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The Spatial Dilemma of Sustainable Transportation and Just Affordable Housing: Part II, Low-income Housing Tax Credits

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Part II, Low-income Housing Tax Credits

September 2022

UCLA Center for Neighborhood Knowledge

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16. Abstract

This study examines the spatial distribution of Low-income Housing Tax Credit (LIHTC) units to understand whether geographic patterns and trends are consistent with climate change and equity goals. The analysis compares the location of LIHTC units in 2012 and net changes from 2012 to 2019 with a number of transportation, environmental, and racial and economic equity metrics. Unit locations are, at best, somewhat more sustainable than the state overall, with slightly lower-skewing vehicle miles traveled and better walkability, though low transit accessibility. What environmental gains there were, though, come at the cost of higher exposure to pollution. LIHTC units are also concentrated in disproportionately low-income neighborhoods and neighborhoods of color, with worse access to economic opportunity. The findings reveal an inherent structural dilemma in whether the LIHTC program is able to simultaneously achieve climate and equity goals.

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The UCLA Center for Neighborhood Knowledge conducts basic and applied research on the socioeconomic formation and internal dynamics of neighborhoods and how these collective spatial units are positioned and embedded within regions. The Center for Neighborhood Knowledge works with a broad set of data and employs a range of analytical skills to examine neighborhood phenomena across time and space.

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The University of California Institute of Transportation Studies (UC ITS) is a network of faculty, research and administrative staff, and students dedicated to advancing the state of the art in transportation engineering, planning, and policy for the people of California. Established by the Legislature in 1947, ITS has branches at UC Berkeley, UC Davis, UC Irvine, and UCLA.

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Introduction

California's intense affordable housing crisis has highlighted the fundamental linkage between land use, transportation, climate policy, and equity. Reducing climate-changing greenhouse-gas emissions is a priority policy goal for the State of California, and, as both research and policy interest have shown, reducing vehicle travel represents a key mechanism for achieving this goal. In order to equitably achieve this reduction, it is critical that affordable housing options be situated in geographies that facilitate less driving. That means reliable access to public transit, walkable neighborhoods, and economic opportunities. When combined, these (and other) elements can create more sustainable communities.

In the face of rising housing prices, publicly subsidized affordable housing plays an important role in housing low-income and other vulnerable Californians. This report examines a major type of subsidized affordable housing, Low-income Housing Tax Credit (LIHTC) housing projects. The federally administered LIHTC program is the nation's largest project-based affordable housing development program (and the longest-lasting program supporting the construction of new affordable units), with over 3 million units subsidized since 1986. LIHTC provides developers federal tax credits that they exchange for the funds to build and subsidize housing at below-market rates, for tenants at a variety of incomes below area medians (Scally, Gold, and DuBois, 2018; Fischer, 2018; Kneebone and Reid, 2021; and Keightley, 2022).

This study examines the spatial distribution of units where LIHTC family units are located to determine whether recent geographic patterns and trends are consistent with climate change and equity goals. Although there is an extensive literature on the location of affordable housing with respect to the geographic concentration of poverty and racially segregated neighborhoods, this study is the first to assess empirically and quantitatively such spatial patterns in relation to environmental and social justice. The analysis compares the location of LIHTC units in 2012 to net changes from 2012 to 2019. The study focuses on two sets of primary policy goals: transportation and environmental (as measured by vehicle miles traveled, pollution, and other transportation characteristics) and racial and economic equity (measured by levels of racial segregation, unemployment, and employment opportunity).

This report first analyzes the extent to which LIHTC units meet the state's climate policy goals and whether those patterns have changed over time. Our analysis finds that the distribution of units in 2012 and change in units from 2012 to 2019 were, at best, only somewhat more sustainable than the state overall, with slightly lower-skewing vehicle miles traveled (VMT) and better walkability, though low transit accessibility. What environmental gains there were, though, come at the cost of higher exposure to pollution.

In addition to climate goals, the state has broader socio-economic justice goals—backed in part by state and federal fair housing law, which mandates that the location of affordable housing not perpetuate segregation or concentration of poverty. We again measure the extent to which LIHTC units meet these goals, and find that the trends are not encouraging, with LIHTC units concentrated in census tracts that are disproportionately low-income and predominantly people of color. Additionally, the location of units has relatively low access to economic opportunity, as measured through tract-level unemployment and jobs-housing fit.

These findings, taken together, reveal a major policy dilemma for the location of affordable housing. Shifting the location of affordable housing to more sustainable and lower-VMT neighborhoods consequently decreases access to employment opportunities, exacerbates racial segregation, and increases health risks. This reality creates a major challenge to the state and local governments as they struggle to address climate change and promote more racial and economic equity and fairness. As California continues to experience a growing housing crisis and the demand for affordable housing continues to rise, resolving this dilemma will be essential. There are partial solutions that can marginally reduce the tradeoff, but real change will require rectifying deeply embedded systemic inequality.

Literature Review

This section summarizes the literature relevant to this study, highlighting the many ways that geography interacts with opportunity, health, and other factors that influence wellbeing. We discuss four bodies of research below. The first focuses on how urban spatial structure and transportation disparities can negatively impact residents in disadvantaged neighborhoods. Segregated and stratified places, in combination with inadequate means to overcome distance, in turn contribute to poor outcomes. The second part summarizes the findings from the Moving to Opportunity Program, a major social experiment designed to study the benefits of relocating households from poor to less poor neighborhoods. Although the results are mixed, there appears to be short-term and long-term gains by a number of metrics to justify offering renters the opportunity to move into less poor neighborhoods. The next part reviews studies of vehicle travel by low-income people. Not surprisingly, they generate fewer VMT than others, due in part to having fewer vehicles per person. The final body of research covers the negative externalities encountered by residents living in disadvantaged areas. They experience multiple burdens, ranging from mobile sources of air pollution to higher traffic injury and death rates.

Spatial and Transportation Mismatch

Extensive literature over the last half century explain that where people live greatly determines their opportunities and affects health, employment, income, and educational outcomes (Brooks-Gunn, Duncan, and Aber, 1997; Ellen and Turner, 1997; Jencks and Mayer, 1990; Popkin et al., 2000; Joassart-Marcelli, 2007; and Ong and González, 2019). Recent research has found that neighborhood disparities contribute significantly to the intergenerational reproduction of inequality—that is, children growing up in poor neighborhoods are likely to become poor adults (Chetty and Hendren, 2018). Such spatial inequality also contributes to the compounding reproduction of racial inequality (Chetty et al., 2020).

The seminal work in the field of space and inequality is by John Kain (1968), who studied how the evolving urban spatial structure in the 1960s contributed to Black unemployment. He argues that minorities, trapped in the inner city due to long histories of racialized housing discrimination, became increasingly separated from economic opportunities as jobs moved into suburban areas. Implicit in this physical reconfiguration of the cityscape was the lack of jobs within and close to low-income neighborhoods, due to disinvestment and underinvestment (Soja, Morales, and Wolff, 1983). The growing spatial disconnection is inherently a form of inequality in relative location. Since Kain's (1968) initial publication, his core argument, called the spatial mismatch hypothesis (SMH), has been tested numerous times. A majority of the findings are consistent with at least the central tenet of SMH: restrictions to residential mobility produce adverse labor market outcomes for low-skilled Black urban residents (Gobillon, Selod, and Zenou, 2007; Holzer, 1991; Ihlanfeldt and Sjoquist, 1998; and Kain, 2004).

One of the theoretical limitations of SMH as originally formulated is that it does not explicitly take into account residents' means to overcome spatial disconnection. According to the logic of SMH, the separation between housing and jobs in and of itself produces inequalities. However, affluent and suburban areas also have a wide separation between housing and jobs but with far fewer negative consequences. Unlike the urban residents discussed by Kain (1968), these suburbanites generally have the means to overcome the separation. This insight led to the development of the concept of spatial-transportation mismatch (STM). It examines distance and transportation/modal access as a contributing factor of employment outcomes. STM also refines SMH by incorporating the role of an individual's transportation resources in confounding the effects of spatial mismatch. In particular, studies of transportation mismatch highlights the lack of access to a private automobile as a key factor in access to opportunities. Beyond the socioeconomic status of neighborhoods alone, spatial barriers are less daunting if an individual can travel by car as opposed to public transit, allowing access to far more jobs and destinations in shorter time, even in many dense urban areas (De La Cruz-Viesca et al., 2016; Blumenberg and Ong, 1998; Ong and Miller, 2005; Raphael et al., 2001; Taylor and Ong, 1995; Kawabata and Shen, 2006; and Shen, 2000). It is for this reason that in response to spatial mismatch findings, the federally and state-funded reverse commute transit programs of the 1960s through 1980s proved largely ineffective (Rosenbloom, 1992), as they neither addressed automobile access nor worked to undo residential segregation itself.

Car ownership is influenced by both income and costs (including purchase, lease, loan costs and interest, insurance premiums, maintenance, fuel, etc.). Residents in disadvantaged neighborhoods face disproportionately higher poverty rates and thus are less likely to have a private vehicle, which in turn lowers access to opportunities and produces systemic inequality of outcomes. This can be partially offset by two other factors that also influence accessibility: 1) whether transit stops are within a reasonable walking distance, whether that transit is frequent and reliable, and whether it travels to desired destinations and 2) the availability of nearby services and opportunities, as density of land use also plays a major role (Ong and González, 2019). A 2021 study comparing employment, quality of elementary schools, and health care accessibility indicators in rural and urban neighborhoods in California confirms that residents in disadvantaged neighborhoods face significant barriers to opportunities as a result of spatial stratification (Ong et al., 2021). Partially the product of larger structural factors like the dispersal of spatial structure and a lower-wage labor market, these outcomes are a result from greater reliance on automobiles and more VMT.

Moving to Opportunity

This extensive literature on the negative impacts of racial and class segregation (implicit elements of SMH and STM) prompted policy initiatives to incentivize and support movement out of areas of concentrated poverty into more economically and racially integrated neighborhoods. Designed as a social experiment, the Moving to Opportunity (MTO) Program was launched by the federal government in 1993 to understand how residential mobility into areas with higher income would affect residents previously living in public housing. Volunteers from public housing in New York City, Los Angeles, Chicago, Boston, and Baltimore received vouchers and counseling support to move to neighborhoods with low poverty rates, received vouchers without counseling to move to any neighborhood regardless of neighborhood characteristics, or were placed in a control group (U.S. HUD, 2017 and Katz, Ludwig, and Sanbonmatsu, 2022).

Evaluations of the MTO program over ten years showed mixed results, with economic outcomes such as employment proving inconclusive (Carlson et al., 2012; Jacob and Ludwig, 2012; Ludwig et al., 2008; Abt Associates et al., 2006; and Blumenberg and Pierce, 2014). In fact, many outcomes for the MTO volunteers were only slightly different than the control group (Goering and Feins, 2003 and Joassart-Marcelli, 2007), and most households ultimately returned to higher-poverty neighborhoods (Feins and Shroder, 2005; Turner et al., 2011; and Blumenberg and Pierce, 2014). Outcomes appear to have been partially dependent on overcoming transportation barriers. Blumenberg and Pierce (2014) studied the relationship between vehicle and public transit access and employment outcomes among the subsidized-housing participants in the MTO program. They found that having an automobile helped participants gain and keep employment, indicating that policies to increase low-income households' access to a vehicle would benefit employment outcomes.

Despite the mixed labor-market effects, MTO produced a number of benefits. The long-term effects for young children were promising (Chetty, Hendren, and Katz, 2016). Both children and adults saw improved quality of life, especially by health measures such as asthma, obesity, and mental illness incidence (Ludwig et al., 2008 and Joassart-Marcelli, 2007). Child behavior and test scores also showed significant positive results, though research suggests that children who were older at the time of the move received less benefit than those who were younger at the time of the move (Chetty, Hendren, and Katz, 2016).

In spite of the potential gains from moving to neighborhoods that offered better opportunities, many residents remained in low-opportunity areas for various reasons, ranging from mechanisms associated with social networks, limited human capital, discrimination, and reliance on public transportation (Fernandez and Harris, 1992; Tigges, Browne, and Green, 1998; Galster, 2012; Bergman et al., 2019; and Houston, Basolo, and Yang, 2013). A 2019 study of recipients of Housing Choice Vouchers were more likely to move to higher-opportunity neighborhoods if they were provided with additional services and counseling (Bergman et al., 2019). These results indicate that it is not simply a matter of choice that keeps people concentrated in low-income neighborhoods but rather that there are structural and personal barriers preventing them from moving to other neighborhoods (Gennetian et al., 2012).

Vehicle Miles Traveled

Most low-income adults depend on vehicles to complete trips within a reasonable time, but they are less likely than higher-income adults to own vehicles (Clifton, 2004; Froud et al., 2002; Pucher and Renne, 2003; Rogalsky, 2010; and Blumenberg and Agrawal, 2014). Low-income people without vehicles may pay for taxis, share rides, or borrow from family and friends (Giuliano and Moore, 1999; Lovejoy and Handy, 2011; Rogalsky, 2010; Roy, Tubbs, and Burton, 2004; Clifton, 2004; Grieco, 1995; and Blumenberg and Agrawal, 2014). Income and person-trips per household are also positively related (Santos et al., 2011 and Blumenberg and Agrawal, 2014). More specifically, a 2011 study found that household VMT rises steeply with income up to $50,000 a year per household and then levels out until it rises again when income reaches $150,000 (Boarnet et al., 2017 and Newmark and Haas, 2015).

Residents of subsidized affordable housing developments in particular are less likely to use available parking in their buildings and therefore to have cars and travel by car. A survey looking at parking utilization overnight in affordable housing developments in San Diego found that their residents used parking at under half the rate of all rental units (Willson, O’Connor, and Hajjiri, 2012). A similar survey in the San Francisco Bay Area found 31 percent of the over 9,000 spaces in 68 surveyed affordable developments sat empty (Cohen, 2015 and Hughes, 2022), demonstrating reduced VMT.

Policy discussions about reducing VMT should consider the spatial barriers facing disadvantaged neighborhoods. Low-income residents living in disadvantaged areas own fewer vehicles and therefore have low VMT, but they also face residential segregation and economic underinvestment on top of lower access to transportation resources like public transit. The most disadvantaged might need to increase their VMT to gain access across spatial barriers. The most just VMT reduction strategies should aim to lower average VMT across all of society, where residents in advantaged areas can reduce vehicle usage enough to offset potential increases in VMT in disadvantaged areas.

It is also important to note the difficulty in interpreting the average VMT by neighborhood. Neighborhood VMT can be influenced by a variety of factors with potentially conflicting motivations. Take vehicle ownership: a neighborhood with low VMT may have low VMT because its residents face greater barriers to vehicle ownership. It could also have low VMT because vehicle ownership is not required because it has greater diversity of uses in close proximity and greater access to high-quality public transit. High VMT could be an indicator of greater access, where residents have the ability to travel for work and to access retail. It could also indicate that traveling to work or for retail is forced. Residents may have to travel outside of their neighborhood to get those same opportunities. Thus, high and low VMT alone do not necessarily indicate positive or negative aspects of a neighborhood in relation to either climate or equity goals. Given these nuances, this study aims to describe where affordable housing is located and how that is changing in reference to VMT by analyzing those same locations and changes along a number of other climate and equity metrics.

Negative Externalities

An extensive body of published research finds that economically and socially disadvantaged neighborhoods are disproportionately exposed to negative localized externalities, the indirect cost imposed on residents from nearby activities. Of particular interest to this study are environmental hazards and risks associated with traffic.

Air pollution has been linked with a myriad of negative health outcomes (Englert, 2004 and Braithwaite et al., 2019). While many federally regulated pollutants (particulate matter, lead, ground-level ozone, carbon monoxide, nitrogen dioxide, and sulfur dioxide) are widely dispersed, others are highly localized. Of particular concern among the latter is $PM_{2.5}$ (fine particulate matter with a diameter of 2.5 micrometers or smaller), much of which is generated by vehicular traffic. The level of $PM_{2.5}$ decays rapidly, approaching ambient level within one or two hundred meters (Ong, Graham, and Houston, 2006). This pollutant can produce adverse health impacts, such as cardiopulmonary disorders and adverse birth outcomes (Feng et al., 2016). Because of past discriminatory siting of freeways and other factors, environmentally disadvantaged neighborhoods are disproportionally impacted by traffic-generated particulate matter (Houston et al., 2004, 2006, 2011 and Wu et al., 2009). In turn, subsidized housing units are concentrated in such high-traffic, health-impairing locations (Houston, Basolo, and Yang, 2013).

The other relevant negative externality to this study is traffic collisions. In 2019, motor vehicle crashes led to over 2.5 million emergency room visits for injuries and caused more than 36,000 deaths, making this one of the leading causes of death in the U.S. (Centers for Disease Control and Prevention, 2022). Although many vehicle collisions are preventable, they are an unfortunate and inherent part of the vehicle-centered transportation system in the U.S. Automobile crash risks are disproportionately concentrated in disadvantaged neighborhoods (LaScala, Gruenewald, and Johnson, 2004; Loukaitou-Sideris, Liggett, and Sung, 2007; Cottrill and Thakuriah, 2010; Morency et al., 2012; and Yuan and Wang, 2021). The disparity in the spatial distribution of vehicular collisions is due to a number of factors: differences in the volume and density of traffic, roadway infrastructure and design, placement of private and public facilities, and legal rules. The previous cited research has found that the high-risk factors associated with collision rates are correlated with a neighborhood's socioeconomic and demographic characteristics. Affluent and non-minority areas tend to experience significantly lower crash rates than poorer and predominantly minority areas. Much of the traffic in the latter areas is generated by private and commercial travel originating from outside the neighborhood. In other words, disadvantaged neighborhoods bear a heavy external cost for the mobility benefits of others.

Policy and Programmatic Context

This section summarizes the information on the policies and programs relevant to this study. This study sits at the intersection of policies to build sustainable communities to combat climate change and policies to further fair housing. Fair housing initiatives aim to encourage individual locational choices as well as site affordable housing in locations with lower poverty and higher racial diversity. The climate initiatives of interest seek to reduce automobile travel in pursuit of a broader goal of reducing greenhouse-gas (GHG) emissions. This research seeks to understand how these two sets of policies interact and to formulate new strategies that spatially redistribute affordable housing in ways that improve access to economic and educational opportunities while simultaneously contributing to climate-change objectives.

Climate Change Initiatives

Curbing VMT is a top policy priority for sustainability, as vehicle emissions are a top contributor to climate-changing GHG emissions (CARB, 2021). In 2006, California passed the Global Warming Solutions Act (Assembly Bill 32), which required California to reduce its GHG emissions by approximately 15 percent to achieve 1990 emissions levels by 2020. One initiative of AB 32 was the Emissions Trading Program ("cap-and-trade"), which established a statewide cap on GHG emissions across multiple industries, including electrical power plants, industrial plants, and natural gas and petroleum distributors. Businesses are required to limit their carbon emissions to below the cap or obtain one of the allocated pollution permits that dwindle throughout the program. Revenue from auctioning the permits funds California's Greenhouse Gas Reduction Fund for state agencies to disperse to emissions-reducing programs (CARB, 2022 and Sahota, 2015).

In 2008, Senate Bill 732 established the Strategic Growth Council to coordinate state agency activities related to climate and equity, including planning to meet AB 32 measures. Under this council, the Affordable Housing and Sustainable Communities Program receives funding from the Greenhouse Gas Reduction Fund to create and maintain affordable housing near transit stations (Georgetown Climate Center, 2011 and California HCD, 2022a).

California also established their commitment to offset the negative effects of climate change by integrating transportation, land-use, and housing strategies to reduce private vehicle emissions through the Sustainable Communities and Climate Protection Act of 2008 (Senate Bill 375). SB 375 requires the California Air Resources Board (CARB) to set GHG emissions reduction targets. Strategies to reach those targets promote improved transportation options and sustainable communities where housing and access to opportunities are both located within neighborhoods, reducing residents' commutes to work or trips to school. Developing affordable housing adjacent to opportunities align both climate and equity concerns, ensuring that low-income residents can access education, employment, and other needs in a manner that contributes to broader state sustainability goals (Terner Center, 2020).

An integral part of California's climate change initiatives is a stated commitment to equity. In 2012, the Legislature passed Senate Bill 535, directing that 25 percent of the proceeds from the Greenhouse Gas Reduction Fund go to projects that provide a benefit to disadvantaged communities, with at least ten percent of these projects located within those communities. The legislation gave California Environmental Protection Agency (CalEPA) responsibility for identifying disadvantaged communities, a task for which the agency uses the CalEnviroScreen tool, discussed further below, to identify the most pollution-burdened neighborhoods. In 2016, the Legislature passed Assembly Bill 1550, which amended SB 535's rules to require that 25 percent of proceeds from the cap-and-trade fund be spent on projects both benefiting and *located in* disadvantaged communities (Magavern et al., n.d.; Magavern and Sanchez, 2015; and Eng and Nzegwu, 2018).

Affordable Housing Siting and Fair Housing Initiatives

While the primary aim of subsidized housing programs is affordability for low-income families, fair housing laws also require that they not perpetuate segregation and concentrated poverty (Acevedo-Garcia et al., 2016). In 2018, the California Legislature passed Assembly Bill 686, which changed the legal requirements for all public agencies involved in housing development (California HCD, 2021). Taking language from the federal Affirmatively Furthering Fair Housing rule (proposed in 2015, rescinded in 2020, and currently in the process of being reinstated (Capps, 2021 and White House, 2022)), the California rule requires stricter adherence to "taking meaningful actions, in addition to combating discrimination, that overcome patterns of segregation and foster inclusive communities" (California HCD, 2021, pp. 9, 14, 57). These obligations require all public agencies "to promote more inclusive communities" in their policies and plans (California HCD, 2021, p. 9). Additionally, the housing element, a state requirement of all local governments as part of their general plan, must include fair housing outreach, enforcement, identification and reduction of barriers, and identification of potential sites, subject to review by the state Department of Housing and Community Development (HCD) (California HCD, 2021, 2022b). The analysis must include examination of "trends and patterns within the locality and in comparison to the broader region," "integration and segregation," "racially or ethnically concentrated areas of poverty," and, of particular interest here, "disparities in access to opportunity" (California HCD, 2021, p. 11).

Overview of the Low-income Housing Tax Credit

The government uses two primary avenues to subsidize housing: building project-based developments and providing vouchers for individual units or households. Project-based developments consist of public housing, Low-income Housing Tax Credit developments, and the U.S. Department of Housing and Urban Development's (HUD) Project-based Voucher Section 8 Buildings. Affordable housing development through tax incentives is facilitated through the LIHTC program.

The LIHTC program, the primary federal program for building and maintaining affordable housing, was established through the Tax Reform Act of 1986. LIHTC is designed to alleviate the housing burden on low-income households by incentivizing affordable housing development or rehabilitation through tax subsidies. Rather than distributing funding through HUD, these subsidies are part of the Internal Revenue Code administered by the Internal Revenue Service (IRS). Developers are given these federal tax credits, which they sell to investors to cover the expense of an affordable housing project in exchange for charging lower-than-market rents. Income-restrictions on these units are set in relation to family size and a federally calculated Area Median Income (AMI) for each region (Schwartz, 2014; Lipschultz, 2016; Scally, Gold, and DuBois, 2018; and Keightley, 2022):

1. Renters earning 50 percent or less of AMI ("very low-income"), adjusted for family size, must occupy at least 20 percent of subsidized units,
2. Renters earning 60 percent or less of AMI, adjusted for family size, must occupy at least 40 percent of subsidized units, *or*

3. The average income of renters in subsidized units must be 60 percent or less of AMI, adjusted for family size, and every renter must earn 80 percent or less of AMI ("low-income"), adjusted for family size (Lipschultz, 2016; Scally, Gold, and DuBois, 2018; and Keightley, 2022).

The requirements of other funding sources can lead to stricter affordability limits (e.g., "extremely low-income" units at 30% of AMI) (California Strategic Growth Council and California HCD, 2021). Because the tax credits are disbursed only for restricted affordable units and because of competition for tax credits, most LIHTC buildings have some level of affordability restriction on *all* of their units ("100% affordable housing"), even though, per the rules above alone, buildings could be mixed-income (Scally, Gold, and DuBois, 2018). In all cases, LIHTC tenants are charged 30 percent of their respective family-size adjusted AMI threshold in rent and utilities. Some renters may, in reality, earn less than the AMI threshold for their unit, but, unlike with Section 8 vouchers, their rent does not change based on their actual income (Lipschultz, 2016 and California Tax Credit Allocation Committee, 2021).

Federal tax credits are dispersed through state and local governments, who create applications to determine who should receive the credits (Cummings and DiPasquale, 1998 and Ballard, 2003). The application changes based on the administering agency: some elements of the application process are required by the IRS for every application; others are tailored to prioritize local values and needs (Lipschultz, 2016; Gustafson and Walker, 2002; and Luque, Ikromov, and Noseworthy, 2019). When a developer is awarded tax credits, they create a limited-liability partnership with an investor, selling or exchanging them the tax credits (which they use to offset their own federal tax liability) over ten years in return for an upfront influx of capital to construct the building. The amount an investor is willing to pay for the credits changes based on their perceived risk, location, and market fluctuations (Schwartz, 2014; Scally, Gold, and DuBois, 2018; and Keightley, 2022), with rates between 90¢ and $1.05 per dollar of tax credits in recent years (Novogradac, 2022). There are two types of tax credits: competitive "nine percent" tax credits, which are intended to cover around 70 percent of a project's cost, divided across states by formula, and granted to top-scoring developers in each state each application cycle, and non-competitive "four percent" tax credits, which are intended to cover around 30 percent of the cost (Luque, Ikromov, and Noseworthy, 2019; Keightley, 2022; and Scally, Gold, and DuBois, 2018).

Since 1990, LIHTC units must remain affordable for at least 30 years (55 years for projects funded by 9% tax credits in California). The IRS requires property owners to submit compliance reports to ensure the property provides the minimum number of affordable units for the first 15 years. If, at any point during that window, the affordable unit count falls under the requirement, the IRS may recapture the tax credits. After 15 years, the IRS does not require compliance reporting and will not recapture credits, though states may conduct their own enforcement (Luque, Ikromov, and Noseworthy, 2019; California Tax Credit Allocation Committee, n.d.; Khadduri et al., 2012; Cummings and DiPasquale, 1998; and Ballard, 2003). After the affordability period, units may be rented at market rate, or the building-owner may find a new source of funds (potentially another round of LIHTC for "rehabilitation") to continue the rent subsidies (Khadduri et al., 2012).

Housing developed through the LIHTC program is primarily located in metropolitan areas, with 52 percent of all units put into service between 1987 and 2010 in central areas and 35 percent in the suburbs. Only 13 percent of units fell outside of metropolitan areas (Schwartz, 2014). Houston et al. (2013) found that LIHTC developments were more often sited in commercial and transportation corridors rather than in areas with more residential uses.

Early LIHTC projects were disproportionately built in older neighborhoods because of the perceived risk for investors. As the program progressed and the risk decreased, the price a developer could fetch for their credits increased, allowing them to locate developments in higher-income neighborhoods in the suburbs (McClure, 2006). Nonetheless, even though their siting is more dispersed than public housing, LIHTC buildings have yet to be fully dispersed equally into high- and low-poverty neighborhoods (McClure, 2019). The LIHTC program provides incentives to site in areas with high development costs relative to incomes (“Difficult to Develop Areas”). It also provides incentives to site in census tracts with a poverty rate of at least 25 percent or in which 50 percent of households have incomes below 60 percent of AMI (“Qualified Census Tracts”). In both of these sets of areas, allocated credits can cover a greater share of project costs. That said, there is also an inherent incentive for developers to build in neighborhoods with low market rents, where land costs less and the forgone opportunity cost of market rents is lower, which further contributes to locating LIHTC housing in high-poverty areas (Lang, 2012).

Data, Indicators, and Methodology

To explore the relationships between the locations of LIHTC units, vehicle miles traveled, and other neighborhood factors, we drew on a wide range of data sources to construct indicators and analyze geographic relationships. This section describes those data sources and our analytical methods. We first describe our data, including the use of indicators created for previous analyses. Second, we outline the methodology used to create the variables used in this analysis. Finally, we describe the methods for conducting the analysis itself.

Major Data Sources

This report relies on several data sources in part because housing, environmental policy, and equity goals have often been siloed under unique agencies and considered independent from each other. Data on the count of LIHTC units by census tract come from HUD's LIHTC database. The data covers all projects, classified by groups served, the number of units, and year put into service. We selected only LIHTC units classified as serving "families," 45 percent of all California LIHTC units (U.S. HUD, 2022). According to federal definitions, a "family" can include an individual or any group that identifies as a family (U.S. HUD, 2014). LIHTC family-targeted units are thus those units essentially open to the general low-income population, as opposed to other LIHTC units only open to specific groups such as unhoused, disabled, or senior residents. This allows the fairest comparison to the overall California populace. From the date of service, we classified the units into those that existed during or before the 2012 baseline and those that became available since then, up to 2019. We also examined if older units exited the program since 2012. We aggregated unit counts into 2010 census tract boundaries.

We matched these data to census-tract-level data on transportation and other neighborhood characteristics. In prior work for CARB on transportation disparities, UCLA Center for Neighborhood Knowledge (CNK) researchers constructed indicators and metrics on systematic variation in transportation resources and accessibility (Ong et al., 2022). For this project, we use average vehicle miles traveled per household (HVMT), commute vehicle miles traveled per worker (CVMT), access to high-quality transit locations, walkability, traffic collisions, and jobs-housing fit, explained future below.

We also use the American Community Survey (ACS) census-tract-level statistics for neighborhood characteristics, including demographics (racial and ethnic composition of the neighborhood), economic status (employment status and poverty level), and housing (tenure and housing costs). The ACS pools a series of monthly samples to provide an ongoing stream of detailed and updated information. The 2015-2019 five-year ACS estimates are used for this project (except where noted), as they provide larger sample sizes than single-year estimates, making data available for small geographies such as a census tract (U.S. Census Bureau, 2019).

The project also includes pollution data derived from CalEnviroScreen 4.0 (OEHHA, 2022). CalEnviroScreen is a mapping tool developed by the CalEPA Office of Environmental Health Hazard Assessment (OEHHA) to identify the state's most pollution-burdened and vulnerable communities. The final score represents a composite of 21 different indicators relating to the environmental, health, and socioeconomic status of a neighborhood and its residents. Disadvantaged communities are defined as the 25 percent of highest scoring census tracts in CalEnviroScreen, along with other areas with high amounts of pollution and low populations. Using the tool's composite scores, CalEPA is able to identify disadvantaged communities to prioritize public investments using cap-and-trade funds to improve health and economic opportunities (OEHHA, 2022 and August et al., 2021).

The basic geographic unit of analysis in this report is the census tract, which serves as a reasonable proxy for neighborhoods. We use the terms “census tract” and “neighborhood” interchangeably in this report. All indicators are reported at the census-tract-level (2010 vintage boundaries).

Variable Construction

The basic units of analysis for this report are the aggregated counts of available Low-income Housing Tax Credit units, which are reported as two primary variables: 1) the number of LIHTC units per census tract in 2012, and 2) the net change in LIHTC units per census tract between 2012 and 2019. In order to ensure consistent census tract boundaries across all datasets, 2012 data was used as the base year, as it was the first year provided using the 2010 tract boundaries. To analyze change over time, we calculate a simple net difference between 2012 available units and 2019 available units. This metric does not differentiate change by exits and entries; it merely reflects either a positive or negative change in the total count (or no net change).

We compare base year LIHTC unit availability and net change in unit availability against various sustainability, health, and socioeconomic indicators to determine, respectively, a baseline distribution and any progress or regression towards state goals of environmental and socioeconomic justice.

Vehicle miles traveled serves as our primary transportation sustainability metric and dependent variable. The VMT indicator measures the distance traveled by automobile for residents of a particular census tract. Our VMT variable does not indicate individual-level travel, but rather is an average indicator for a given tract.

This report uses two VMT metrics: household VMT and commute VMT. Household VMT measures the average miles traveled per household within a census tract for any trip types, including commuting to school or work, childcare, errands, and more. In prior research (Ong et al., 2022), the HVMT indicator was constructed using a combination of CARB’s VMT estimates (based on California Bureau of Automotive Repairs odometer readings from 2016 to 2017), counts of registered vehicles from California Department of Motor Vehicles, and ACS vehicle and household counts. This HVMT indicator does not isolate VMT for specific types of trips, such as home-to-work commutes, but it can provide insight on a household’s general travel patterns. Commute VMT narrows the trip types counted to only examine commute trips and calculates the average per worker. The CVMT indicator represents the mean distance a worker drives to work by vehicle in a given period of time, providing insight on a commuters’ general travel patterns. Again from prior work (Ong et al., 2022), it was constructed using 2015 Longitudinal Employer-household Dynamics data on commute flows (U.S. Census Bureau, 2015), combined with distances generated through HERE street network.[1]

It is important to note the limitations of relying on VMT data to measure sustainability, some of which are discussed in the literature review above. VMT levels for a given census tract can have myriad explanations. For instance, a tract may have high VMT because it has a significant number of wealthy residents with multiple cars, or it may have a high VMT because it has a significant number of low-income residents who must drive long distances to access jobs. VMT can be due in part to regional opportunities and activities beyond one’s neighborhood and therefore can indicate a necessity to travel rather than an unwillingness to find alternate modes of transportation. However, that is not to diminish the importance of transit: better access to high-quality transit can cut down high VMT by providing meaningful alternatives to households.

1. For more information on the methodologies for constructing the HVMT and CVMT indicators, see Ong et al. (2022).

Another limitation to note is that the average household VMT within a census tract is not necessarily applicable to residents of LIHTC units. If a household moves into a LIHTC unit neighborhood with high average VMT, it is possible they will have similar characteristics and travel behavior and therefore similar VMT to the tract average—or they might be unable to afford a vehicle, placing them far below the average VMT of that tract. While it is impossible to fully separate individual household behavior from average tract behavior, we can draw some conclusions from the overall trends—moving into a high-VMT neighborhood likely changes the structure of one's needs and opportunities.

Although VMT does not capture miles traveled using other transportation modes per se,[2] California residents have a strong dependence on personal vehicles as their primary mode of transportation, and automobiles account for almost all of the state's GHG emissions from passenger travel (Wasserman et al., 2022 and CARB, 2021). We supplement our analysis of VMT, however, with other sustainability indicators, such as access to high-quality transit and walkability. Transit access is measured by the percentage of a census tract that falls in a high-quality transit location: one quarter mile from a bus stop with 15-minute-or-less peak headways, a rail station, or a ferry terminal. Planners generally accept a quarter mile as the distance a typical person is willing to walk to local transit (Ong et al., 2022). Meanwhile, the Walkability Index 2.0 indicator, constructed by the U.S. EPA, characterizes every census tract based on its relative walkability, using physical characteristics (pedestrian-oriented intersections and quantity of occupied housing), business activities (mix of worksite jobs by economic sector), and travel behavior (commute mode). Areas with more intersections, mixed uses, and carpooling are designated as being more conducive to walking and therefore have higher index scores (U.S. EPA, 2013). It should be noted, however, the index does not account for other key factors, such as aesthetics, open space, and safety (Ong et al., 2022).

Changes in LIHTC units are also assessed against neighborhood health-related indicators such as traffic collisions and pollution. UC Berkeley's Transportation Injury Mapping System provides data on the distribution of all traffic collisions that occurred between 2011 to 2015 (Safe Transportation Research and Education Center, UC Berkeley, 2022). To account for differences in roadways across tracts (e.g., some have major arterials, while others have mostly small residential streets), collisions are normalized by the number of lane-miles (e.g., a boulevard with four lanes is weighted twice as much as a two-lane road) (Ong et al., 2022).

To assess changes in LIHTC units against fair housing goals, we include metrics from the ACS related to the level of racial segregation and socioeconomic status (U.S. Census Bureau, 2019). For the former, we utilize the neighborhood's racial composition, specifically the share of residents who are non-Hispanic white. For the latter, we include the poverty rate, which represents the percentage of individuals who live below the federal poverty threshold. That level is based on the minimum income needed to meet basic needs. The threshold is adjusted for family size and inflation but not for the higher cost of living in California. In 2019, the federal poverty line was $25,750 per year for a family of four (U.S. Department of Health and Human Services, 2019).

Lastly, we include metrics related to job opportunities. The first is the neighborhood's unemployment rate, which is the number of unemployed individuals as a percentage of the civilian labor force (U.S. Census Bureau, 2019). Higher rates are associated with both individual characteristics (e.g., level of education) and contextual characteristics (e.g., the relative amount of social capital). We also use the jobs-housing-fit index to gauge employment opportunity. This ratio is the measure of the number of low-wage jobs relative to the availability of nearby affordable housing (Ong et al., 2022). If there is a lack of affordable housing, then workers are forced to commute longer distances. The indicator was constructed using a combination of two publicly available datasets:

2. Though, of course, people shifting travel from cars to other modes would reduce VMT

data on jobs by earnings level were derived from the 2006-2010 five-year Census Transportation Planning Products dataset (U.S. Census Bureau, 2016) and data on housing units by rent levels come from the 2008-2012 five-year ACS (U.S. Census Bureau, 2019).

Methodology

We began by creating a classification for each indicator, dividing all census tracts in California into quintiles with roughly even numbers of tracts. Not all indicators could be perfectly evenly disaggregated because the underlying data are not equally distributed, meaning that in some cases, an indicator could have a large number of tracts with the same value.

We then tabulated the share of base year (2012) LIHTC units and the share of net change in LIHTC units (between 2012 and 2019) in each set of indicator quintiles. For example, a value of ten percent of LIHTC unit change in a given indicator quintile indicates that a tenth of the net change in units occurred in census tracts in that quintile.

Empirical Findings

This section summarizes the empirical findings of our analysis. We begin with an examination of cumulative changes in LIHTC units over time across the state as a whole. From there, we provide a regional example, focusing on Southern California, the state's most populous region (U.S. Census Bureau, 2019), to understand how changes in units are geographically distributed. LIHTC units and changes in unit location are then analyzed in relation to transportation, environmental, and health factors (VMT, transit access, walkability, pollution, and vehicle collisions). Lastly, we examine the implications of changing unit location for socio-economic and racial justice goals, comparing unit location to poverty levels, racial composition of neighborhoods, unemployment, jobs-housing fit, and market rents.

Spatial-temporal Changes in LIHTC Units

The state gained a net of over 27,000 LIHTC between 2012 and 2019, an increase of about 25 percent (from approximately 109,000 in 2012 to over 136,000 in 2019). Geographically, LIHTC units in Southern California were highly concentrated in the urban core of Los Angeles, with smaller concentrations in the San Fernando Valley, Santa Monica and urban Orange County (See **Figure 1**). This distribution mirrors areas that are poor and disproportionately people of color (U.S. Census Bureau, 2019), in line with previous literature on the location of affordable housing units.

Figure 2 shows the net change in LIHTC units by census tract. From 2012 to 2019, no tract had a net loss of LIHTC units. The tracts with the highest net gains are predominantly concentrated in dense urban cores and other areas with high concentrations of both people of color and poverty (U.S. Census Bureau, 2019).

The spatial pattern seen in Southern California is indicative of broader trends statewide: units further concentrated between 2012 and 2019 in denser, more urban, poorer, and more non-white areas. There are a few exceptions, such as in relatively more affluent Santa Monica, which supports LIHTC developments with funds from its Housing Trust Fund, collected from fees on multifamily development and from sales tax and general fund revenue (Nzau and Trillo, 2021; Agle, 2019; and Decavalles-Hughes, 2022). As we discuss below, this geographic pattern has, at best, slightly positive implications for climate goals but negative effects on segregation and access to opportunity.

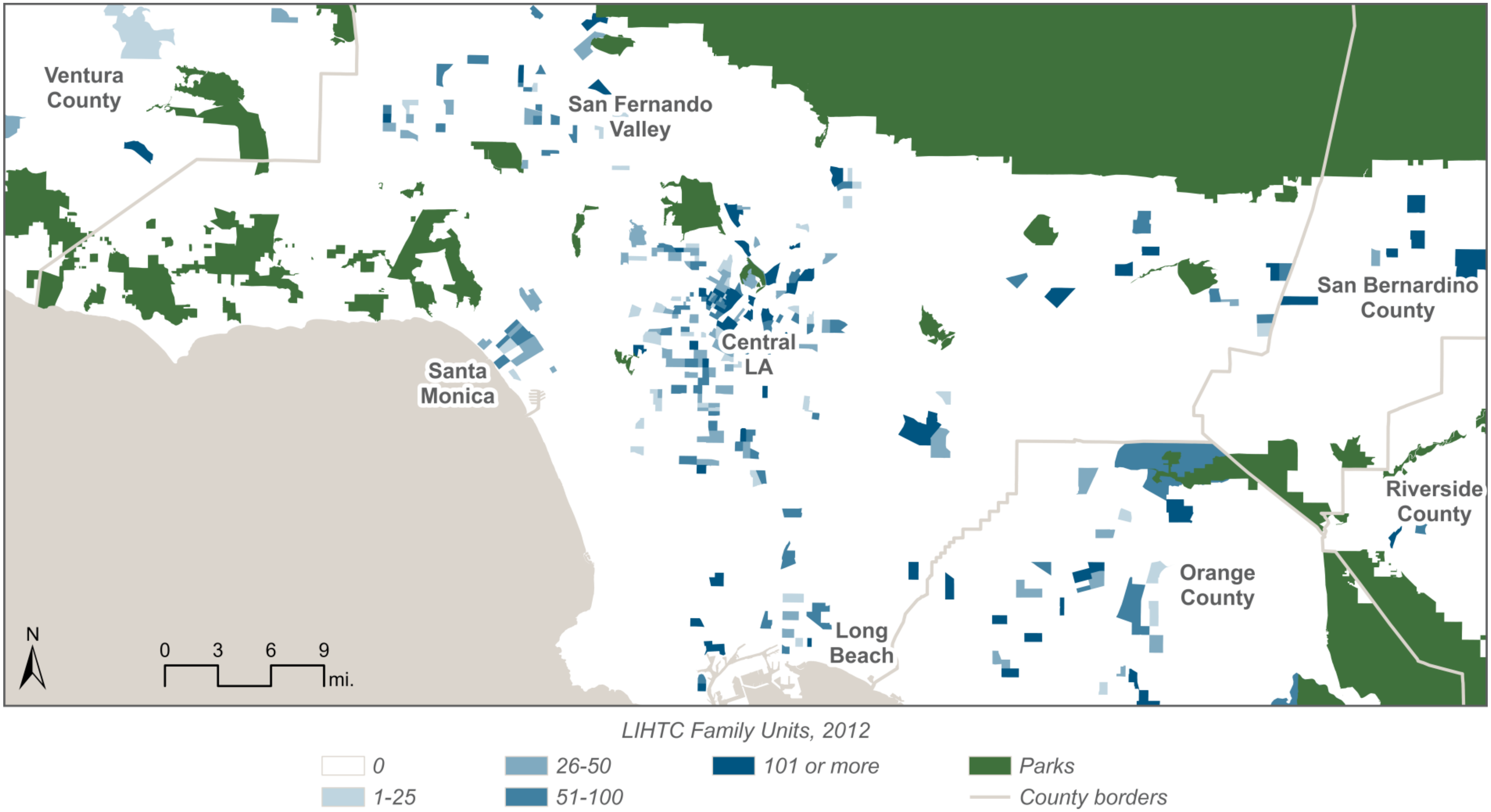

Figure 1. LIHTC Unit Locations. 2012

Data sources: U.S. HUD, 2022; California Open Data, 2019; and Esri, 2010

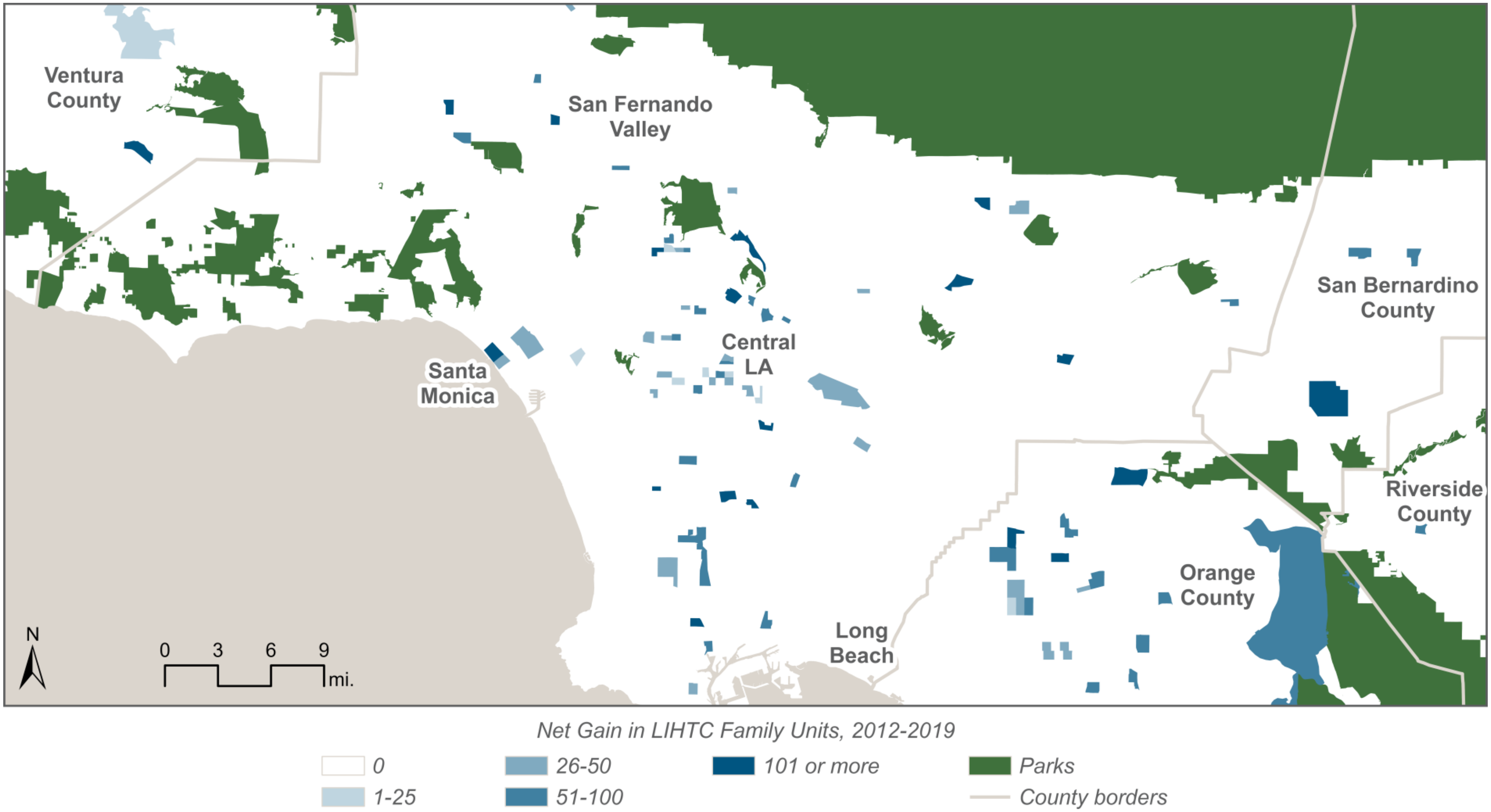

Figure 2. Net Change in LIHTC Units by Tract, 2012-2019

Data sources: U.S. HUD, 2022; California Open Data, 2019; and Esri, 2010

Vehicle Miles Traveled

One of California's high-priority environmental goals is reducing vehicle miles traveled. With vehicle emissions as a top contributor to GHG emissions (CARB, 2021) and other pollutants, this is a crucial step in fighting climate change. In order to achieve this reduction in VMT, the state is promoting the development of sustainable communities that provide access to economic opportunity, school, childcare, and other needs through shorter or more environmentally friendly commuting options, such as public transportation or walking. Developing affordable housing in sustainable neighborhoods is critical to achieving such goals around climate equity.

In 2012, LIHTC units were relatively equally distributed across the four lowest quintiles for HVMT. However, only 13 percent of LIHTC units fell in the highest bracket (See **Figure 3**). From 2012 to 2019, there was no significant progress in shifting LIHTC units to lower-HVMT tracts, with the distribution of net new units over that period similar to the 2012 baseline distribution.

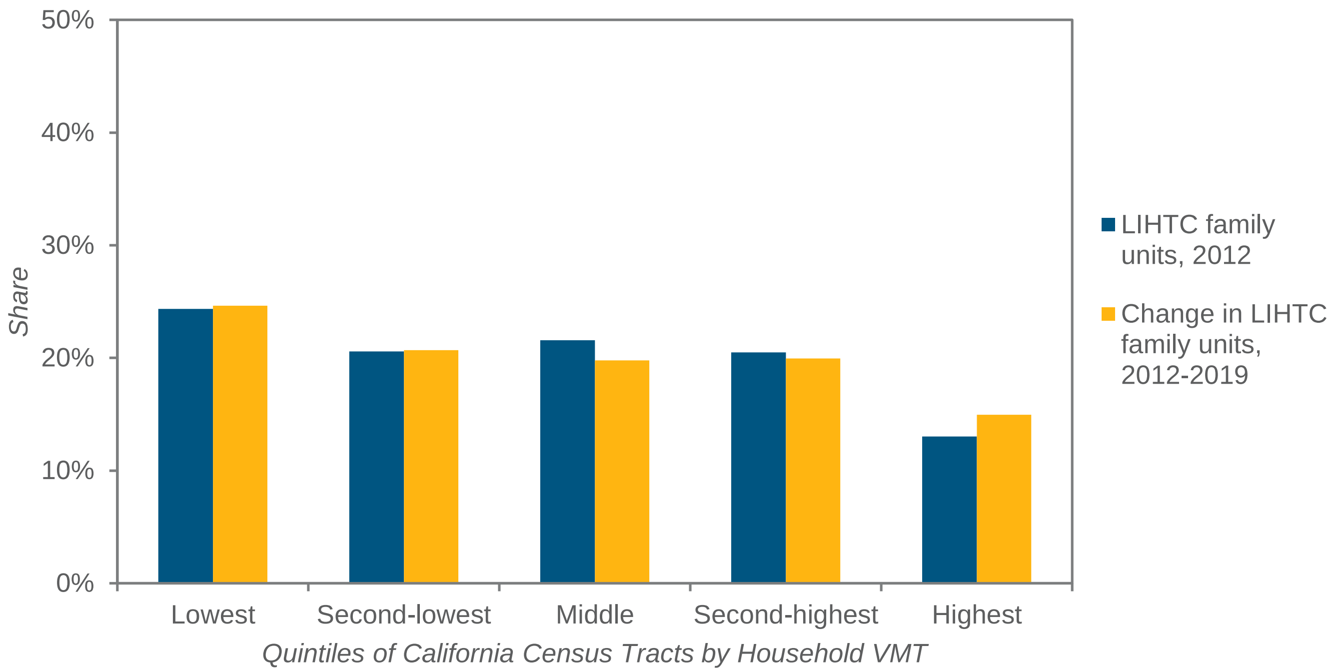

Figure 3. LIHTC Units by Household VMT

Data sources: U.S. HUD, 2022 and Ong et al., 2022

LIHTC units in 2012 and change from 2012 to 2019 were each relatively evenly distributed by commute VMT (See **Figure 4**). As with household VMT, a slightly higher percentage of both the baseline and change in LIHTC units are in the lowest quintile of commute VMT.

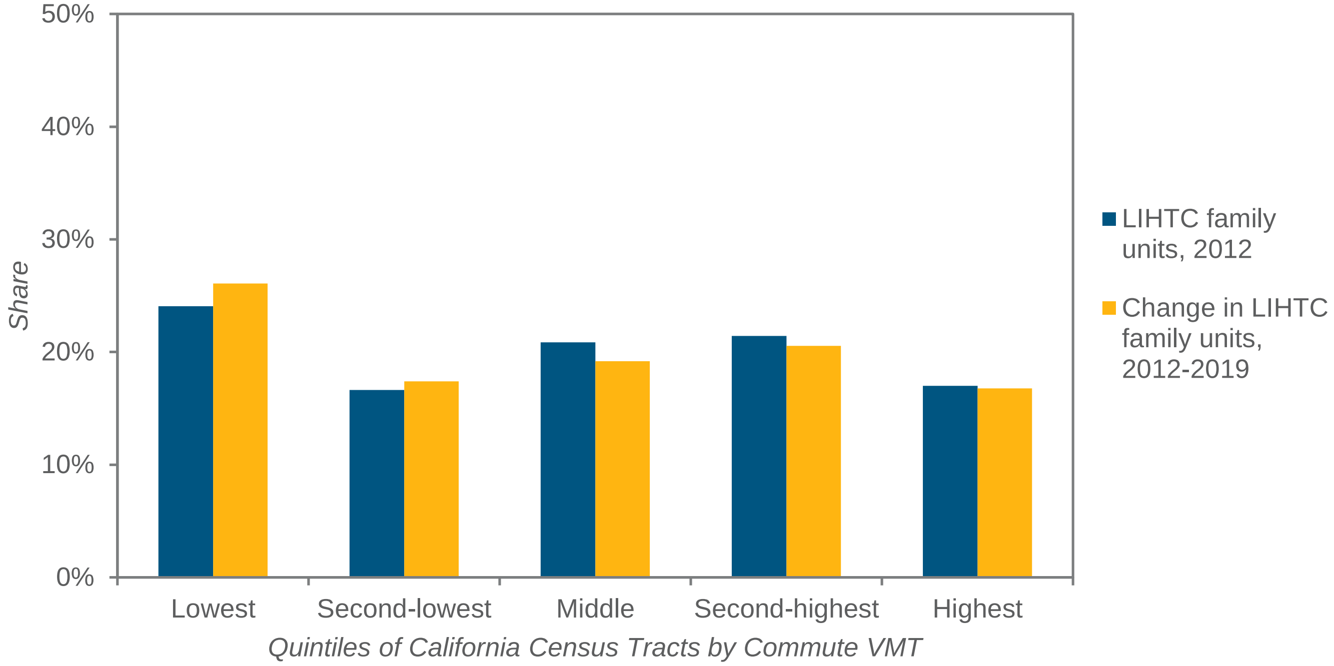

Figure 4. LIHTC Units by Commute VMT

Data sources: U.S. HUD, 2022 and Ong et al., 2022

Secondary Environmental Benefits: Transit and Walkability

In order to ensure that reduced VMT does not come at the expense of access to opportunities, ability to travel within and between communities, and quality of life, it is important to examine the transit access and walkability of LIHTC units as well.

In 2012, LIHTC units varied widely in their access to high-quality public transit (See **Figure 5**). Forty percent of units lay in census tracts that had no high-quality transit locations, as defined above, equivalent to the proportion of units in the middle three categories of transit access combined. A high, disproportionate number of LIHTC residents thus do not have good access to public transportation. Still, the next-highest proportion of LIHTC units fell in the most transit-accessible category: 18% were in tracts where almost the entire tract was within one quarter mile of a high-frequency transit stop. This varied distribution indicates that LIHTC units are not uniform in their access to transit: while some residents may live in census tracts that allow them to easily use public transport, many do not.

A disproportionate number of new LIHTC units continue to have poor access to high-quality transit, with the greatest share of net changed units falling into the lowest category of transit access. However, there appear to be some minor improvements compared to the distribution of 2012 baseline units.

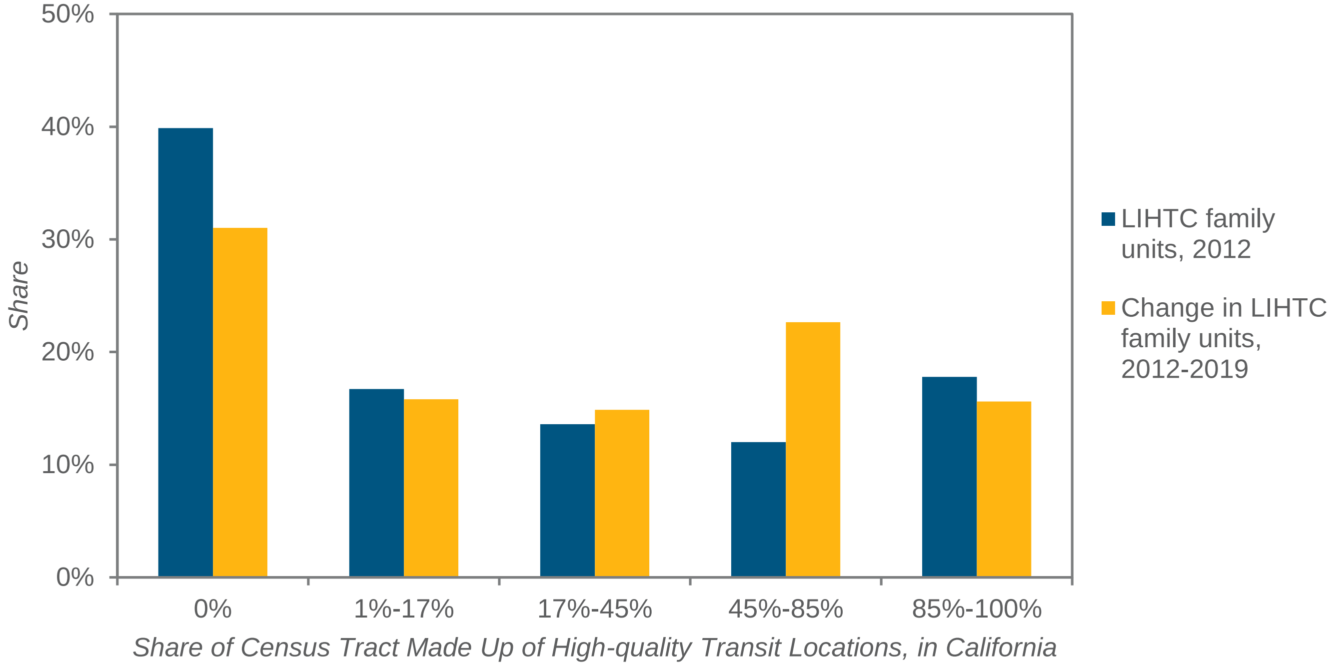

Figure 5. LIHTC Units by High-quality Transit Locations

Data sources: U.S. HUD, 2022 and Ong et al., 2022

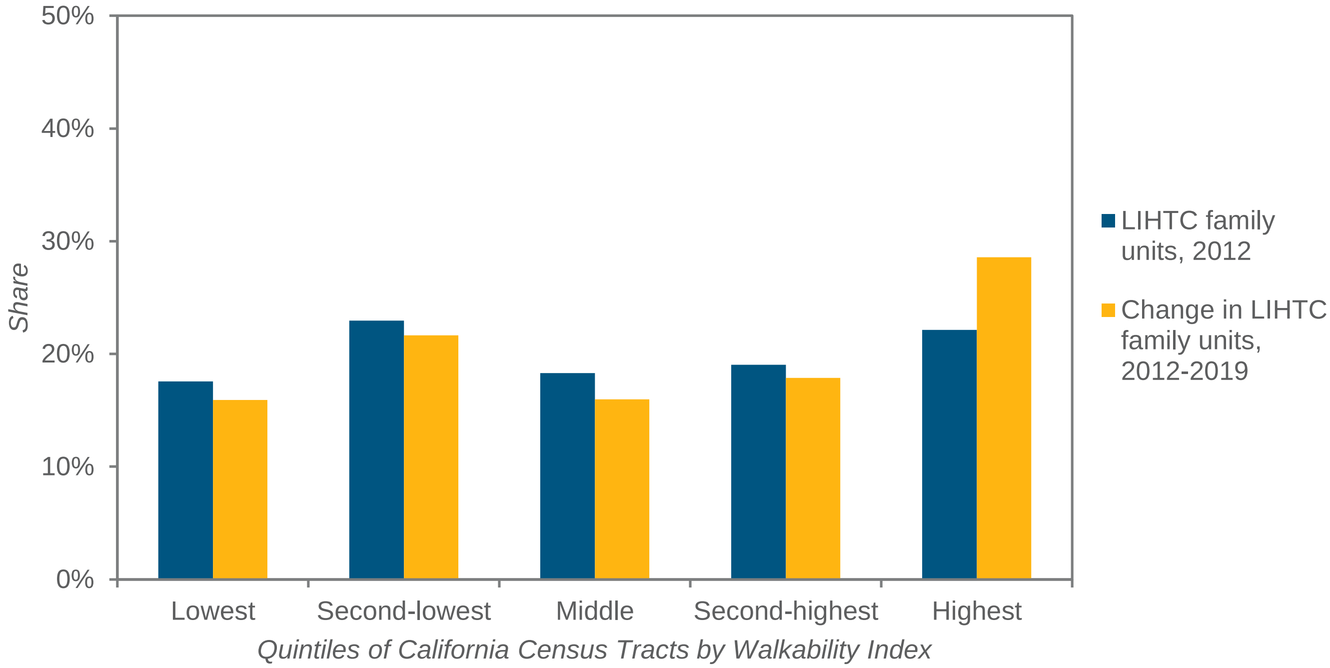

Figure 6. LIHTC Units by Walkability

Data sources: U.S. HUD, 2022; U.S. EPA, 2013; and Ong et al., 2022

Walkability is an important metric in any neighborhood, but perhaps even more so in populations or geographies where car ownership is less likely (as is the case for low-income households). **Figure 6** shows the distribution of units by walkability scores. LIHTC units are fairly evenly distributed across quintiles and changes have remained relatively consistent with the baseline, with the exception of the most-walkable quintile. From 2012 to 2019, almost 30 percent of new units were located in the most walkable neighborhoods, compared to just 18 percent of existing units in 2012.

Health Costs

The distribution of LIHTC units is relatively diffuse across quintiles by VMT and walkability, with marginally higher likelihood of being in neighborhoods with low VMT and high walkability. However, units are more likely to be in neighborhoods with little access to high-quality transit. But given the correlations between such neighborhood travel patterns and potential health costs for neighborhood residents, we next analyze patterns in the distribution of LIHTC units by exposure to pollution and vehicle crashes.

Pollution trends are clearly concerning. In 2012, units were already more likely to be in the higher quintiles of pollution levels (See **Figure 7**): 68 percent of units were in the middle quintile or higher, evenly distributed among the top three levels. The shift from 2012 to 2019 only exacerbated this pattern, with over 30 percent of the new units in the highest quintile and 78 percent in the highest three. While almost 15 percent of units in 2012 were in the least-polluted quintile, only seven percent of the changed units from 2012 to 2019 fell into this quintile. LIHTC units are increasingly less likely to be in neighborhoods with the lowest levels of pollution and increasingly more likely to be in areas with the highest levels of pollution.

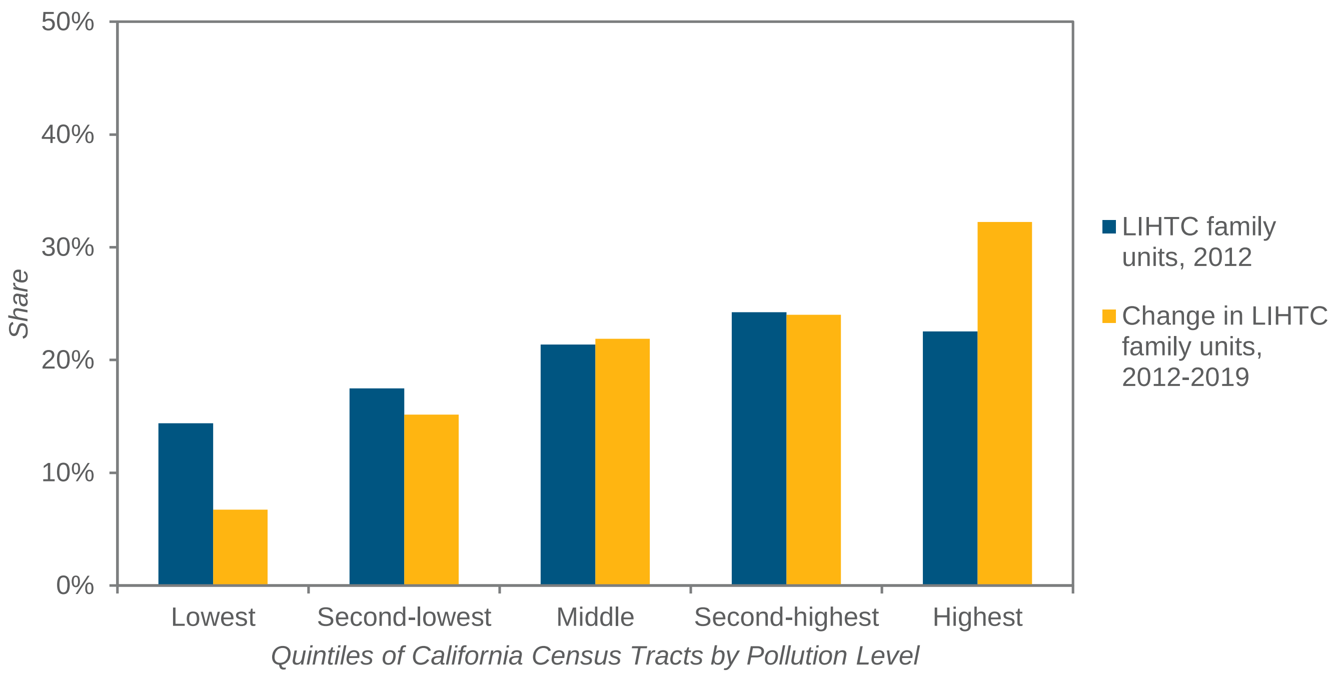

Figure 7. LIHTC Units by Pollution Levels

Data sources: U.S. HUD, 2022 and OEHHA, 2022

Looking at vehicle collision rates, LIHTC units in 2012 fell largely equally across quintiles, ranging between 18 percent and 22 percent. But compared to the baseline, the share of changed units was higher in the two most-crash-prone quartiles, while the three least-crash-prone quartiles observed a decrease (See **Figure 8**). Although changes were minor, these shifts demonstrate a trend toward units locating in areas with higher levels of traffic collisions.

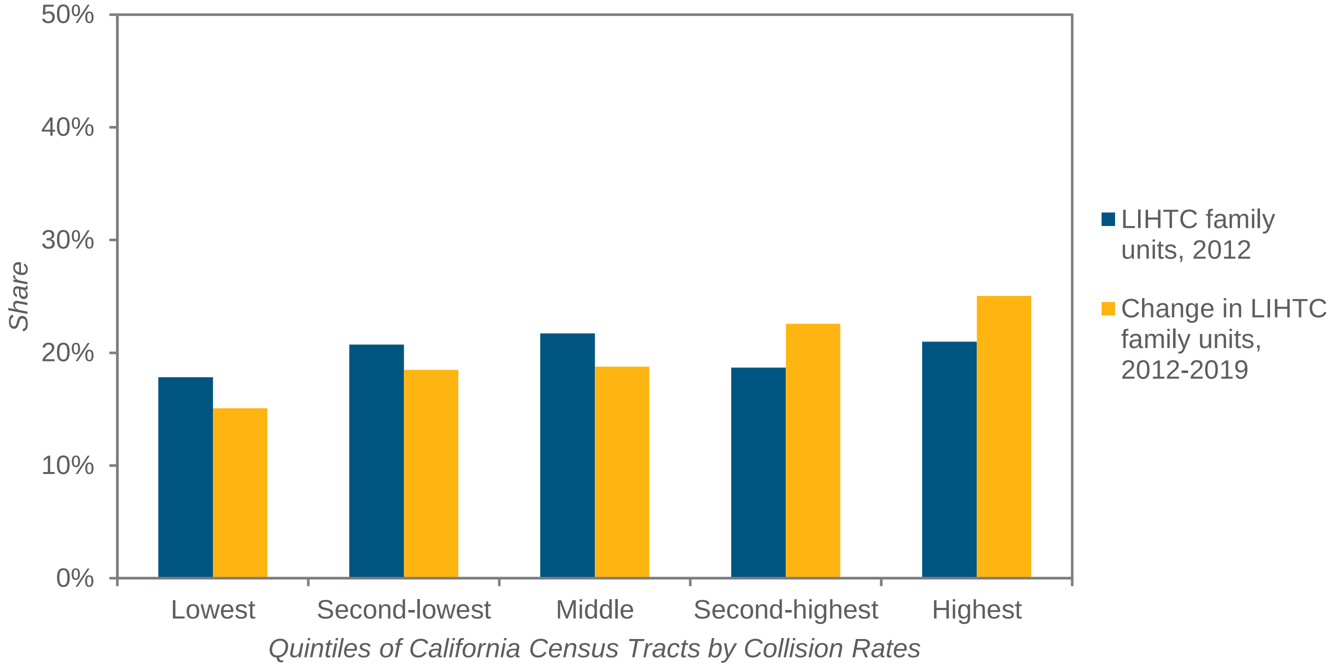

Figure 8. LIHTC Units by Vehicle Collision Rates

Data sources: U.S. HUD, 2022; Safe Transportation Research and Education Center, UC Berkeley, 2022; and Ong et al., 2022

These costs illustrate the need to ensure that environmental goals are being met in a way that is equitable. If affordable housing units are disproportionately located in census tracts with high environmental costs, this pattern will further exacerbate the extent to which low-income residents bear the burden of climate change.

Economic and Racial Segregation

In addition to climate goals, affordable housing must abide by state and federal fair housing laws discussed above, dictating that the location of affordable housing not perpetuate segregation or concentration of poverty. While data on the location of LIHTC units and the change in unit distribution shows some minor improvement on environmental factors like VMT and walkability, they reveal a clear increase in racial and economic segregation. LIHTC units are disproportionately located in poor neighborhoods (See **Figure 9**) and neighborhoods of color (See **Figure 10**).

Forty-five percent of 2012 units were in the highest-poverty census tracts—the largest fraction in a single quintile in any of the breakdowns in this report—and almost 70 percent of units lay in the top two quintiles. The change from 2012 to 2019 was relatively consistent with this baseline, with a minor comparative decrease in the highest quintile and a minor comparative increase in the second-highest quintile (See **Figure 9**). All told, the majority of LIHTC units continue to be concentrated in high-poverty census tracts.

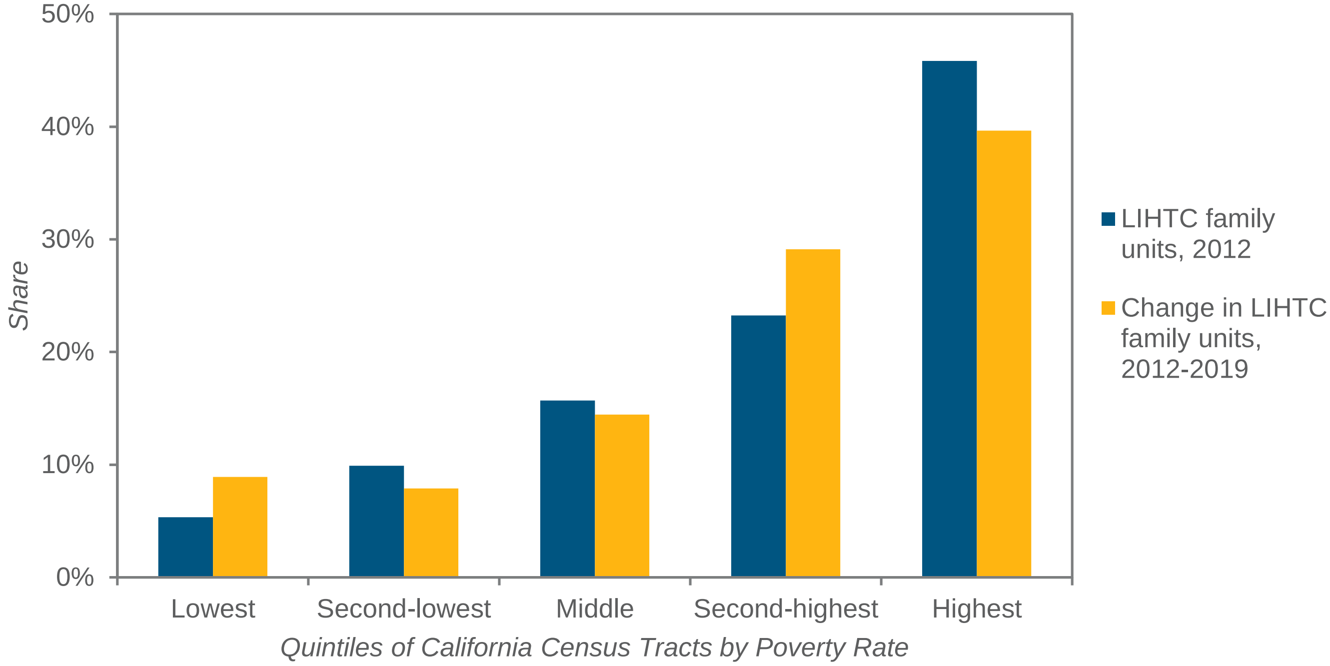

Figure 9. LIHTC Units by Neighborhood Poverty

Data sources: U.S. HUD, 2022 and U.S. Census Bureau, 2019

The same trends emerge when examining the racial makeup of tracts, using the percentage of non-Hispanic white residents as a simplified metric (See **Figure 10**). Most LIHTC residents live in census tracts home to predominantly people of color: fewer than eight percent of units in 2012 and even less of the growth from 2012 to 2019 were located in census tracts with the highest percentage of non-Hispanic white residents. Conversely, over 33 percent of 2012 units were in tracts with the lowest percentage of non-Hispanic white residents, and almost 60 percent were in the lowest two quintiles. These areas were, even more so, where the growth from 2012 to 2019 occurred.

LIHTC units are also generally isolated from employment opportunities. In 2012, units were heavily concentrated in neighborhoods with high unemployment, with almost 60 percent in the top two quintiles. While there were some shifts in new units across quintiles from 2012 to 2019 compared to the baseline, the proportion of units in the top and bottom two quintiles remained unchanged (See **Figure 11**)—illustrating a continued concentration of units in areas with high unemployment.

For jobs-housing fit, a metric that assesses balance between low wage workers and affordable housing, almost 60 percent of LIHTC units in 2012 were located in the lowest two quintiles (See **Figure 12**). A low jobs-housing fit value indicates that there are relatively fewer low-skill or low-wage jobs, relative to the supply of affordable housing. This requires residents to travel from their neighborhoods in order to find employment, with insufficient supply of jobs in their home neighborhood. On the other side, a high value for the jobs-housing fit means there

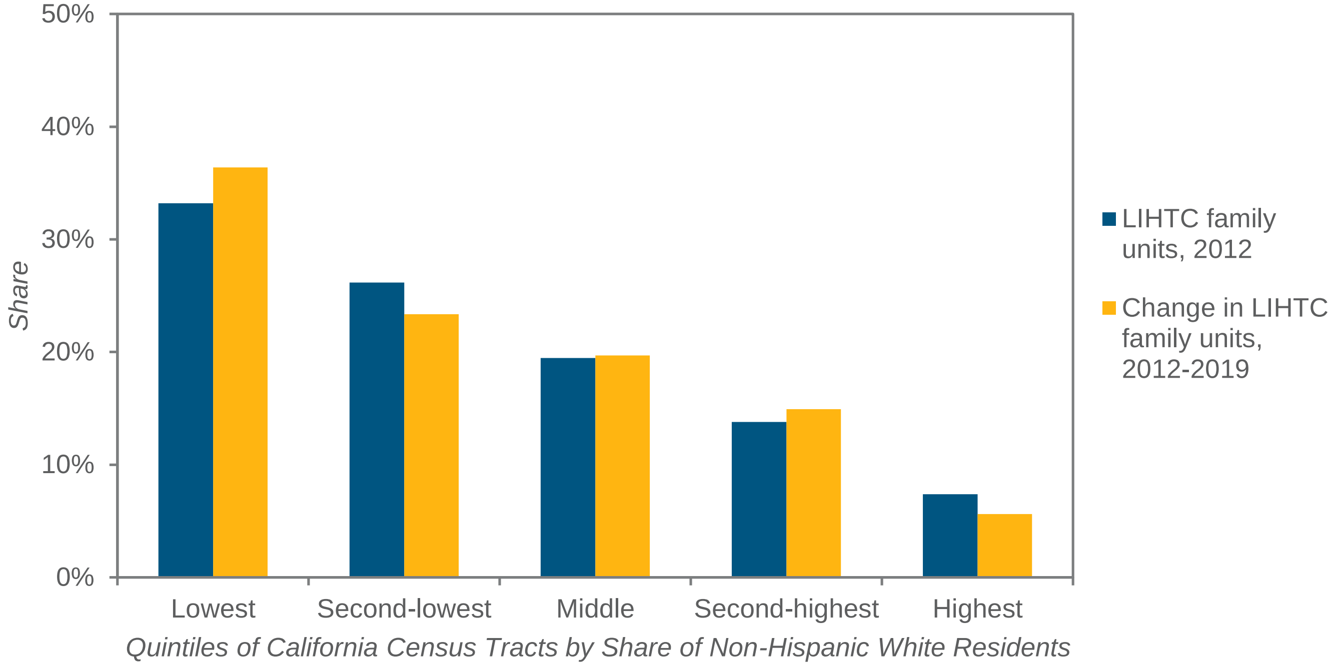

Figure 10. LIHTC Units by Race/Ethnicity

Data sources: U.S. HUD, 2022 and U.S. Census Bureau, 2019

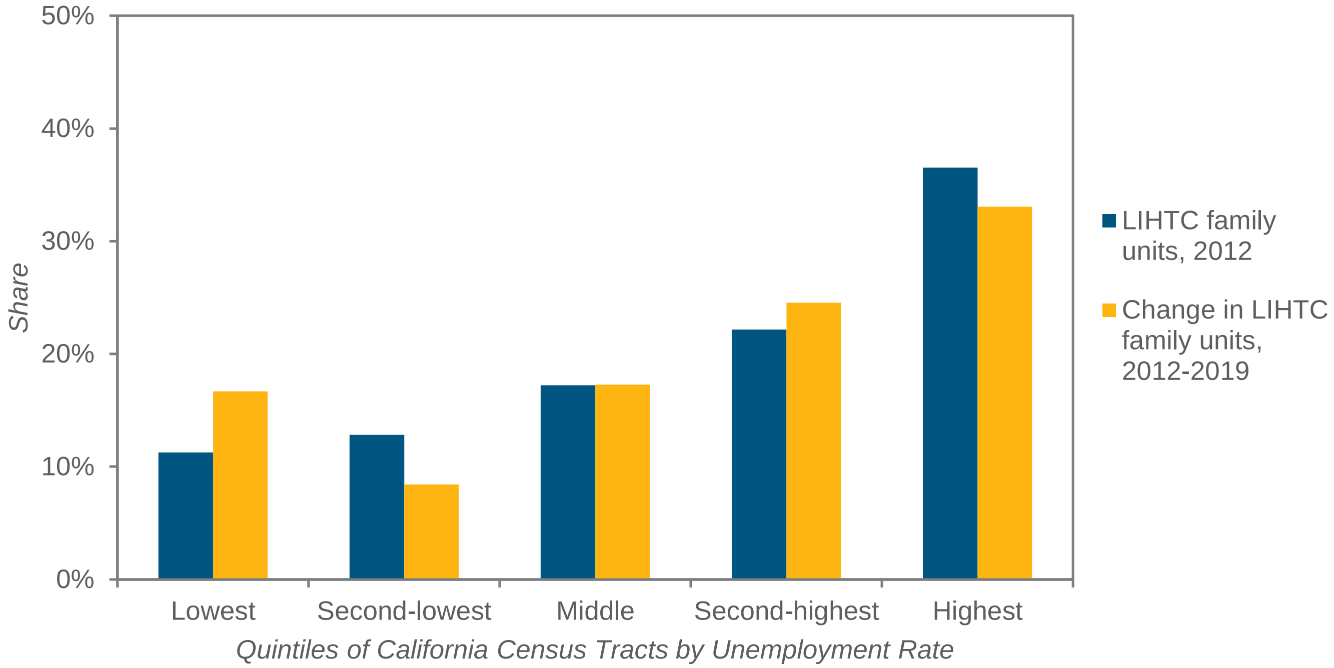

Figure 11. LIHTC Units by Neighborhood Unemployment

Data sources: U.S. HUD, 2022 and U.S. Census Bureau, 2019

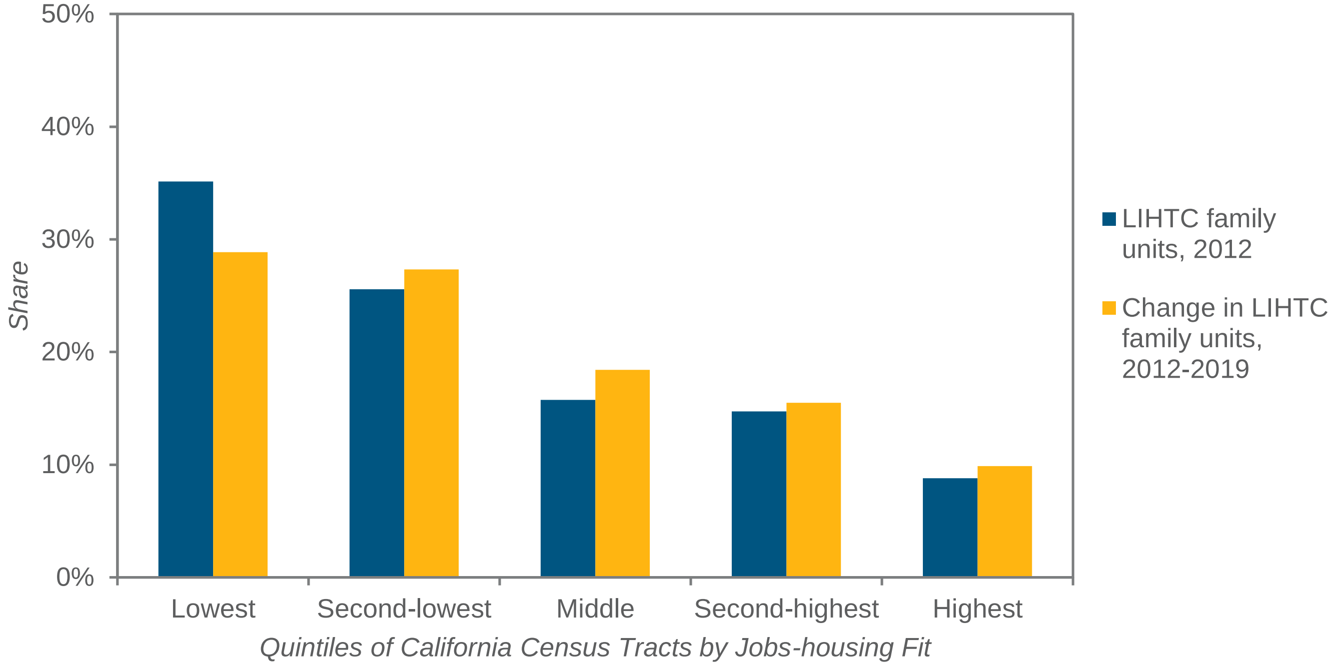

Figure 12. LIHTC Units by Jobs-housing Fit

Data sources: U.S. HUD, 2022 and Ong et al., 2022

are significant low-skill or low-wage jobs relative to the supply of affordable housing, indicating that workers are commuting to this neighborhood from more distant residential areas. While new units from 2012 to 2019 were slightly less likely to be in the lowest quintile compared to the 2012 baseline, the majority of new units continued to be concentrated in neighborhoods that require LIHTC residents to travel from their neighborhoods to find employment opportunities.

These trends, taken in concert, indicate a concerning pattern. LIHTC units are being further concentrated in areas with low economic opportunity and high segregation. These patterns were present in 2012 and have deepened since then. The fact that these trends are so broadly overlapping speaks to another reality about cities: census tracts that are poor tend to also be predominantly people of color, to be more isolated from economic opportunity, and to face high environmental costs. Together, this suggests that the siting of affordable housing units is not meeting state goals of reducing segregation and concentrated poverty and may in fact be perpetuating the very challenges it seeks to overcome.

Conclusion and Recommendations

Our findings reveal an inherent structural dilemma or contradiction in whether the LIHTC program is able to simultaneously achieve two broad and critically important policy goals adopted by California's policymakers. First, the state aims to attenuate climate change through sustainable development and transportation. Climate change drives global warming, which has severe economic, social, and political consequences. Reducing VMT through sustainable urban design is an important element in the effort to reduce GHG emissions, as VMT is a leading contributor (CARB, 2021). The other major societal goal is promoting greater access to geographic opportunities for low-income renters. This is driven by the knowledge that moving poor families to non-poor neighborhoods generates some short-term and long-term benefits for parents and children. The hope is to break a cycle of poverty by allowing greater access to opportunity. One mechanism to do so is to give greater geographic choice to those receiving subsidized housing. This would allow many to relocate from neighborhoods of concentrated poverty if units elsewhere are available. Yet, there are challenges with implementing this approach, as discussed previously in this report.

The empirical evidence shows that the Low-income Housing Tax Credit program has not been able to simultaneously fulfill both policy goals. By standard measures, the location of these subsidized units are relatively evenly distributed across the range of VMT and walkability, with marginally higher likelihood of being in neighborhoods with low VMT and high walkability. This was true in 2012 and largely remained true for units added in the subsequent seven years. Yet the spatial distribution of LIHTC units does not match California overall in other, troubling ways. Subsidized LIHTC renters were disproportionately concentrated in areas with heavy environmental pollution burdens and faced persistent economic segregation into high-poverty areas and racial segregation. Finally, we found poor access to employment prospects and to jobs for LIHTC unit residents. The quantitative findings reveal a real-world inability to simultaneously achieve sustainability goals and socioeconomic justice goals. Moreover, the results show that this issue is not substantively improving over time.

Tackling the dilemma would require multi-agency collaboration. Other CNK research for state agencies and qualitative interviews with their staff and affordable-housing developers suggest that the state is only in an initial stage in its efforts to implement a comprehensive, effective approach to bridge the two major policy goals. State policies do encourage cross-sector collaboration among those in the environmental, transportation, and housing arenas. There has been progress, with some joint committees and projects working on the intersection of those three sectors around equity. However, much more is needed from public agencies that appear to remain largely in separate silos and not yet fully coordinated on similar projects. This is apparent, for example, in the development of separate neighborhood assessment tools for sustainability, housing and transportation, which are critical to monitoring and assessing progress. This division is compounded by the fragmentation of the affordable housing into multiple and separate local jurisdictions. Each state or local agency focuses on and/or prioritizes its own narrow and immediate mission and priorities. Integration across sectors and agencies is understandably incredibly challenging but is essential to countering the negative aspects of the trajectory detailed above in the locations of affordable housing.

Improving interagency coordination alone will likely produce only marginal improvements as more fundamental contradictions are deeply embedded in the spatial urban structure. This stratified structure continuously acts to reproduce racial and class disparities and segregation. For example, one element of this reproduction process is the politically imposed constraints on the overall supply of housing in California metropolitan areas, driven by "not in my backyard" sentiments, which drive up rent and create and sustain more exclusive, high-rent neighborhoods.

Tackling such underlying structural economic, social, and political barriers is daunting—but ultimately must be done to meet equitable sustainability and housing goals.

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