subsidized units [24], an assessment of the application of the good-cause eviction protection in LIHTC housing from a legal perspective [23], a study of the race and ethnicity demography in LIHTC neighborhoods and other neighborhoods with federally assisted housing [27], and an analysis of the impact of LIHTC developments on nearby housing prices [25].

The third period of LIHTC literature (2003–2010) shows an uptick in contributions. Common themes emerge in the literature such as legal issues related to the LIHTC program, financial and production analyses, and characteristics associated with LIHTC development locations; the last of these themes often involves identifying and examining neighborhood quality indicators. Neighborhood quality analyses seem to be increasing, but significant variations exist across studies, including different study areas, the characteristics associated with the developments, the measurement of those characteristics, datasets under analy-

sis, and the degree of comparison, (across-metropolitan areas, across housing assistance programs, or both). In this period, for instance, there was an examination of the LIHTC program in the context of the Fair Housing Act [29], consideration of the LIHTC units at risk due to expiration of affordability requirements [28], assessments of the cost effectiveness of the LIHTC program using California data [31] and a similar study using six metropolitan areas across the country [30], locational analyses including a study about the effect of LIHTC developments on nearby single-family home values in one county in Iowa [33], an analysis of Southern California LIHTC developments in terms of neighborhood poverty and access to employment [34], and a four-metropolitan-area study examining the spatial clustering of LIHTC developments and associations of LIHTC development locations with an array of socio-economic characteristics [35].

The last eight-year period of publications (2011–2018) that we examined indicates a significant increase in the number of articles on the LIHTC. Many familiar themes continue, such as analyses related to the production of LIHTC units; in this period, examples include a comparison of square footage between LIHTC and non-LIHTC developments [40] and an assessment of the extent of mixed-use LIHTC developments [39]. Locational analyses and neighborhood effects research were popular, with a range of sub-topics being discussed, such as clustering of developments in poor, minority neighborhoods [43], social and physical disadvantage analysis of LIHTC units versus other rental units using multiple measures including poverty, schools, and environmental health [3], crime in QCT versus non-QCT neighborhoods [51], location efficiency [44], and walkability [47]. As with the previous period, locational/neighborhood analyses varied by study area, source of data, measurement, and other study design elements.

Also, during the last eight-year period of review, new themes and uncommon topics have emerged in the literature. Examples of new themes include analyses concerning the effectiveness of the QAP, a state-level policy document, in terms of impacting desired outcomes in practice [41,42] and LIHTC tenant rent savings and rent burdens [36–38]. Relatively unique topics for LIHTC also appeared during this period, such as green building and energy efficiency [52] and the association between party politics and the state distribution of the tax credits [53].

Clearly, our brief review of the literature demonstrates that LIHTC research spans a wide range of topics. In this article, we are especially interested in research analyzing the neighborhood characteristics associated with LIHTC development sites which would fall under the theme of locational analyses/neighborhood effects. Thus, we now narrow the focus of our review to a subset of the literature concerned with the neighborhood characteristics associated with LIHTC developments and discuss the findings from these types of studies.

Neighborhood Characteristics and Effects on Residents

Whether neighborhoods matter to individual outcomes for persons living in them is a long-standing question in the social science and policy literatures. In fact, there is a vast among of literature examining neighborhoods and their effects. Despite all this effort and some empirical support for the argument that neighborhoods influence individual outcomes, researchers still only have a partial understanding of how neighborhoods might influence outcomes and what outcomes are affected by which attributes of a neighborhood [54,55]. Nevertheless, on a practical level, housing policy must proceed with a logical conclusion supported by some existing research that "bad" neighborhoods can negatively influence the outcomes of their residents, and "good" neighborhoods can increase opportunity and improve lives.

Research following the implementation of various federal housing programs has investigated the neighborhoods of individuals receiving federal housing assistance. In particular, researchers and policymakers have focused on race/ethnicity and poverty concentrations in neighborhoods with assisted housing. This focus stems in part from the near-decade-long legal battle initiated by Chicago public housing residents alleging purposeful racial

segregation of African Americans into substandard public housing developments in poor neighborhoods. This battle led to the 1976 U.S. Supreme Court ruling in *Hills v. Gautreaux*, finding the Chicago Public Housing Authority and the U.S. Department of Housing and Urban Development had racially discriminated in the public housing program and must respond with a desegregation plan to address the problem. The plan resulted in the movement of thousands of African American households to better housing and neighborhoods [56,57]. Research on this program suggested that relocating to less segregated, lower poverty neighborhoods had positive benefits for the movers [57,58].

The effects of poverty deconcentration was further investigated by researchers studying the federal Moving to Opportunity (MTO) program, which began in the 1990s. The MTO program was designed as a 10-year experiment (with control groups) and involved poor households with vouchers moving from higher- to lower-poverty neighborhoods. The results from MTO were mixed and thus disappointing to some policymakers and scholars who anticipated relocation to a lower-poverty neighborhood would bring many benefits to the members of mover households (see final results in [59]). Nevertheless, longer-term analyses indicate important positive outcomes, especially for children who moved out of poverty at an earlier age [60].

An early contribution examining several housing programs including the LIHTC program found that LIHTC developments tended to be located in neighborhoods with a concentration of minorities and poverty, even though poverty was higher in neighborhoods served by other housing programs [26]. Several years later, a study of an array of assisted housing programs using a national dataset found that LIHTC developments are more likely to be located in neighborhoods with a higher percentage of African Americans, higher poverty rates, and lower housing values, among other factors [27]. Many other studies have looked at the location of LIHTC developments and the poverty rates in the neighborhoods in which they are located. In general, the findings from studies indicate that LIHTC developments do tend to be in lower-income neighborhoods with higher poverty rates compared to market rental units; however, some researchers note size of development matters, LIHTC units are increasingly located in suburbs, and the program is making progress in situating units in lower-poverty neighborhoods with more racial diversity [5,34,42,61–63].

Studies on LIHTC developments and racial/ethnic and poverty concentration often consider other neighborhood characteristics in their analyses. The neighborhood characteristics vary by study, with indicators such as the percentage of households on welfare, unemployment, housing quality, and school quality appearing in some analyses. Generally, these studies find that LIHTC neighborhoods tend to be associated with less favorable associations on these indicators [26,30,64,65]. Moreover, related to location, researchers have examined LIHTC development sites to assess spatial clustering, access to jobs, exposure to traffic, and proximity to transit and related location efficiency. Findings from these studies reveal that LIHTC developments exhibit spatial clustering (at least in some metropolitan areas), have mixed findings on access to jobs, experience a good amount of traffic exposure, have low walkability, and are not as accessible to transit as policy makers may desire [34,35,43,43–45,66–68].

The scholarly research on the neighborhood characteristics associated with LIHTC developments often reflects a connection to the practice of LIHTC policy. Specifically, some characteristics studied by researchers are explicitly mentioned in states' LIHTC policy documents, the QAP. According to [69], "Many states prioritize proximity to transit" (p. 8) by offering amenities points in LIHTC proposal scoring with the goal of increasing employment opportunity and improving the environment. Access to parks or green (open) space is another locational characteristic that garners amenity points in some states' QAPs [69]. The rationale for this amenity preference is clear in the literature; studies have found that parks and green spaces are correlated with better health outcomes [44,70], more physical activity [71], increased social capital [72], improved quality of life [73], and overall community well-being [74]. However, while LITHC development proximity to transit has been included

in numerous LIHTC locational studies, these developments' access to parks has not been examined widely.

Overall, the research suggests that LIHTC development locations tend to be in poor-quality neighborhoods, based on a range of indicators. However, evidence from several studies indicates that improvement on some indicators has occurred over time. Attempting to generalize across the existing research is complicated by the myriad of study designs and study areas. In some cases, researchers compare the LIHTC neighborhoods to all other neighborhoods, while other studies include comparisons of different housing programs. Study areas also vary between case studies of a single metropolitan area and comparisons across multiple metropolitan areas (typically in different states), states, and the nation as a whole. These studies are not directly comparable. For example, the states have a great deal of flexibility in developing their LIHTC policies through the QAP, therefore, direct comparison on some outcomes is ill-advised. However, building a robust body of studies on the neighborhood quality of LIHTC developments is essential for drawing generalized conclusions and for future meta-analyses of these studies.

This study aims to add to the body of research on the neighborhood quality of LIHTC developments. In the next section, we discuss the study design including the study areas and our rationale for our choices. We also describe the data and methodology used in our analyses.

3. Study Design, Data, and Methodology

This research examines the neighborhood quality associated with LIHTC developments compared to the quality of neighborhoods without a LIHTC development. Specifically, we ask, "Which characteristics are associated with neighborhoods that contain a LIHTC development?" We also seek to determine if differences in the quality of LIHTC neighborhoods change across geographic scales within one state.

This study was designed as a multi-level, state and urban county study. By examining one state and one county within that same state, this study does not introduce variation in the policies governing the LIHTC program, such as state preferences influencing site selection, which most likely would be present in a comparison of areas from different states. At the same time, the literature suggests that local market conditions affect the siting of LIHTC developments, and our design allows for an exploration of any differences between the statewide program and one local urban market in that state.

The State of California was chosen as the state, because, by virtue of its status as the most populous state in the nation, it receives the largest number of LIHTCs. Additionally, the state has a sizeable inventory of LIHTC developments. According to the California Tax Allocation Committee project data (can be assessed at: https://www.treasurer.ca.gov/ctcac/projects.asp, accessed on 2 March 2020), as of 2018, California had produced over 389,000 units supported by the LIHTC with over 94% of the units for low-income households. While these developments are more concentrated in urban areas, the project map shows that there are LIHTC developments throughout the state, including rural agricultural areas. Furthermore, California, with its extremely high housing costs and over 56% of the households being housing-cost burdened (see Table 2), has a critical need for affordable housing.

As shown in Table 2, California as a whole is racially and ethnically diverse, and its annual median household income, at almost $62,000, is relatively high. For LIHTC tenants in the state, their racial/ethnic composition at the end of 2017 was also diverse, with about a quarter of tenants being white, 17.6% being African American, and approximately four percent being Asian; across all races, 38.8% reported being Hispanic. Understandably, because the LIHTC serves low-income households, the 2017 annual median household income of LIHTC tenants, at $20,540, was much lower, about one-third lower, than the statewide figure (U.S. Department of Housing and Urban Development, 2019).

Table 2. Population and Housing Characteristics, CA and LA County, 2015.

Characteristics	California		Los Angeles County	
	Number	Percent of Total Population	Number	Percent of Total Population
African American	2,160,795	5.62%	801,739	7.99%
Asian	5,192,548	13.51%	1,401,289	13.96%
White	14,879,258	38.73%	2,703,547	26.93%
Hispanic	14,750,686	38.40%	4,842,319	48.24%
Other [1]	1,438,177	3.74%	246,111	2.88%
Foreign Born	10,390,086	27.04%	3,485,724	34.72%
Persons in Poverty	6,135,142	16.3%	1,800,265	18.20%
Renter Households	5,808,625	45.67%	1,763,190	54.03%
Housing Cost Burdened	3,133,822	56.91%	1,002,593	59.70%
Median Household Income		$61,818		$56,196
Median Gross Rent		$1255		$1231

[1] Includes all other races and mixed races. *Source: U.S. Census Bureau, 2015, ACS 5-Year Estimates.*

The County of Los Angeles was chosen as the county case for several reasons. It has a considerable amount of LIHTC-financed housing, approximately 68,000 units, and a great need for affordable rental housing. Furthermore, it is a large, urbanized area with over 10,000,000 residents who are highly diverse in terms of socio-economic characteristics including a relatively high poverty rate and very high housing costs. In fact, when comparing LA County and California as a whole, the County is more racially–ethnically diverse, has a higher poverty rate, has a larger proportion of renter households, and has a higher percentage of cost-burdened households (see Table 2).

The data for the multivariate analyses were compiled from numerous publicly available secondary sources. Data on LIHTC development siting in California were downloaded from the California Tax Allocation Committee website. The demographic and housing characteristics for census tracts in California were retrieved from the U.S. Census, 2015 American Community Survey (five-year estimates). The built-environment characteristics, i.e., the presence of High-Quality Transit Areas and parks, are from the Southern California Association of Governments (SCAG) and UCLA Institute for Digital Research and Education, respectively.

The data from all sources were compiled into one file for analysis and inspected for missing values and distribution of variables. None of the categorical variables had missing values. Several of the continuous variables, however, had missing values. There are numerous methods for filling missing values, including imputation by statistical means, which is a longstanding and common approach. We followed this approach by using the mean of the existing cases for a variable to fill the missing cases on that variable; variables with missing values typically had less than 1% of the cases missing. Given the low proportion of missing values on variables, filling the missing values with that variable's mean is appropriate and would not be expected to bias results in any meaningful way.

In addition to filling missing values, several of the variables were transformed for use in the multivariate analysis. A natural log or square root transformation was applied to several variables to address skewness of their distributions (the tables with analytic results identify these variables and their transformations). Moreover, three variables were constructed for the multivariate analyses. First, the racial diversity index was computed using the Simpson index, a measure of biological diversity which can be applied to urban studies (Talen, 2006). In this study, the index is calculated based on five racial/ethnic groups (race categories): non-Hispanic white, non-Hispanic Black, non-Hispanic Asian, non-Hispanic others, and Hispanic. The equation of the index is as follows:

$$\text{Simpson's Index} = \frac{N_i(N_i - 1)}{\Sigma\, n_{ij}(n_{ij} - 1)}, \quad (1)$$

where n_{ij} is the total population of the j^{th} *race category* in census tract i, and N_i is the total population of census tract i. When the value of the index is one, only one race category

occupies the area. A higher value of the index implies greater diversity, which can reach the total number of race categories included in the data (five in this study). The index indicates the probability of two individuals belonging to the same race category from random selection [75].

Second, a composite measure of economic hardship was created using four indicators: the poverty rate, unemployment rate, percentage of households on public assistance, and median household income (income reversed so all indicators move in same direction). Every indicator but the unemployment rate was transformed to address skewness and each indicator was standardized before summing the four indicators. Finally, using GIS, we identified LIHTC clusters or where five or more LIHTC developments existed in a census tract and/or neighborhoods contiguous to it.

To answer our primary research question, we use logistic regression for our multivariate analyses. This approach is appropriate, because the dependent variable is dichotomous, i.e., the presence of a LIHTC development in a neighborhood or not. The results from the analyses are presented in the next section.

4. Analyses

This research was designed to investigate the neighborhood quality of LIHTC developments in California at the state-level and in Los Angeles County. Prior to multivariate analysis, we recognized that federal policy supported the location of LIHTC developments in QCTs. QCTs are defined by income and poverty indicators, and such an approach could result in LIHTC housing being located in poorer neighborhoods; in other words, federal policy could be influencing the neighborhood location of these developments. The degree of influence is uncertain and some scholars have found that, even without the QCT locational incentive, LIHTC developments would tend to be sited in low rent, hence lower income, areas [76].

We examined the overlap of LIHTC neighborhoods (one or more LIHTC developments in the neighborhood) and QCTs in our study areas. In California as a whole, twenty-five percent of the LIHTC neighborhoods were QCTs; in Los Angeles County that figure was higher, at 38.7%. While LIHTC neighborhoods were not overwhelmingly located in QCTs, there was an association between these two types of neighborhoods, as revealed in a chi-square analysis. We found that LIHTC neighborhoods and QCTs in California, and in Los Angeles County, are associated statistically (see Table 3).

We also investigated the relationship between QCTs and one of the substantive independent variables in our multivariate analyses, the economic hardship index. This index is comprised of indicators related to the definition of a QCT. For this reason, we ran correlations between QCTs, these indicators, and the economic hardship index and found moderate and statistically significant correlations between QCTs and the indicators separately, as well as with the index measure. Based on further analyses, we chose to leave QCT out of the multivariate analyses.

This research examines the neighborhood quality of the LIHTC developments in California. We begin by investigating these developments throughout the state. Next, we narrow our analysis to consider the large urban county of Los Angeles. We then compare the statewide results to the County. Given that the QAP is a state policy document, we would expect similarities in our findings from these two geographies. However, it is possible that the models display differences due to local market conditions in the urban area.

The analyses consider the relative contributions of different sets of characteristics to the likelihood that a LIHTC development will be located in a neighborhood. The variables are grouped by race–ethnicity and racial diversity, economic hardship, housing characteristics, and built-environment features.

Table 3. LIHTC Neighborhoods and QCTs, CA and LA County.

California	QCT		Not a QCT		Total
	#	%	#	%	
One or more LIHTC Development	427	25.0	1279	75.0	1706
No LIHTC Development	520	8.2	5786	91.8	6306
Total	947	11.8	7065	88.2	8012
X^2 (1 df) = 362.9 (p = 0.000)					
Los Angeles County					
One or more LIHTC Development	158	38.7	250	61.3	408
No LIHTC Development	216	11.3	1702	88.7	1918
Total	374	16.1	1952	83.9	
X^2 (1 df) = 188.1 (p = 0.000)					2326

4.1. California

We analyzed 8012 census tracts (neighborhoods) in California after removing census tracts with a population of zero. LIHTC developments are located in 21% of these neighborhoods. The presence of a LIHTC development in a neighborhood is the dependent variable, and the analysis is designed to identify the neighborhood characteristics associated with LIHTC locations. These neighborhood characteristics include: (1) demographic (white, not Hispanic, and racial diversity), (2) economic (the economic hardship index), (3) housing (median gross rent and percentage renter occupied units), and (4) built environment (population density, presence of a cluster of LIHTC developments). Table 4 displays these variables, their measurements, and their descriptive statistics.

Table 4. Descriptive Statistics for Variables in the Model, California.

Variables	Description	Mean
Dependent variable		
LIHTC Neighborhood	1 = at least one LIHTC development in neighborhood, 0 = none	0.21
Independent Variables		
White, not Hispanic	Proportion of persons who are White, not Hispanic	0.404 (0.268)
Racial Diversity [1]	Index using five racial groups to indicate racial/ethnic diversity	2.230 (0.719)
Economic Hardship in Neighborhood [2]	Additive Index of four indicators of economic hardship	0.000 (3.375)
Median Gross Rent in Neighborhood	Median Gross Rent in $	1404.30 (487.21)
Rental Housing Units in Neighborhood	Proportion of units that are renter occupied	0.448 (0.235)
Population Density	Number of persons per sq. mile	8588 (9622)
LIHTC Development Concentration	1 = Five or more LIHTC developments in neighborhood and contiguous neighborhoods, 0 = Less than five	0.186

[1] Based on Simpson's Reciprocal Index where 1 means perfect homogeneity and a higher number implies racial diversity. [2] The index ranges from −9.04 (lowest hardship) to 19.31 (highest hardship). The Cronbach's alpha is 0.865.

We use a nested logistic regression approach to reveal the relative contribution of each type of characteristic (see Table 5). In Model 1, we include the demographic variables, proportion of non-Hispanic Whites in the neighborhood, and racial diversity. Both coefficients are statistically significant (p = 0.05 and p = 0.01, respectively), with a lower proportion of non-Hispanic Whites in LIHTC neighborhoods compared to neighborhoods without LIHTC developments. This result suggests that LIHTC developments tend to be in

neighborhoods with a higher proportion of minorities. The racial diversity coefficient is positive, indicating that LIHTC developments tend to be located in more racially diverse neighborhoods. Together, these variables suggest that LIHTC developments tend to be in racially diverse neighborhoods with some minority concentration. The next variable entered into the model (Model 2) captures economic hardship in the neighborhood. Due to the fact that it is a composite measure, it captures more than the poverty concentration, it captures other economic characteristics that may accompany poverty and thus reflects the degree to which a neighborhood experiences multiple detrimental conditions. The coefficient is statistically significant ($p \leq 0.01$) and positive, revealing that LIHTC neighborhoods experience more economic hardship, on average, than non-LIHTC neighborhoods.

Table 5. Logistic Regression Results for California as a Whole.

	Model 1		**Model 2**		**Model 3**		**Model 4**	
Variable	**B**	**SE**	**B**	**SE**	**B**	**SE**	**B**	**SE**
White, not Hispanic	−1.563 **	0.109	−0.242	0.127	−0.337 *	0.132	0.182	0.154
Racial Diversity (ln)	0.185 *	0.083	0.470 **	0.086	0.506 **	0.089	0.456 **	0.094
Econ Hardship index			0.203 **	0.010	0.042 **	0.015	0.034 *	0.016
Median Gross Rent (ln)					−1.612 **	0.141	−1.566 **	0.157
Rental housing (%)					1.661 **	0.139	1.124 **	0.163
Population density (ln)							0.095 **	0.023
Five or more LIHTC developments							1.624 **	0.068
Nagelkerke's R^2	0.042		0.120		0.170		0.265	
	X^2 = 222.296 **		X^2 = 644.959 **		X^2 = 929.827 **		X^2 = 1503.010 **	
	(2 d.f.)		(3 d.f.)		(5 d.f.)		(7 d.f.)	

* $p \leq 0.05$ ** $p \leq 0.01$.

Housing characteristics are the next set of variables added to the model (Model 3). The median gross rent and the proportion of rental housing units in the neighborhood are both statistically significant (at $p \leq 0.01$). The median gross rent is lower in LIHTC neighborhoods compared to non-LIHTC neighborhoods, and LIHTC developments are located in neighborhoods with a higher proportion of units occupied by renters.

The final model (Model 4) adds built-environment characteristics, i.e., population density and concentration of LIHTC developments. Both of these variables are positive and statistically significant (at $p \leq 0.01$). Thus, LIHTC neighborhoods are associated with higher population densities and spatial clusters of LIHTC developments.

Each set of variables increased the pseudo-R^2, and the model was stable, as variables were added. The only coefficient that wavered on statistical significance was the white, not Hispanic variable, which suggests some caution in over-interpreting the individual coefficient. However, this variable appears to add to the overall fit of the model, so we retained it in our full model. We exponentiated coefficients for all the variables and two in particular appear to have strong effects. For every one percent increase in renter units in the neighborhood, the odds that the neighborhood has a LIHTC development increases by 308% (exp(B) = 3.08). A LIHTC cluster is five times more likely in a LIHTC neighborhood than a neighborhood without a LIHTC development (exp(B) = 5.07).

The results for California reveal that there are strong associations between demographic, economic, housing, and built-environment characteristics and the location of LIHTC developments. In general, for the state as a whole, it appears that LIHTC developments tend to be clustered and are more likely to be in poorer-quality neighborhoods compared to neighborhoods without LIHTC developments.

4.2. Los Angeles County

Los Angeles County is by far the largest county in California. It has many neighborhoods and a huge inventory of LIHTC housing. We analyzed 2326 census tracts (neighborhoods) in the County after removing 20 census tracts with zero populations. In Los Angeles, LIHTC developments are located in 18% of these neighborhoods, a slightly lower proportion of these neighborhoods than found at the state level. The same variables are

used for Los Angeles County as in the statewide analysis and constructed measures, i.e., racial diversity and economic hardship, were similarly created for the area. However, in the Los Angeles analysis, we include two additional built-environment variables, i.e., high quality transit areas and parks, in the final model. We included these variables in the County analysis for two reasons. First, access to transit and parks have been included in the state QAP as preferences and thus earn amenities points for development proposals, so we expect that LIHTC developments would be associated with them. Second, these data were available at the County level from reliable sources. Table 6 displays the variables used in the Los Angeles models with their measurements and descriptive statistics.

Table 6. Descriptive Statistics for Variables in the Model, Los Angeles County.

Variables	Description	Mean
Dependent variable		
LIHTC Neighborhood	1 = at least one LIHTC development in neighborhood, 0 = none	0.180
Independent Variable		
White, not Hispanic	Proportion of persons who are White, not Hispanic	0.276 (0.258)
Racial Diversity [1]	Index using five racial groups to indicate racial/ethnic diversity	2.138 (0.704)
Economic Hardship in Neighborhood [2]	Additive index of four indicators of economic hardship	0.000 (3.270)
Median Gross Rent in Neighborhood	Median Gross Rent in $	1378.37 (454.19)
Rental Housing Units in Neighborhood	Proportion of units that are renter occupied	0.513 (0.260)
Population Density	Number of persons per sq. mile	13451 (11164)
LIHTC Development Concentration	1 = Five or more LIHTC developments in neighborhood and contiguous neighborhoods, 0 = Less than five	0.132
High Quality Transit Area [3]	1 = Neighborhood in high quality transit area, 0 = not	0.810
Park(s)	1 = At least one park in neighborhood, 0 = no parks	0.500

[1] Based on Simpson's Reciprocal Index, where 1 means perfect homogeneity and a higher number implies racial diversity. [2] The index ranges from −9.04 (lowest hardship) to 19.31 (highest hardship). The Cronbach's alpha is 0.865. [3] This variable comes from the Southern California Association of Governments (SCAG). SCAG The definition that SCAG bases its definition on "language in SB375 which defines: A. Major Transit Stop: A site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 min or less during the morning and afternoon peak commute periods (CA Public Resource Code Section 21064.3)" (accessed on 2 March 2020 at http://gisdata-scag.opendata.arcgis.com/datasets/1f6204210fa9420b87bb2e6c147e85c3_0).

Following the nested model approach used in the statewide analysis, we present the results from each model as we add sets of variables (see Table 7). The results are reasonably stable across the models. We focus on two specifications of the model, Model 4, which is comparable to the full model for California, and Model 5, which adds two additional built-environment variables to the analysis. In Model 4, the coefficients for five variables are statistically significant (p = 0.05 or better). First, the racial diversity estimate is positive, indicating that LIHTC developments are located in more racially diverse neighborhoods. The economic hardship variable is also positive, revealing LIHTC neighborhoods experience more economic hardship than non-LIHTC neighborhoods. The result for median gross rent shows that LIHTC neighborhoods are associated with lower rent on average. In addition, LIHTC developments are located in neighborhoods with a higher proportion of units occupied by renters compared to neighborhoods without a LIHTC project. Finally, LIHTC development clusters are associated with neighborhoods that have a LIHTC development. These results are similar to the statewide model, with the exception of population density, which was significant at the state level but not at the Los Angeles County level.

Table 7. Logistic Regression Results for Los Angeles County.

	Model 1		Model 2		Model 3		Model 4		Model 5	
Variable	**B**	**SE**	**B**	**SE**	**B**	**SE**	**B**	**SE**	**B**	**SE**
White, not Hispanic	−0.505 **	0.055	0.030	0.071	0.068	0.075	0.111	0.081	0.113	0.082
Racial Diversity (ln)	0.798 **	0.198	0.646 **	0.213	0.644 **	0.220	0.491 *	0.229	0.509 *	0.230
Econ Hardship index			0.337 **	0.027	0.150 **	0.031	0.132 **	0.033	0.137 **	0.033
Median Gross Rent (ln)					−2.782 **	0.377	−2.398 **	0.387	−2.415 **	0.389
Rental housing (%)	data	data			1.484 **	0.295	0.743 *	0.352	0.777 *	0.359
Population density (ln)							0.073	0.070	0.097	0.073
Five or more LIHTC developments	data						1.491 **	0.149	1.492 **	0.151
Parks	data	data							0.311 *	0.132
High Quality Transit Area									0.047	0.235
Nagelkerke's R^2	0.065		0.188		0.254		0.313		0.316	
	X^2 = 93.399 **		X^2 = 281.375 **		X^2 = 388.800 **		X^2 = 488.447 **		X^2 = 494.119 **	
	(2 d.f.)		(3 d.f.)		(5 d.f.)		(7 d.f.)		(9 d.f.)	

* $p \leq 0.05$ ** $p \leq 0.01$.

In model 5, we add two additional variables to capture other characteristics of the built environment. Using GIS, we created these two location-based variables: whether a neighborhood is in a high-quality transit area as determined by the Southern California Association of Governments and whether there is a park in the neighborhood; these variables are dichotomous. The presence of these characteristics is considered positive for a neighborhood. The results remain relatively stable for the five variables found statistically significant in Model 4. For the additional variables, the high-quality transit coefficient is not statistically significant, but the coefficient for the park variable is significant and positive. Therefore, neighborhoods with a LIHTC development are more likely to have a park within them compared to non-LIHTC neighborhoods.

The pseudo-R^2 increased with each model, although the fits from Models 4 and 5 improved only slightly. Nevertheless, the higher pseudo-R^2 from Model 5 indicates the final model best predicts the dependent variable in this study. We exponentiated coefficients for the variables in the final model and found, similar to the statewide model, there are two variables with relatively strong effects. The first is a housing characteristic variable: renter-occupied housing. For every one percent increase in renter-occupied units in the neighborhood, the odds that the neighborhood has a LIHTC development increases by 218% (exp(B) = 2.18). The second variable concerns the clustering of LIHTC developments. A LIHTC cluster is over four times more likely in a LIHTC neighborhood than in a neighborhood without a LIHTC development (exp(B) = 4.47).

Thus far, our analyses reveal that the State and LAC appear to have similar results. However, the County's population, about three times the size of the next largest county, a relatively high proportion of renter households and significant poverty level (U.S. Census Bureau, 2018) illustrate it is different from the state as a whole in many respects. Moreover, given its large inventory of LIHTC units, it is possible LAC is dominating the state analysis. We investigated this possibility by rerunning the California model with 5686 cases, i.e., after excluding neighborhoods in Los Angeles County. These results are shown in Table 8.

The exclusion of LAC from the state analysis produces one important change in the results. Without LAC in the analysis, there is no statistically significant relationship between neighborhood economic hardship and the location of LIHTC developments. In other words, LIHTC housing in California, except for LAC, is not more likely to be in disadvantaged neighborhoods. The results for all other variables in the model did not change substantively (direction of association and statistical significance remain), and the Nagelkerke R^2 dipped only slightly to 26.1.

In the next section, we discuss the results of our analyses and identify the strengths and limitations of the study.

Table 8. Logistic regression: LIHTC Neighborhoods, California without Los Angeles County.

Variable	B	SE
White, not Hispanic	−0.058	0.182
Racial Diversity	0.294 *	0.116
Econ Hardship index	0.004	0.018
Median Gross Rent (LN)	−1.543 **	0.178
Rental housing (%)	1.413 **	0.192
Population density (LN)	0.126 **	0.025
Five or more LIHTC developments	1.555 **	0.078
Nagelkerke's R^2	0.261	
	X^2 = 1071.37 ** (7 d.f.)	

* $p = 0.05$ ** $p \leq 0.01$.

5. Discussion

This research has two major strengths. First, the research adds to the growing body of literature on the geography of LIHTC neighborhoods, particularly as this geography relates to policy goals. That is, this research indicates that state policy can influence the locational patterns of LIHTC developments and result in better neighborhoods for residents of this housing. Second, our findings reveal that state policies may not be uniformly effective across geographic areas. Some regions may have unique characteristics and challenges that state policies fail to fully address.

The primary purpose of the research was to examine the neighborhood characteristics associated with LIHTC neighborhoods compared with neighborhoods without a LIHTC development. The rationale for the research concerns the policy goals of the program. If the goal is to provide high-quality, lower-income housing in good-quality residential environments, then neighborhoods with a LIHTC development should not be worse off compared to neighborhoods without LIHTC projects. Secondarily, the study was designed to compare across geographic scales under the same state policy guidance. While it is assumed that the program outcomes may differ across states due to variations in state-determined goals, it is less clear if outcomes would vary within states. We explored similarities and differences to assess if a local market may be different from the state as a whole.

The analyses reveal that neighborhoods with LIHTC developments versus neighborhoods without these developments differ in numerous ways, in the state as a whole and in LAC. That is, LIHTC neighborhoods, in both cases, tend to be in racially/ethnically diverse neighborhoods with higher levels of economic hardship, lower rent, a higher percentage of renters, and spatial clustering of LIHTC developments. However, when LAC is removed from the state-level analysis, there is a critical difference. Most notably, while LIHTC neighborhoods in LAC are more likely to experience economic hardship, without LAC in the analysis, there was no association between LIHTC neighborhoods and economic hardship at the state level. This result is consistent with some existing research indicating local markets vary and may not represent the LIHTC outcomes of the state. In the case of California, it is important to separate out the behemoth county of Los Angeles to assess the state's progress toward the goal of siting LIHTC developments in less disadvantaged neighborhoods. While the state has performed well on such a goal generally, the question remains as to why LIHTC housing in LAC is so much more likely to be sited in economically worse neighborhoods.

While LIHTC neighborhoods have improved over time according to some researchers [1], Los Angeles County seems to be lagging behind the rest of California in delivering LIHTC housing in economically strong neighborhoods. This finding is intriguing, given that, in California as a whole and in LAC, LIHTC developments tend to be in neighborhoods that are racially diverse with lower median gross rent, a higher proportion of renter occupied housing, and a clustering of LIHTC developments. In other words, LIHTC developments in California are sited in neighborhoods that serve similar households: racially diverse, lower-income renters. The divergent results concerning the economic disadvantage of LIHTC

neighborhoods in LAC, however, suggest a unique aspect of the county, possibly the particular geography of neighborhoods, the housing market, and/or local policy preferences for LIHTC development. Additional research on LAC is necessary to fully understand the pattern of LIHTC developments and the forces producing this pattern.

The results from LAC are positive in terms of neighborhood amenities. Transit appears to be distributed in such a way that a large majority of neighborhoods are in high quality transit areas, indicating reasonably good access across all neighborhoods. Moreover, LIHTC neighborhoods in LAC are more likely to have at least one park. As discussed in the literature, access to green spaces and recreational activities has the potential to offer health and social benefits to residents.

The results for California and LAC reveal the influence of the QAP, the state LIHTC policy document. The state (without LAC) appears to be encouraging the location of LIHTC development in neighborhoods that are relatively strong economically. In LAC, the granting of amenities points for parks in the QAP may be responsible for the higher likelihood that LIHTC developments will be nearer to parks compared with non-LIHTC development. These finding are consistent with the analysis of the QAPs from 21 states by [69], who concluded that the QAP had an effect on the location decisions for LIHTC developments.

This research should be understood in relation to its limitations. First, the analyses, while guided by the extant literature, are correlational, not causal, in nature. For this reason, our findings provide valuable insights about the relationships between the siting of LIHTC developments and neighborhood characteristics but are not definitive. Second, the research focused on one state and one urbanized area within that state, therefore, the results should not be generalized to all states and urbanized areas in the nation. That being said, if a large number of studies across many states and urbanized areas are completed with similar results, then a stronger case for generalizability could be made.

In general, our results for LAC are consistent with the existing research. Although our findings vary between LAC and the state of California, there is a tendency for LIHTC developments to be clustered and, in LAC, to be concentrated in economic hardship (or distressed) neighborhoods. Such persistence of disappointing locational outcomes for the LIHTC program in regions has spurred housing policy scholars to offer a range of prescriptive measures to address the program's siting shortcomings (see [1,77]). These proposed approaches offer the grist for policy discourse at the programmatic level. In the final section, we discuss a few of these recommendations and present some of our own.

6. Conclusions

The LIHTC program is the largest federally subsidized housing production program in the U.S. It has produced millions of housing units and serves the needs of many lower-income households. The program also enjoys bi-partisan political support for the most part. However, housing policy scholars remain concerned that the program concentrates tenants in neighborhoods with few opportunities and thus could perpetuate a cycle of disadvantage.

The research in this article contributes to the growing body of literature focused on the neighborhood quality associated with LIHTC developments and yields some important conclusions. First, we investigated demographic, economic, housing, and built-environment characteristics in LIHTC versus non-LIHTC neighborhoods at two levels of government: the state as a whole and LAC. We found that the neighborhood conditions of LIHTC developments at both scales share numerous similarities. In both cases, LIHTC neighborhoods had a higher level of racially/ethnic diversity, more economic hardship, lower rent, a higher percentage of renters, and spatial clustering of LIHTC developments. Second, after removing LAC from the state level analysis, we discovered a stark difference on one condition between these two geographies: LIHTC developments in LAC are more likely to be in economically disadvantaged neighborhoods, while the same is not true at the state level. Due to the fact that LAC is a large urban region with a relatively large number of LIHTC developments, siting developments in disadvantaged neighborhoods and concentrating these developments in these areas is a major concern in need of further investigation. Third,

because many outcomes were similar between the state and LAC, we conclude the power of statewide policy guidance as presented in the QAP is effective for most of the state. The discretion of the state, therefore, seems to be an important influence on the program's locational outcomes. Given the politics of land use at the local level of government in the U.S., states may be more politically able to impose requirements that would lead to a more equitable distribution of LIHTC developments.

Some policy scholars have suggested approaches to improve the locational outcomes for LIHTC developments. Given our findings, we agree with [1], who proposes the program be reconfigured to promote mixed-income housing, and [77], who calls for a rethinking of the distribution of LIHTC developments through the elimination of the Qualified Census Tract bonus, a policy that can lead to concentration of LIHTC units in disadvantaged neighborhoods. We also agree (for California at least) with [77], who suggests a metropolitan approach to the administration of assisted housing programs. Housing programs and other urban system functions could be more efficient and equitable under a regional government. Nevertheless, we recognize that regionalists have argued for this approach to urban operations for many decades, but political barriers to such a change are significant.

In addition, based on our analyses, we recommend the LIHTC program offer a bonus (additional credits) for developments specifically locating in neighborhoods with lower numbers of renters, higher rent, and a lower concentration of LIHTC and other subsidized housing. Policy researchers [1,77] emphasize that such changes would need to be performed at the federal level. While direct and narrow mandates for the siting of LIHTC developments would likely encounter significant pushback from states, localities, and developers of LIHTC housing, offering a bonus would be an incentive, not a mandate, for developing in relatively more affluent neighborhoods without a large concentration of subsidized housing. Thus, this approach may be more politically palatable.

Federal changes to the LIHTC program should be pragmatic, inclusive, and produce improvements in terms of outcomes. Understanding the obstacles to effective new siting requirements at the state and local levels is crucial. For example, our past conversations with nonprofit developers producing LIHTC units in California revealed one of their ongoing challenges. Specifically, the location of LIHTC developments is often driven by the willingness of a local jurisdiction to support this type of development. In some cases, a local jurisdiction may welcome or support LIHTC developments as a form of revitalization or new investment in a disadvantaged neighborhood. In other words, a local jurisdiction may want the new capital investment of a LIHTC development in a poorer neighborhood, with the hope of spurring new market-based interest in the area, even if the siting of this low-income housing brings more low-income persons to the neighborhood initially. Given the complexities of the politics of land use and the layers of government, states face a challenging task of crafting their LIHTC policies to allow some level of local discretion while meeting more equitable distributive outcomes for housing developments. In California, fostering cooperation from local governments through their regional council of governments may be a step in the right direction, but, to achieve improved LIHTC locational outcomes and thus better opportunities for LIHTC tenants, California may need to link other state-controlled funding to these outcomes.

Housing scholars need to expand their research and move toward more generalizable results. Additional research on the LIHTC program will enhance the existing body of literature, especially research focused on particular aspects of the program, such as locational outcomes and their effects, and would contribute to a future meta-analysis. Results based on a substantial body of these studies will strengthen the generalizability (or not) of findings about the program. Furthermore, studies of the pattern of support by local jurisdictions, particularly the motivations for this support, would provide insights to state officials revising their QAP. Finally, future and expanded analyses of neighborhoods before and after the siting of a LIHTC development will be helpful to determine the influence of LIHTC developments on the revitalization, stagnation, or decline of neighborhoods.

Author Contributions: Conceptualization, V.B. and E.H.; methodology and software, V.B., E.H. and J.W.; formal analysis, V.B.; writing–original draft preparation, V.B., E.H., J.W.; writing–review and editing, V.B., E.H., and J.W. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Data compiled from multiple public sources discussed in article.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. McClure, K. What Should Be the Future of the Low-Income Housing Tax Credit Program? *Hous. Policy Debate* **2019**, *29*, 65–81. [CrossRef]
2. Deng, L. Low-Income Housing Tax Credit Developments and Neighborhood Change: A Case Study of Miami-Dade County. *Hous. Stud.* **2011**, *26*, 867–895. [CrossRef]
3. Ellen, I.G.; Horn, K.M.; Kuai, Y. Gateway to Opportunity? Disparities in Neighborhood Conditions Among Low-Income Housing Tax Credit Residents. *Hous. Policy Debate* **2018**, *28*, 572–591. [CrossRef]
4. Kingsley, T. *Trends in Housing Problems and Federal Housing Assistance*; Urban Institute: Washington, DC, USA, 2017; p. 22.
5. McClure, K.; Johnson, B. Housing Programs Fail to Deliver on Neighborhood Quality, Reexamined. *Hous. Policy Debate* **2015**, *25*, 463–496. [CrossRef]
6. Wallace, J.E. Financing Affordable Housing in the United States. *Hous. Policy Debate* **1995**, *6*, 785–814. [CrossRef]
7. Roberts, B.F.; Harvey, F.B., III. Comment of Jean L. Cummings and Denise DiPasquale's The Low-Income Housing Tax Credit: An Analysis of the First Ten Years. *Hous. Policy Debate* **1999**, *10*, 309–320. [CrossRef]
8. Reid, C.K. Rethinking "Opportunity" in the Siting of Affordable Housing in California: Resident Perspectives on the Low-Income Housing Tax Credit. *Hous. Policy Debate* **2019**, *29*, 645–669. [CrossRef]
9. Orlebeke, C.J. The Evolution of Low-Income Housing Policy, 1949 to 1999. *Hous. Policy Debate* **2000**, *11*, 489–520. [CrossRef]
10. Cummings, J.L.; DiPasquale, D. The Low-Income Housing Tax Credit An Analysis of the First Ten Years. *Hous. Policy Debate* **1999**, *10*, 251–307. [CrossRef]
11. Stegman, M. Comment of Jean L. Cummings and Denise DiPasquale's The Low-Income Housing Tax Credit: An Analysis of the First Ten Years: Lifting the Veil of Ignorance. *Hous. Policy Debate* **1999**, *10*, 321–332. [CrossRef]
12. Stearns, J. The Low-Income Housing Tax Credit: A Poor Solution to the Housing Crisis. *Yale Law Policy Rev.* **1988**, *6*, 203–228.
13. Climaco, C.; Finkel, M.; Nolden, S.; Karen, R. *Updating the Low-Income Housing Tax Credit (LIHTC) Database Projects Placed in Service Through 2002*; A Report Prepared for the U.S. Department of Housing and Urban Development, Office of Economic Affairs; Abt Associates: Cambridge, MA, USA, 2004.
14. Freedman, M.; McGavock, T. Low-Income Housing Development, Poverty Concentration, and Neighborhood Inequality: Low-Income Housing Development. *J. Policy Anal. Manag.* **2015**, *34*, 805–834. [CrossRef]
15. Deng, L. The External Neighborhood Effects of Low-Income Housing Tax Credit Projects Built by Three Sectors. *J. Urban Aff.* **2011**, *33*, 143–166. [CrossRef]
16. Horn, K.M.; O'Regan, K.M. The Low Income Housing Tax Credit and Racial Segregation. *Hous. Policy Debate* **2011**, *21*, 443–473. [CrossRef]
17. Schwartz, A.F. *Housing Policy in the United States*; Routledge: New York, NY, USA, 2021.
18. Ballard, M.J. Profiting from Poverty: The Competition between for-Profit and Nonprofit Developers for Low-Income Housing Tax Credits. *Hastings LJ* **2003**, *55*, 211.
19. McClure, K. The Low-income Housing Tax Credit as an Aid to Housing Finance: How Well Has It Worked? *Hous. Policy Debate* **2000**, *11*, 91–114. [CrossRef]
20. Callison, J.W. New Tax Credit for Low-Income Housing Provides Investment Incentive. *J. Tax.* **1987**, *66*, 100–106.
21. McClure, K. Low and Moderate Income Housing Tax Credits Calculating Their Value. *J. Am. Plan. Assoc.* **1990**, *56*, 363–369. [CrossRef]
22. Stegman, M.A. The Excessive Costs of Creative Finance: Growing Inefficiencies in the Production of Low-income Housing. *Hous. Policy Debate* **1991**, *2*, 357–373. [CrossRef]
23. Jolin, M. Good Cause Eviction and the Low Income Housing Tax Credit. *Univ. Chic. Law Rev.* **2000**, *67*, 521. [CrossRef]
24. Malpezzi, S.; Vandell, K. Does the Low-Income Housing Tax Credit Increase the Supply of Housing? *J. Hous. Econ.* **2002**, *11*, 360–380. [CrossRef]
25. Lee, C.; Culhane, D.P.; Wachter, S.M. The Differential Impacts of Federally Assisted Housing Programs on Nearby Property Values: A Philadelphia Case Study. *Hous. Policy Debate* **1999**, *10*, 75–93. [CrossRef]

26. Newman, S.J.; Schnare, A.B. " ... And a Suitable Living Environment": The Failure of Housing Programs to Deliver on Neighborhood Quality. *Hous. Policy Debate* **1997**, *8*, 703–741. [CrossRef]
27. Rohe, W.M.; Freeman, L. Assisted Housing and Residential Segregation: The Role of Race and Ethnicity in the Siting of Assisted Housing Developments. *J. Am. Plan. Assoc.* **2001**, *67*, 279–292. [CrossRef]
28. Schwartz, A.; Meléndez, E. After Year 15: Challenges to the Preservation of Housing Financed with Low-income Housing Tax Credits. *Hous. Policy Debate* **2008**, *19*, 261–294. [CrossRef]
29. Orfield, M. Racial Integration and Community Revitalization: Applying the Fair Housing Act to the Low Income Housing Tax Credit. *Vand. L. Rev.* **2005**, *58*, 1747.
30. Deng, L. The Cost-effectiveness of the Low-income Housing Tax Credit Relative to Vouchers: Evidence from Six Metropolitan Areas. *Hous. Policy Debate* **2005**, *16*, 469–511. [CrossRef]
31. Eriksen, M.D. The Market Price of Low-Income Housing Tax Credits. *J. Urban Econ.* **2009**, *66*, 141–149. [CrossRef]
32. Baum-Snow, N.; Marion, J. The Effects of Low Income Housing Tax Credit Developments on Neighborhoods. *J. Public Econ.* **2009**, *93*, 654–666. [CrossRef]
33. Funderburg, R.; MacDonald, H. Neighbourhood Valuation Effects from New Construction of Low-Income Housing Tax Credit Projects in Iowa: A Natural Experiment. *Urban Stud.* **2010**, *47*, 1745–1771. [CrossRef]
34. Joassart-Marcelli, P. Closing the Gap between Places of Work and Residence: The Role of Rental Housing Assistance in Southern California. *Hous. Policy Debate* **2007**, *18*, 107–144. [CrossRef]
35. Oakley, D. Locational Patterns of Low-Income Housing Tax Credit Developments: A Sociospatial Analysis of Four Metropolitan Areas. *Urban Aff. Rev.* **2008**, *43*, 599–628. [CrossRef]
36. Burge, G.S. Do Tenants Capture the Benefits from the Low-Income Housing Tax Credit Program?: Do Tenants Capture the Benefits from the Low-Income Housing Tax Credit Program? *Real Estate Econ.* **2011**, *39*, 71–96. [CrossRef]
37. O'Regan, K.M.; Horn, K.M. What Can We Learn About the Low-Income Housing Tax Credit Program by Looking at the Tenants? *Hous. Policy Debate* **2013**, *23*, 597–613. [CrossRef]
38. Williamson, A.R. Can They Afford the Rent? Resident Cost Burden in Low Income Housing Tax Credit Developments. *Urban Aff. Rev.* **2011**, *47*, 775–799. [CrossRef]
39. Freemark, Y. Challenges in the Creation of Mixed-Use Affordable Housing: Measuring and Explaining Its Limited Prevalence. *Hous. Policy Debate* **2018**, *28*, 1004–1021. [CrossRef]
40. Lang, B.J. Input Distortions in the Low-Income Housing Tax Credit: Evidence from Building Size. *Reg. Sci. Urban Econ.* **2015**, *52*, 119–128. [CrossRef]
41. Ellen, I.G.; Horn, K.M. Points for Place: Can State Governments Shape Siting Patterns of Low-Income Housing Tax Credit Developments? *Hous. Policy Debate* **2018**, *28*, 727–745. [CrossRef]
42. Walter, R.J.; Wang, R.; Jones, S. Comparing Opportunity Metrics and Locational Outcomes in the Low-Income Housing Tax Credit Program. *J. Plan. Educ. Res.* **2018**, *38*, 449–462. [CrossRef]
43. Dawkins, C. The Spatial Pattern of Low Income Housing Tax Credit Properties: Implications for Fair Housing and Poverty Deconcentration Policies. *J. Am. Plan. Assoc.* **2013**, *79*, 222–234. [CrossRef]
44. Adkins, A.; Sanderford, A.; Pivo, G. How Location Efficient Is LIHTC? Measuring and Explaining State-Level Achievement. *Hous. Policy Debate* **2017**, *27*, 335–355. [CrossRef]
45. Houston, D.; Basolo, V.; Yang, D. Walkability, Transit Access, and Traffic Exposure for Low-Income Residents With Subsidized Housing. *Am. J. Public Health* **2013**, *103*, 673–678. [CrossRef] [PubMed]
46. Woo, A.; Joh, K.; Van Zandt, S. Unpacking the Impacts of the Low-Income Housing Tax Credit Program on Nearby Property Values. *Urban Stud.* **2016**, *53*, 2488–2510. [CrossRef]
47. Koschinsky, J.; Talen, E. Affordable Housing and Walkable Neighborhoods: A National Urban Analysis. *Cityscape* **2015**, *17*, 13–56.
48. White, J.R. *Tax Credits: Opportunities to Improve Oversight of the Low-Income Housing Program: Statement of James R. White, Associate Director, Tax Policy & Administration Issues, General Government Division, Before the Subcommittee on Oversight, Committee on Ways and Means, House of Representatives*; United States General Accounting Office: Washington, DC, USA, 1997.
49. Gramlich, E. Low-Income Housing Tax Credit Program. Available online: https://www.nlihc.org/sites/default/files/2014AG-254.pdf (accessed on 2 March 2022).
50. Keightley, M.P. *An Introduction to the Low-Income Housing Tax Credit (Updated)*; Congressional Research Service: Washington, DC, USA, 2021.
51. Freedman, M.; Owens, E.G. Low-Income Housing Development and Crime. *J. Urban Econ.* **2011**, *70*, 115–131. [CrossRef]
52. Zhao, D.; McCoy, A.P.; Agee, P.; Mo, Y.; Reichard, G.; Paige, F. Time Effects of Green Buildings on Energy Use for Low-Income Households: A Longitudinal Study in the United States. *Sustain. Cities Soc.* **2018**, *40*, 559–568. [CrossRef]
53. Gay, C. A Room for One's Own? The Partisan Allocation of Affordable Housing. *Urban Aff. Rev.* **2017**, *53*, 40–70. [CrossRef]
54. Joseph, M.L.; Chaskin, R.J.; Webber, H.S. The Theoretical Basis for Addressing Poverty Through Mixed-Income Development. *Urban Aff. Rev.* **2007**, *42*, 369–409. [CrossRef]
55. Ellen, I.G.; Turner, M.A. Does Neighborhood Matter? Assessing Recent Evidence. *Hous. Policy Debate* **1997**, *8*, 833–866. [CrossRef]
56. Polikoff, A. *Waiting for Gautreaux: A Story of Segregation, Housing, and the Black Ghetto*; Northwestern University Press: Evanston, IL, USA, 2006.

57. Rosenbaum, J.E. Changing the Geography of Opportunity by Expanding Residential Choice: Lessons from the Gautreaux Program. *Hous. Policy Debate* **1995**, *6*, 231–269. [CrossRef]
58. Rosenbaum, J.E. Closing the Gap: Does Residential Integration Improve the Employment and Education of Low-Income Blacks? In *Affordable Housing and Public Policy*; University of Chicago Press: Chicago, IL, USA, 1993.
59. Sanbonmatsu, L.; Ludwig, J.; Katz, L.; Gennetian, L.; Duncan, G.; Kessler, R.; Adam, E.; McDade, T.W.; Lindau, S.T. *Moving to Opportunity for Fair Housing Demonstration Program: Final Impacts Evaluation*; Office of Policy Development and Research, U.S. Department of Housing and Urban Development: Washington, DC, USA, 2011.
60. Chetty, R.; Hendren, N.; Lawrence, K. The Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment. *Am. Econ. Rev.* **2016**, *106*, 855–902. [CrossRef]
61. Shamsuddin, S.; Cross, H. Balancing Act: The Effects of Race and Poverty on LIHTC Development in Boston. *Hous. Stud.* **2020**, *35*, 1269–1284. [CrossRef]
62. McClure, K. The Low-income Housing Tax Credit Program Goes Mainstream and Moves to the Suburbs. *Hous. Policy Debate* **2006**, *17*, 419–446. [CrossRef]
63. Freeman, L. *Siting Affordable Housing: Location and Neighborhood Trends of Low-Income Housing Tax Credit Developments in the 1990s*; Living Cities Census Series; Center on Urban and Metropolitan Studies, The Brookings Institution: Washington, DC, USA, 2004.
64. Woo, A.; Kim, Y.-J. Spatial Location of Place-Based Subsidized Households and Uneven Geography of Opportunities: Case of Austin, Texas in the US. *Community Dev.* **2016**, *47*, 45–62. [CrossRef]
65. Deng, L. Comparing the Effects of Housing Vouchers and Low-Income Housing Tax Credits on Neighborhood Integration and School Quality. *J. Plan. Educ. Res.* **2007**, *27*, 20–35. [CrossRef]
66. Woo, A.; Yu, C.-Y.; Lee, S. Neighborhood Walkability for Subsidized Households: Revisiting Neighborhood Environments of Housing Choice Voucher and Low-Income Housing Tax Credit Households. *Cities* **2019**, *89*, 243–251. [CrossRef]
67. Lens, M. Employment Accessibility Among Housing Subsidy Recipients. *Hous. Policy Debate* **2014**, *24*, 671–691. [CrossRef]
68. Welch, T.F. Equity in Transport: The Distribution of Transit Access and Connectivity among Affordable Housing Units. *Transp. Policy* **2013**, *30*, 283–293. [CrossRef]
69. Ellen, I.G.; Horn, K.; Kuai, Y.; Pazuniak, R.; Williams, M.D. *Effect of QAP Incentives on the Location of LIHTC Properties*; Office of Policy Development and Research, U.S. Department of Housing and Urban Development: Washington, DC, USA, 2015.
70. Bell, J.F.; Wilson, J.S.; Liu, G.C. Neighborhood Greenness and 2-Year Changes in Body Mass Index of Children and Youth. *Am. J. Prev. Med.* **2008**, *35*, 547–553. [CrossRef]
71. Brownson, R.C.; Hoehner, C.M.; Day, K.; Forsyth, A.; Sallis, J.F. Measuring the Built Environment for Physical Activity. *Am. J. Prev. Med.* **2009**, *36*, S99–S123.e12. [CrossRef]
72. Cohen, D.A.; Inagami, S.; Finch, B. The Built Environment and Collective Efficacy. *Health Place* **2008**, *14*, 198–208. [CrossRef] [PubMed]
73. Kweon, B.-S.; Marans, R.W.; Yi, C.-W. Parks and Quality of Life: Differences among African American and White Residents. *Landsc. Jrnl.* **2016**, *35*, 97–108. [CrossRef]
74. Baur, J.W.R.; Tynon, J.F. Small-Scale Urban Nature Parks: Why Should We Care? *Leis. Sci.* **2010**, *32*, 195–200. [CrossRef]
75. Talen, E. Neighborhood-Level Social Diversity: Insights from Chicago. *J. Am. Plan. Assoc.* **2006**, *72*, 431–446. [CrossRef]
76. Lang, B.J. Location Incentives in the Low-Income Housing Tax Credit: Are Qualified Census Tracts Necessary? *J. Hous. Econ.* **2012**, *21*, 142–150. [CrossRef]
77. Galster, G.C. Neighborhoods and National Housing Policy: Toward Circumscribed, Neighborhood-Sensitive Reforms. *Hous. Policy Debate* **2019**, *29*, 217–231. [CrossRef]