



# Location Affordability and Fair Housing on a Collision Course?

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16. Abstract In 2014 HUD released the Location Affordability Index (LAI), a publicly-available online tool that allows users to compare the location affordability of various neighborhoods throughout the United States. Calls are beginning to mount for the LAI or similar indices to be considered in decision-making criteria on the siting of new publicly-subsidized low-income rental housing developments. We raise concerns that headlong efforts to integrate location affordability criteria into the siting of new affordable housing pose a tension with Fair Housing goals. We seek to answer a simple empirical question: is incorporating location affordability into the siting of new subsidized housing projects likely to steer such developments into predominantly African American and Latino neighborhoods? We find that from a Fair Housing standpoint, transportation costs may not be an ideal factor to consider when siting affordable housing. At the very least, they should be used with caution to avoid inadvertently intensifying the segregated locational patterns that subsidized rental housing has long exhibited.			
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# Chapter 1. Introduction

In 2014 HUD released the Location Affordability Index (LAI), a publicly-available online tool that allows users to compare the location affordability of various neighborhoods throughout the United States. Calls are beginning to mount for the LAI or similar indices to be considered in decision-making criteria on the siting of new publicly-subsidized low-income rental housing developments (Belsky, Goodman, and Drew, 2005; Bogdon and Can, 1997; Coulombel, 2018; Haas et al., 2006; Hamidi, Ewing, and Renne, 2016; Holtzclaw, 1994; Holtzclaw et al., 2002; Jewkes and Delgadillo, 2010; Saberi et al., 2017). In the United States, in particular, these calls have generated policies to promote more generous mortgages and more affordable housing construction in areas with good transit access and lower than average transportation costs (Blackman and Krupnick, 2001; Center for Neighborhood Technology, n.d.; Chatman and Voorhoeve, 2010).

Since households spend more on transportation than on any other household budget item other than housing, locating affordable housing in neighborhoods with low transportation costs could lead to substantial household savings. However, we raise concerns in this report that headlong efforts to integrate location affordability criteria into the siting of new affordable housing pose a tension with Fair Housing goals. The most important of these goals, for our purposes, is to dismantle, or at the very least to cease actions that perpetuate, concentrations of disadvantaged people. Because of the deep history of racial segregation in the United States, spatial concentration of disadvantage in metropolitan areas maps closely onto concentrations of Blacks and Hispanic at the neighborhood level.

In essence, we seek to answer a simple empirical question: is incorporating location affordability into the siting of new subsidized housing projects likely to steer such developments into predominantly Black and Hispanic neighborhoods? In other words, could the well-intentioned use of location affordability as a programmatic criterion for awarding housing subsidies inadvertently contradict their local Fair Housing efforts? Conversely, could Fair Housing policies concentrate vulnerable households in areas with high transportation costs? Furthermore, does the answer vary across metropolitan regions, perhaps conditioned by differing spatial patterns of racial and ethnic segregation, housing costs, and transportation infrastructure?

To address these questions, the rest of the paper is structured as follows. First, we briefly review existing scholarship on location affordability and Fair Housing. Next, we describe the data we rely upon for location affordability and the locations of subsidized rental housing developments, and the techniques we use to analyze them. We then present results of our national-scale analysis of whether location efficient places overlap with racialized enclaves, followed by metropolitan-specific analyses of the same. We then continue with a discussion of our findings, which in brief are that people of color tend to live in neighborhoods with lower transportation costs, and these are often the neighborhood where LIHTC units are cited. While the citing of subsidized housing in lower transportation cost areas is appealing from a housing affordability perspective, it also presents distinct Fair Housing challenges. Specially, if our goal is to use existing programs to reduce racial concentration, and in particular racial concentration in low opportunity neighborhoods, then transportation costs may not be an ideal factor to consider when siting affordable housing.

## Chapter 2. Location Affordability: An Emergent Concept

### 2.1. The origins of location affordability

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The old aphorism of a week's wages for a month's rent informed an affordability standard that dictated that no more than a quarter of a household's gross income ought to go towards its housing costs (Feins and Lane, 1981). This standard was codified into law by the U.S. government in 1969, which ensured its use in federal housing subsidy programs. Later, in 1983, the standard was relaxed to 30% (Pelletiere, 2008), where it has remained ever since (ibid).

While critiques of the 30% standard have circulated for decades, one of the most influential was Michael Stone's (1993) landmark book, *Shelter Poverty*. As Greenlee & Wilson (2016) put it, Stone "suggests moving from a simple ratio approach to one that relies upon a broader suite of income and household composition measures to adjust ratios to reflect the spending priorities of different household types. Central to this approach is the measurement of residual income—the income left over after paying for basic housing expenses" (p. 587). Subsequent scholarship beginning several years later began to draw specific attention to the role of transportation costs often being largest share of basic household expenses after housing (Bogdon and Can, 1997; Belsky et al., 2005).

The operationalization of location affordability took a major step forward when the Center for Neighborhood Technology (CNT) released its Housing + Transportation (H+T) Affordability Index (Haas et al., 2006). One early policy effort that aimed to take advantage of this new tool was the Location Efficient Mortgage (LEM). The LEM was predicated on modifying mortgage underwriting standards to allow homebuyers to borrow more than they normally could, provided they purchased homes in locations where they could save on transportation costs. Due to a variety of reasons, including skepticism from lenders and widely available credit alternatives, the LEM was abandoned in 2008 amidst anemic uptake (Hamidi, Ewing, and Renne, 2016). Recent studies have found that transportation costs play only a small role in household location decisions and that households do not shift transportation spending by much after moving to a more or less transportation affordable neighborhood. spend much less on transportation after (Tremoulet, Dann, and Adkins, 2016; Smart and Klein, 2017).



Despite the failure of the LEM, the concept of location affordability has grown, not receded, in prominence. An updated version of the H+T index fixed some of its methodological flaws and gained an official stamp of approval when HUD adopted the LAI in 2014 (Haas, Newmark & Morrison, 2016). The LAI is in turn facilitating a widening array of research on topics as varied as the relationship between location affordability and Housing Choice Vouchers (Bieri and Dawkins, 2016), Transit Oriented Development (Zuk and Carlton, 2015; Dawkins and Moeckel, 2016; Renne, Tolford, Hamidi, and Ewing, 2016), rental housing with expiring subsidies (Lens & Reina, 2016), and the post-move outcomes of public housing residents displaced by a HOPE VI redevelopment (Nguyen et. al, 2016); and location affordability in Rustbelt (Tighe and Ganning, 2016) and Canadian cities (Revington and Townsend, 2016).

Criteria that seek to steer the siting of subsidized rental housing developments to areas with amenities that result in household-level transportation cost savings are already embedded in some of the programs that allocate existing funding streams. For instance, as of 2014, 27 of the 50 states awarded additional points to applicants seeking Low Income Housing Tax Credits (LIHTCs) who proposed projects near transit stations, and 24 awarded points to projects within walking distance of neighborhood amenities such as banks and schools (Zuk and Carlton, 2015).

But now calls for a more explicit link between evaluation criteria for the allocation of affordable housing subsidies and location affordability are beginning to emerge. For instance, Tremoulet, Dann & Adkins (2016) recommend that Oregon add location affordability to its Qualified Allocation Plan (QAP) governing the disbursement of LIHTCs. Similarly, Hamidi, Ewing & Renne (2016) present empirical results that support apportioning HUD subsidies to location affordable neighborhoods, which they argue is of greatest importance within auto-dependent regions. They argue that their results also support an equivalent argument applied to other funding streams, particularly the LIHTC. Since one recent study found that LIHTC developments are more location efficient than housing in general, but still have considerable room for improvement (Adkins, Sanderford, and Pivo, 2017), it stands to reason that explicit location efficiency requirements implemented as part of state QAPs would alter their locational patterns. But might there be a risk of a conflict with Fair Housing arguments?

## 2.2. Fair Housing: a longstanding but contested tradition

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Goetz (2015) traces the Fair Housing movement in the United States back to the 1950s. He argues that it has encompassed two prongs. The first is a fight to contest discrimination in the sale or rental of housing, wherever it occurs, which is an aspatial strategy and relatively uncontroversial among those generally in support of greater housing options for the poor. The second approach is to achieve racially and ethnically integrated communities, which is an inherently spatially-focused approach. This is where internal tensions have arisen within the Fair Housing community (ibid).

What might be termed the “integration” objective itself focuses on three subsidiary goals. These are, in order of an increasing level of governmental intervention required, the “opening up” of predominantly white (usually suburban) communities to affordable housing; ending governmental actions that preserve or create racialized enclaves; and public and private action to eliminate already existing racialized enclaves (ibid). The concerns we raise in this report relate to the second, and are informed by past efforts by Fair Housing advocates to contest the construction of new subsidized rental housing developments in predominantly Black or Hispanic neighborhoods.

Underlying the internal tensions among those generally sympathetic to the Fair Housing movement and legal tradition is, at base, a fundamental disagreement between those who prioritize aggressive action to introduce affordable housing into high-opportunity areas and those who advocate above all for community development in existing disadvantaged neighborhoods (Goetz and Chapple, 2010). Successful pro-poor efforts connected to affordable housing have taken markedly different trajectories influenced by the organizational cultures of the entities carrying them out and by differing demographics and economic conditions within metropolitan areas, as the contrasting cases of Dallas and Austin illustrate (Mueller and Van Zandt, 2014). As we explain below, the rise to prominence of location affordability may be opening a new front in the long-running schism within the Fair Housing movement.

## 2.3. Emerging critiques of location affordability invoking Fair Housing

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While much of the emergent location affordability literature summarized earlier does not examine geographical patterns by race, studies that have done so recently have found some disquieting

patterns. For instance, Koschinsky and Talen (2016) find that while some of the nation’s 3.8 million HUD-assisted tenants have greater opportunities to access walkable neighborhoods—generally those with lower transportation costs—than they would in the absence of those subsidies, disadvantaged tenants benefit less. Specifically, those Hispanic and Black tenants living within walkable neighborhoods and receiving Project Based Section 8 subsidies or Housing Choice Vouchers, or living in public housing, tend to live in racially isolated and high-poverty areas. Similarly, in an examination of single-parent low-income renter families with children in the 100 largest metros, another study found that a one-quintile increase in a child opportunity index resulted in a 2.5 point increase in the “H” component of the LAI but also a 0.6 point increase in “T” (Acevedo-Garcia et al., 2016). The clear implication: “Policies that rely on a definition of affordability that combines housing and transportation costs alone, such as the LAI, risk directing low-income families to low-opportunity neighborhoods, which may eventually result in poorer child outcomes” (ibid, p. 624).

It is not as though newly-constructed affordable housing—which in the past 30 years has chiefly meant LIHTC-financed developments—has a stellar track record of furthering the integrationist objective of the Fair Housing Agenda. For instance, 71% of LIHTC units within New York City and seven surrounding counties in New York State opened between 1998 and 2007 are in areas of high or extreme poverty, and fully 77% are in neighborhoods with a majority population of color (Kawitzky et al., 2013). Relatedly, LIHTC-funded developments have tended to locate in submarkets within metropolitan areas in which there is little or no overall shortage of housing (McClure, 2010), even if they have been more likely to be built in the suburbs than developments funded by earlier direct assistance programs (McClure, 2006).

But if the current record of LIHTC-funded developments in fostering integration is middling, nationally-prominent Fair Housing activists are now raising concerns that incorporating location affordability into siting decisions could make it worse (Tegeler and Chouest, 2010; see also Tegeler’s argument against Bernstein in Tegeler and Bernstein, 2013). These concerns are amplified still further by two recent developments that make successful Fair Housing challenges to LIHTC developments sited in disadvantaged neighborhoods more likely than before.

The first is the U.S. Supreme Court’s 2015 ruling in the case of *Texas Department of Housing & Community Affairs v. Inclusive Communities Project, Inc.* The Court accepted the Dallas-based plaintiffs’ use of the broad “disparate impact” legal theory. The plaintiffs used this theory to challenge the State of Texas’ LIHTC allocation procedures, which had resulted in LIHTC developments in Dallas being overwhelmingly sited in low-income, predominantly Black and Hispanic neighborhoods. This decision sets a far-reaching precedent for future challenges (Epstein et al., 2015). As a consequence, the State of Texas completely overhauled its QAP, which now heavily emphasizes location within low-poverty neighborhoods and high-performing school districts, criteria that in Texas metropolitan areas almost always lead towards neighborhoods that are not “low T,” i.e., where residents have few transportation choices other than automobiles.<sup>1</sup>

The other major recent development in Fair Housing was HUD’s unveiling of the Affirmatively Furthering Fair Housing (AFFH) standard for local governments and other governmental entities that accept HUD funding (HUD, 2015). This standard has since been deferred under the Trump administration, but there is currently a lawsuit that aims to reinstate that mandate. Though the long-term probability of this mandate existing and the level of impact it will have if reinstated are still uncertain, many observers have interpreted it as a portend of sharpened federal scrutiny of local and state actions that hurt efforts to overcome historic patterns of segregation.

Given these trends, there is a heightened likelihood of success for a legal challenge that established that incorporating location affordability criteria into siting decisions for LIHTC developments would tend to steer them towards Black and Hispanic

-majority neighborhoods. We now turn towards the empirical question of whether such an outcome would in fact be likely.

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<sup>1</sup> This has led to some striking geographic patterns. For instance, three of the four 9% LIHTC awards allocated to the Austin metropolitan area in 2016 were given to developments located along a two-mile stretch of road in suburban Georgetown (TDCHA, 2016).

## Chapter 3. Empirical Findings

### 3.1. Description of data sets and methods

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The primary goal of this report is to explore variation in transportation costs across regions, and identify what this means for Fair Housing goals. This paper uses three primary data sources to explore this question. First, it uses US Census data from the 2000 and 2010 decennial censuses along with the 2012-2016 American Community Survey to identify demographics, and changes in demographics, over time. Second, it uses The Center for Neighborhood Technology’s H+T Affordability Index to identify tract-level housing and transportation costs. Finally, it uses the National Housing Preservation Database to identify the location of all LIHTC properties. These three data sets, used in combination, allow us to look at how tract-level racial composition relates to housing and transportation costs and the location of units developed through the LIHTC program.

The nature of this analysis is associative rather than causal. In taking this approach we follow the type of evidence often presented in Fair Housing jurisprudence, which emphasizes correlations between key variables rather than causal relationships. If a relevant association exists--in this case, between the presence of LIHTC developments, location efficiency, and the percentage of Black and Hispanic residents at the tract level—then an action that further reinforces it is likely to be problematic from a Fair Housing standpoint.

We begin by providing a series of descriptive tables that show housing and transportation costs across the country. We then use several linear regressions to further explore the relationship between race and housing costs, race and transportation costs, subsidized housing and race, subsidized housing and housing costs, and subsidized housing and transportation costs within and across metropolitan areas. To account for variation within metropolitan areas and the metropolitan nature of housing and transportation markets, we include fixed effects for each metropolitan area.

### 3.2. Analysis

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Across the United States and a sample of the 25 largest metropolitan areas, households of color are disproportionately concentrated in neighborhoods that rank well in terms of transportation affordability. Across the 66,256 census tracts for which there is housing and transportation cost

data, there are clear differences in transportation costs by race (Table 1). In general, households of color tend to live in census tracts with lower transportation costs, whereas white households<sup>2</sup> tend to live in higher transportation cost tracts. This relationship holds true when looking at only the top 25 MSAs in the country, with only 13 percent of whites living in tracts in the lowest quintile of transportation costs and 27 percent of Blacks and 22 percent of Hispanics living in tracts in the lowest quintile of transportation costs.

**Table 1: Transportation costs at tract level by quintile and race**

Race	Transportation Cost Quintile	Region	
		USA (overall sample)	Top 25 MSAs
Share White	1	12.61%	12.99%
	2	17.54%	14.06%
	3	21.08%	17.93%
	4	24.48%	24.86%
	5	24.22%	30.11%
	Total for Whites	100.00%	100.00%
Share Black	1	27.31%	27.25%
	2	20.46%	24.73%
	3	20.67%	22.58%
	4	16.82%	15.49%
	5	14.45%	9.72%
	Total for Blacks	100.00%	100.00%
Share Hispanic	1	26.50%	22.33%
	2	22.67%	23.86%
	3	20.74%	21.92%
	4	15.63%	18.34%
	5	14.33%	13.49%
	Total for Hispanics	100.00%	100.00%

When we then look at the 25 largest MSAs in the country, we can see some regional differences in the distribution of transit costs by race.<sup>3</sup> For example, only 16 percent of Black residents live in

2. In the rest of this report we follow the standard convention and use the term “white” to refer to people who identify solely as white non-Hispanic.

3. Even though the Census makes a distinction between respondents’ race (white vs. black vs. Asian vs. American Indian vs. more than one race, etc.) and ethnicity (Hispanic or non-Hispanic), in the rest of this report we use the term “race” as shorthand for a distinction between white non-Hispanics, Black non-Hispanics, and Hispanics. We focus our analysis on these three groups, since together they comprise a

tracts in the lowest quintile of transportation costs in the Seattle MSA, whereas 48 percent in the San Francisco MSA live in such tracts. In addition, just over 2 percent of Blacks in Chicago live in the highest quintile of transportation costs, whereas 20 percent do in Boston. Regardless of the variation, across all of the major MSAs in the country, the general reality is that lower transportation cost areas tend to be highly Black and Hispanic.

**Table 2: Linear regression of transportation costs at tract level on race**

		Base Model	With MSA fixed effect	Top 25 MSAs w/ MSA fixed effect
Intercept	Estimate	25.423***	32.592***	25.328***
	Standard Error	0.034	0.043	0.113
Percent Black	Estimate	-5.544***	-4.499***	-5.079***
	Standard Error	0.107	0.067	0.095
Percent Hispanic	Estimate	-5.874***	-4.667***	-4.662***
	Standard Error	0.109	0.082	0.102
	Sample Size	66,256	66,256	27,517
	R2	0.070	0.714	0.597
*** p<0.01, **p<0.05, *p<0.1				

To examine the strength and statistical significance of these relationships within and across metropolitan areas, we predict transportation costs as a function of race using linear regression. As seen in Table 2, a one percentage point increase in the share of Black households in a tract is associated with 5.5 percentage point decrease in transportation costs. For Hispanics, the corresponding drop is 5.9 percentage points. The magnitude remains roughly the same even when controlling for differences across MSAs, and restricting the sample to the largest MSAs in the country (Table 2).

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supermajority of the US population, and receive the most attention in Fair Housing jurisprudence, advocacy, and scholarship.

**Table 3: Housing costs at tract level by quintile and race**

Race	Housing Cost Quintile	Region	
		USA (overall sample)	Top 25 MSAs
Share non-Hispanic White	1	11.46%	8.98%
	2	18.20%	15.44%
	3	21.96%	20.25%
	4	24.14%	25.49%
	5	24.11%	29.75%
Share Black	1	33.21%	33.92%
	2	23.66%	24.11%
	3	18.38%	18.79%
	4	14.60%	14.77%
	5	9.75%	8.13%
Share Hispanic	1	23.03%	29.06%
	2	21.62%	24.77%
	3	20.05%	20.53%
	4	18.43%	15.52%
	5	16.69%	10.01%

Next, we can see that there is also variation in housing costs by race (Table 3). On the whole, households of color tend to live in tracts with lower housing costs. We know that the levels of services and amenities in a neighborhood are often capitalized into housing costs, which means that these lower costs likely reflect lower opportunity neighborhoods. Again, similar to transportation costs, there is significant variation in housing costs by race across regions. For example, over 52 percent of black households in the Philadelphia MSA live in tracts in the lowest quintile of housing costs, whereas only 19 percent do in San Antonio. On the other end of the cost spectrum, just over 5 percent of Blacks in Baltimore live in the highest housing cost quintile of their MSA, whereas nearly 20 percent do in the Riverside-San Bernardino MSA. While there are a lot of similarities in the distribution of Blacks and Hispanics across the housing cost spectrum, there are some notable differences. For example, over 50 percent of Hispanics in the Boston MSA live in the lowest housing cost quintile, whereas only 38 percent of Blacks live in such tracts. Again, the linear regression confirms these relationships (Table 4), but it also highlights that there are considerably higher housing costs for Black and Hispanics in the top 25 MSAs relative to the rest of the country. Interestingly, the share Black or Hispanic in a tract explains nearly 43 percent



of the variation in housing costs in the top 25 MSAs. This reality shows the distinct Fair Housing challenges in the major urban areas of the United States.

**Table 4: Linear regression of housing costs on race, by tract**

		Base Model	With MSA fixed effect	Top 25 MSAs w/ MSA fixed effect
Intercept	Estimate	34.143***	32.028***	39.407***
	Standard Error	0.055	0.103	0.314
Percent Black	Estimate	-15.718***	-18.506***	-20.093***
	Standard Error	0.172	0.160	0.263
Percent Hispanic	Estimate	-8.421***	-24.781***	-27.238***
	Standard Error	0.175	0.196	0.284
	Sample Size	66,256	66,256	27,517
	R2	0.129	0.401	0.427
*** p<0.01, **p<0.05, *p<0.1				

As seen in Table 5, nationally, a one percentage point increase in the share of Black households in a census tract is associated with 87 more LIHTC units in a tract, and 105 more units in the top 25 MSAs. Similarly, nationally, a one percentage point increase in the share Hispanic is associated with nearly 45 units in a tract, and 62 in the largest 25 metro areas. On the one hand, these patterns raise concerns about LIHTC units being disproportionately cited in areas with high populations of color. Conversely, as seen in Table 6, LIHTC units tend to be located in tracts with lower transportation costs, particularly in the top 25 MSA. In fact, as seen in Table 6, over 46 percent of existing LIHTC units are located in tracts with the lowest transportation costs, and this number is as high as 61 percent in the New York MSA. Similarly, few MSAs have LIHTC units located in the highest transportation cost tracts. For example, less than 2 percent of LIHTC units are located in tracts in the highest quintile of transportation costs in the Seattle MSA.

**Table 5: Linear regression of LIHTC units and race, by tract**

		Base Model	With MSA fixed effect	Top 25 MSAs w/ MSA fixed effect
Intercept	Estimate	13.288***	11.482***	23.316***
	Standard Error	0.538	1.201	4.059
Percent Black	Estimate	87.380***	97.332***	105.928***
	Standard Error	1.683	1.868	3.397
Percent Hispanic	Estimate	44.845***	60.471***	61.988***
	Standard Error	1.716	2.287	3.665
	Sample Size	66,256	66,256	27,517
	R2	0.045	0.065	0.054
*** p<0.01, ** p<0.05, *p<0.1				

**Table 6: Linear regression of LIHTC units and transportation costs, by tract**

		Base Model	With MSA fixed effect	Top 25 MSAs w/ MSA fixed effect
Intercept	Estimate	86.732***	200.361***	238.078***
	Standard Error	1.460	3.510	6.072
Transportation Cost	Estimate	-2.268***	-5.524***	-7.447***
	Standard Error	0.060	0.104	0.202
	Sample Size	66,256	66,256	27,517
	R2	0.021	0.058	0.058
*** p<0.01, **p<0.05, *p<0.1				

## Chapter 4. Discussion

With increasing concerns about housing affordability, the idea of including transportation costs in location affordability measures is an important and worthwhile goal. However, the concept of location affordability does not come without tradeoffs. In this paper we show that transportation and housing costs are strongly associated with race. As a result, policies that aims to decrease housing and transportation costs may steer units into high minority areas, an outcome that runs counter to Fair Housing goals.

The LIHTC program is currently the largest affordable housing financing program in the U.S., which means it is often viewed as a vessel for addressing some of our broader policy goals. Evidence shows that LIHTC properties increase local property values (Ellen et al 2007) particularly when sited in more distressed areas (Diamond and McQuade 2016). However, such siting has a disparate impact of furthering segregation. Incorporating location affordability metrics that aim to reduce transportation costs poses the same risk of increasing segregation as opposed to remedying it.

Despite these tensions, there are several solutions that can reconcile the tension between location affordability and fair housing. As discussed in this paper, the relationship between location affordability and race varies across regions, which makes the case for using data to better estimate the Fair Housing implications of location affordability policies. Policies around location efficiency may be less risky when implemented within a given city (i.e., as a way of allocating locally-generated funds to subsidize affordable housing) than statewide. This is challenging because in many states the Qualified Allocation Plans (QAP) that determine the point structure in the LIHTC program are determined at the state level. New York City and Chicago, which receive their own allocation of LIHTC financing are well positioned to develop location affordability goals that better align with local Fair Housing needs. In the case of statewide QAPs there is room to include a requirement to show how location affordability affects Fair Housing in the point structure. Another policy suggestion is to conduct a state-level Fair Housing analysis before implementing any location efficiency criteria within QAPs. Finally, incentives, or programs, that reduce

transportation costs in higher opportunity, largely white, neighborhoods should be coupled with mandates that enable low-income minority households to access these areas.

In this paper we highlight an important reality, which is that housing and transportation costs are strongly associated with race. This means that if we establish a policy goal aimed at reducing transportation costs in the siting of subsidized housing then we are more likely to steer these units toward neighborhoods that already have high concentrations of Black or Hispanic residents, contrary to Fair Housing objectives. Given the current concentration of minorities in low transportation cost areas, we need to use the data at our disposal to develop clear and informed policies that reduce segregation and maximize location affordability.

## References

- Acevedo-Garcia, Dolores, Nancy McArdle, Erin Hardy, Keri-Nicole Dillman, Jason Reece, Unda Ioana Crisan, David Norris, and Theresa L. Osypuk. 2016. "Neighborhood Opportunity and Location Affordability for Low-Income Renter Families." *Housing Policy Debate* 26(4-5), 607-645.
- Arlie Adkins, Andrew Sanderford & Gary Pivo. 2017. "How Location Efficient Is LIHTC? Measuring and Explaining State-Level Achievement." *Housing Policy Debate* 27(3), 335-355.
- Belsky, Eric, Jack Goodman, and Rachel Bogardus Drew. 2005. "Measuring the Nation's Rental Housing Affordability Problems." Joint Center for Housing Studies, Graduate School of Design and John F. Kennedy School of Government, Harvard University.
- Bieri, David S. and Casey J. Dawkins. 2016. "Quality of Life, Transportation Costs, and Federal Housing Assistance: Leveling the Playing Field." *Housing Policy Debate* 26(4-5), 646-669.
- Blackman, Allen, and Alan Krupnick. 2001. "Location-Efficient Mortgages: Is the Rationale Sound?" *Journal of Policy Analysis and Management* 20 (4): 633–49.
- Bogdon, Amy and Can, Ayse, 1997. "Indicators of Local Housing Affordability: Comparative and Spatial Approaches." *Real Estate Economics* 25 (1), 43–80.
- Center for Neighborhood Technology. n.d. "Applications for Use of H+T Index." Accessed June 14, 2018. <https://htaindex.cnt.org/applications/>.
- Chatman, Daniel, and Niels Voorhoeve. 2010. "The Transportation-Credit Mortgage: A Post-Mortem." *Housing Policy Debate* 20 (3): 355–82. <https://doi.org/10.1080/10511481003788786>.
- Coulombel, Nicolas. 2018. "Why Housing and Transport Costs Should Always Be Considered Together: A Monocentric Analysis of Prudential Measures in Housing Access." *Transport Policy* 65 (July): 89–105. <https://doi.org/10.1016/j.tranpol.2017.04.011>.
- Dawkins, Casey and Rolf Moeckel. 2016. "Transit-Induced Gentrification: Who Will Stay, and Who Will Go?" *Housing Policy Debate* 26(4-5), 801-818.
- Diamond, Rebecca, and Timothy McQuade. 2016. *Who wants affordable housing in their backyard? An equilibrium analysis of low income property development*. No. w22204. National Bureau of Economic Research.

Ellen, Ingrid Gould, Amy Ellen Schwartz, Ioan Voicu, and Michael H. Schill. 2007. "Does federally subsidized rental housing depress neighborhood property values?." *Journal of Policy Analysis and Management: The Journal of the Association for Public Policy Analysis and Management* 26, no. 2: 257-280.

Epstein, Eric, Joseph Lynyak, David Scheffel, Nicholas Vliestra, and Brent Ylvisaker. 2015. "The U.S. Supreme Court's Decision in Texas Department of Housing & Community Affairs v. Inclusive Communities Project, Inc." Dorsey. Downloaded on September 29, 2016 from: <https://www.dorsey.com/newsresources/publications/client-alerts/2015/06/the-us-supreme-courts-decision-in-itexas-departm>

Feins, J.D. and Lane, T.S., 1981. *How much for housing?: new perspectives on affordability and risk*. Cambridge, Mass.: Abt Books.

Pelletiere, D., 2008. *Getting to the Heart of Housing's Fundamental Question: How*

*Much Can a Family Afford: A primer on Housing Affordability Standards in U.S. Housing Policy*.

Goetz, Edward G. 2015. "From Breaking Down Barriers to Breaking Up Communities: The Expanding Spatial Strategies of Fair Housing Advocacy." *Urban Affairs Review* 51(6), 820-842.

Goetz, Edward G. and Karen Chapple. 2010. "You Gotta Move: Advancing the Debate on the Record of Dispersal." *Housing Policy Debate* 20 (2), 209-236.

Greenlee, Andrew J. and Beverly K. Wilson. 2016. "Where Does Location Affordability Drive Residential Mobility? An Analysis of Origin and Destination Communities." *Housing Policy Debate* 26(4-5), 583-606.

Guerra, Erick and Mariel Kirschen. 2016. "Housing Plus Transportation Affordability Indices: Uses, Opportunities, and Challenges." Technical paper for round-table on income inequality, social inclusion, and mobility. Paris, Organisation for Economic Co-operation and Development. <https://www.econstor.eu/bitstream/10419/173922/1/87058233X.pdf>

Haas, Peter M., Carrie Makarewicz, Albert Benedict, Thomas W. Sanchez, and Casey J. Dawkins. 2006. "Housing & Transportation Cost Trade-Offs and Burdens of Working Households in 28 Metros." *Center for Neighborhood Technology*. <http://www.academia.edu/download/38251494/H-T-Tradeoffs-for-Working-Families-n-28-Metros-FULL.pdf>.

Haas, Peter, Gregory L. Newmark and T. R. Morrison. 2016. “Untangling Housing Cost and Transportation Interactions: The Location Affordability Index Model—Version 2 (LAIM2).” *Housing Policy Debate*, 26 (4-5), 568-582.

Hamidi, Shima, Reid Ewing, and John Renne. 2016. “How Affordable Is HUD Affordable Housing?” *Housing Policy Debate* 26 (3): 437–55.  
<https://doi.org/10.1080/10511482.2015.1123753>.

Holtzclaw, John. 1994. *Using Residential Patterns and Transit to Decrease Auto Dependence and Costs*. Vol. 11. San Francisco: Natural Resources Defense Council.  
[https://www.researchgate.net/profile/John\\_Holtzclaw/publication/235358501\\_Using\\_residential\\_patterns\\_and\\_transit\\_to\\_decrease\\_auto\\_dependence\\_and\\_costs/links/55baaef508aed621de0ad4b7.pdf](https://www.researchgate.net/profile/John_Holtzclaw/publication/235358501_Using_residential_patterns_and_transit_to_decrease_auto_dependence_and_costs/links/55baaef508aed621de0ad4b7.pdf).

Holtzclaw, John, Robert Clear, Hank Dittmar, David Goldstein, and Peter Haas. 2002. “Location Efficiency: Neighborhood and Socio-Economic Characteristics Determine Auto Ownership and Use - Studies in Chicago, Los Angeles and San Francisco.” *Transportation Planning & Technology* 25 (1): 1–27.

HUD (U.S. Department of Housing and Urban Development). 2015 (July 16). “Affirmatively Furthering Fair Housing.” *Federal Register* 80(136), 42272-42371.

Jewkes, Melanie, and Lucy Delgadillo. 2010. “Weaknesses of Housing Affordability Indices Used by Practitioners.” *Journal of Financial Counseling and Planning* 21 (1).

Kawitzky, Simon, Fred Freiberg, Diane L. Houk, Salimah Hankins. 2013 (August). “Choice Constrained, Segregation Maintained: Using Federal Tax Credits to Provide Affordable Housing.” Fair Housing Justice Center. Downloaded on September 29, 2016 from <http://www.fairhousingjustice.org/wp-content/uploads/2013/08/FHJC-LIHTCREPORT-Aug13-Fullv1-7-WEB.pdf>

Koschinsky, Julia and Emily Talen. 2016. “Location Efficiency and Affordability: A National Analysis of Walkable Access and HUD-Assisted Housing.” *Housing Policy Debate* 26(4-5), 835-863.

Lens, Michael C. and Vincent Reina. 2016. “Preserving Neighborhood Opportunity: Where Federal Housing Subsidies Expire.” *Housing Policy Debate* 26(4-5), 714-732.

McClure, Kirk. 2006. “The Low-Income Housing Tax Credit Program Goes Mainstream and Moves to the Suburbs.” *Housing Policy Debate* 17(3), 419-446.

McClure, Kirk. 2010. "Are Low-Income Housing Tax Credit Developments Locating Where There is a Shortage of Affordable Units?" *Housing Policy Debate* 20(2), 153-171.

Mueller, Elizabeth and Shannon S. Van Zandt. 2014. "Beyond 'Accidents of Geography:' Using Housing Policy to Improve Access to Quality Education." In Ingram, Gregory K. and Daphne. A Kenton (Eds.), *Education, Land, and Location*. Cambridge, Mass.: Lincoln Institute of Land Policy.

Nguyen, Mai Thi, Michael Webb, William Rohe and Estefany Noria. 2016. "Beyond Neighborhood Quality: The Role of Residential Instability, Employment Access, and Location Affordability in Shaping Work Outcomes for HOPE VI Participants." *Housing Policy Debate* 26(4-5), 733-749.

Renne, John L. and Lisa A. Sturtevant. 2016. "Background, Outline, Emerging Themes, and Implications for Housing and Transportation Policy." *Housing Policy Debate* 26(4-5), 563-567.

Renne, John L. Tara Tolford, Shima Hamidi, and Reid Ewing. 2016. "The Cost and Affordability Paradox of Transit-Oriented Development: A Comparison of Housing and Transportation Costs Across Transit-Oriented Development, Hybrid and Transit-Adjacent Development Station Typologies." *Housing Policy Debate* 26(4-5), 819-834.

Revington, Nick and Craig Townsend. 2016. "Market Rental Housing Affordability and Rapid Transit Catchments: Application of a New Measure in Canada." *Housing Policy Debate* 26(4-5), 864-886.

Saberi, Meead, Hongzhi Wu, Richard Amoh-Gyimah, Jonathan Smith, and Arunachalam Dharmalingam. 2017. "Measuring Housing and Transportation Affordability: A Case Study of Melbourne, Australia." *Journal of Transport Geography* 65 (December): 134–46. <https://doi.org/10.1016/j.jtrangeo.2017.10.007>.

Smart, Michael J., and Nicholas J. Klein. 2017. "Complicating the Story of Location Affordability." *Housing Policy Debate*, October, 1–18. <https://doi.org/10.1080/10511482.2017.1371784>.

Stone, Michael E. 1993. *Shelter Poverty: New Ideas on Housing Affordability*. Philadelphia: Temple University Press.



TDCHA (Texas Department of Housing and Community Affairs). 2016. “Competitive Housing Tax Credits Award and Waiting List (September 23).” Downloaded on September 29, 2016 from <http://www.tdhca.state.tx.us/multifamily/housing-tax-credits-9pct/>

Tegeler, Philip and Scott Bernstein. 2013. “Counterpoint: the ‘Housing + Transportation Index’ and Fair Housing.” In Tighe, J. Rosie and Elizabeth Mueller, (Eds.), *The Affordable Housing Reader*. New York: Routledge.

Tegeler, Philip and Hanna Chouest. 2010. “The ‘Housing + Transportation Index’ and Fair Housing.” *Poverty & Race*, 19(4), 13–14.

Tighe, J. Rosie and Joanna P. Ganning. 2016. “Do Shrinking Cities Allow Redevelopment Without Displacement? An Analysis of Affordability Based on Housing and Transportation Costs for Redeveloping, Declining, and Stable Neighborhoods.” *Housing Policy Debate* 26(4-5), 785-800.

Tremoulet, Andrée, Ryan J. Dann, and Arlie Adkins. 2016. “Moving to Location Affordability? Housing Choice Vouchers and Residential Relocation in the Portland, Oregon Region.” *Housing Policy Debate* 26(4-5), 692-713.

Zuk, Miriam and Ian Carlton. 2015 (March). “Equitable Transit Oriented Development: Examining the Progress and Continued Challenges of Developing Affordable Housing in Opportunity and Transit-Rich Neighborhoods.” Poverty & Race Research Action Council, Civil Rights Research. Downloaded on September 29, 2016 from <http://www.prrac.org/pdf/EquitableTOD.pdf>