

# Mapping Susceptibility to Gentrification: The Early Warning Toolkit



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## Introduction

The Bay Area is one of the most expensive and challenging housing markets in the country.<sup>1</sup> On average, local households spend 48% of their income on housing, compared to 29% for the country as a whole, and just 12% can afford the median priced home.<sup>2</sup> A quarter of Bay Area renters meet HUD's definition of severely housing burdened, dedicating more than 50 percent of their income to housing.<sup>3</sup>

Anticipated growth will place even more pressure on the region's housing market. The Association of Bay Area Governments (ABAG) projects an additional 1.9 million people and 1.6 million jobs by 2035.<sup>4</sup> Meanwhile, new funding for transit approved by Bay Area voters will add 100 new stations, many in already built-up areas, to the region's existing 300 rapid transit stations and transit corridors.<sup>5</sup>

Although the planned new transit facilities will help to accommodate much of the population growth, they also present a challenge. Researchers generally agree that new transit investment will bring higher property values to the surrounding area (except in the immediate vicinity of the transit station).<sup>6</sup> This could spur a process of gentrification, which will be beneficial to some – but not to those who cannot bear rent increases and are forced to leave the neighborhood.

This report was prepared for ABAG as part of its Development without Displacement project funded by an environmental justice grant from CalTrans. This project is meant to increase regional and local understanding of gentrification and displacement, and in particular increase awareness of equitable development policies that jurisdictions can use to capture the benefits of new growth for their current residents. The purpose of this report is to create an early warning toolkit to help communities identify whether their neighborhood is susceptible to gentrification as reinvestment occurs. This in turn suggests potential for displacement – but does not necessarily predict it. In order to understand future displacement potential more fully, a jurisdiction would need to combine the toolkit with an assessment of its existing affordable housing policies and stock, as well as the effects of any proposed redevelopment plan.



Mission District, San Francisco  
Photo: Center for Community Innovation

## Gentrification, displacement, and TODs

Since the term "gentrification" first appeared in the 1960s, the debate over its meaning and impact has only intensified.<sup>7</sup> The definitions range from the purely economic (such as new high-income households, housing investment, or transition from renter- to owner-occupancy), to the demographic (influx of white households, college-educated residents, non-family households, etc.), to some combination. Some describe gentrification's impact as revitalization that for the most part benefits the entire neighborhood's population; others equate it directly with the displacement of existing residents.

How we define gentrification matters. Depending on its characteristics, this type of neighborhood change can be positive or negative. Neighborhood residents may benefit from the influx of new residents. For instance, a group of college-educated artists may arrive; instead of pushing up rents so that long-term residents cannot afford to stay, these newcomers may be renovating former commercial spaces, creating public art, and offering low-cost art classes. An increase in median household income in the neighborhood might reflect improved access to college education for second-generation immigrants. All residents will benefit from the presence of new services attracted by the rising neighborhood incomes. And, housing price appreciation might make it possible for families to sell their homes and move to neighborhoods with better amenities.

At the same time, the influx of new residents and capital may be harmful. As reinvestment occurs and property values rise, the potential for different forms of indirect displacement rises. Able to command higher rents on the market, landlords will raise rents to the extent permitted by law, increasing tenant turnover. While these increases may impact any tenant not residing in permanently affordable housing, they are most likely to displace those already paying a disproportionate share of their income for rent, who are not able to squeeze their transportation or food budget any more to pay for housing. Whether the influx is of affluent homeowners or nontraditional households, the changes are likely to tighten the housing market and make it difficult for new low-income residents to move in. Moreover, the new population will undoubtedly change the neighborhood's essential character, in some areas making it difficult to preserve historic significance.<sup>8</sup>

This report defines gentrification as a process of neighborhood change that encompasses economic change in the form of increases in both real estate investment and household income, as well as demographic change in the form of increases in educational attainment. These changes may be highly correlated with racial/ethnic transition as well, though this is not measured directly. Although some change could be coming from within, as existing residents improve their economic circumstances, most is driven by exogenous forces, as evidenced by home price appreciation.<sup>9</sup> Thus, we differentiate gentrification from revitalization more generally, which consists simply of improvements in neighborhood income (due either to newcomers or changes for existing residents). Specifically, this report uses the definition of gentrification put forth by Freeman (2005), modified slightly for the Bay Area, to describe change in the decade of the 1990s: a central city neighborhood with housing price appreciation above the regional average, increase in educational attainment above the regional average, and household income at or below the 40th percentile of regional household income (roughly 80% of median income, a standard definition of low-income) in the starting year (as the process begins).<sup>10</sup>

Though it is helpful in identifying low-income neighborhoods in which the market is expressing interest, this definition does not include any measures of indirect displacement that occurs as the neighborhood changes. Researchers have found that it is very difficult to define how much indirect and involuntary displacement is occurring in conjunction with neighborhood change. The best estimate of the extent of involuntary displacement comes from Newman & Wyly (2006), who find that up to ten percent of rental moves in New York City occur due to displacement. However, New York City may be anomalous, due to a very hot rental market and stringent rent control and stabilization laws. Several national studies suggest that gentrification and mobility are not strongly associated – in fact, poor renters are more likely to remain in gentrifying areas than to depart.<sup>11</sup>



Even when survey data on the reason for moving is available (as in New York City), it may be inaccurate.<sup>12</sup> For instance, it may understate displacement by not surveying those who have moved out of the city, or not including those who moved because of the *threat* of a rent increase rather than an actual increase. But it may also overstate displacement by including those experiencing trouble paying the rent due not to rent increases but personal economic hardship, such as the loss of a job, or landlord-tenant disagreements over who is responsible for building maintenance.

Since it is so difficult to know why households move, another way of determining whether indirect and involuntary displacement is occurring is to look at evictions. Court records on evictions describe the reasons for owner action. However, they are not available in database or aggregate format, with the exception of the few cities with rent control laws that track evictions carefully (e.g., San Francisco). In any case, one study of evictions data in Richmond found that only a very small share of households were evicted for rent increases – suggesting that either displacement is rare in low-income neighborhoods or, more likely, landlords cite other reasons when trying to evict tenants.<sup>13</sup>

No research to date has explicitly examined the relationship between transit investment and gentrification. But findings from many studies suggest that the area around rail transit stations may be particularly susceptible to gentrification – and potentially displacement as well – for several reasons.<sup>14</sup> It is well established that new transit stations increase property values (except in their immediate vicinity), because of the improved accessibility they bring. Also, when built in urban areas, these neighborhoods are more economically and racially diverse than other neighborhoods; they house a relatively large share of low-income households (many of whom are transit-dependent), and are likely to attract college-educated commuters and non-family households – exactly the types of changes associated with gentrification (as we find in this study). Even the process of developing new transit facilities can spur displacement, since the disamenity of construction can result in temporary displacement that becomes permanent, or discourage the traditional neighborhood in-migrants from moving in.

North Beach, San Francisco  
Photo: Tom Dill

# A portrait of neighborhood change and transit in the Bay Area, 1990 to 2000

In this report we demonstrate current (as of 2000) patterns of gentrification and, based on the factors behind that change, predict where it is most likely to occur in the future (Figure 1). Further, we identify a number of factors that may increase the likelihood that residents are displaced by new development. However, we are not able either to describe where displacement has occurred or predict exactly where it will take place in the future. In other words, though we can use past trends to help predict how neighborhoods will change in the future, we do not know whether existing (and new) residents are benefiting or harmed by the change.

The following presents our findings in four sections. The first describes patterns of neighborhood change in the Bay Area from 1990 to 2000 (the most recent period for which reliable small-area data were available), using census tracts, areas of approximately 4,000 residents, to represent neighborhoods and U.S. decennial census data for the analysis. The second looks specifically at change in the form of gentrification – which, though not extensive, is strongly associated with transit stations – and determines the factors that cause this type of change (again relying mostly on census data). This analysis allows us to predict future susceptibility to gentrification; if an area scores high on the factors that cause gentrification, then it is likely to gentrify at some point in the future. A third analysis identifies other indicators that suggest the potential for displacement in the future. These analyses together comprise the early warning toolkit, and the next section uses the Lake Merritt station area as a case study to show how the toolkit might be used. A final section outlines steps for future research.

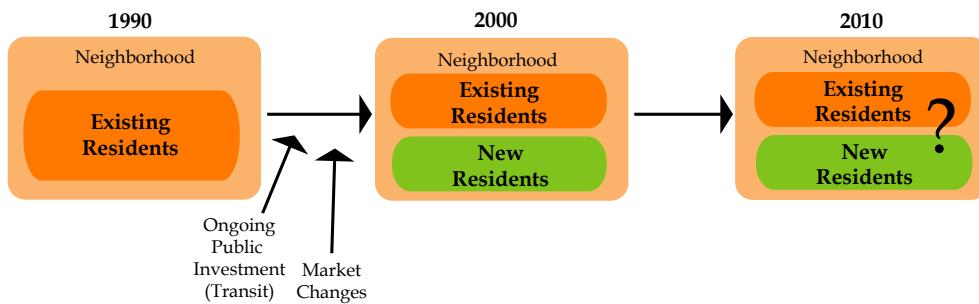
Every Bay Area neighborhood is going through some process of neighborhood change. One type of change is of course gentrification. By defining gentrification based on these factors – starting as a low-income neighborhood in a central location, and experiencing increases in household income and educational attainment greater than the Bay Area region as a whole – there are 102 census tracts that gentrified from 1990 to 2000 (7.3% of the total tracts, with 6% of all households) (see Figure 2 and Appendix Figures 1-6 for subregional maps). Thus, 93% of Bay Area neighborhoods are going through other types of change. We can characterize these changes by looking at how the distribution of household income changes in neighborhoods over time. Neighborhood income distributions may shift either through household turnover (out-migrants and in-migrants) or changes in income status for existing households. Although publicly available census data does not allow us to understand whether change is happening through turnover or existing households, it does paint a picture of income trends in the aggregate.

Neighborhoods consist of households with incomes that fall into one of six categories relative to the area median income (AMI) of the nine-county Bay Area. We chose the categories to represent categories commonly used by affordable housing programs:<sup>15</sup>

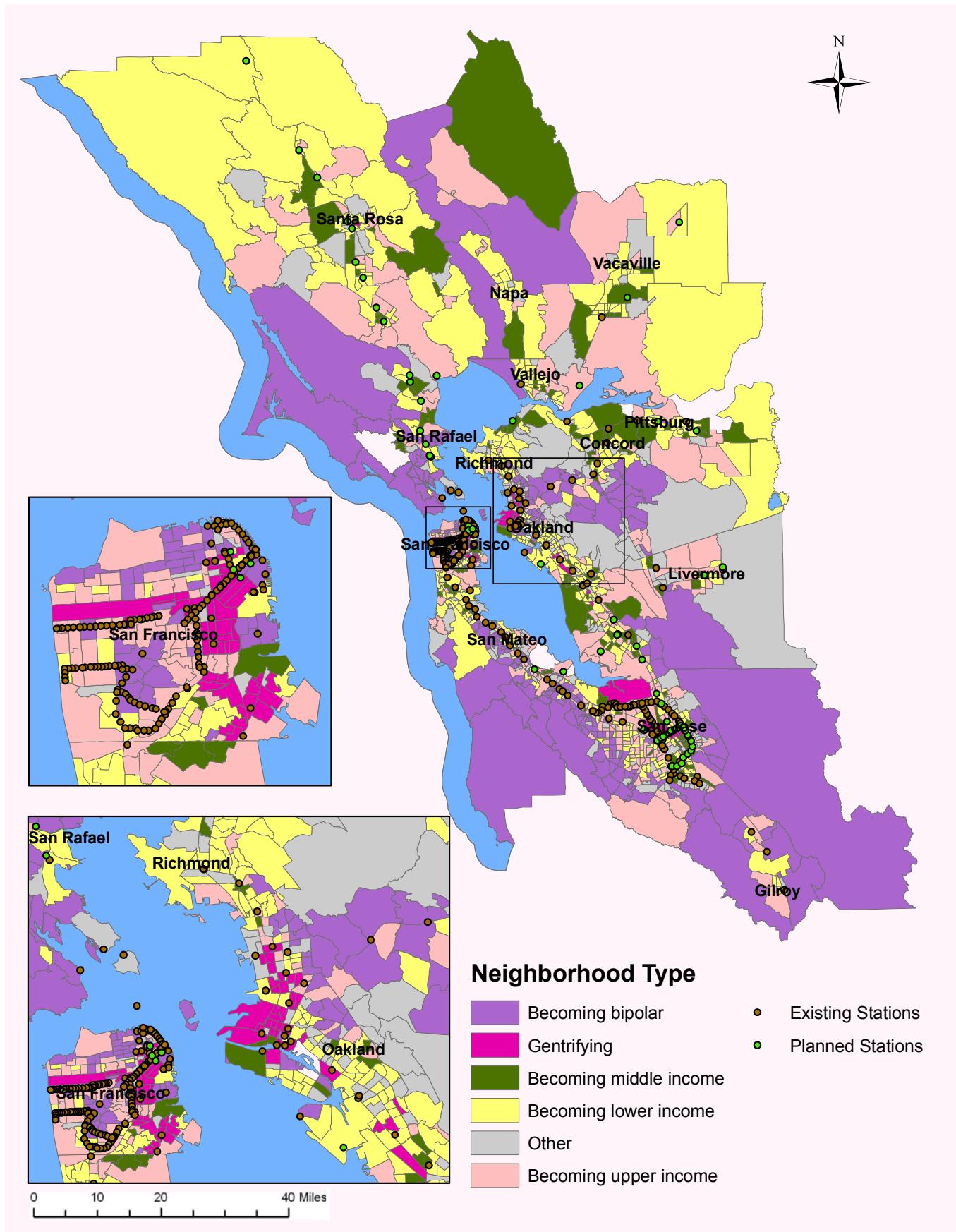
- 1) very low income (less than 50% of AMI);
- 2) low-income (50% to 80% of AMI);
- 3) moderate income (80% to 100% of AMI);
- 4) high to moderate-income (100% to 120% of AMI);
- 5) high income (120% -150% of AMI);
- 6) very-high-income (150% of AMI and above).

The analysis looks at neighborhood change from 1990 to 2000 using the Neighborhood Change Database developed by Geolytics, Inc., a database which allows for the comparison of census tracts over time even when boundaries change.<sup>16</sup> Data on housing sales (to analyze gentrification) comes from Dataquick zip code data.

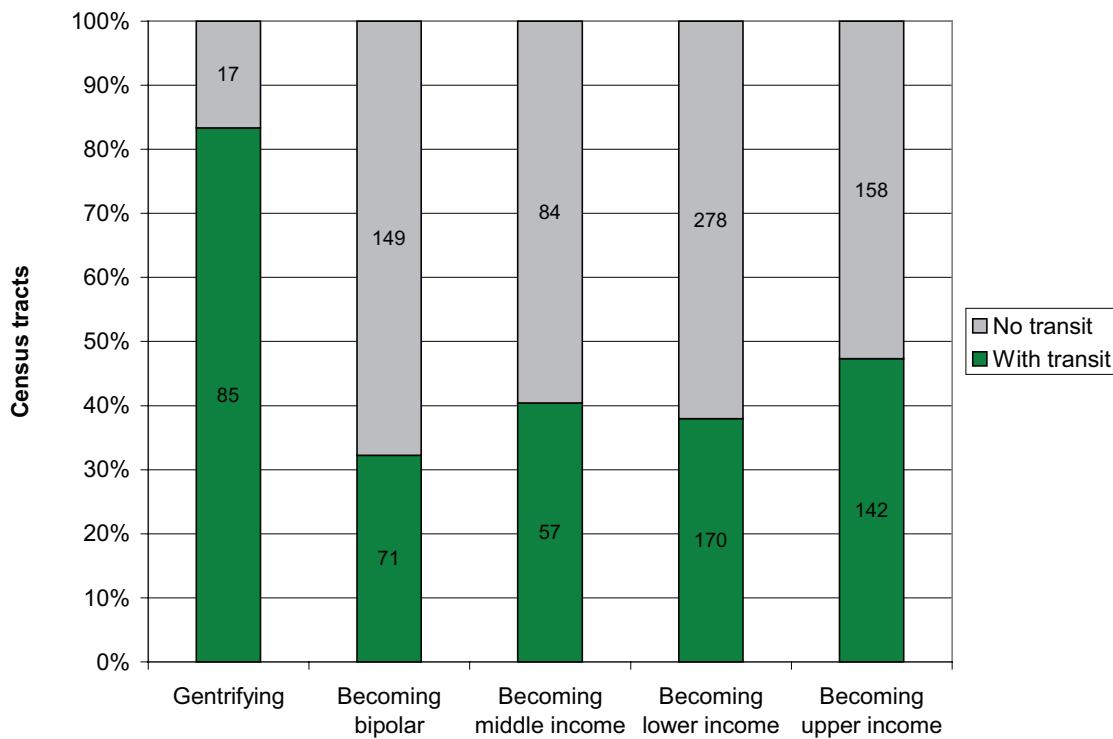
**Figure 1. Process of neighborhood change.**



**Figure 2. Typology of neighborhood change, 1990-2000.**



**Figure 3. Relationship between transit accessibility and type of neighborhood change.**



Source: Author's calculations from Geolytics Neighborhood Change Database and Dataquick.

Tracts that are becoming *bipolar* are seeing growth of households in both the lowest and highest of the six income groups, at the expense of the four groups in the middle.<sup>17</sup> There are 220 bipolar tracts in the San Francisco Bay Area, about 16 percent of the total (see Figure 3).<sup>18</sup> This type of change often occurs in areas with concentrations of both permanently affordable housing and new high-end units.

Other types of change include *becoming more middle income*, *becoming lower income*, or *becoming upper income*.<sup>19</sup> Middle income neighborhood change occurs when the share of population in the two middle income categories is greater in 2000 than in 1990, and is over 25% by 2000. 141 (ten percent) of Bay Area tracts are becoming more middle income, many in the inner-ring suburbs which have experienced an influx of first-time homebuyers. Likewise, lower income change (448 tracts, 32 percent of the total) occurs when the share in the two lower income categories is greater in 2000, and the ending point is at least 25 percent. These areas are mostly in the urban core and ex-urban fringe. Concentrated mostly in areas that are already affluent, upper income change (300 tracts, 21 percent) is when the share in the top two income categories is greater in 2000, with a ending share of 25 percent or more. "Other" (185 tracts) is a residual category and seems to consist of a mix of tracts where there is no systematic pattern of change.

Most (85) of the *gentrifying* tracts are located within a half-mile walk from a rail and ferry transit station (see Appendix Table 1), half in San Francisco and the other half in Alameda and Santa Clara counties. It is not surprising that many gentrifying neighborhoods are located adjacent to transit, since studies have shown the residential market pressures around TODs. But what is striking is the contrast between neighborhoods experiencing gentrification as their predominant form of neighborhood change and those undergoing different types of change: gentrifying neighborhoods are nearly **twice** as likely to be located within one-half mile of transit than any other kind of neighborhood (Figure 3).

As is evident in Appendix Table 1, many of these transit stations (42 in total) are BART or BART plus other modes; 22 are Muni Metro (or Muni plus other modes); twelve Caltrain, ten VTA, eight Amtrak, four ferry stations, and even four cable car stops! Thus, gentrification can occur around many different forms of transit. Though this analysis does not incorporate bus transit stops, it should be noted that bus lines run through almost all of the gentrifying census tracts.

# Predicting susceptibility to gentrification in the Bay Area

What types of neighborhoods are most susceptible to gentrification? To answer this question, we can look at the 102 tracts that gentrified from 1990 to 2000 and examine what they were like in 1990. Using multivariate regression, we can identify different types of factors that make a neighborhood more likely to gentrify.<sup>20</sup> These might be demographic factors, such as types of families in the neighborhood; income factors, such as the extent to which local households are experiencing high rent burdens; transportation factors, such as reliance on transit for the commute; housing factors, such as a large share of rental housing; locational factors, such as where the neighborhood lies in the region; and amenities, including parks and community facilities.<sup>21</sup>

Table 1 lists the nineteen factors that lay behind gentrification in the 1990s, showing whether they had a positive influence, causing more gentrification, or negative influence, causing less. The table ranks the variables' significance and shows the most important ones in bold; since these factors are many times more important than the others, it is worth examining them in more detail.

**Availability of amenities and public transportation** top the list of factors (see Figures 7-12 in Appendix). More than who lived in the neighborhood in 1990, or where it was located within the region, or even the characteristics of the neighborhood, what was most important in attracting change and investment to the area was the proximity of amenities such as youth facilities and public space (and to a lesser extent, small parks), as well as the convenient location of transit (as evidenced by a high share of transit commuters). Interestingly, two of these variables were more likely to cause neighborhoods not to gentrify (i.e., were negative in influence): the presence of public/nonprofit recreational facilities and a concentration of homes with more than three cars. The latter variable simply reflects auto-oriented outer suburban areas that are not likely to gentrify anyway because they are not central locations. Though more research is needed to understand why recreational facilities deter gentrification, it may be because they draw heavy traffic from more disadvantaged groups.

**Table 1. Factors behind gentrification in the 1990s.**

Variable type	Variable	Direction	Rank
Transportation	<b>% of workers taking transit</b>	<b>Positive</b>	4
	<b>Youth facilities per 1,000</b>	<b>Positive</b>	3
	<b>Public space per 1,000</b>	<b>Positive</b>	5
Amenities	Small parks per 1,000	Positive	17
Demographic	<b>% non-family households</b>	<b>Positive</b>	8
	<b>% of dwelling units in buildings with 5+ units</b>	<b>Positive</b>	7
	<b>% of dwelling units in buildings with 3-4 units</b>	<b>Positive</b>	10
Housing	<b>% renter-occupied</b>	<b>Positive</b>	13
	Public housing units	Positive	19
Income	<b>Income diversity</b>	<b>Positive</b>	6
	<b>% of renters paying &gt; 35% of income</b>	<b>Positive</b>	11
Location	Distance to San Jose	Positive	14
Transportation	<b>% of dwelling units with three or more cars available</b>	<b>Negative</b>	2
Amenities	<b>Recreational facilities per 1,000</b>	<b>Negative</b>	1
	<b>% married couples w/ children</b>	<b>Negative</b>	9
Demographic	<b>% non-Hispanic white</b>	<b>Negative</b>	12
	Median gross rent	Negative	18
Income	% of owners paying > 35% of income	Negative	15
Location	Distance to San Francisco	Negative	16

Three **income** variables (Figures 13-15 in Appendix) make a significant difference in whether a neighborhood will gentrify. Income diversity is a very important indicator: if an area is more diverse, i.e., has relatively equal representation across the six income groups, then it is more likely to attract this form of neighborhood change.

Likewise, if there is a high share of renters who pay over 35% of their income for rent, then the neighborhood is more susceptible.<sup>22</sup> It is easy to envision what occurs in this case: as an influx of newcomers increases area rents, these overburdened renters find themselves unable to pay an even higher share of their income for rent, so they depart, leaving more vacancies for new gentrifiers. In contrast, neighborhoods with concentrations of overburdened owners are less likely to gentrify, perhaps because the neighborhoods with high concentrations of home ownership tend to be more affluent.

One predictable, but important, **demographic** variable that leads to gentrification is a larger share of nonfamily households. In contrast, the more non-Hispanic whites are in the area, the less likely it is to gentrify: the most susceptible areas are those where the majority is minorities. Likewise, the more married couples with children, the less likely the area is to gentrify (though there are some exceptions in areas with concentrations of Latino families, e.g., San Jose) (Figures 16-18 in the Appendix).

Finally, four types of **housing** variables, closely related to each other, matter significantly (Figures 19-23 in the Appendix). In particular, the higher the share of multi-unit buildings (with three or more units) and the higher the share of renter-occupied housing, the more likely the

area is to gentrify, perhaps because change can occur more rapidly through turnover of rental units.<sup>23</sup> Not surprisingly, the higher the median gross rent, the less likely the area is to gentrify (since it may be affluent already). Finally, the higher the number of public housing units, the more likely the area is to gentrify, perhaps because there is often a lot of mobility in neighborhoods adjacent to public housing.<sup>24</sup>

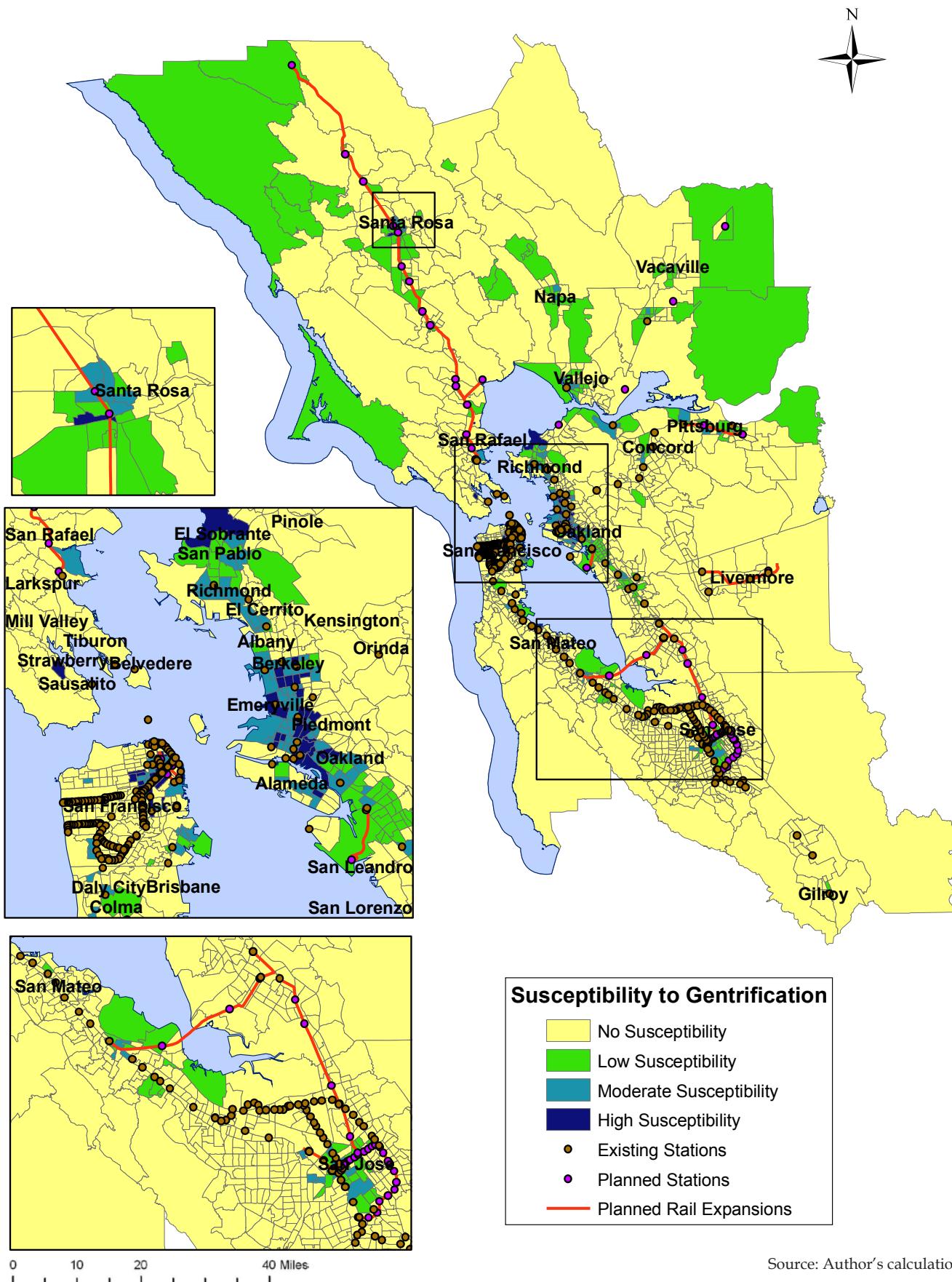
If these factors caused gentrification in the past, then they are likely to make neighborhoods more susceptible to gentrification in the future. We can look at how each tract scores on each of these factors to determine whether it is likely to gentrify by 2010 or shortly thereafter.

For each tract, we look at whether it is above or below average on each of the nineteen factors in 2000. For instance, the East Northside neighborhood of San Jose has a below average share of non-Hispanic whites (13% compared to 50% in the region) but an above average share of overburdened renters (35% compared to 30% in the region). Since tracts with a below average share of non-Hispanic whites are more likely to gentrify, this neighborhood scores 1 on this factor; likewise, since tracts with above average rent-burdened households are more likely to gentrify, this neighborhood also scores 1 on the rent burden factor. We total the scores across all nineteen factors to come up with the susceptibility index. Using this index, Figure 4 maps the susceptibility to gentrification across the region (see also subregional maps in the Appendix), while Table 2 shows the 18 neighborhoods near transit deemed highly susceptible that haven't gentrified already.



Chinatown, Oakland  
Photo: Center for Community Innovation

**Figure 4. Projected susceptibility to gentrification in the future (2000-2010).**



**Table 2. Bay Area transit-oriented neighborhoods most susceptible to gentrification in the future.**

County	Tract	Susceptibility Index	Neighborhood/City	System
Alameda	4013	18	Telegraph/23rd/Art Murmur	BART
Alameda	4021	17	West Oakland	BART
Alameda	4035	17	Broadway/Auto Row	BART
Alameda	4234	17	South Berkeley	BART
Alameda	4235	17	South Berkeley	BART
San Francisco	106	17	North Beach/ Telegraph Hill Downtown/Chinatown (Oakland)	Cable Car, Central Subway, Street Car
Alameda	4030	16	Lakeside (Oakland)	Ferry
Alameda	4034	16	Adams Point (Oakland)	BART
Alameda	4037	16	East Peralta (Oakland)	BART
Alameda	4224	16	Downtown Berkeley	BART
Alameda	4251	16	Emeryville	Amtrak
San Francisco	107	16	North Beach	Cable Car, Street Car
San Francisco	155	16	Japantown	Cable Car*
San Francisco	159	16	Western Addition	Cable Car*
San Francisco	163	16	Hayes Valley (West)	MUNI Metro, Street Car
Solano	2509	16	Downtown Vallejo	Ferry
Sonoma	1530.03	16	West Santa Rosa	SMART

\*Note: Though the nearest rail transit station in these neighborhoods is the cable car, in practice the frequent 38 Geary bus service likely attracts far more residents.

To qualify as highly susceptible, a tract has to score 1 or 16 or more factors, have a median income below the regional median, and be within one-half mile of a rail or ferry transit station (to highlight impacts of transit investment). The most susceptible tracts are concentrated in or near downtown Oakland and San Francisco.

Tracts that are moderately susceptible to gentrification have a score of 13, 14, or 15 on the index. There are 90 of these tracts within one-half mile of transit, 61 of which have not gentrified already. Though most are near the major downtowns, they also appear in older suburbs and in urban low-income neighborhoods such as in East Oakland, Bayview in San Francisco, and the Iron Triangle in Richmond. Table 2 in the Appendix shows the susceptibility levels for all the tracts in the Bay Area.

If each of these factors contribute towards gentrification, there could in theory be some level or threshold for each at which the gentrification process becomes more likely. Although it is hard to pinpoint an exact threshold, it is possible to compare the factors across gentrifying and non-gentrifying neighborhoods in order to determine the point at which gentrifying areas distinguish themselves.

Table 3 shows the average level of each variable in gentrifying and non-gentrifying areas. For instance, in the gentrifying neighborhoods, 26% of the workers commute via transit (versus about 9% other neighborhoods). Any neighborhood with that level of transit usage or more may be more susceptible to gentrification. Likewise, neighborhoods with over 44% non-family households may be more likely to gentrify. These numbers should not be taken as exact thresholds, but rather approximate levels at which to watch for multiple signs of gentrification.

Each of these factors has a direct implication for planning. This research has shown that accessibility to transit (and inconvenience for multiple-car households) makes a neighborhood much more likely to gentrify. This suggests that whenever planners make transit improvements, they should also examine how to preserve and create more permanently affordable housing, whether through joint development, coordination with the housing element, partnerships with nonprofits, or other means.

**Table 3. Mean factor levels in gentrifying and non-gentrifying neighborhoods.**

Variable type	Variable	Average by neighborhood type	
		Non-gentrifying	Gentrifying
Transportation	% of workers taking transit	8.7%	25.9% ***
	% of dwelling units with three or more cars available	22.3%	8.3% ***
Amenities	Recreational facilities per 1,000 residents	0.006	0.004
	Youth facilities per 1,000 residents	0.010	0.032 ***
	Public space per 1,000 residents	0.025	0.055 ***
	Small parks per 1,000 residents	0.189	0.300 ***
Demographic	% non-family households	31.7%	44.0% ***
	% non-Hispanic white	63.1%	28.9% ***
	% married couples w/ children	28.5%	16.7% ***
Housing	% of dwelling units in buildings with 5+ units	20.4%	37.7% ***
	% of dwelling units in buildings with 3-4 units	5.9%	12.0% ***
	% renter-occupied	38.3%	63.7% ***
	Median gross rent	\$742	\$516 ***
Income	Public housing units	57	146 ***
	Income diversity	0.73	0.74
	% of renters paying > 35% of income	31.6%	38.6% ***
Location	% of owners paying > 35% of income	21.7%	21.2%
	Distance to San Jose (miles)	0.566	0.784 ***
	Distance to San Francisco (miles)	0.399	0.176 ***

\*\*\* Difference significant at  $p < .001$

Most amenities, from small parks to public space to youth facilities, seem to be strongly associated with gentrification. Again, this makes an argument for linking planning for open space and other design improvements to various processes for planning and building affordable housing. Some amenities may actually deter gentrification – for instance, this research found that the presence of recreational facilities was negatively associated with gentrification. This finding warrants further research, but does suggest the importance of developing amenities that explicitly support the existing population, rather than some potential future residents.

A number of factors lead to direct implications for affordable housing planning. The association of non-family households with gentrifying areas suggests that planners might slow this type of neighborhood change by requiring buildings with larger units (e.g., three or more bedrooms) and amenities that cater to children or the elderly. Most susceptible to gentrification are neighborhoods with multi-unit, renter-occupied buildings.

Cities with rent and eviction controls should make sure that these buildings remain protected; if they are project-based Section 8 or some other type of subsidized housing with expiring affordability provisions, cities should intervene pro-actively to ensure that they remain affordable. Restrictions on condo conversion may also help to preserve affordable rental units. Finally, in areas where renters pay a disproportionately high share of income for rent, planners should identify households with high rent burdens and connect them to rental assistance programs. Proactive action may be able to preserve housing affordability for tenants as neighborhood rents rise.

## **Other indicators of displacement potential**

Though we are not able to measure precisely how much displacement is taking place in neighborhoods due to gentrification, there are a variety of factors that make it more likely that displacement will occur in a certain neighborhood. Of the factors presented above, renter occupancy and high rent burdens are likely the most strongly associated with displacement, since renters may not have the choice to stay in their unit as rents increase. In addition, housing policy can prevent or accelerate displacement processes directly: two factors that drive the extent of displacement are rent control and availability of subsidized housing.

Just nine Bay Area cities have some form of rent control: Berkeley, Campbell, East Palo Alto, Fremont, Hayward, Los Gatos, Oakland, San Francisco, and San Jose. Almost all of these cities exempt more recent buildings (typically those built from 1980 on) from the controls. The strength of rent control legislation varies widely across cities by the types of units covered, the extent to which “landlord hardship” can be invoked to release units from rent control, and the amount that landlords are allowed to increase the rent or charge for improvements. Most cities now have vacancy decontrol, which has meant a steady decrease in the number of rent-controlled units. Almost all of these cities also have just cause eviction controls to protect renters, meaning that landlords can only evict with proper cause, such as a tenant’s failure to pay rent or destruction of property. Combined, rent and eviction controls should help stem, though not halt altogether, the number of tenants displaced because of rising market rents in the neighborhood.

The Bay Area has almost 90,000 units of public housing built under the 1937 and 1949 Housing Acts. Some of this stock will remain permanently affordable (especially if cities do one-for-one replacement as they renovate the projects into mixed-income developments); however, some local cities are selling their scattered-site units and rehousing occupants via Section 8 vouchers. Moreover, nearly half of its subsidized housing stock now consists of units built since the 1970s, in the form of project-based Section 8 (approximately 20,000 units), Low Income Housing Tax Credit projects (almost 60,000 units), or other programs. Many of these programs have expiring affordability clauses; in other words, the government helped to fund the projects based on a commitment to keep the units affordable to low-income families for a period of years (from 15 to 30). Projects that are in gentrifying areas and are not managed by nonprofits often convert the units to market-rate once the affordability clause expires. Figures 5 and 6 illustrate the potential loss of subsidized housing because of expirations in the project-based Section 8 program; if a project is not managed by a

nonprofit, it is deemed more likely to be lost to the market when the project expires.<sup>25</sup> Figure 5 shows the location of the 19,491 units available in 2010; by 2025 (Figure 6), just under 4,000 remain. It is possible that more units will be retained, as intermediaries such as the Local Initiatives Support Corporation work actively to transfer this stock to nonprofit management. But much depends on the amount of market pressure in years to come.

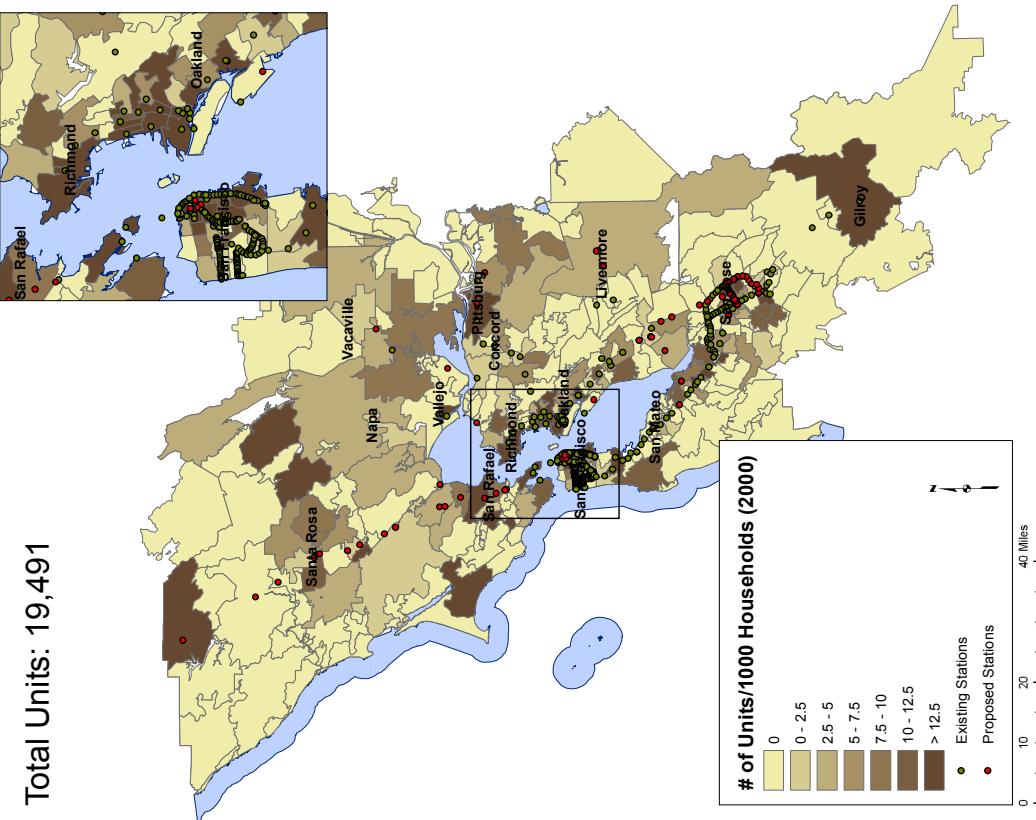
Housing policies drive the supply of affordable housing, but household incomes indicate the demand. Two income indicators suggest potential for displacement because of pressures on the family budget: the compound burden of housing and transportation costs, and the burden of unaffordable mortgages resulting in foreclosure.

The Center for Neighborhood Technology (in collaboration with the Center for Transit-Oriented Development) has devised a methodology to estimate how much households of different income levels pay for both housing and transportation (H+T). Overall, in the Bay Area, households pay 48% of their income for housing and transportation costs combined. However, low-income households pay a much greater share of their income for H+T: in fact, were it not for public subsidies that help pay for H+T, some low-income households would find that the two combined exceed their entire income. Figure 7 maps H+T for families at the 25<sup>th</sup> percentile of household income or below (\$35,000) for block groups in the Bay Area. Low-income households living in the core areas and/or near transit tend to have a much lower H+T (less than 65%) than households living in outer areas. In neighborhoods highly susceptible to gentrification, an H+T that is disproportionately high indicates that residents are unlikely to be able to stay in the absence of supportive housing policies. Overall, this indicator suggests more potential for displacement in outer suburbs, due to the high H+T.

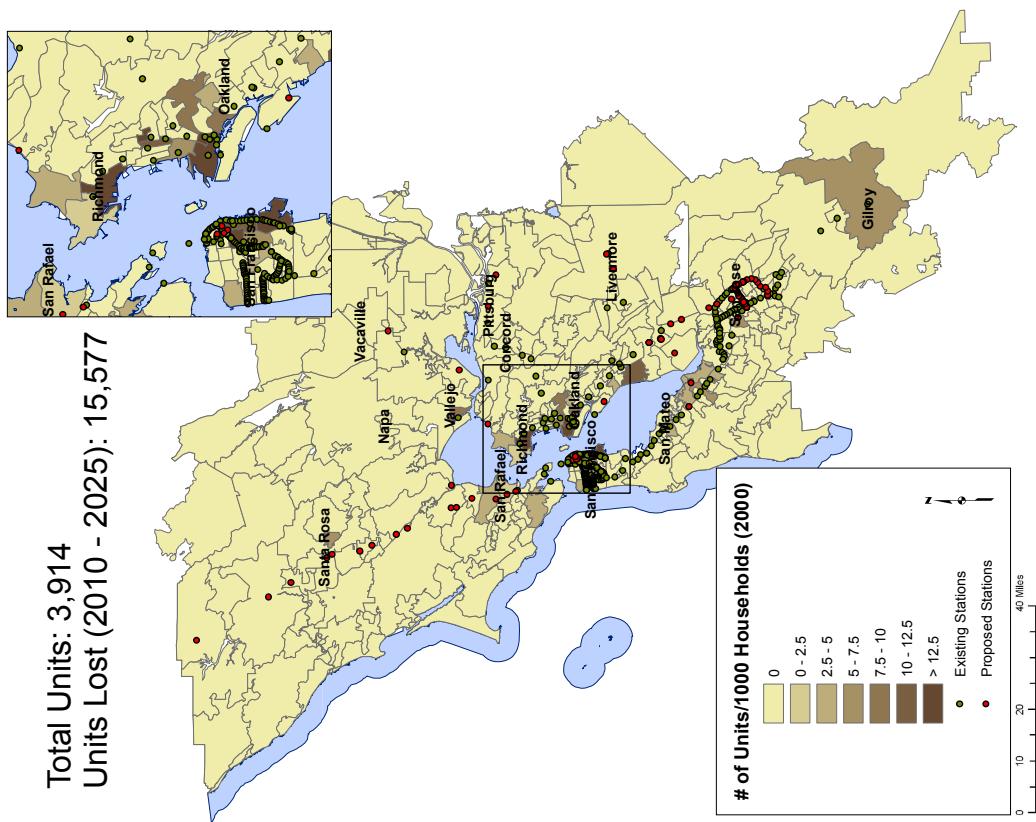


Tenderloin, San Francisco  
Photo: Center for Community Innovation

**Figure 5. Project-based Section 8  
Units in 2010 by zip code.**

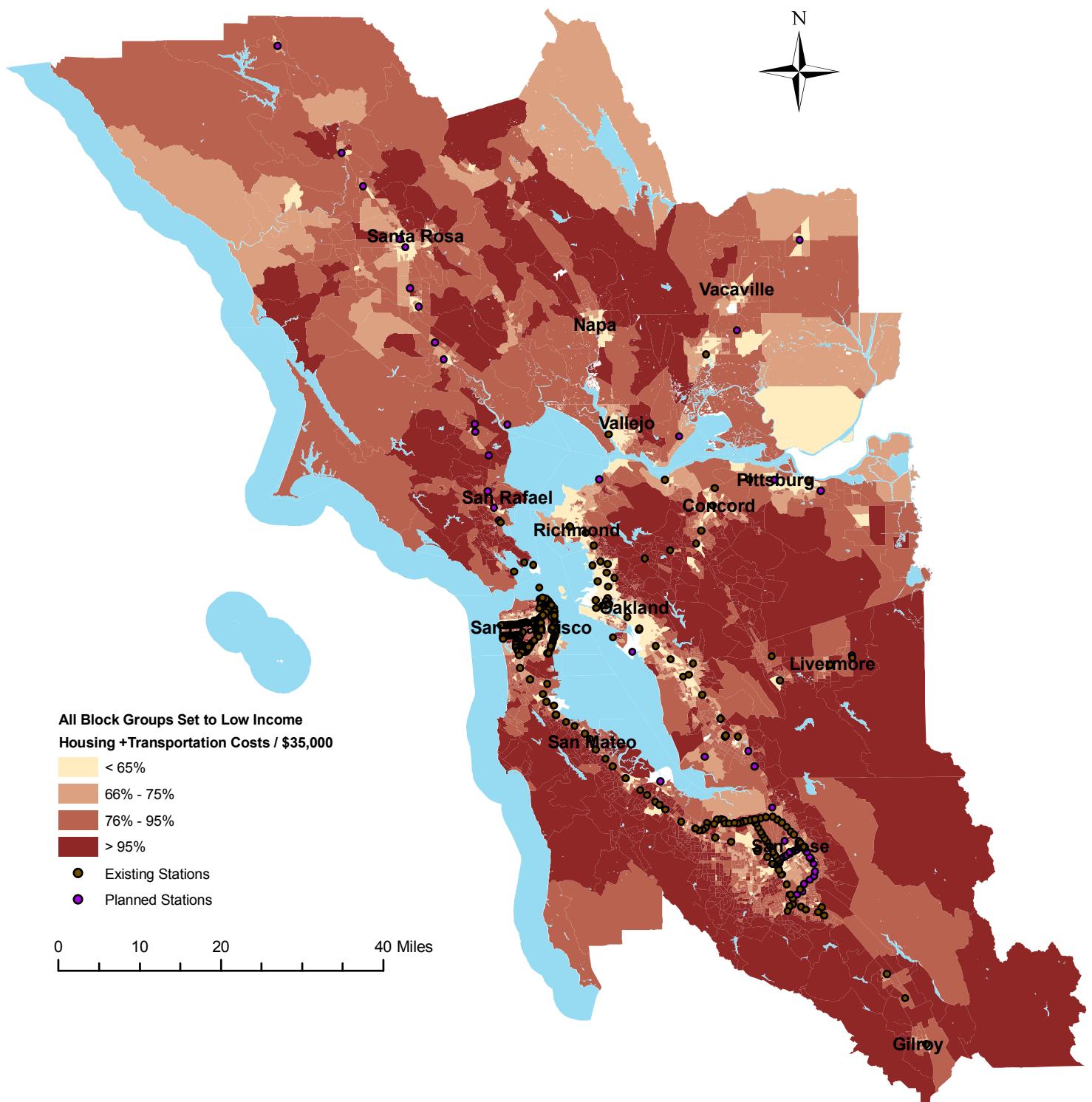


**Figure 6. Project-based Section 8  
Units in 2025 by zip code.**



Source: U.S. Department of Housing and Urban Development, as modified by the California Housing Partnership.

**Figure 7. Housing plus transportation costs for those at an income level of \$35,000 or below, San Francisco Bay Area, 2000.**



Source: Center for Neighborhood Technology. This shows the combined H+T costs for families with incomes of \$35,000 or below in those neighborhoods.

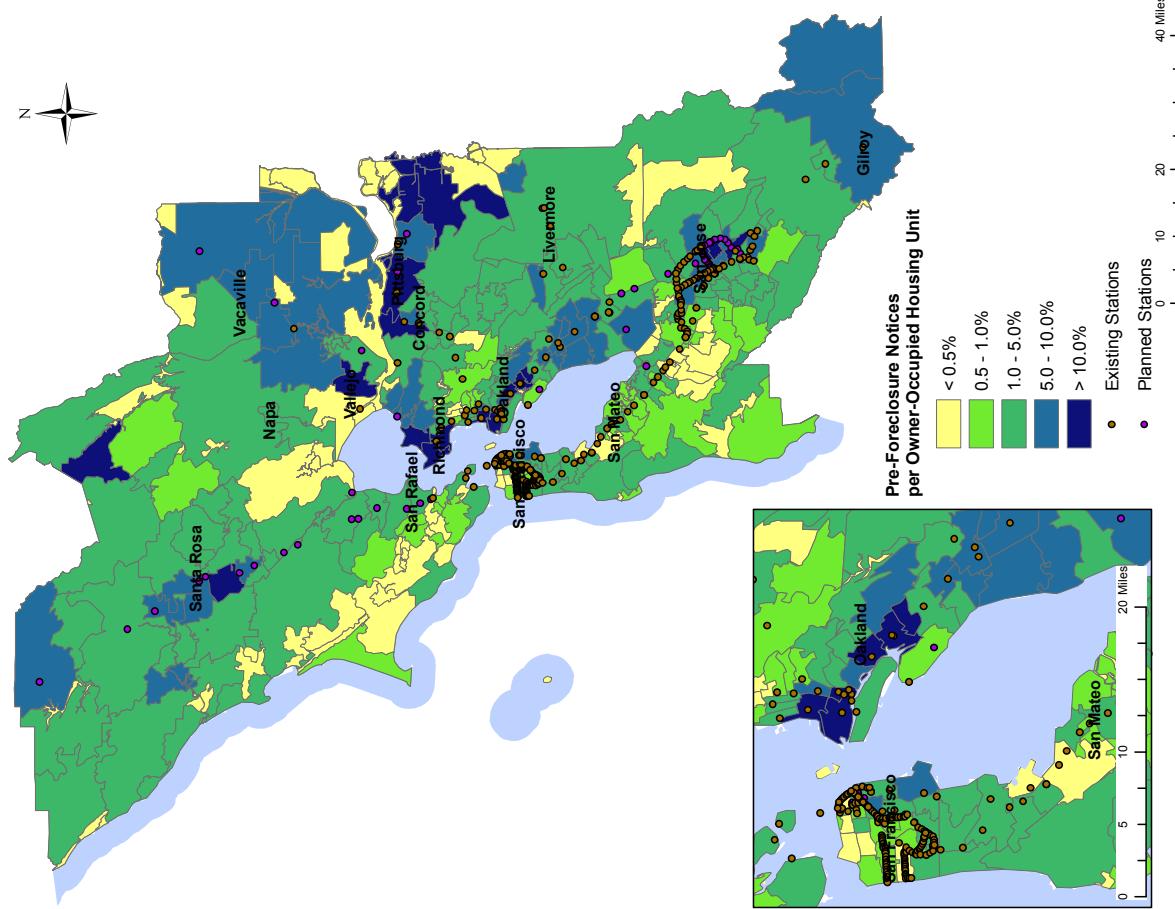
Another indicator is the incidence of preforeclosure notices, the initial notice of default when a household has not met its mortgage payment (Figure 8). Data on foreclosures is provided by private vendors at low cost and is typically available at three levels: the preforeclosure notice, the auction (when the lender puts up the property for sale because of mortgage default), and the REO (real estate owned), a property that goes back to the mortgage company after an unsuccessful foreclosure auction. The preforeclosure stage is the best indicator of housing burden, as it reveals all the households having difficulty paying the mortgage; using REO as an indicator is not as accurate since it does not include owners able to sell their property on the private market or ward off foreclosure temporarily. In general, owners burdened by their mortgages are concentrated in the core areas of the East Bay (Richmond and Oakland) and suburban areas of the North and East Bay. Although these households may be displaced by foreclosure, if they can stay in the neighborhood they may actually benefit from gentrification, as rising property values increase their home equity.

Finally, another income burden indicator readily available in the U.S. census is the share of neighborhood income that comes from newcomers to the area. If a relatively large share of aggregate neighborhood income comes from immigrants, the nature of the neighborhood might change in particular as the new income attracts retailers catering to the newcomers – and offering goods at prices unaffordable to long-time residents. Figure 9 maps neighborhood income for the Bay Area, indicating a high share of new income in the core areas identified by the susceptibility index, as well as in outer suburban areas not so likely to gentrify.



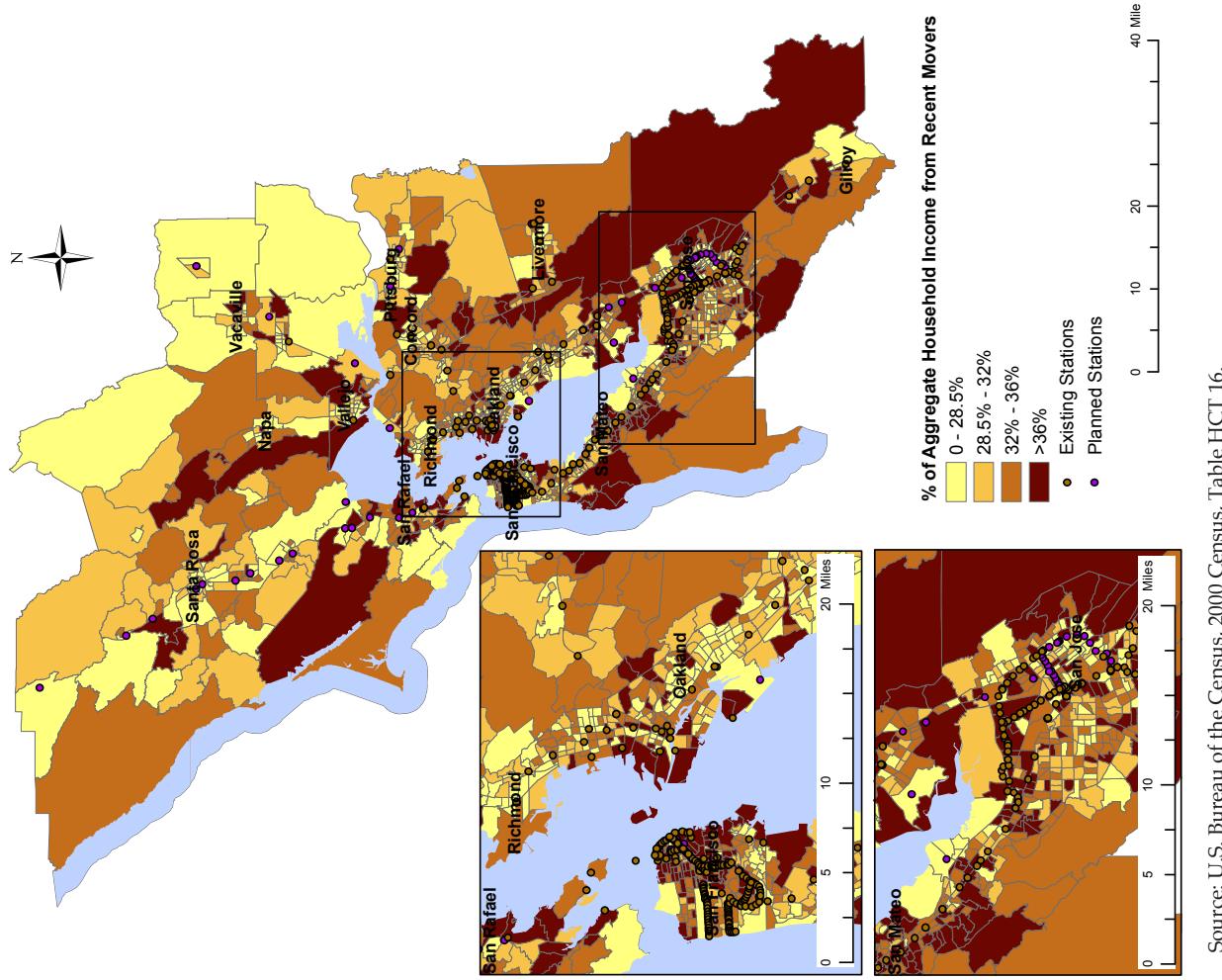
Tenderloin, San Francisco  
Photo: Center for Community Innovation

**Figure 8. Preforeclosure notices in the Bay Area, 2008.**



Source: Foreclosures.com.

**Figure 9. Share of aggregate household income from recent movers.**



Source: U.S. Bureau of the Census, 2000 Census, Table HCT 16.

## Using the Early Warning Toolkit: the Lake Merritt/Chinatown case

The Lake Merritt/Chinatown area provides an interesting case not only because of how the neighborhood is changing, but also because the early warning toolkit can help inform ongoing planning processes that will shape its future. The City of Oakland is currently developing a station area plan for the neighborhood around the Lake Merritt BART Station, with the goal of creating a more livable and sustainable neighborhood by improving coordination between transportation and land use, improving mobility, and encouraging mixed-use development. In conjunction with the planning process and its own Development without Displacement project, ABAG awarded Asian Health Services and the Oakland Chinatown Chamber of Commerce (along with PolicyLink and the Center for Community Innovation as technical consultants) a small grant to conduct a community engagement process before the planning process started. That engagement process, which included several public meetings, focus groups, and a survey, revealed several community priorities: in particular, preserving and increasing neighborhood open space, reducing crime, and improving pedestrian conditions. More than anything, it revealed deep bitterness among current and former community members who remembered the displacement that occurred with many previous redevelopment efforts, in particular the construction of the BART Lake Merritt station, which demolished three blocks of Chinatown.

Oakland, along with CalTrans and Alameda County, began urban renewal and highway construction efforts in the 1950s. Early projects, almost all involving the condemnation and acquisition of predominantly residential properties, included the Nimitz Freeway, the Oakland Public Library, the Alameda County Administration Building, and Laney College.

The 1960s saw additional acquisition and demolition of residences and community facilities to construct the BART Lake Merritt Station, the BART administration building, the MTC administration building, and the Oakland Museum. By the 1980s, awareness of the loss of housing in Chinatown had grown, and local nonprofits, including the East Bay Asian Local Development Corporation, began building more affordable housing in the area. The pace of large-scale redevelopment slowed in the 1990s, with the exception of the Pacific Renaissance Plaza, which included 200 units of market-rate housing, 50 units of affordable housing, and space for the Asian Cultural Center and Oakland Asian Library. After the landlord evicted the affordable housing tenants, several community groups organized the Stop Chinatown Evictions Coalition, which fought successfully in court to restore the affordable units and construct more affordable units off-site. The Pacific Renaissance experience, compounded by the history of redevelopment and Mayor Jerry Brown's recent "10K" initiative to bring housing back downtown, has made the community very aware of how development pressures are shrinking the boundaries of Chinatown (Figures 10 & 11).

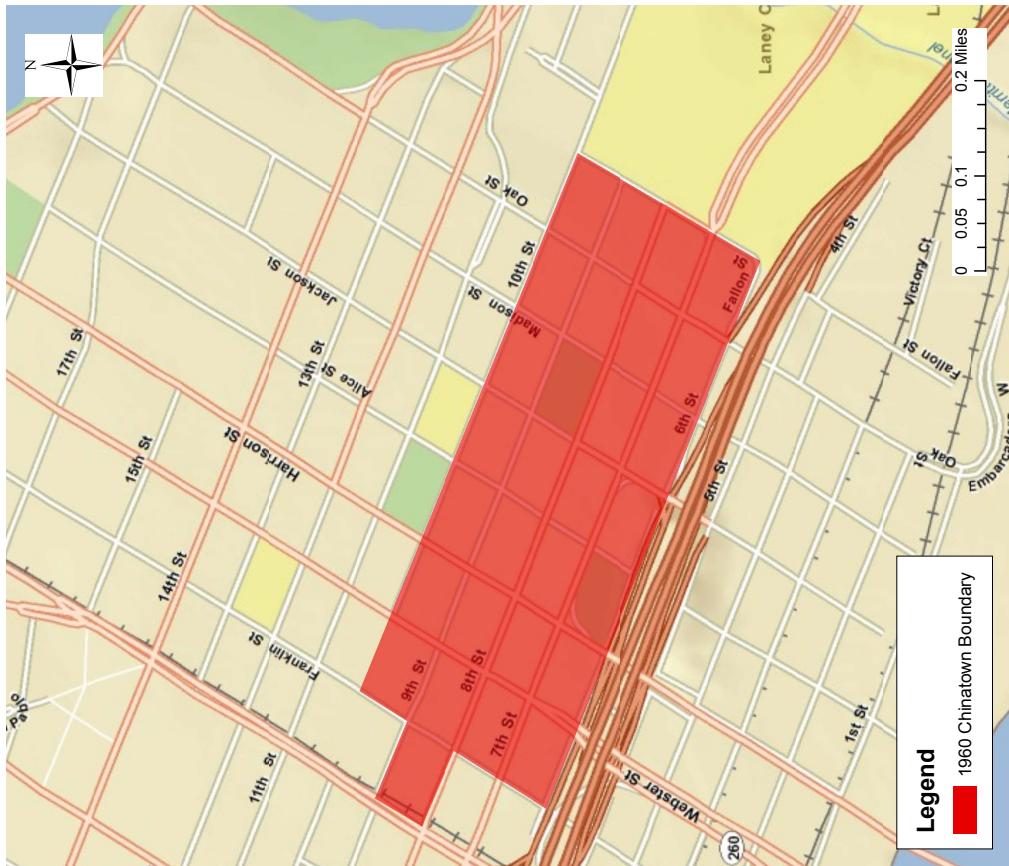
In contrast, however, there is less concern for the potential for displacement through gentrification, in part because of the uncertainty over its extent. Local activists are aware that families are leaving for nearby suburbs, but it is unclear whether this is because of high rents, poor schools, rising crime, or some other motives. Whatever the reason, many express a desire to return to the neighborhood.

The Lake Merritt/Chinatown study area includes the area adjacent to the Lake Merritt Bart station, consisting mostly of redeveloped superblocks with institutional and government users, and the intact grid in Chinatown to the west. The area in the immediate vicinity of the station was already gentrifying in the 1990s, but Chinatown, to the west, was becoming increasingly low-income due to the continued influx of new immigrants (Figure 12).



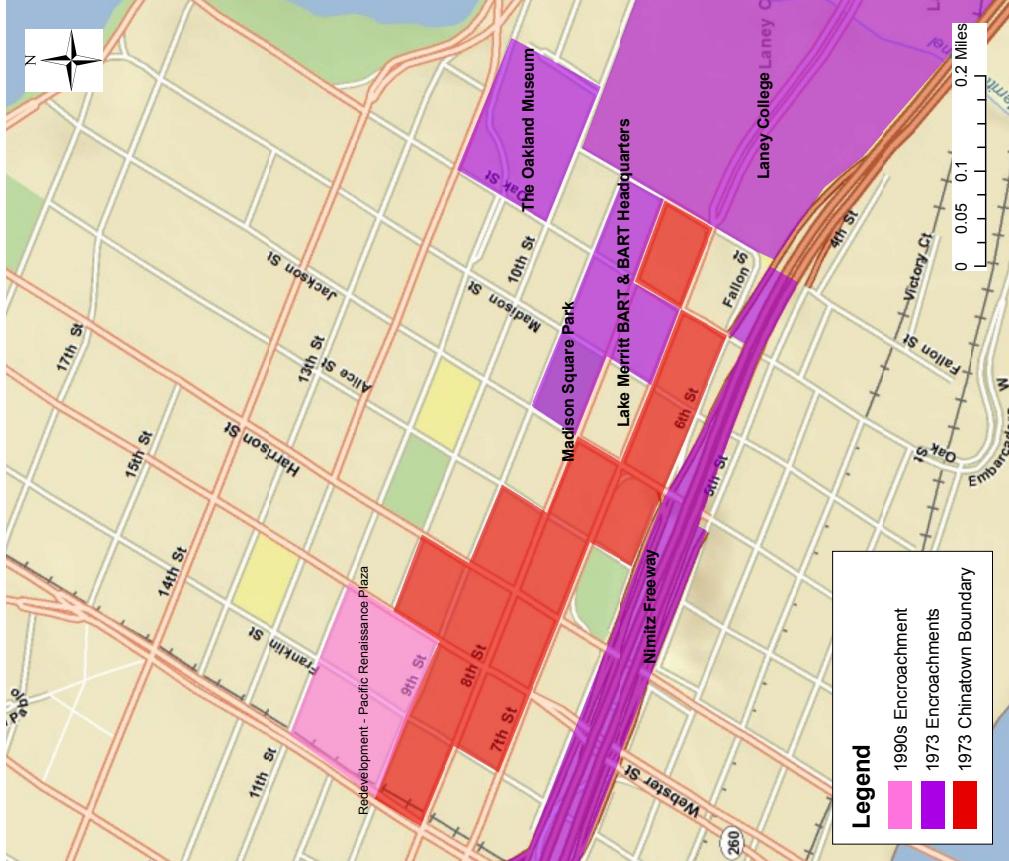
Lake Merritt Neighborhood, Oakland  
Photo: Center for Community Innovation

**Figure 10. Oakland Chinatown boundaries, 1960.**



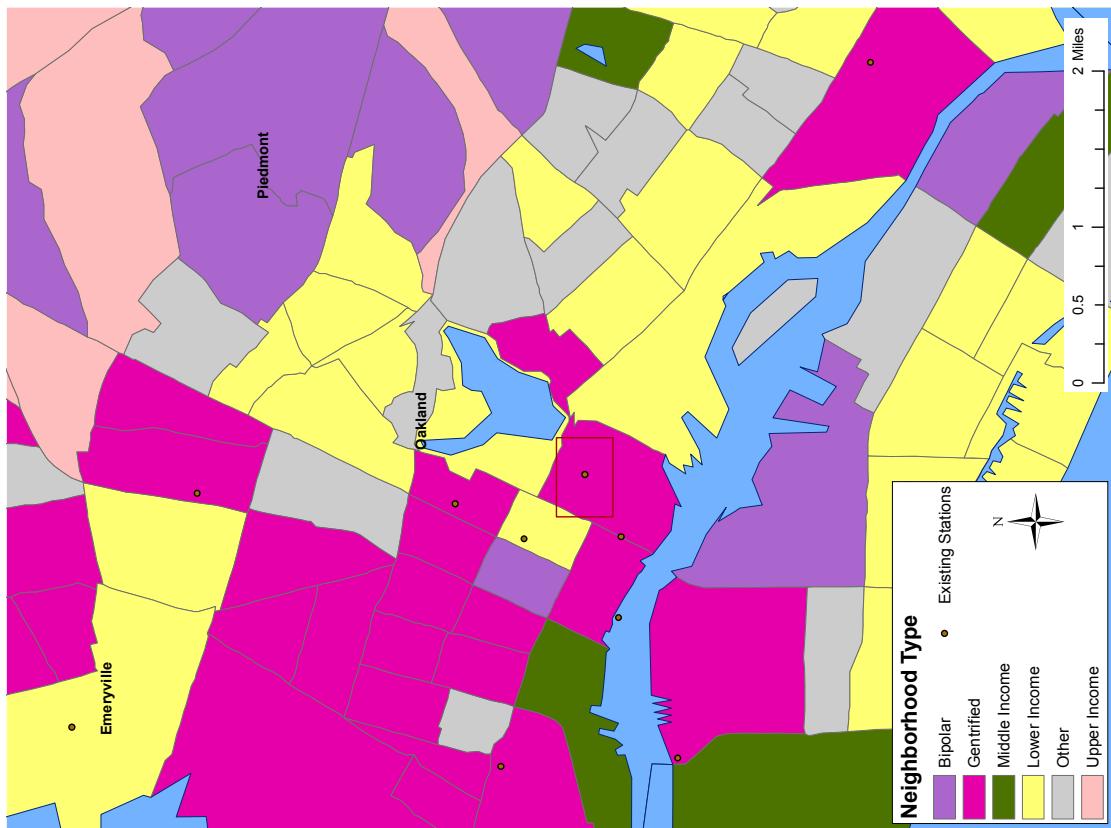
Source: Center for Community Innovation.

**Figure 11. Oakland Chinatown boundaries, 2000.**



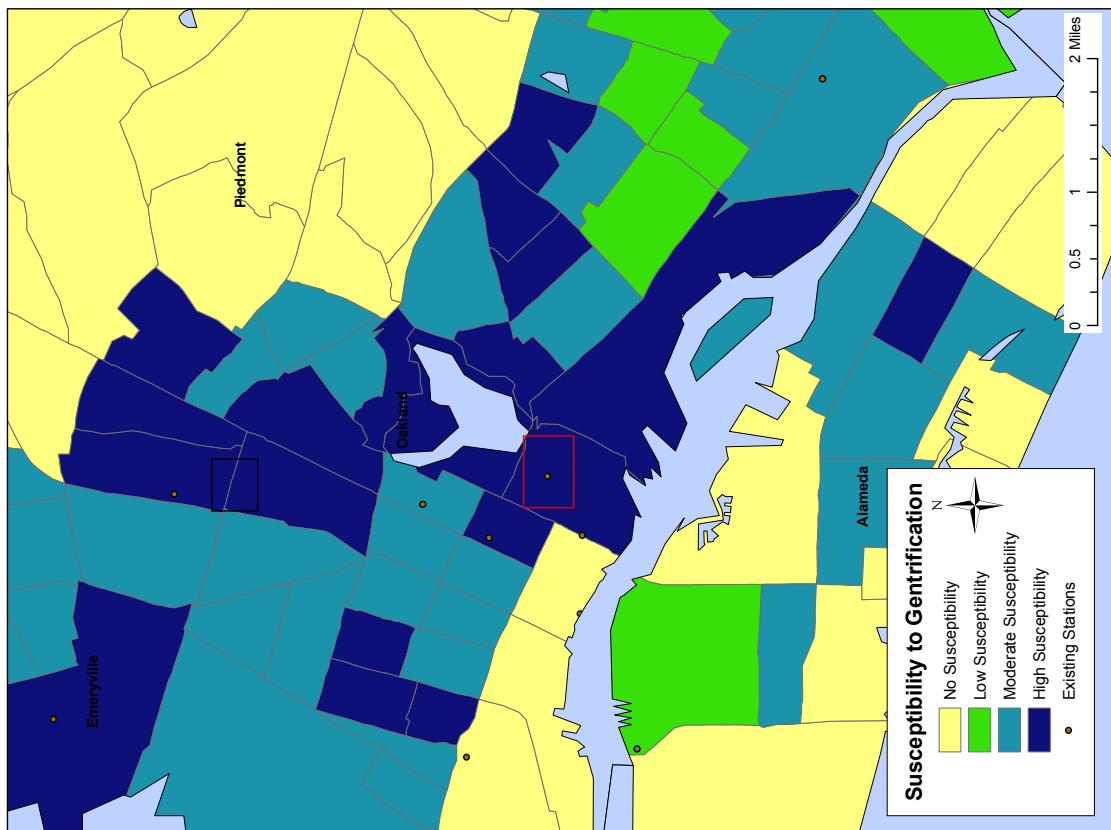
Source: Center for Community Innovation.

**Figure 12. Neighborhood change, 1990-2000.**



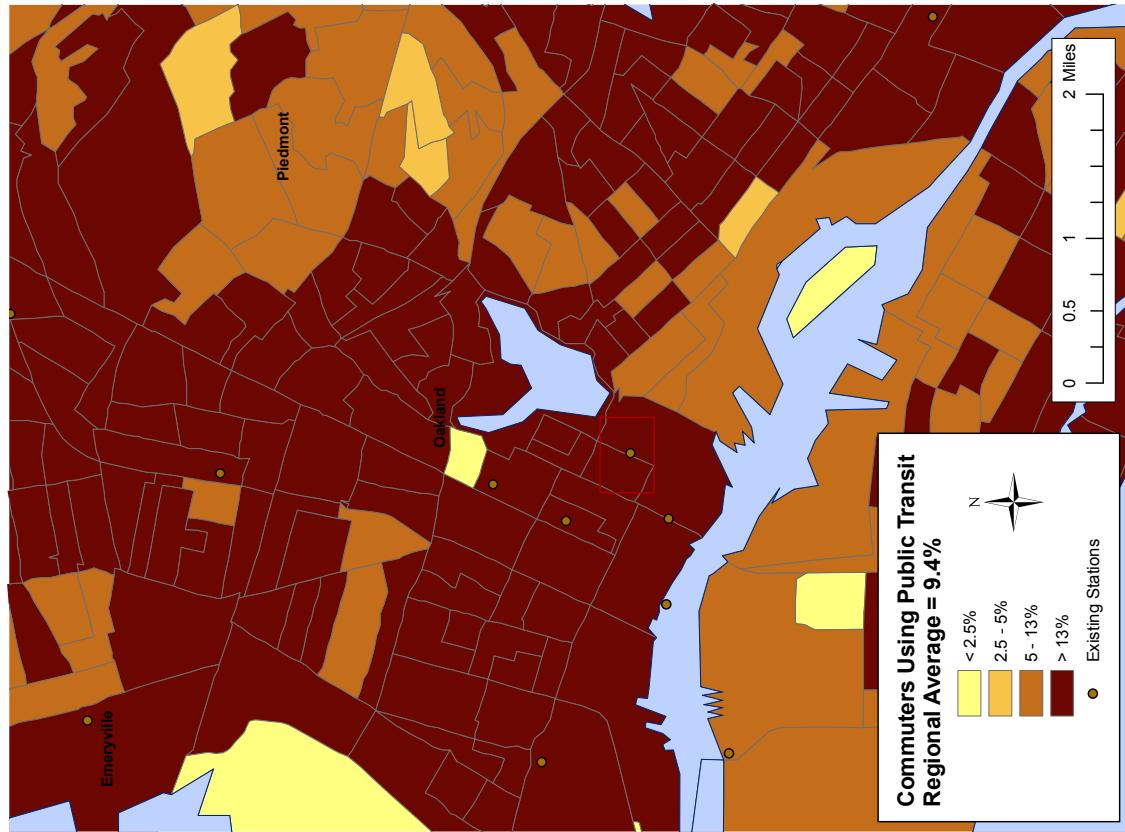
Source: Author's calculations from Geolytics Dataquick data.

**Figure 13. Projected susceptibility to gentrification in the future, 2000-2010.**



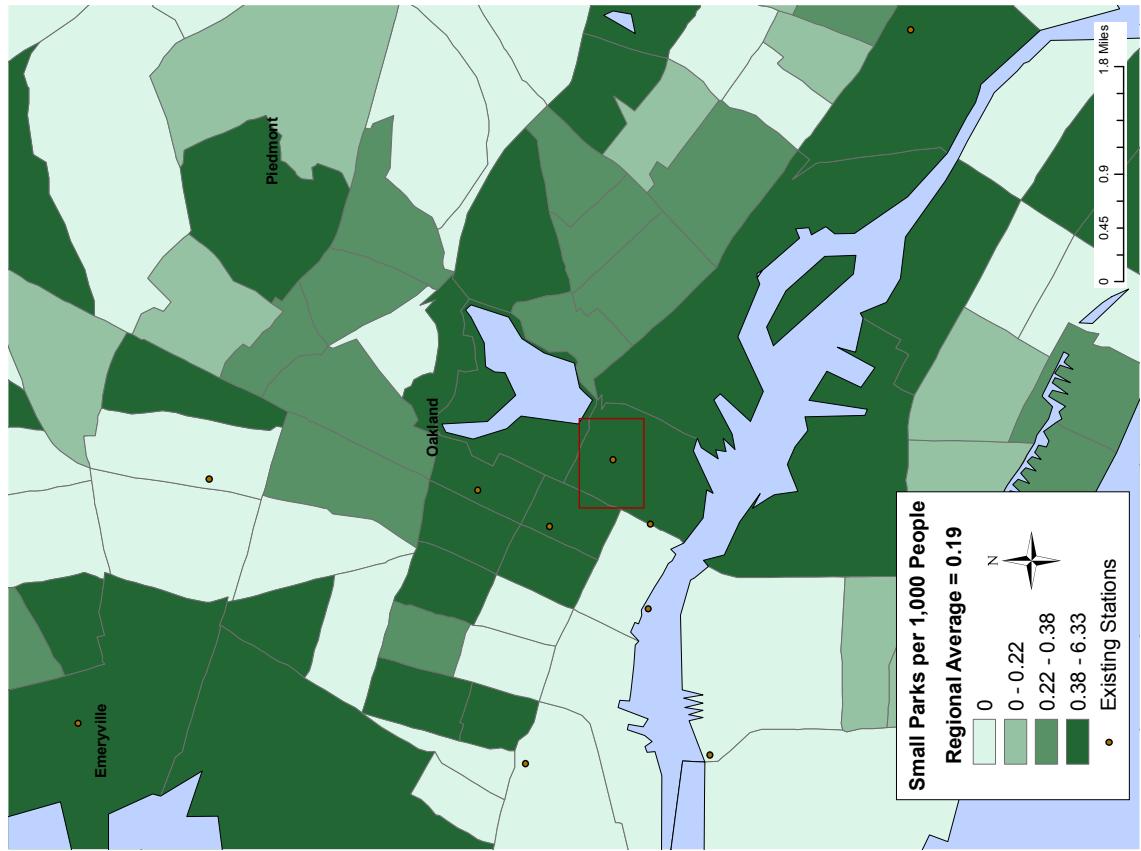
Source: Author's calculations.

**Figure 14. Share of workers who commute via public transit, 2000.**



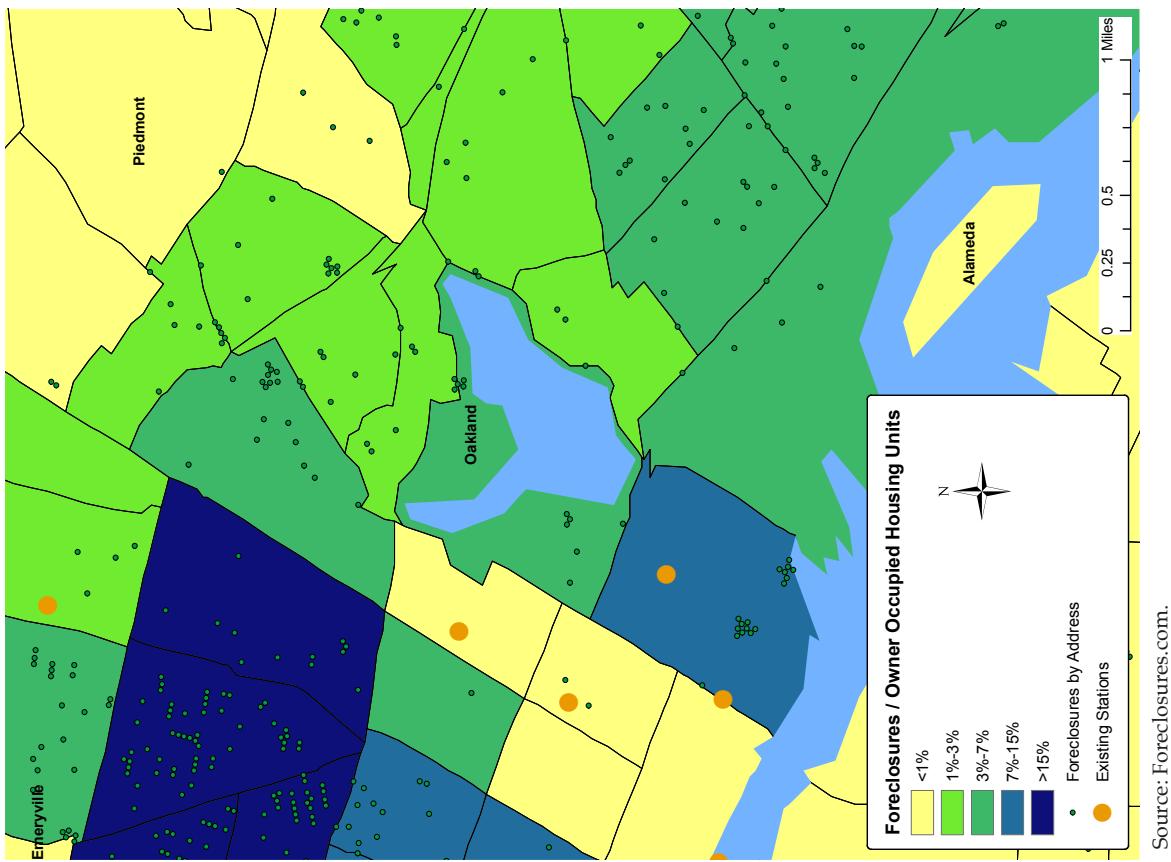
Source: U.S. Bureau of the Census, 2000.

**Figure 15. Small parks per 1,000 people.**

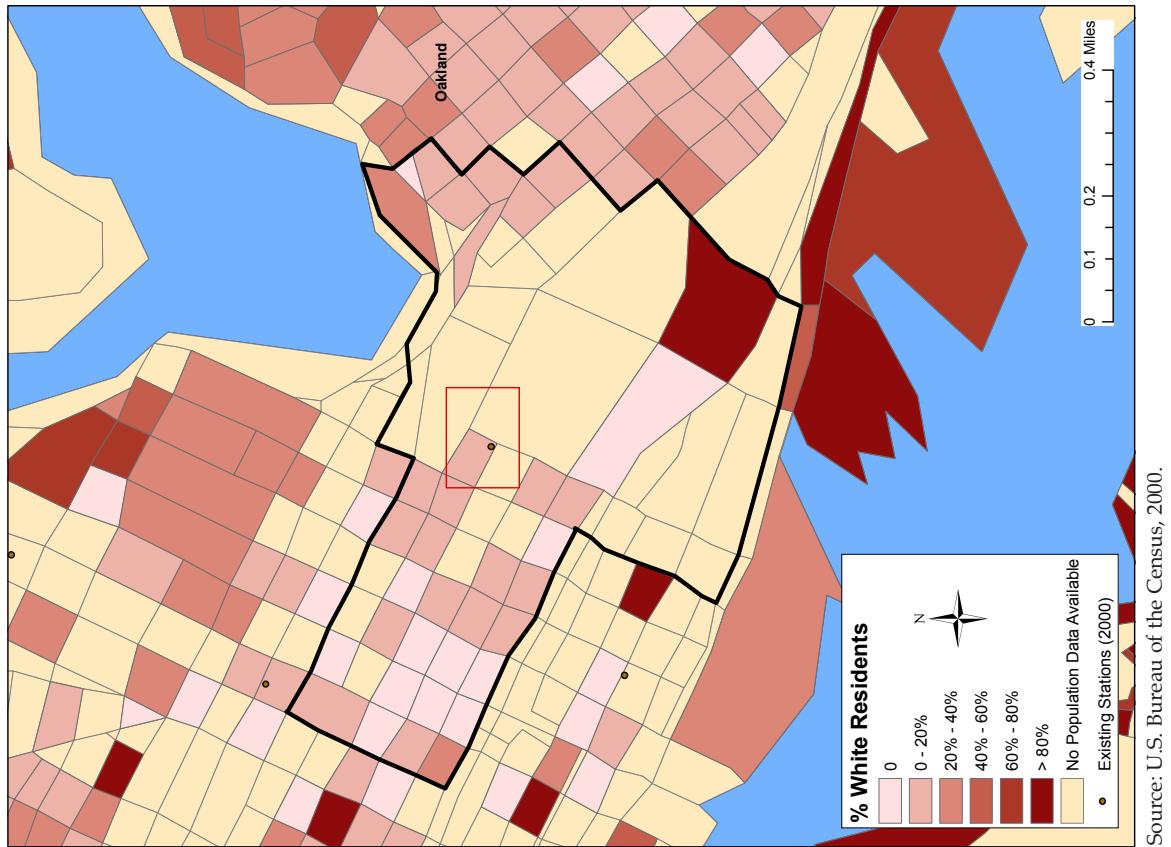


Source: Author's calculations.

**Figure 17.** Foreclosures as a percent of owner occupied housing units, 2006-2007.



**Figure 16.** Share of white residents by block, 2000.



## Conclusion and next steps

The early warning toolkit suggests that this area is highly susceptible to gentrification in the future, with a score of 16 out of the 19 indicators (Figure 13). Interestingly, the area does not have a high enough level of income diversity, household rent burden, or non-family households to score positively on those indicators, but it scores high on all of the others. In particular, it has a high level of amenities, with a large share of transit commuters and small parks (Figures 14 and 15), and a very low share of white population (Figure 16). It also has a relatively high concentration of foreclosures, likely due to defaults in market-rate condominiums near the waterfront (Figure 17).

What, then, might the community learn from the toolkit? First, the high susceptibility level should inform the residents that they will need to remain engaged. The neighborhood is likely to be very attractive to newcomers, and the existing residents will want to manage the change that is likely to happen. This will require a community engagement process that continues well beyond the station area planning process.

From a policy and planning perspective, the most important intervention is to create permanently affordable housing. Since rent burden does not (yet) seem to be a critical issue, the focus should be on offering more opportunities for low-income homeownership, to slow the pace of residential turnover. If rent burdens increase as newcomers arrive, rental assistance programs will be appropriate.

One of the community's current strengths that may be slowing the pace of gentrification is the presence of families with children; to ensure that families remain as the neighborhood changes, new housing should include a disproportionate share of large units (with three or more bedrooms). Another strength--but one which may be attracting gentrification--is the concentration of small parks. Over the coming years, as the city and developers enhance existing parks and build new public spaces, these parks should focus on the recreational needs of existing residents (e.g., their need for tai chi space) and celebrate existing culture rather than provide more generic amenities.

This report offers an early warning toolkit for predicting neighborhood change in the form of gentrification. Gentrification is perhaps not as common as many perceive it to be. Just 7% of Bay Area neighborhoods are gentrifying. However, these areas house a disproportionate share of the region's transit stations. A number of different factors predict whether a neighborhood will gentrify, most importantly local amenities, transit commuting, and income diversity. Neighborhoods that score high on these factors are likely to gentrify at some point in the near future. This process of neighborhood change is particularly likely to result in the displacement of residents in the absence of certain housing policies, in particular rent control, preservation of affordable rental units, and rental assistance programs to ease the rent burden.

This toolkit will help inform the many different planning processes in the Bay Area's new transit station and priority development areas. New development presents an opportunity to recapture value to benefit existing residents. A growing literature on transit-oriented development and value capture suggests mechanisms from assessment districts to tax increment financing to development impact fees that could be leveraged to protect residents as neighborhoods experience reinvestment.<sup>26</sup> Value capture policies, as well as other policies preserving affordable rental housing stock, might best target the area within a 1/2-mile radius of the transit station, where pressures will be greatest.

Future research should try to expand the reach of the toolkit. In particular, this project would benefit from a better understanding of the relationship between public investment and gentrification. If data on public improvements were added to the database, it would be possible to determine the types of neighborhood change and the extent of gentrification that might occur with different types and levels of public investment. Though we now understand better the relationship between rail transit investment and gentrification, it is important to expand this research to examine the impacts of bus transit, as well as to determine the time frame of gentrification, in other words, how long after the transit investment it is likely to gentrify. It would be valuable to understand the effects of neighborhood change on different subgroups of the population: for instance, very low-income vs. low-income households, rent-burdened households, family households, and so forth. We look forward to the publication of the 2010 census data, which will allow us to refine this model and anticipate the next decade of change.

## Notes

<sup>1</sup>National Association of Realtors; National Low-Income Housing Coalition, *Out of Reach*, 2006.

<sup>2</sup>Bay Area Council, Bay Area Economic Forum and the Association of Bay Area Governments, *The Innovation Economy: Protecting the Talent Advantage*, Bay Area Economic Profile, 2006. "Affordable" housing costs are defined here as 30 percent of income – the prevailing standard used by the US Department of Housing (HUD). Source: ABAG, *A Place to Call Home: Housing in the San Francisco Bay Area*, (2006): 2.

<sup>3</sup>California Budget Project, *The Rising Tide Left Some Boats Behind: Boom, Bust & Beyond in the San Francisco Bay Area*, December 2005.

<sup>4</sup>Association of Bay Area Governments, *Projections 2009*.

<sup>5</sup><http://www.greatcommunities.org>

<sup>6</sup>For a summary of the literature, see Parsons Brinkerhoff, *The Effect of Rail Transit on Property Values: A Summary of Studies*, prepared for the Denver Regional Council of Governments [<http://www.drcog.org>], 2001

<sup>7</sup>It was coined by Ruth Glass, who was describing the invasion of the middle class into poor London neighborhoods in *London: Aspects of Change* (London: MacGibbon & Kee, 1964).

<sup>8</sup>Maureen Kennedy and Paul Leonard, *Dealing with Neighborhood Change: A Primer on Gentrification and Policy Choices*, discussion paper prepared for the Brookings Institution Center on Urban and Metropolitan Policy and PolicyLink [<http://www.policylink.org/pdfs/BrookingsGentrification.pdf>], 2001.

<sup>9</sup>New housing investment serves as a proxy for an influx of newcomers into the neighborhood. Ideally, the definition of gentrification would include some measure of in- and out-movers. However, as other researchers have found, the type of data that is available at the neighborhood level – tract, block group, or block data from the U.S. Census – is not well suited to measure very localized population flows.

<sup>10</sup>Freeman's definition also includes a measure of building age (percent of housing units built in the last twenty years), since gentrifiers are often attracted by older, architecturally significant housing stock. However, this variable does not work well in the Bay Area, where gentrifying neighborhoods have seen much new construction. Lance Freeman, "Displacement or succession? Residential

mobility in gentrifying neighborhoods," *Urban Affairs Review* 40.4, (2005): 463-491.

<sup>11</sup>These studies include Freeman & Braconi (2004); Vigdor (2002); McKinnish, Walsh & White (2008); and Freeman (2005). However, it should be noted that most of these studies (with the exception of Freeman) have flaws either in how they define gentrification (as in McKinnish, Walsh & White, who do not include real estate investment) or how they define their comparison sample.

Lance Freeman and Frank Braconi, "Gentrification and displacement in New York City," *Journal of the American Planning Association* 70.1, (2004) 39-52.

Jacob Vigdor, "Does Gentrification Harm the Poor?" *Brookings-Wharton Papers on Urban Affairs* (2002): 133-182.

Terra McKinnish, Randall P. Walsh, and Kirk White, *Who Gentrifies Low-Income Neighborhoods?* NBER Working Paper No. W14036. [<http://ssrn.com/abstract=1139352>], 2008.

<sup>12</sup>Kathe Newman and Elvin Wyly, "The right to stay put, revisited: Gentrification and resistance to displacement in New York City," *Urban Studies* 43.1, (2006): 23-57.

<sup>13</sup>Brock Winstead, *The Politics of Tenant Protection in Richmond, California* (Berkeley, CA: Center for Community Innovation, 2006). Winstead found that about one percent of unlawful detainers (landlord actions when tenants disobeyed a "notice to quit") were no-cause and associated with rent increases. Collecting such data from the courts is a very time-consuming task (the Richmond study took approximately 300 hours to complete). Purchasing it from vendors is not viable because they sell the data per building or tenant, not by geographic unit.

<sup>14</sup>To learn more about the income and housing characteristics of transit station areas, see Center for Transit-Oriented Development, *Preserving and Promoting Diverse Transit-Oriented Neighborhoods*, prepared for the Ford Foundation, 2006, and *Capturing the Value of Transit*, prepared for the US Department of Transportation and Federal Transportation Administration, 2008.

<sup>15</sup>To construct these six categories, we first had to convert the census data on household income from 10-16 irregular categorical variables (in 1990 and 2000) into consistent and meaningful groups. Following Berube and Tiffany (2004) and Galster et. al. (2005) we use two different methods to aggregate the finer (census) distribution into our six categories (based on the income cutoffs relative to the AMI). First, we calculate the area median income

using the linear interpolation method. Then, for each census tract in the Bay Area we calculate the share of households in each of the census categories and their cumulative density. In aggregating to our six categories, we use linear interpolation to find breakpoints within a census category for those at or below the median income. However, we assume that the distribution of households within the higher-income categories follows a pareto distribution. This assumes that there is more density towards the lower cutoff. Alan Berube and Thacher Tiffany, *The shape of the curve: Household income distributions in U.S. Cities, 1979-1999*. Living Cities Census Series. (Washington, DC: Brookings Institution, 2004).

George Galster, Jason C. Booza, Jackie Cutsinger, Kurt Metzger, and Up Lim, *Low-Income Households in Mixed-Income Neighborhoods: Extent, Trends, and Determinants*. Report prepared for the U.S. Department of Housing and Urban Development. (Washington D.C.: HUD. 2005).

<sup>16</sup> The NCDB provides 1990 census data for normalized 2000 census tract definitions, allowing us to compare 1990 neighborhood characteristics to 2000.

<sup>17</sup> Galster & Booza (2007) identify neighborhoods that are “bipolar” using a formulation based on the entropy index. The entropy index is based upon the thermodynamic principle that any system will naturally trend towards evenness. The amount of entropy in a system refers to how far along a system is in reaching complete evenness or equilibrium. In the social sciences researchers have developed an index that varies from 0 to 1, also called the Shannon-Weaver Index, to measure entropy of a population across social categories:

$$H = -\sum_i^k \pi_i \ln \pi_i / \ln k$$

where H is the index,  $\pi_i$  is the proportion of the population in each category, and k is the number of categories. In addition to this nominal entropy index, Galster & Booza construct a new ordinal entropy index and use the ratio of the two to measure bipolarity. George Galster and Jason Booza, “The Rise of the Bipolar Neighborhood,” *Journal of American Planning Association* 73.4, (2007): 421–435.

<sup>18</sup> Just ten of the tracts that were becoming bipolar were also gentrifying, and we classified them as gentrifying. Interestingly, this confirms Galster & Booza’s finding that the bipolar category is

basically distinct from gentrification.

<sup>19</sup> A small share of these neighborhoods is experiencing gentrification at the same time as consolidating in one of these income categories. Thirteen tracts fall into both becoming middle income and gentrifying categories, 19 into both becoming lower income and gentrifying, and 41 into both becoming upper income and gentrifying. We classify all of these as gentrified since this is the dominant type of change.

<sup>20</sup> Since this analysis was attempting to identify systematically which variables did and didn’t matter, we used a stepwise regression, which starts with a large number of variables and eliminates collinear variables, or those which are highly associated with variables that fit better in the analysis.

<sup>21</sup> The analysis began with a very large set of variables identified in the literature on gentrification, and reduced it to the variables that most powerfully predict gentrification. Variables on youth facilities, public space, and recreational facilities were constructed from 501(c)3 data from the National Center for Charitable Statistics. The small park variable comes from ESRI, supplemented by city websites. The distance to major city variables come from ESRI. All of the other variables were constructed from U.S. Decennial Census data.

<sup>22</sup> We use the 35% threshold, rather than 30%, to reflect the Bay Area context, where high housing costs have made it customary to pay a higher share of income for housing.

<sup>23</sup> It should be noted that it is not the density itself that is causing gentrification: in fact, controlling for all else, the higher share of multi-unit buildings the less likely the area is to gentrify. Thus, there are several intervening variables which make high-density neighborhoods more susceptible: in particular, higher levels of renter occupancy and higher shares of amenities.

<sup>24</sup> Again, however, controlling for all other factors, public housing actually makes gentrification less likely, suggesting that some other variables are intervening to make the influence of public housing seem positive.

<sup>25</sup> The California Housing Partnership provided the analysis of potential expiration for these maps.

<sup>26</sup> See Nadine Fogarty, Nancy Eaton, Dena Belzer, and Gloria Ohland, *Capturing the Value of Transit*. (Prepared for the Federal Transit Administration, U.S. Department of Transportation, November 2008).



