Draft 2026 Methodology for Neighborhood Change Mapping Tool

October 2025

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Background and Purpose

About affirmatively furthering fair housing

As defined in state law,[1] affirmatively furthering fair housing (AFFH) means taking meaningful actions, in addition to combating discrimination, that overcome patterns of segregation and foster inclusive communities free from barriers that restrict access to opportunity based on protected characteristics. Specifically, affirmatively furthering fair housing means taking meaningful actions that, taken together:

- Address significant disparities in housing needs and in access to opportunity,
- Replacing segregated living patterns with truly integrated and balanced living patterns,
- Transforming racially and ethnically concentrated areas of poverty into areas of opportunity, and
- Fostering and maintaining compliance with civil rights and fair housing laws.

Purpose of the neighborhood change mapping tool

The Neighborhood Change Map identifies places where demographic change presents both challenges and opportunities for advancing several AFFH objectives, including advancing racial and economic integration and addressing disproportionate housing needs. The map captures both substantial racial/ethnic demographic change (growth in the non-Hispanic white share of the population) and economic demographic change (growth in median household income), as well as markers of disproportionate housing needs (rising median rents and the home value/income percentile gap).

About the research partners

In 2023, the Department of Housing and Community Development (HCD) convened a group of independent organizations and research centers, referred to henceforth as the "research partners," to provide research support for HCD's Opportunity Framework, whose goal is to develop evidence-based approaches for advancing AFFH objectives in a variety of neighborhood and policy contexts. The mapping tool described in this methodology documentation is an outgrowth of this work.[2]

[1] For more information on HCD's approach to advancing AFFH objectives, see: https://www.hcd.ca.gov/planning-and-community-development/affirmatively-furthering-fair-housing.

[2] The research partners currently include representation from the Othering & Belonging Institute at UC Berkeley, the Terner Center for Housing Innovation at UC Berkeley, and the California Housing Partnership.

Neighborhood Change Methodology

Objectives

The Neighborhood Change Map identifies places where demographic change, in the absence of policy intervention, risks exacerbating AFFH-related challenges while also presenting an opportunity to advance several AFFH objectives, particularly with policy intervention.[3] The map captures both substantial racial/ethnic demographic change (growth in the non-Hispanic white share of the population) and economic demographic change (growth in median household income), as well as markers of disproportionate housing needs (rising median rents and the home value/income percentile gap).

The map's overarching objective is to inform policies which seek to stabilize neighborhood choice in places that are undergoing or have undergone substantial demographic change, and thus have the potential for advancing the AFFH objectives of (1) racial and economic integration, but are at risk of experiencing losses in the historic population of people of color (POC) and/or low-income residents, thus providing the opportunity to advance the AFFH goal of (2) addressing disproportionate housing needs through displacement prevention. In particular, the map seeks to inform policies which achieve the following goals:

> *Goal 1*: Stabilize and prevent displacement of current low-income and/or POC residents in neighborhoods experiencing or that recently experienced an influx of high-income and white households.
>
> *Goal 2*: Ensure neighborhoods experiencing or that recently experienced an influx of high-income and white households remain open and accessible to potential future low-income and/or POC residents, and mitigate future exclusion.
>
> *Goal 3*: Preserve and foster racial and economic integration in neighborhoods experiencing an influx of high-income and white residents, preventing historic patterns of segregation from reconfiguring.

Justification for mapping tool

[3] On the promise and peril of neighborhood change for advancing AFFH goals, see the following selection of key research: Brummet, Q., & Reed, D. (2019). The effects of gentrification on the well-being and opportunity of original resident adults and children. *Federal Reserve Bank of Philadelphia*. https://doi.org/10.21799/frbp.wp.2019.30; Chapple, K., Hwang, J., Jeon, J. S., Zhang, I., Greenberg, J., & Shrimali, B. P. (2022). Housing market interventions and residential mobility in the San Francisco Bay Area. *Federal Reserve Bank of San Francisco, Community Development Working Paper Series*, 01–179. https://doi.org/10.24148/cdwp2022-01; Dragan, K. L., Ellen, I. G., & Glied, S. A. (2019). Gentrification and the health of low-income children in New York City. *Health Affairs*, *38*(9), 1425–1432. https://doi.org/10.1377/hlthaff.2018.05422; Dragan, K., Ellen, I. G., & Glied, S. (2020). Does gentrification displace poor children and their families? new evidence from Medicaid data in New York City. *Regional Science and Urban Economics*, *83*, 103481. https://doi.org/10.1016/j.regsciurbeco.2019.103481; Ellen, I. G., & Torrats-Espinosa, G. (2018). Gentrification and fair housing: Does gentrification further integration? *Housing Policy Debate*, *29*(5), 835–851. https://doi.org/10.1080/10511482.2018.1524440; Freeman, L. (2009). Neighborhood diversity, metropolitan segregation and gentrification: What are the links in the US? *Urban Studies*, *46*(10), 2079–2101. https://doi.org/10.1177/0042098009339426

There is a wide literature on neighborhood change, including various "off-the-shelf" methodologies or tools.[4] The research partners conducted a literature review and an evaluation of existing tools in the context of the policy goals stated above, leading to the development of the following criteria to guide the review:[5]

> *Criteria 1:* Captures historically POC neighborhoods with substantial recent increases in the non-Hispanic white population.
>
> *Criteria 2:* Captures historically low- and/or moderate-income neighborhoods with substantial recent increases in high-income households.
>
> *Criteria 3:* Addresses disproportionate housing needs, such as through measurements of displacement, loss of affordable housing, and/or increased housing costs.

The review did not reveal a single existing definition or tool that fully and directly addressed these criteria. As a result, directed by HCD, the research partners drew from the existing literature to create a threshold-based methodology that captures racial/ethnic and economic demographic change, as well as markers of disproportionate housing need (increases in median rent and home value/income percentile gap), thus meeting the criteria used to evaluate other methodologies. This approach creates a narrowly tailored tool to identify neighborhoods where the development of subsidized housing and other measures to stabilize, and ensure future access for, low-income people and POC people can best help advance AFFH objectives. Further, the tool is designed to be sensitive enough to capture the dynamics of interest, but straight-forward enough that its purpose and content can be easily communicated to the public

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[4] "Gentrification" is a term that many use to describe a particular form of neighborhood change, which can often include the type of change of interest here. However, we are purposefully avoiding this term due to the lack of consistency of definitions used in the literature and in policy. Further, several popular formulations of gentrification explicitly exclude racial/ethnic demographic change in their definitions, while this type of demographic change is of central importance to the stated policy goals.

[5] Methodologies and tools reviewed include the following: Brummet, Q., & Reed, D. (2019). The effects of gentrification on the well-being and opportunity of original resident adults and children. *Federal Reserve Bank of Philadelphia*. https://doi.org/10.21799/frbp.wp.2019.30; Chapple, K., & Thomas, T., and Zuk, M. (2021). *California Estimated Displacement Risk Model*, Urban Displacement Project website. Berkeley, CA: Urban Displacement Project; Chapple, K., & Thomas, T., and Zuk, M. (2021). *Displacement Typology*, Urban Displacement Project website. Berkeley, CA: Urban Displacement Project; Orfield, M. W. (2019). *American Neighborhood Change in the 21st Century.* https://www.law.umn.edu/sites/law.umn.edu/files/metro-files/american_neighborhood_change_in_the_21st_century_-_full_report_-_4-1-2019.pdf; Dragan, K., Ellen, I. G., & Glied, S. (2020). Does gentrification displace poor children and their families? new evidence from Medicaid data in New York City. *Regional Science and Urban Economics*, 83, 103481. https://doi.org/10.1016/j.regsciurbeco.2019.103481; Ellen, I. G., & Torrats-Espinosa, G. (2018). Gentrification and fair housing: Does gentrification further integration? *Housing Policy Debate*, 29(5), 835–851. https://doi.org/10.1080/10511482.2018.1524440; Freeman, L. (2009). Neighborhood diversity, metropolitan segregation and gentrification: What are the links in the US? *Urban Studies,* 46(10), 2079–2101. https://doi.org/10.1177/0042098009339426; Hwang, J. (2020). Gentrification without segregation? race, immigration, and renewal in a diversifying city. *City & Community*, 19(3), 538–572. https://doi.org/10.1111/cico.12419; Hwang, J., & Shrimali, B. P. (2021). Constrained choices: Gentrification, housing affordability, and residential instability in the San Francisco Bay Area. *Federal Reserve Bank of San Francisco*, Community Development Research Brief Series. https://doi.org/10.24148/cdrb2021-02; Mordechay, K., Ayscue, J., & Orfield, G. (2017). White Growth, Persistent Segregation: Could Gentrification Become Integration? *UCLA: The Civil Rights Project / Proyecto Derechos Civiles*. Retrieved from https://escholarship.org/uc/item/6jn9r4x2

and other stakeholders. It also relies on publicly accessible data and can be updated as needed.

Methodology

The Neighborhood Change Map relies on the following pathways to identify neighborhoods as experiencing or having experienced substantial change:

Pathway 1: Substantial Racial/Ethnic and Economic Demographic Change (Criteria 1 & 2)

- Pathway 1A: Tract that is historically low- and moderate-income (LMI) and comprised predominantly by people of color (POC) – e.g., everyone that identifies as something other than non-Hispanic white – in 2000 that experienced both racial/ethnic *and* economic demographic change equal to or above the 50th percentile region-wide between 2000-2023.[6]
- Pathway 1B: Tract that is historically LMI and POC in 2013 that experienced both racial/ethnic *and* economic demographic change equal to or above the 75th percentile region-wide between 2013-2023.

Pathway 2: Recent Racial/Ethnic and Economic Demographic Change in Proximity to Substantial Change Tracts, with Markers of Disproportionate Housing Needs (Criteria 1/2 & 3)

- Within 1/2-mile of a Pathway 1A tract;[7] and
- Tract that is historically LMI in 2013 that experienced economic demographic change equal to or above the 50th percentile region-wide *or* tract that is historically POC in 2013 that experienced racial/ethnic demographic change equal to or above the 50th percentile region-wide between 2013-2023; and
- Tract that is historically LMI in 2013 that experienced a rise in median rents equal to or above the 50th percentile region-wide between 2013-2023 *or* a tract with a home value/income percentile gap above 25 percentage points in 2023.[8]

Full definitions for each criterion are outlined in Table 1 below.[9,10]

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[6] Census estimates are harmonized to 2020 geographic boundaries using NHGIS geographic crosswalks. See Manson, Steven, Jonathan Schroeder, David Van Riper, Katherine Knowles, Tracy Kugler, Finn Roberts, and Steven Ruggles. (2024) "IPUMS National Historical Geographic Information System: Version 19.0 [dataset]." *IPUMS*. http://doi.org/10.18128/D050.V19.0.

[7] The ½-mile radius is taken from the population-weighted centroid of a census tract to the population weighted-centroid.

[8] The home value/income percentile gap helps to capture currently ongoing and likely imminent neighborhood change. It is based on a metric that has shown to be predictive of future income increases years prior to existing tools. For more, see bunten, devin michelle, Preis, B., & Aron-Dine, S. (2023). "Re-measuring gentrification." *Urban Studies*. https://doi.org/10.1177/00420980231173846.

[9] While the 2024 Neighborhood Change Map used a county-wide threshold, a methodological change was made in the draft 2025 Map to a region-wide threshold to increase annual stability and better align the Map with other state AFFH mapping tools (such as the CTCAC/HCD Opportunity Map).

[10] Changes in median household income do not directly measure increase in high-income households. While the 2024 Neighborhood Change Map used a high-income households metric, a methodological change was made in the draft 2025 Map to increase annual stability and better align the Map with existing neighborhood change research, which more often utilizes a median household income metric. The previous change in high-income households metric was not directly provided by the Census and thus subject to relatively high levels of annual instability.

The intent of Pathway 1, Substantial Racial/Ethnic and Economic Demographic Change (Criteria 1 & 2), is to identify neighborhoods of interest (low- and moderate- income communities of color at baseline) that have already undergone substantial racial and economic change over a sustained period of time – meaning they have already experienced and may continue to experience the kinds of changes of interest from an AFFH perspective. As discussed above, these are places that present an opportunity to advance the AFFH objective of fostering integrated living patterns but may require additional policy interventions to ensure stability and access for current and future low-income people and communities of color. In Pathway 1, tracts must meet both criteria as opposed to one or the other as this provides a more focused view on intensive neighborhood change, allowing any policy interventions to advance multiple AFFH objectives. Allowing tracts that only met one of the criteria was analyzed and found that the approach resulted in too many false positives.

Pathway 1B, which assesses change between 2013-2023, uses the higher 75th percentile to ensure that neighborhoods distant from those neighborhoods assessed over this more recent time period have experienced a similar magnitude of demographic change as neighborhoods identified in Pathway 1A, particularly since they are not required to be located in close proximity to these areas (as required in Pathway 2).

The intention of Pathway 2, Recent Racial/Ethnic and Economic Demographic Change in Proximity to Substantial Change Tracts, with Markers of Disproportionate Housing Needs (Criteria 1/2 & 3), is to identify places that have undergone recent racial and/or economic changes, and where high levels of pressure on populations of interest may lead to even more change, particularly in light of being in close proximity to places that have already experienced high levels of racial and economic change over a longer period of time (Pathway 1A). A half-mile buffer is utilized to account for spillover effects of neighborhood change.[11] Change in median rent is used to identify places where displacement pressures are likely increasing for vulnerable populations.[12,13] The home value/income percentile gap is used to both recognize that disproportionate housing needs can impact homeowners in addition to renters – especially

[11] Spillover effects refers to the indirect impacts that tract-level demographic change can have on neighboring tracts, which can help better identify marginal demographic change in ways that rigid census tract boundaries are unable to capture. For more on the impact of neighborhood spillover effects, see: Aaronson, Daniel. (2001). Neighborhood Dynamics. *Journal of Urban Economics*. 49. 1-31. https://doi.org/10.1006/juec.2000.2181. The ½-mile buffer was selected to capture spillover effects based on both input from researchers and related research on the impact of place-based investments in the context of neighborhood change, which has found effects on housing prices within 2,000 feet (about 0.4 miles) of a development. For example, see: Galster, George, et al. (2006): Targeting Investments for Neighborhood Revitalization, *Journal of the American Planning Association*, 72:4, 457-474. http://dx.doi.org/10.1080/01944360608976766.

[12] Change in median rent is a proxy for displacement pressure intended to capture neighborhoods where low-income renters are most at-risk of being unable to afford housing. The Oregon Housing and Community Service's Anti-Displacement Mapping Tool uses a similar measure of change in median rent to assess housing market activity, see: https://experience.arcgis.com/experience/be18c21c7691446e8d90747079f06f0f/page/Spatial-Analysis/?draft=true. While Zillow data for rental costs was considered, the error introduced from the ZIP code to tract harmonization required to integrate Zillow estimates into the Neighborhood Change Map was deemed too high. Census estimates provided through the American Community Survey are used instead.

[13] While net loss of low-income households was initially considered as a proxy for displacement, further review and discussions with researchers led the research partners to conclude that the net loss of low-income households calculated with census data was deemed an unreliable measure of low-income displacement as it does not capture mobility patterns of displaced households. For example, see: Carlson, H. Jacob. "Measuring displacement: Assessing proxies for involuntary residential mobility." City & Community 19, no. 3 (2020): 573-592

lower-income homeowners and homeowners of colors – as well as a signal of ongoing displacement pressures in the overall housing market. This metric has been shown to be a reliable indicator for continued and future growth in neighborhood income.[14]

This definition relies on tract-level geographies located in non-rural areas, as defined in the Opportunity Map methodology, following the literature on neighborhood change – historically, this literature has not focused on rural areas. Further, the margins of error associated with block groups (which are used to assess resources and opportunity in rural areas in the Opportunity Map methodology) are unacceptably high to replicate the methodology described here in rural areas.

[14] Home values are derived from American Community Survey (ACS) estimates, which are self-reported. On a discussion of how property values are "expectations-based" and act as a signal, see: bunten, devin michelle, Preis, B., & Aron-Dine, S. (2023). "Re-measuring gentrification." *Urban Studies*. https://doi.org/10.1177/00420980231173846.

Table 1: Neighborhood Change Definition

Definition		Criteria 1 (Racial/Ethnic Change)	Criteria 2 (Economic Change)	Criteria 3 (Disproportionate Housing Needs)	Sources
Pathway 1: Substantial Racial/Ethnic and Economic Demographic Change (Criteria 1 & 2)	Pathway 1A: 2000-2023	**BASELINE:** In 2000, tracts where the % of the population that was POC* was above the region's % of the population that was POC* and was non-rural; *and* **CHANGE:** Between 2000 and 2023, tracts that experienced a percentage point increase in the NH** white population within the top half (50%) of region-wide increases.	**BASELINE:** In 2000, tracts where the median income was at or below 120% of the region median income and was non-rural; *and* **CHANGE:** Between 2000 and 2023, tracts that experienced a percent increase in median household income within the top half (50%) of region-wide increases.	-	2000 Decennial Census (Tables P004, P053); 2023 5-year estimate ACS (Tables B03002, B19013)
	Pathway 1B: 2013-2023	**BASELINE:** In 2013, tracts where the % of the population that was POC* was above the region's % of the population that is POC* and was non-rural; *and* **CHANGE:** Between 2013 and 2023, tracts that experienced a percentage point increase in the NH** white population within the top quarter (75%) of region-wide increases.	**BASELINE:** In 2013, tracts where the median income was at or below 120% of the region median income and was non-rural; *and* **CHANGE:** Between 2013 and 2023, tracts that experienced a percent increase in median household income within the top quarter (75%) of region-wide increases.	-	2013 & 2023 5-year estimate ACS (Tables B03002, B19013)

Definition	Criteria 1 (Racial/Ethnic Change)	Criteria 2 (Economic Change)	Criteria 3 (Disproportionate Housing Needs)	Sources
Pathway 2: Recent Racial/Ethnic and Economic Demographic Change in Proximity to Substantial Change Tracts, with Markers of Disproportionate Housing Needs (Criteria 1/2 & 3) • Within 1/2-mile of a Pathway 1A tract	**BASELINE:** In 2013, tracts where the % of the population that was POC* was above the region's % of the population that was POC* and was non-rural; *and* **CHANGE:** Between 2013 and 2023, tracts that experienced a percentage point increase in the NH** white population within the top half (50%) of region-wide increases.	**BASELINE:** In 2013, tracts where the median income was at or below 120% of the region median income and was non-rural; *and* **CHANGE:** Between 2013 and 2023, tracts that experienced a percent increase in median household income within the top half (50%) of region-wide increases.	**BASELINE:** In 2013, tracts where the median income was at or below 120% of the region median income and was non-rural; *and* **CHANGE:** Between 2013 and 2023, tracts that experienced a percent increase in median gross household rent within the top half (50%) of region-wide increases *or* tracts with a home value/income percentile gap above 25 percentage points in 2023.	2000 Decennial Census (Tables P004, P053); 2013 & 2023 5-year estimate ACS (Tables B03002, B19013, B25064, B25075)

Notes: All criteria limited to non-rural census tracts. Tracts are further excluded if they meet any of the Opportunity Map exclusion criteria – i.e., unreliable data, large prisoner population, low population density, large population employed by the armed forces.
** People of color*
*** Non-Hispanic*

Generally, thresholds were selected to reduce the frequency of false positives as opposed to false negatives. By reducing false positives, we are better able to identify those neighborhoods where it is possible to be confident demographic change is occurring in such a manner that policy intervention can best advance multiple AFFH objectives. While false negatives are also not desirable, less priority was placed on avoiding them due to their likelihood of being borderline cases with less potential to advance AFFH objectives.

Explanations for various methodological decisions, including how specific thresholds were selected, are included below. There are both practical and methodological justifications for the thresholds and time frames outlined in Table 1, and most thresholds were selected after several rounds of iterating to ensure our results matched existing geographic conceptions of neighborhood change. Certain thresholds and/or baselines were also adjusted based on public input.

Time Frame

Neighborhood-level demographic change typically occurs over long time periods, and it can be difficult or impossible to capture demographic churn in the short- to medium-range using Census data alone. Only household-level longitudinal data can provide that level of specificity, and this type of data is not readily accessible at a statewide scale. Calculating change over shorter time frames also risks assuming brief trends may continue long-term, which is not always the case. Therefore, a longer time frame is required to confidently identify the dynamics of substantial and sustained neighborhood change.

The most obvious candidates for base years are 2000 and 2010, as they are decennial years and have the most accurate data; they are also most frequently used in the literature. After several rounds of iteration, 2000 was selected as the more appropriate baseline for this tool because the 2010 baseline was not capturing neighborhoods that experienced their most intense demographic change prior to 2010 (e.g., the Mission neighborhood in San Francisco), but nonetheless have recently experienced the type of demographic change of interest. Using a longer time frame helps to better capture these neighborhoods. Pathway 1A relies on the 2000 baseline.

The selected end year is 2023 as 1) it is the most recently available year of data available at the time the methodology was developed; and 2) the 2020 decennial estimates are generally not reliable.

Recognizing that more recent demographic change is also relevant to the AFFH policy goals, the 2013 to 2023 time frame is included in Pathway 1B and Pathway 2. Limiting the scope of more recent demographic change to only those neighborhoods experiencing rapid rent increases and/or a home value/income gap as well as recent racial and/or economic change, in proximity to previously identified neighborhoods that have experienced racial and economic change on a longer time frame, helps account for boundary effects of neighborhood change while also ensuring that we capture those areas that are most likely to experience continued change. Substantial demographic and economic change between 2013 and 2023 independent of disproportionate housing needs is included as part of Pathway 1B. The baseline is 2013 and not 2010 due to data limitations in the American Community Survey as several variables of interest are not available until the 2013 five-year survey – 2013 also marks a post-Great Recession housing market that better reflects more recent conditions.

50% Racial/Ethnic and Economic Change Threshold

Literature on neighborhood change often uses change within the top 40% of the region as a threshold for substantial or rapid demographic change. This methodology instead uses the top 50% (top half) to capture places that have experienced the most intense change. The more expansive threshold is used in light of the methodology requiring that multiple criteria be met.

50% Median Rent Change Threshold

The top 50% (top half) threshold was selected to capture those neighborhoods with meaningful increases in median rent, as these are the neighborhoods likely to face the strongest displacement pressures.

Historic LMI Tracts (120% AMI Threshold)

The 120% area median income (AMI) threshold is used to capture low- and moderate-income (LMI) neighborhoods, as 120% of AMI is typically the upper limit for moderate-income households in housing policies and programs. This is a more permissive definition than is found in some of the literature, as these studies often highlight only low-income neighborhoods. The more inclusive income threshold is used in light of the methodology requiring that multiple criteria be met. Further, the inclusion of moderate-income households in the baseline is important as preserving economic integration is one of the fundamental goals of this tool.

Historic POC Tracts

In the literature on neighborhood change, there are many approaches to defining communities of color. This Map defines communities of color as census tracts where the percentage of people of color (POC) – everyone that identifies as something other than non-Hispanic white – is above the region's overall percentage of POC. This definition is consistent with much of the literature, though more permissive (e.g., includes more neighborhoods) than definitions used in some studies. Like the 120% AMI threshold used to define historic LMI neighborhoods, this more inclusive racial/ethnic threshold is used in light of the methodology requiring that multiple criteria be met. Further, the more inclusive definition helps to capture more racially/ethnically integrated communities, which is relevant to the goal of racial/ethnic integration guiding the Map's methodology.

Caveats and additional considerations

An internal review of the neighborhood change definition found that neighborhoods captured by the definition have experienced both racial and economic integration at levels far higher than seen in other neighborhoods across the state, suggesting that housing interventions may help stabilize these neighborhoods for existing residents and facilitate access for new low-income or POC residents, thereby helping foster racial and economic integration. However, it should be noted that a number of high-poverty and segregated neighborhoods are also identified under this definition.

Similarly, a meaningful share (approximately 23%) of tracts identified as experiencing neighborhood change are categorized as High/Highest resource in the 2026 Opportunity Map, though most (approximately 97%) non-rural High/Highest resource tracts are not flagged by the 2026 Neighborhood Change Map. These different geographies represent distinct, but sometimes overlapping, AFFH goals.