The background of the entire page is a teal color. Overlaid on this is a network of wooden blocks, each with a black silhouette of a person's head and shoulders. The blocks are connected by white lines, forming a complex, interconnected web that symbolizes community and social connections. The blocks are arranged in a way that they appear to be floating or connected in a 3D space.

# Residential Instability in the Bay Area through the COVID-19 Pandemic

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July 2022

The logo consists of a solid teal circle to the left of a vertical teal line. To the right of the line, the text "Federal Reserve Bank of San Francisco" is written in a white, sans-serif font, stacked in four lines.

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## **Disclaimer**

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## Executive Summary

This report draws on a unique, longitudinal dataset of over 250,000 Bay Area residents to examine residential instability—including moving, crowding, and financial health—in the Bay Area during the pandemic. Our research finds a substantial decrease in moving during the pandemic, particularly for residents of extremely low socioeconomic status (SES). At the same time, we report a concerning rise in residents living in crowded conditions and experiencing declining credit scores. These trends suggest that COVID-19 rent relief programs and eviction moratoria may be successful in reducing displacement; however, alternative strategies may be necessary to address other forms of residential instability, like crowding, especially in Black and low-income neighborhoods. This report concludes with recommendations to address residential instability in the Bay Area.

### Key Takeaways

- During the first year of the pandemic, people were moving less but increasingly living in crowded housing and experiencing declines in their financial health. We count a move as an individual moving out of their block group.<sup>1</sup> In the context of COVID-19 job loss, it is likely that people moved into shared living spaces with friends or family members who live nearby (i.e., within the same census-designated block group) to reduce and share expenses. Additionally, young adults living in other parts of the country may also have moved back home to the Bay Area at the onset of the pandemic.
- In places hit hardest by COVID-19, more households started living in crowded conditions (i.e., transitioned from low-density to high-density households), gained new delinquencies, and experienced declines in their financial health. We report significant correlations between case rates and these residential instability outcomes.
- Trends are unequal across neighborhoods by racial composition: Neighborhoods with at least a 10 percent Black population (i.e., Mixed-Black neighborhoods) experienced the largest decrease in moving rates during the pandemic. Although low-moderate-SES residents moved more in Majority White neighborhoods, they moved less in Mixed-Black neighborhoods. Residents in Mixed-Black neighborhoods also saw the largest increase in people living in crowded conditions.
- Moves into crowded conditions, new delinquencies, and declines in financial health were concentrated in the southeast parts of San Francisco (including Bayview/Hunters Point), the eastern and northern parts of the North Bay (including Vallejo and Calistoga), Deep East Oakland, the northeast of the East Bay (including Pittsburg and Antioch), central San Jose (in Naglee Park and Little Saigon), and central South Bay (including Menlo Park and East Palo Alto).

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<sup>1</sup> A census block group is a cluster of blocks and contains approximately 600–3,000 residents. Refer to Appendix B for additional information.



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## Introduction

The economic fallout from the COVID-19 pandemic has exacerbated residential and financial instability. These effects are especially prevalent in the Bay Area, where housing has become increasingly unaffordable. This report analyzes various aspects of residential instability in the Bay Area during the first year of the pandemic, compared with before the pandemic. We find that although moving decreased during the pandemic, people were making constrained choices by entering crowded conditions and experiencing declines in their credit scores. We also find that residential instability is concentrated in different areas of the Bay Area. These analyses aim to guide strategies to mitigate the negative effects of the pandemic on individuals and their neighborhoods.

The analyses in this report draw on several data sources that we describe in more detail in Appendix A. These sources include the Federal Reserve Bank of New York Consumer Credit Panel/Equifax (CCP), American Community Survey (ACS) 2015–2019 (hereafter, 2019) five-year estimates,<sup>2</sup> and county-level COVID-19 data.<sup>3</sup> We track about 250,000 Bay Area residents per year up to December 2020 using the CCP data. To measure residential instability, we consider the following outcomes: **moving** (whether someone moves out of his or her census block group<sup>4</sup>), **household crowding**, **financial delinquencies**, and **declining financial health**, as measured by credit scores. For household crowding, we examine the extent to which individuals in households with one to two adults transition into households with at least four adults (including people who move out of their home and people who move into the home). To measure financial instability, we examine the extent to which individuals are in households that gain new delinquencies on any credit accounts and the extent to which residents became extremely low-SES from a higher-SES category.

We define SES using Equifax Risk Scores, proprietary credit scores that estimate the likelihood that an individual will pay his or her debts without defaulting, as a proxy of financial instability. We define the SES categories in the following way by their Equifax Risk Scores, which range from 280 to 850:

**extremely low** SES refers to a score less than 580 or no score; **low-moderate SES** refers to a score between 580 and 749; and **middle-high SES** refers to a score at 750 or greater.<sup>5</sup> More information on our measures can be found in Appendices B and C.

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<sup>2</sup> The ACS data for census tracts are available only as five-year estimates due to the sampling design.

<sup>3</sup> COVID-19 case rates are based on the number of cases per 100,000 residents, using population counts from the 2015–2019 ACS. Data were obtained from the public websites of each Bay Area county’s Department of Public Health on February 25, 2021. Refer to Appendix A for additional information.

<sup>4</sup> Census block groups contain approximately 600–3,000 residents and are nested within census tracts. Census tracts contain an average of 4,000 residents.

<sup>5</sup> Analysis of population distributions using data from the Comprehensive Housing Affordability Strategy (CHAS) for the City of Oakland suggests that our SES categories are similar to the following HUD AMI categories, respectively: <30% AMI (“extremely low,” as labeled by the State of California), between 30% and 50% AMI (“very low”), between 50% and 100% AMI (“low” and “moderate”), and above 100% AMI (“high”).



Subregions account for the variation in housing affordability dynamics across the Bay Area. These subregions are North Bay (Marin, Napa, Solano, and Sonoma counties), East Bay (Alameda and Contra Costa counties), and South Bay (San Mateo and Santa Clara counties). In this report, we also examine trends in the core cities of the Bay Area: San Francisco, Oakland, and San Jose.



## Trends in Residential Instability

First, we compare annual trends in residential instability outcomes in 2018–2019 before the pandemic with trends in 2019–2020 during the pandemic. We examine the extent to which residents move out of their neighborhoods, as well as the extent to which they experience informal forms of displacement. We consider these outcomes by SES, subregion, neighborhood ethnoracial composition, and neighborhood income quintile.

Moving rates dropped in all areas except San Francisco, and low-moderate-SES residents moved at the highest rates. In addition to declines in moving rates, we report that rates of households that started living in crowded conditions (high-density households) and became extremely low-SES (from a higher-SES category) increased during the pandemic, while households with new delinquencies decreased. Shifts to crowded households were especially prevalent in the South Bay, while shifts into the extremely low-SES category were more concentrated in the East Bay and North Bay. When we break down these trends by neighborhood ethnoracial category, residents in Mixed-Black neighborhoods experienced the largest decreases in moving during the pandemic while also seeing the largest increases in household crowding.

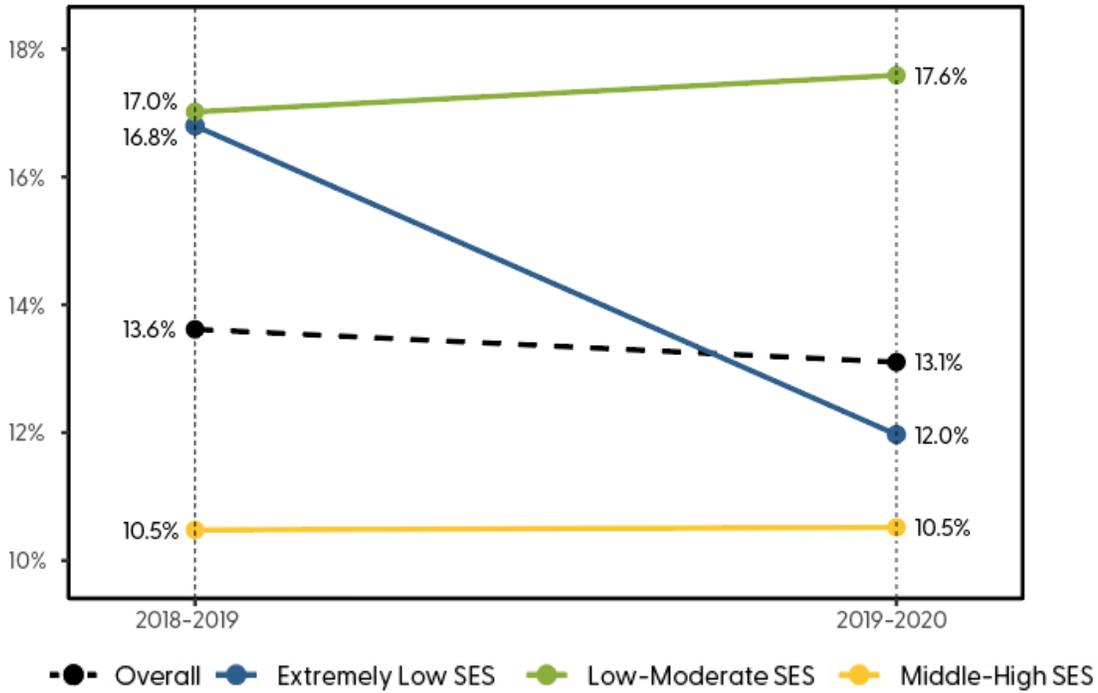
### Overall Trends

As Figure 1 demonstrates, extremely low-SES and low-moderate-SES residents saw similar levels of moving prior to the pandemic. However, extremely low-SES residents experienced a substantial decline in moving rates during the pandemic, while low-moderate-SES residents saw a small increase. Middle-high-SES residents saw no change and remained the group with the lowest levels of moving. Overall, people moved slightly less in the Bay Area, with this change being largely driven by extremely low-SES residents. This decrease may be due to eviction moratoriums in effect during the pandemic, whereas for low-moderate-SES residents, the slight increase could be due to narrow eligibility criteria of rent relief programs (targeted at extremely low-SES residents), but it may also indicate flight of higher-SES workers with flexible remote work options.



**Figure 1**

**Percentage of Bay Area Residents Who Moved in 2018–2019 and 2019–2020, by SES**



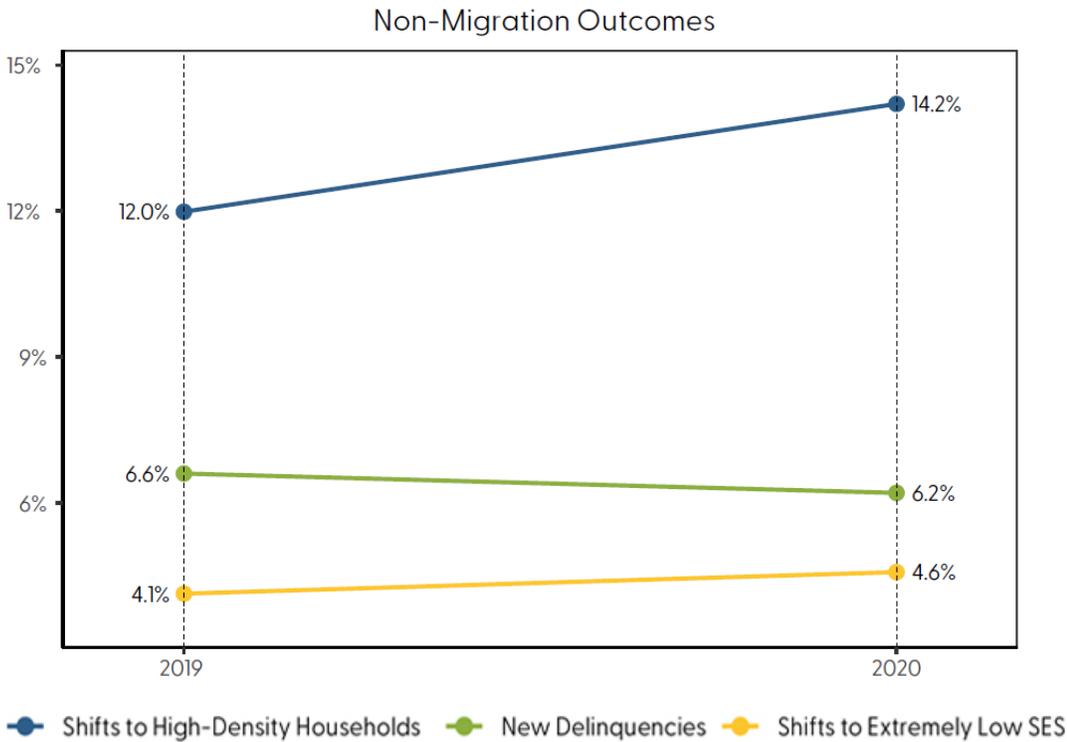
Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax Data.

Although overall moving rates decreased, other indicators of residential instability reveal that a higher share of residents shifted into crowded or high-density households (i.e., households with at least four adults) during the pandemic (Figure 2). The proportion of residents who entered the extremely low-SES credit category also increased. Conversely, rates of new delinquencies decreased slightly during the pandemic. (This may be due to creditors, such as mortgage lenders and credit card companies, offering temporary payment relief during 2020.) In the context of COVID-19, crowded conditions are especially concerning (we examine correlations with COVID-19 later in this brief).



**Figure 2**

**Percentage of Bay Area Residents Who Shifted to High-Density Households, Households with New Delinquencies, and Residents Who Became Low-SES in 2019 and 2020**



Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax Data.

**Trends by Subregion**

Next, we examine the above annual trends broken down by Bay Area subregions. With the exception of San Francisco, all regions in the Bay Area saw declines in moving; San Francisco experienced a modest increase (Figure 3). Still, across all subregions, extremely low-SES residents experienced the sharpest drops in moving. Low-moderate-SES residents, on the other hand, moved more in 2020 in all regions, with the largest increase being San Francisco. Trends for middle-high-SES residents varied across the Bay Area: they moved more in Oakland, San Francisco, and the South Bay, yet moved less in San Jose and other parts of the East Bay. In Oakland, in particular, middle-high-SES residents saw the largest increase in moving, compared with other SES groups.

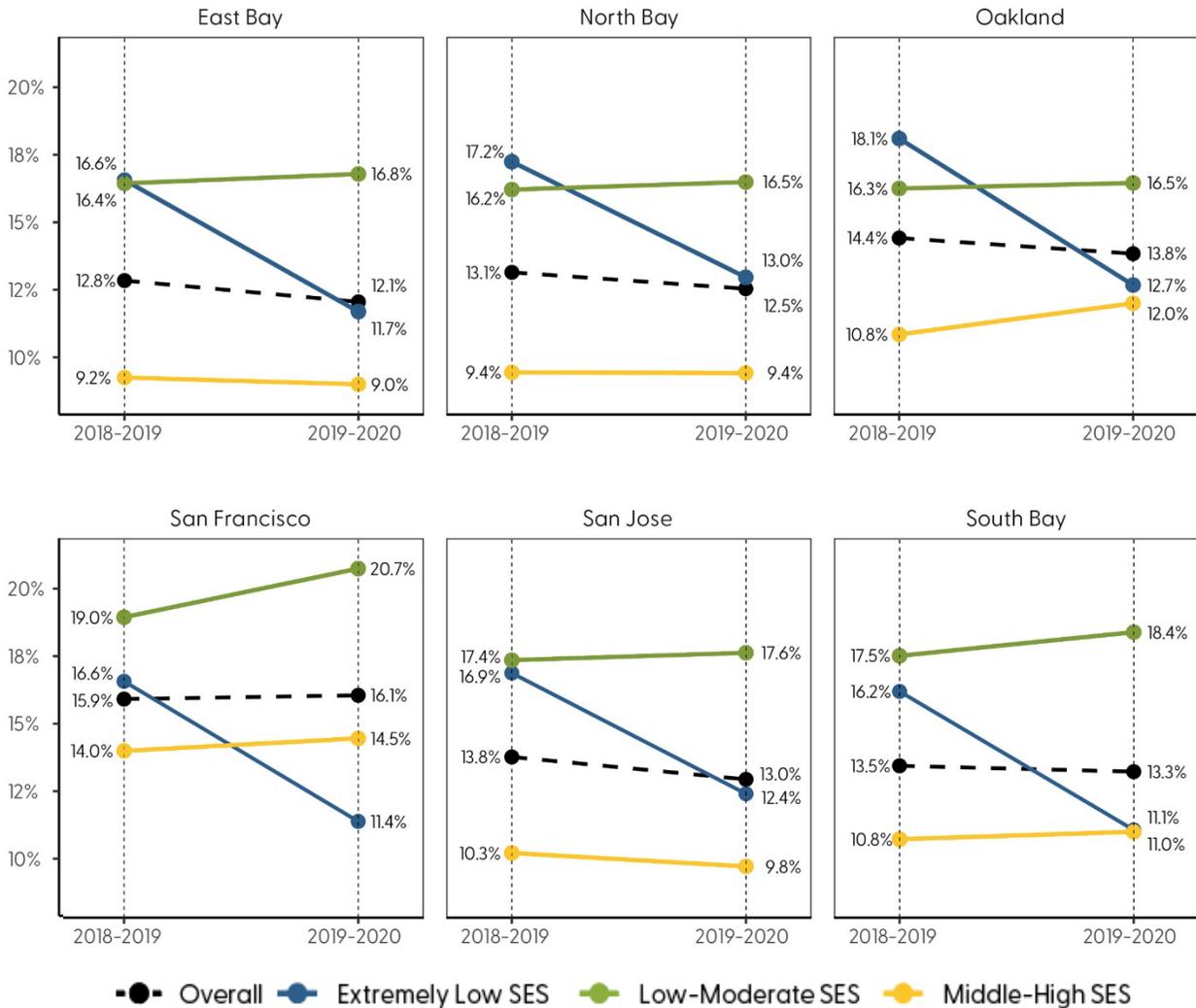
Compared with 2019, while overall moving rates decreased during the pandemic, shifts to high-density households (from low-density households) rose in all regions during the pandemic, with San Jose having the highest rates in both years (Appendix Figure E-1). The rate of new delinquencies decreased in all areas, yet Oakland remained the region with the highest levels. Additionally, shifts into the



extremely low-SES category increased in all areas, with Oakland still experiencing the highest rates both prior to and during the pandemic.

**Figure 3**

**Percentage of Bay Area Residents Who Moved in 2018–2019 and 2019–2020, by SES and Subregion**



Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax Data.

### Trends by Neighborhood Ethnoracial Composition

To compare variations in residential instability by ethnoracial group, we separate the Bay Area’s neighborhoods (defined as census tracts) into categories by ethnoracial composition. Neighborhoods are classified based on their racial and ethnic composition in 2019 with categories that recognize the multiethnic nature of cities today: Majority White, Mixed-Black, and Multiethnic. Majority White neighborhoods are census tracts with a majority White population. Mixed-Black neighborhoods are

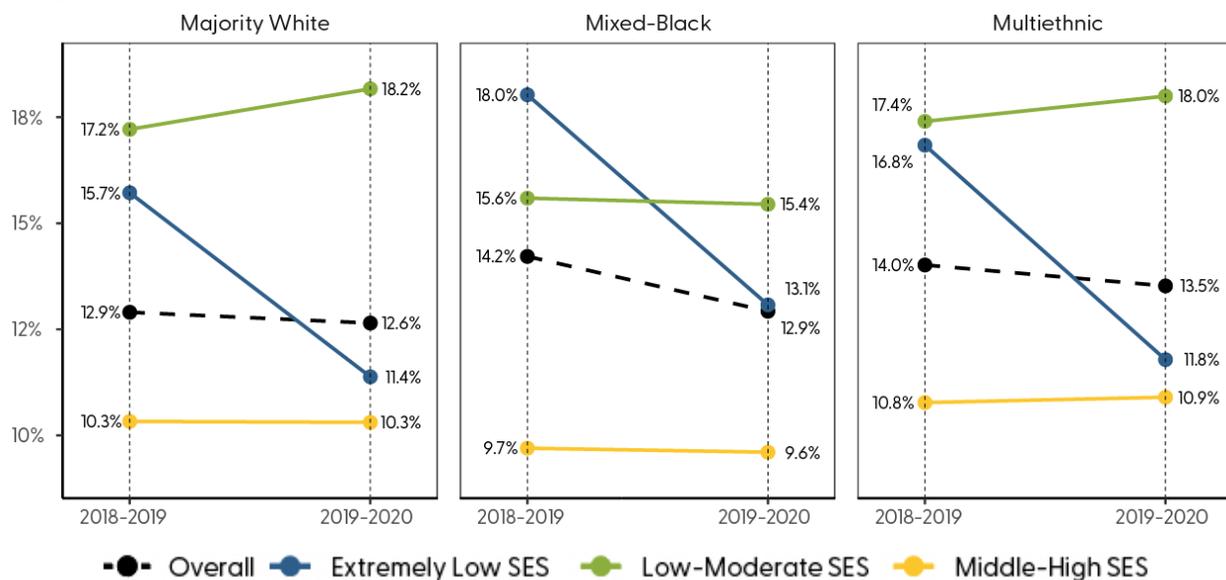


characterized by a notable Black population in combination with another race group. Multiethnic refers to neighborhoods with either a multiethnic population or a majority Hispanic, Asian & Pacific Islander, or other race group population. Appendix C provides more details on the construction of these categories.

Our research reveals that residents in Mixed-Black neighborhoods experienced the largest drop in moving rates while also seeing the largest increase in shifts to crowded household conditions. Overall, moving rates decreased across all ethnoracial groups, but Mixed-Black neighborhoods saw the largest decrease (Figure 4). The Multiethnic group surpassed Mixed-Black as the group that moved at the highest rates. From 2019 to 2020, Majority White neighborhoods continued to move the least. Looking at these trends broken down by residents' SES category, extremely low-SES residents in all groups saw large declines in moving. Low-moderate-SES residents, on the other hand, showed varying trends across neighborhood categories: they moved at higher rates in Majority White and Multiethnic neighborhoods but saw a decrease in Mixed-Black neighborhoods. Lastly, middle-high-SES residents saw only minimal increases in Multiethnic neighborhoods and decreases in Mixed-Black neighborhoods.

**Figure 4**

**Percentage of Bay Area Residents Who Moved in 2018–2019 and 2019–2020, by SES and Neighborhood Ethnoracial Composition**



Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax Data.

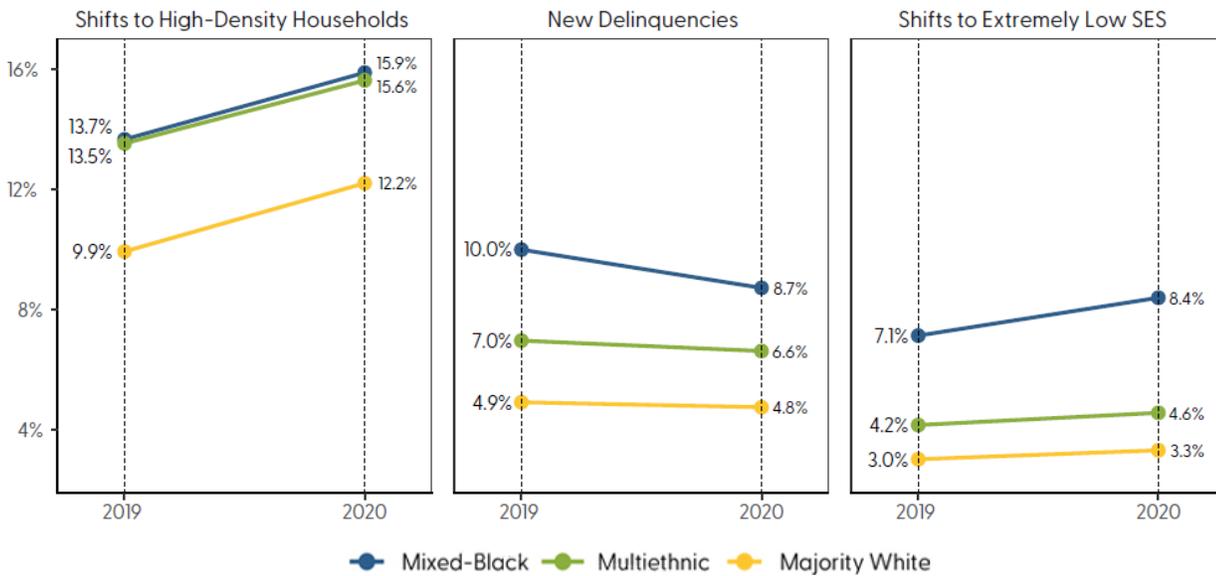
As for additional indicators of residential instability, the share of households that started living in crowded or high-density households over the course of the pandemic grew in all three ethnoracial categories, but Mixed-Black neighborhoods experienced the largest increase (Figure 5). The rates of



shifts to the extremely low-SES category (from a higher-SES category) also increased, but the increase in Mixed-Black neighborhoods was slightly more pronounced. Lastly, new delinquencies decreased across all groups, with the change again most pronounced in Mixed-Black neighborhoods. Residents in Majority White neighborhoods saw the lowest rates in both periods across all three outcomes.

**Figure 5**

**Percentage of Bay Area Residents Who Shifted from Low-Density to High-Density Households, Households with New Delinquencies, and Residents Who Became Low-SES in 2019 and 2020, by Neighborhood Ethnoracial Composition**



Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax Data.

**Trends by Neighborhood Income**

In this section, we separate the Bay Area’s census tracts into categories by income. Neighborhoods are classified based on their income composition. We classify census tracts into quintiles using the distribution of median household incomes in 2019, with Quintile 1 being the highest-income group and Quintile 5 being the lowest-income group.

During the pandemic, moving decreased across all neighborhood income quintiles except for the highest-income quintile (Appendix Figure F-1). The share of residents who started living in crowded conditions rose across all quintiles (Appendix Figure F-2). The rate of new delinquencies decreased for all quintiles--and more so for the lowest-income quintiles, Quintile 4 and Quintile 5. Finally, the shifts to the extremely low-SES category increased for all quintiles, with the lowest-income group (Quintile 5) having the greatest increase and higher-income groups (Quintiles 1 and 2) showing the smallest increase.

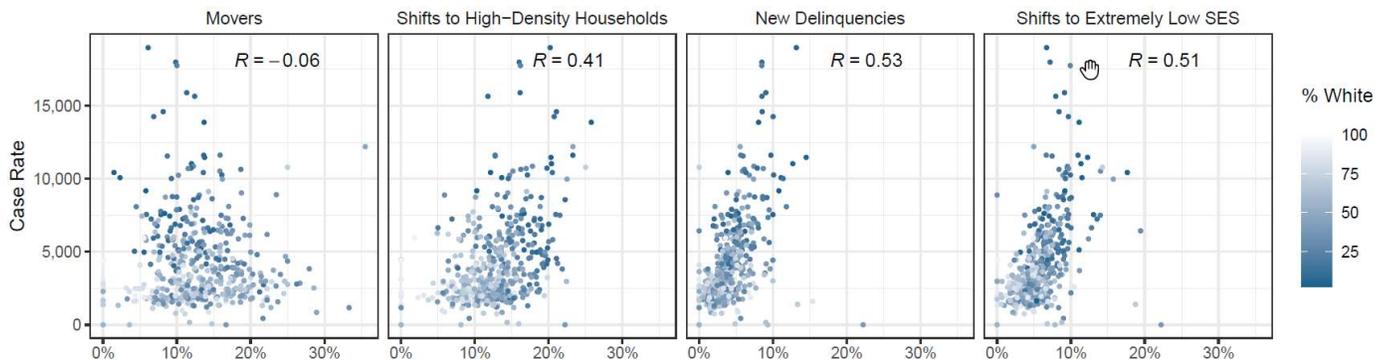
## Correlations with COVID-19

This section examines correlations between COVID case rates and indicators of residential instability among extremely low-SES and low-moderate-SES residents.

We found no correlation between areas with high COVID case rates and moving rates (Figure 6). However, there are strong correlations between areas with high COVID case rates and increases in living in crowded housing, new delinquencies, and extremely low credit ratings. These findings suggest that COVID-19 is not related to displacement but to additional instability outcomes as people find alternative ways to deal with residential challenges resulting from the pandemic.

### Figure 6

**Correlations of Residential Instability Outcomes with COVID Among Extremely Low-SES and Low-Moderate-SES Residents, % Non-Hispanic White**



Note: Case rates are based on the number of cases per 100,000 residents.

Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax Data, Departments of Public Health for Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Sonoma, and Solano Counties. American Community Survey 2015–2019 Five-Year Estimates.



## Vulnerable Neighborhoods

This section examines neighborhoods in the Bay Area where residents may be most vulnerable to residential instability, particularly as COVID-19 relief protections expire. Our above analysis suggests that residents may be trying to stay in place and avoid displacement by resorting to other forms of residential instability (crowding, delinquencies, declining credit scores). Hence, in the following maps, instead of looking at areas where moving rates are high, we emphasize (in the darkest red) high concentrations of extremely low-SES residents who **did not** move. In addition, we show neighborhood-level concentrations of shifts to high-density households (from low-density households), new delinquencies, and shifts to extremely low SES (from a higher-SES category). In these maps, the darkest red color represents high levels of the respective residential instability outcome.

Given that high levels of household crowding are especially concerning in the context of the COVID-19 pandemic, we highlight regions with low rates of moving and high levels of household crowding in the last map for each Bay Area subregion. We also show COVID-19 case rates for each subregion.<sup>6</sup>

Across the Bay Area, there was great variation in areas with the highest overall moving rates. High shifts to crowded households, new delinquencies, and shifts to low SES were found in the southeast parts of San Francisco (including Bayview/Hunters Point), the eastern and northern parts of the North Bay (including Vallejo and Calistoga), Deep East Oakland, the northeast of the East Bay (including Pittsburg and Antioch), central San Jose (in Naglee Park and Little Saigon), and central South Bay (including Menlo Park and East Palo Alto).

### San Francisco

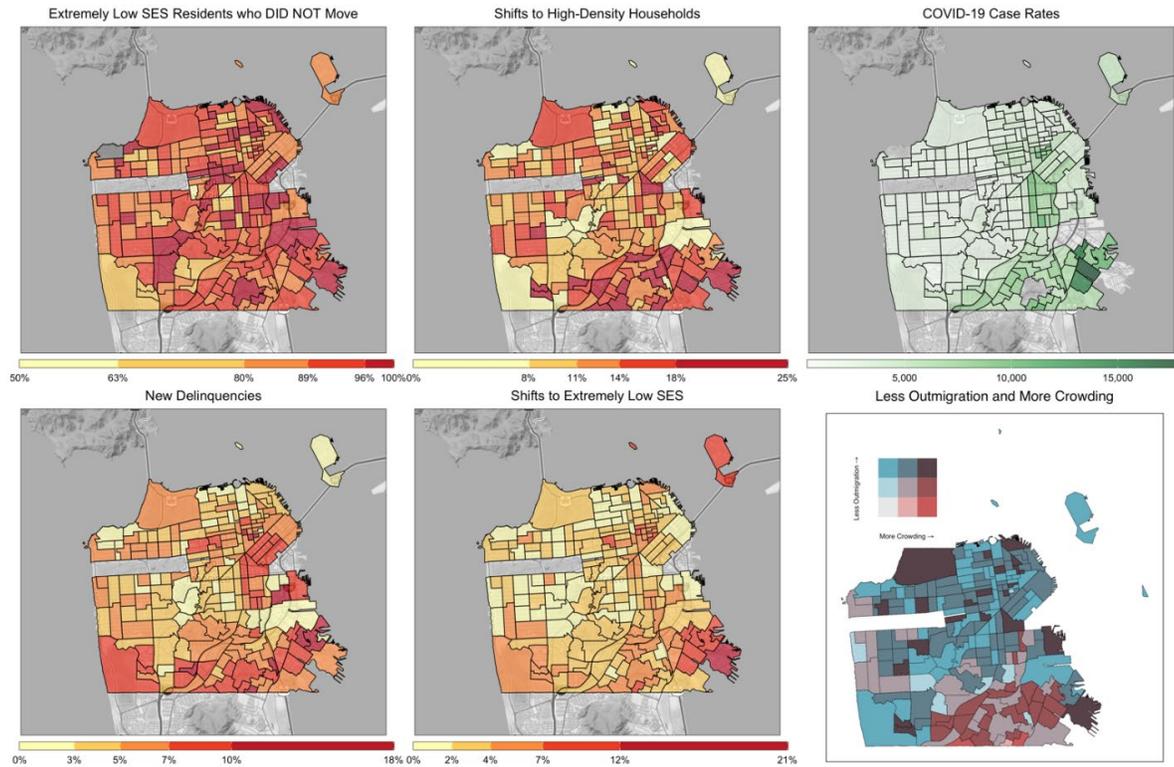
Though overall outmigration in the Bay Area was low, census tracts widely to the northeast (including the Waterfront and Financial District neighborhoods) and southern (Crocker Amazon, Portola, Bayview/Hunters Point, and Balboa Park) parts of San Francisco saw low levels of moving among extremely low-SES residents (Figure 7). Many of these neighborhoods overlap with parts of the city with high shifts to high-density households, indicating that residents may be resorting to other forms of residential instability in order to avoid displacement. High concentrations of new delinquencies and shifts to extremely low SES were also found in southeast San Francisco, particularly the Bayview/Hunters Point neighborhood, where moving rates were low for extremely low-SES residents. The part of the city hit hardest by COVID-19, Bayview/Hunters Point, was impacted by all forms of residential instability.

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<sup>6</sup> Rates are based on cases per 100,000 residents. Refer to Appendix A for details.

**Figure 7**

**San Francisco: Percentage of Extremely Low-SES Residents Who Did Not Move, Residents Who Shifted into High-Density Households, Households with New Delinquencies, Residents Who Became Low-SES, COVID-19 Rates, and Relationship Between Immobility and Crowding, 2019–2020**



Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax Data.

## Oakland

Parts of North Oakland, Downtown Oakland, Deep East Oakland, and parts of West Oakland had low overall moving rates among extremely low-SES residents (Figure 8). High shifts to crowding were prevalent in many of the same neighborhoods with low overall moving rates, including Deep East Oakland and parts of West and East Oakland. This again suggests that residents, while perhaps able to take advantage of temporary forms of assistance that allow them to remain in residence, may be resorting to other forms of residential instability at the same time. Regions where residents may be resorting to crowded conditions to remain in their homes and avoid displacement are identified as parts of the Coliseum and Eastmont (bright red), as well as West Oakland and parts of the East Oakland Hills (dark red).

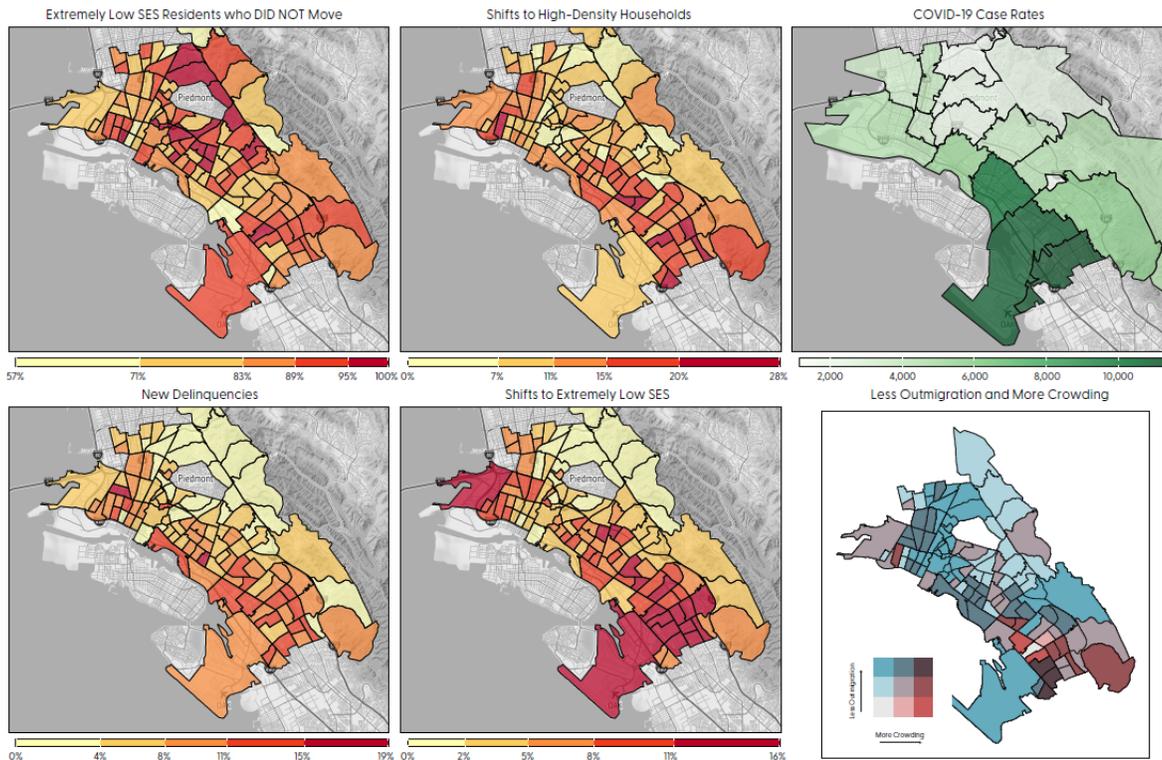
Many of the neighborhoods with low overall moving rates among extremely low-SES residents also overlap with parts of the city with high concentrations of new delinquencies, as well as high



concentrations of shifts to extremely low SES. First, similar to trends in low overall moving rates, high concentrations of new delinquencies were found in Downtown Oakland and parts of West and East Oakland. Second, high concentrations of shifts to extremely low SES were present in Deep East Oakland, Downtown Oakland, and West Oakland. However, there are comparably more parts of West Oakland that have high concentrations of shifts to extremely low SES, while North Oakland has both low concentrations of new delinquencies and shifts to extremely low SES. These trends reveal that residents in some neighborhoods may be forgoing other financial obligations and experiencing declines in their credit scores in order to continue paying rent and avoid moving; areas in West Oakland and Deep East Oakland are particularly vulnerable to such residential instability. The highest COVID-19 case rates were found in East Oakland, where residents were also highly impacted by declining credit scores (i.e., shift to the extremely low-SES category).

### Figure 8

**Oakland: Percentage of Extremely Low-SES Residents Who Did Not Move, Residents Who Shifted into High-Density Households, Households with New Delinquencies, Residents Who Became Low-SES, COVID-19 Rates, and Relationship Between Immobility and Crowding, 2019–2020**



Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax Data.



## San Jose

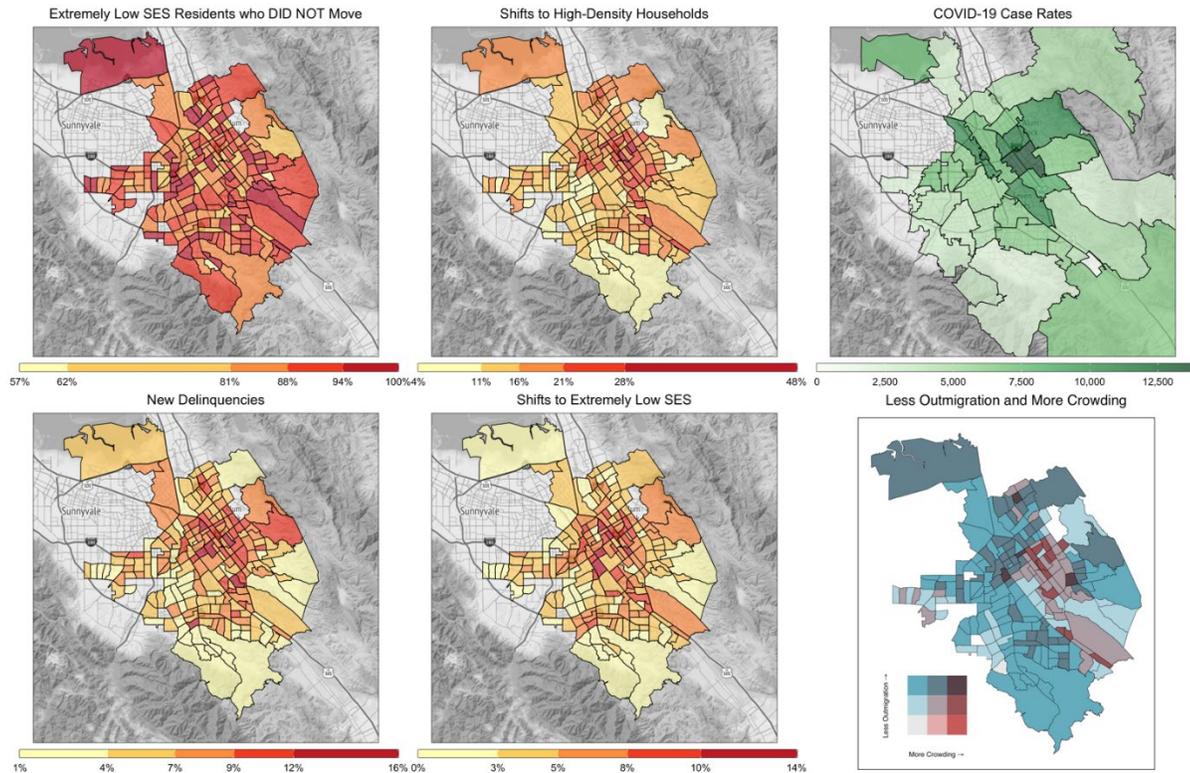
Although there are low moving rates among extremely low-SES residents across the city, census tracts in the northern parts of San Jose (Alviso and North San Jose neighborhoods) had especially low moving rates among extremely low-SES residents (Figure 9). High concentrations of shifts to crowded households, new delinquencies, and shifts to extremely low SES were prevalent in central San Jose, suggesting that residents in the area may be experiencing multiple forms of residential instability in order to remain in their homes.

The neighborhoods in central San Jose with high concentrations of shifts to crowded households and new delinquencies include Naglee Park and Little Saigon. In addition to central San Jose, high shifts to new delinquencies were also found in east San Jose (Alum Rock). Neighborhoods vulnerable to resorting to crowding to hold onto their homes are found in parts of Alum Rock, East San Jose, and South San Jose. These trends reveal that residents in some neighborhoods may be resorting to a mix of crowded conditions, delinquencies, and drops in credit rating to remain in their homes; areas in central San Jose are particularly vulnerable to such residential instability. All forms of residential instability are concentrated in areas with high COVID-19 rates.



## Figure 9

**San Jose: Percentage of Extremely Low-SES Residents Who Did Not Move, Residents Who Shifted into High-Density Households, Households with New Delinquencies, Residents Who Became Low-SES, COVID-19 Rates, and Relationship Between Immobility and Crowding, 2019–2020**



Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax Data.

## North Bay

Low moving rates among extremely low-SES residents were found in central North Bay, as well as eastern and northern parts of the North Bay (Appendix Figure G-1). These areas include parts of Sonoma County (Santa Rosa and southwest parts of the county near Bodega Bay), Napa County (St. Helena), and Solano County (Vallejo and Fairfield).

Many regions of the North Bay with low overall moving rates among extremely low-SES residents also overlap with various parts of the North Bay that have high concentrations of shifts to crowded households, high shifts to new delinquencies, and high shifts to extremely low SES. High concentrations of shifts to crowded households were found in the eastern parts of the North Bay (American Canyon and parts of Solano County, such as Vallejo and Fairfield). Similar to both moving rates and crowding, high shifts to new delinquencies were found in Solano County (Vallejo, Benicia, and Vacaville). High



shifts to extremely low SES were found to the north of the North Bay (Calistoga). These trends reveal that residents in some parts of the North Bay may be resorting to different forms of residential instability. Eastern areas of this region are particularly vulnerable to crowding and new delinquencies, while areas in the northern parts of the North Bay are particularly vulnerable to shifts to extremely low SES.

### **East Bay**

In the East Bay, low moving rates among extremely low-SES residents were found toward the northeast, in Orinda and Berkeley, and in the southwest, including Fremont and Union City (Appendix Figure G-2). The northeastern tip of Contra Costa County also experienced low rates of moving among extremely low-SES residents. Many of these neighborhoods also overlap with parts of the city with high concentrations of shifts to crowded households. Similar to trends in low overall moving rates, high concentrations of shifts to crowded households were found in the southwest in Alameda County (Hayward and San Leandro). All three forms of residential instability were found in the northeast in Contra Costa County. High concentrations of shifts to crowded households, new delinquencies, and shifts to extremely low SES were found in Pittsburg and Antioch, and high concentrations of shifts to crowded households were also found in Antioch.

### **South Bay**

Census tracts in the central South Bay (parts of San Mateo County, such as Redwood City and Santa Clara County, including Palo Alto) had low levels of moving among low-SES residents (Appendix Figure G-3). The three additional forms of residential instability were all found in the central South Bay. Specifically, high concentrations of shifts to crowded households were found in San Mateo County, including Menlo Park and parts of Santa Clara County, such as East Palo Alto. High concentrations of new delinquencies and shifts to extremely low SES were also found in Menlo Park and East Palo Alto.

Additionally, high concentrations of shifts to crowded households and new delinquencies were both found in Santa Clara County in east South Bay, including Sunnyvale and Milpitas, respectively. High shifts to extremely low SES were also found in northwest South Bay (San Mateo County, including Colma and Daly City).



## Conclusion

The economic fallout from the COVID-19 pandemic has exacerbated residential and financial instability. In this research brief, we note that moving rates have decreased during the pandemic, particularly for extremely low-SES residents across all Bay Area regions. Still, these residents remain vulnerable to other forms of instability, specifically crowded conditions. Compared with 2019, in 2020 residents in Mixed-Black and low-income neighborhoods moved out less, and more of these residents were living in crowded households. A noticeable share of Bay Area residents also saw drops in credit scores and became extremely low-SES. Hence, residents are at risk of several forms of instability, with crowded conditions representing an especially pressing concern due to the correlation with COVID-19.

### Key Considerations for Policy and Practice

1. **Strategies can support residents who experience more pressure toward crowded housing and residents who experience greater financial instability in order to remain in their homes.** Though declines in moving rates may be a sign of the success of eviction moratoria, a greater share of residents shifted to crowded housing, gained new delinquencies, and became extremely low-SES during the pandemic. Approaches to improve the stability of these neighborhoods, which also address crowding and poverty, may more successfully reduce COVID transmission. Crowding and financial instability are correlated with increased COVID-19 rates, revealing increased vulnerability in these distinct areas.
2. **Specific neighborhoods in Oakland, San Francisco, San Jose, and other parts of the South Bay may have the greatest need for these strategies.** Continue to monitor vulnerable areas for displacement and financial instability. During the pandemic, residents moved less in all areas of the Bay Area, except for San Francisco. However, residents are resorting to other forms of residential instability in order to remain in their homes. Particular attention should be given to address the unique challenges that extremely low-SES residents face. Transitions into crowded conditions increased in the South Bay more so than in other regions, and credit rating drops into the extremely low-SES category occurred most in the East and North Bay. Within each of these subregions, certain neighborhoods and cities are more vulnerable than others to displacement, crowding, and financial instability. This geographic variation reveals the need to consider the complexities in how residents in each area are responding to residential instability and the pandemic.
3. **Examine racial and income disparities in displacement, crowding, and financial instability.** Though residents across all neighborhood ethnoracial composition categories moved less and shifted to crowded housing more during the pandemic, the rate at which residents in Mixed-Black neighborhoods shifted to crowded housing and the extremely low-SES category



increased much more than other ethnoracial groups. Similarly, the rate at which residents in the lowest neighborhood income quintile shifted into crowded conditions increased much more than other income levels. Examining the conditions that lead to these varying trends across neighborhood racial and income categories will help to inform policies that address these differences.

4. **Increase displacement protections for low-moderate-SES residents.** Low-moderate-SES residents in the Bay Area moved at the highest rates leading up to the pandemic and during the pandemic. Although this may represent greater housing choice and residential mobility, it is possible that residents at the lower end of this SES category are being displaced. To avoid additional displacement for this income group, anti-displacement policies and programs could also be extended to low-moderate-SES residents who may be currently ineligible for rental assistance programs.



## Appendix

### Appendix A: Information on Data Sources

#### ***Federal Reserve Bank of New York Consumer Credit Panel/Equifax Data (CCP)***

This restricted longitudinal dataset from the Federal Reserve Bank provides quarterly information on a 5 percent sample of adult consumers from January 2002 to December 2019 and monthly information from January 2020 to December 2020, with census block group–level information on where respondents live, as well as respondents’ age, loans, mortgages, financial issues (e.g., delinquencies, bankruptcy, foreclosure), and Equifax Risk Scores (credit scores that indicate financial stability). These data are used to analyze individuals’ financial health and moving patterns over time for an average of 12,500 Bay Area residents per year. Adult consumers comprise those with at least one credit account or collection/public record (such as bankruptcy or foreclosure), as well as those with closed or authorized user accounts. We analyze residents aged 25 to 84.<sup>7</sup> More details about the dataset and Equifax Risk Scores are in Appendix D.

#### ***U.S. Census and American Community Survey (ACS) Data***

These publicly available datasets provide information for several variables, including demographic (race, ethnicity, nativity, age), socioeconomic (income, poverty, educational attainment), and housing (occupancy, rent, home value) indicators. These data are available at various geographies, with the lowest aggregation at the census block group level, from the decennial census years from 1970 to 2000 and from five-year estimates from the American Community Survey, which began collecting data in 2005. The most recent available ACS data are the 2015–2019 five-year period. Census variables rely on a one-in-six sample, and ACS variables rely on samples that are pooled across five years and are half as large as the census samples.<sup>8</sup>

#### ***COVID-19 Data***

Counties in the Bay Area regularly publish data on COVID-19 cases and deaths, though the geographic specificity varies by county. Marin and San Francisco counties report data at the census tract level; Alameda, Santa Clara, and Sonoma counties report data as low as the zip code level; and the remaining counties report data for municipalities and unincorporated or smaller geographic areas in their counties. We obtained COVID-19 data from the public websites for each county’s Department of Public Health on February 25, 2021. These data contain the number of cases and deaths, and we

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<sup>7</sup> Residents younger than 25 years are underrepresented in the data and can have inaccurate address reporting due to moving for reasons related to higher education during this period; residents older than 84 years are overrepresented in the data, most likely due to a lag in registered deaths in the data.

<sup>8</sup> Sampling variation in the estimates can introduce error and is higher in the ACS, especially when it comes to reporting dollar values, such as income and home values. Although there is no systematic bias in the measures, measures about individual tracts are subject to error, particularly those with smaller populations.



calculated case rates as the number of cases per 100,000 residents based on population counts from the 2015–2019 ACS. All counties, except Napa County, list geographies with small numbers of cases as “< 10,” but they also list places with zero cases. Areas with “< 10” cases are bottom-coded to 10 cases.<sup>9</sup>

To merge the tract-, zip code-, and municipal-level COVID-19 case rates with gentrification measures and the CCP data, which use U.S. Census 2000 boundaries, we crosswalk the reported census blocks in the CCP data to 2010 census tracts using the geographic crosswalk provided by the National Historic Geographic Information System and to municipalities based on geographic identifiers from the U.S. Census 2000. A total of 21 places reported in the COVID data refer to broad unspecified areas (e.g., between St. Helena and Calistoga) or are located in places that were not in the U.S. Census 2000. For these areas, we identified census tracts using shapefiles from the counties and the U.S. Census.

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<sup>9</sup> In Napa County, there were five areas for which only a range was specified (6–50), though areas with counts above 32 were listed. We assumed that the count in the area with the smallest population was 6, the count in the largest area was 32, and the counts for the three areas in between were proportionate to their population sizes. Results are similar to those presented when we bottom-code all areas with low ranges to 10 or 0.



## Appendix B: Measuring Residential Instability

Constraints on housing costs can entail residential displacement, but they can also involve complex tradeoffs and constrained choices when it comes to housing and neighborhoods for both movers and stayers. We draw on the comprehensive set of data sources above to analyze residential instability in multiple ways:

- **Moving Out:** For each year (beginning on June 1st of one year and ending on June 1st of the following year<sup>10</sup>), we examine if residents move from their census block group (which contains an average of 39 blocks and about 600–3,000 people). Residents may certainly move within these block groups, and our data do not capture these short-distance moves.
- **Move Characteristics:** To examine where movers go, we assess whether they moved out of their city or outside of the Bay Area, as well as where they move within the Bay Area. Moving far distances can have implications for access to pre-existing networks, sources of support, and resources and opportunities, such as employment and health care. Moving to different cities or towns can also imply changes in school districts, as well as other resources and public goods that align with municipal boundaries.
- **Crowding:** As housing becomes increasingly unaffordable, individuals and families may be doubling up and sharing spaces at greater rates, which has various negative health implications. For everyone in the CCP sample, the data contain the number of adults with a credit history who live in the individual's household. We examine the extent to which individuals in households with one to two adults transition into households with at least four adults and the prevalence of households with at least four adults.
- **Financial Instability:** Rising housing costs can induce financial burdens onto households, and this is likely to become evident before households move from their homes, as financially burdened households may prioritize paying their rent or mortgage over other bills. We examine the prevalence of new delinquencies on any credit accounts, which includes mortgages, using the CCP data. We also examine the prevalence of shifts to low SES, meaning residents who became low-SES from a higher-SES category.

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<sup>10</sup> We rely on annual changes because although locations are reported quarterly, there is variation in reporting, particularly due to lags when an individual moves.



## Appendix C: Additional Definitions and Measures

### ***Socioeconomic Status (SES)***

These are defined using Equifax Risk Scores, proprietary credit scores that estimate the likelihood that an individual will pay his or her debts without defaulting. They are a proxy of financial stability and reflect a distinct dimension of SES from typical measures, such as income or wealth, that are particularly relevant to the housing market, where landlords often use credit scores to screen tenants and lenders use credit scores to distribute mortgage products and make lending decisions. We define the SES categories in the following way by their Equifax Risk Scores, which range from 280 to 850:

- **Extremely Low SES:** < 580 or no score (too few accounts or new credit)
- **Low-Moderate:** 580–649
- **Middle-High:** 750 or higher

Separate analysis suggests that the distribution of residents in the Bay Area by these SES categories is similar to the distribution of adult residents in the following income categories, respectively: < 50% of the U.S. median household income; between 50%–100% of the U.S. median household income; between 100–200% of the U.S. median household income; and over 200% of the U.S. median household income. Because we do not have information on household size (including children) and the CCP data are a sample of individuals, not households, our data are not directly comparable to the U.S. Department of Housing and Urban Development (HUD) Area Median Income (AMI) categorizations, which are based on metropolitan area, family size, and income. Analysis of population distributions using data from the Comprehensive Housing Affordability Strategy (CHAS) for the City of Oakland suggests that our SES categories are similar to the following HUD AMI categories, respectively: <30% AMI (“extremely low,” as labeled by the State of California), between 30% and 100% AMI (“very low,” “low,” and “moderate”<sup>11</sup>), and above 100% AMI (“high”).

### ***Ethnoracial Composition***

We classify census tracts, the smallest standard spatial aggregations for which consistent data are available over time, based on their racial and ethnic composition in 2019 with categories that recognize the multiethnic nature of cities today: Majority White, Mixed-Black, and Multiethnic. The below table outlines the racial and ethnic composition of each neighborhood category.

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<sup>11</sup> The State of California categorizes those between 80% and 120% AMI as “moderate,” but data from the CHAS provide categories for residents only up to 100% AMI.



<b>Ethnoracial Category</b>	<b>Subcategory</b>	<b>Criteria</b>
Majority White	Predominantly White	Over 80% White; Under 10% Black; Under 10% Hispanic; Under 10% Asian; Under 10% Other
	White-Other	Under 10% Black; Under 50% Hispanic, Asian, Other combined; Over 10% Hispanic, or over 10% Asian, or over 10% Other, or (Over 10% Hispanic, Asian, Other combined, with under 80% White)
Mixed-Black	Predominantly Black	Over 50% Black; Under 10% Hispanic; Under 10% Asian; Under 10% Other, Under 10% Hispanic, Asian, Other combined
	Black-White	Over 40% White; Between 10 and 50% Black; Under 10% Hispanic; Under 10% Asian
	Black-Other	Under 40% White; Over 10% Black; Over 10% Hispanic, or over 10% Asian, or over 10% Other, or over 10% Hispanic, Asian, Other combined
Multiethnic	Multiethnic	Over 40% White; Over 10% Black; Over 10% Hispanic, or over 10% Asian
	Predominantly Other	Under 10% Black; Over 50% Hispanic, Asian, Other combined



## **Appendix D: Federal Reserve Bank of New York Consumer Credit Panel/Equifax Data (CCP)**

The CCP data consist of an anonymized 5 percent random sample of consumers over 18 years old with Social Security numbers (SSNs) and a credit history, collected quarterly by the credit bureau Equifax. The sample is intended to be a nationally representative sample of consumers in a given quarter. About 1–3 percent of consumers are dropped, and a similar share are added to the panel each quarter to maintain this representativeness. Thus, younger people and new immigrants who become consumers are added, and consumers who die, move out of the United States, or have a prolonged period of inactivity are dropped. The sample includes consumers with at least one credit account or collection/public record (such as bankruptcy or foreclosure), as well as those with closed or authorized user accounts (Lee and van der Klaauw 2010). Although 45 million U.S. adults do not have credit scores (Wherry, Seefeldt, and Alvarez 2019), nearly half of these adults are represented in our data.

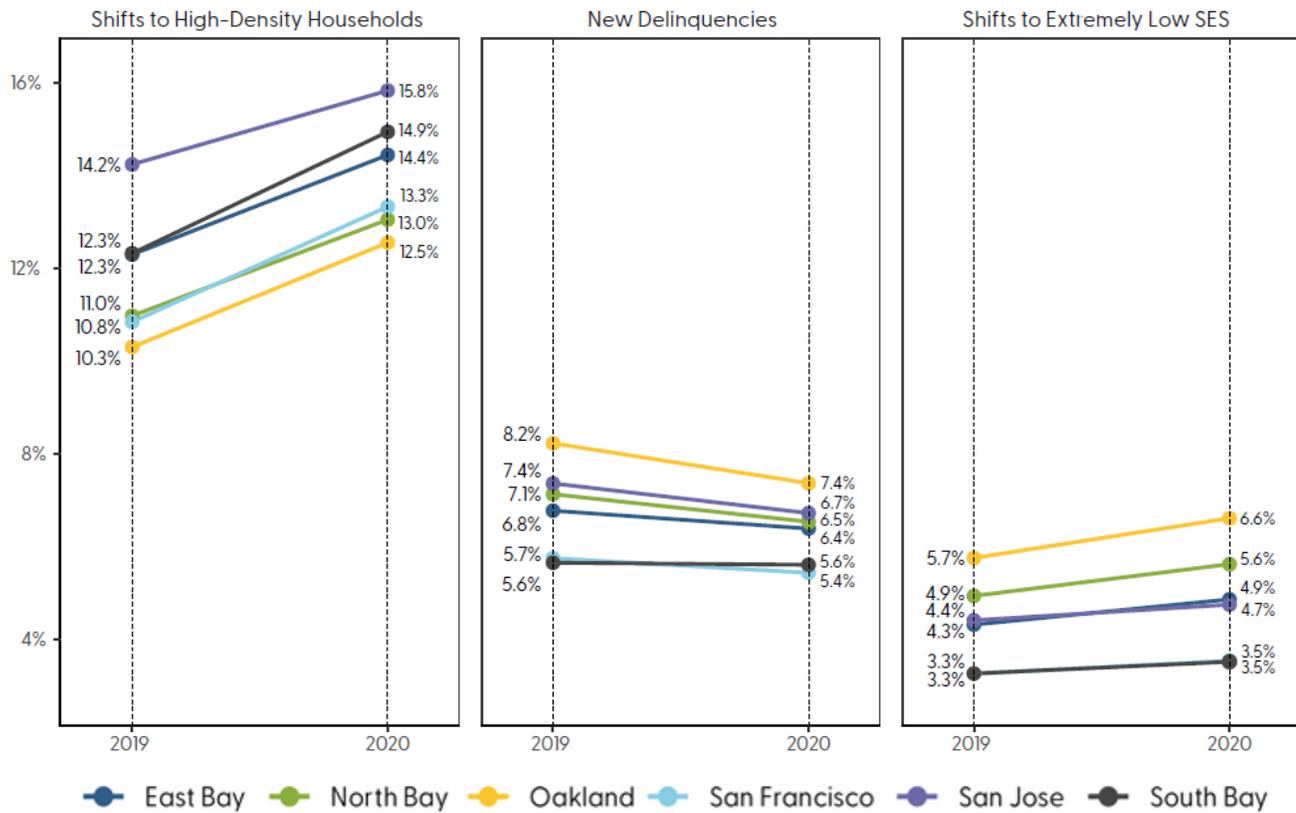
The CCP data include information on individuals' age, credit information (including Equifax Risk Scores—credit scores), census block group of address, and payment activity of mortgages and other credit accounts. Similar information is provided for all other adult consumers in the same household, based on their residential address. The CCP data exclude individuals who lack credit or a credit history, which may underrepresent younger individuals, noncitizens or undocumented immigrants, and very low-SES individuals and may overrepresent older individuals and include those who are deceased. Further, our ability to assess mobility among homeless individuals and those who are severely residentially unstable is limited because their residential data are likely misreported.

The Equifax Risk Score is a proprietary credit score that estimates the likelihood that an individual will pay his or her debts without defaulting. A variety of factors that relate to loan performance contribute to credit scores, including previous payment history, outstanding debts, length of credit history, new accounts opened, and types of credit used (Federal Reserve Board 2007; Fair Isaac Corporation 2015); delinquency, large increases in one's debt, and events of public record (e.g., bankruptcy or foreclosure) often lead to low credit scores (Anderson 2007). The scores range from 280 to 850, with higher scores representing greater financial health and advantage. Having no score indicates that the consumer has a “thin” file, or too few accounts or new credit such that there is too little information to estimate a score (Brevoort, Grimm, and Kambara 2016). Because the CCP data contain individuals who have a public record for collection, thin files are disproportionately lower-income, but younger consumers are also more likely to have thin files (Brevoort, Grimm, and Kambara 2016). Credit bureaus do not consider income when calculating credit scores, though credit scores correlate highly with income levels; however, credit scores can reflect individuals across the income and wealth distributions (Bostic, Calem, and Wachter 2005; Brevoort, Grimm, and Kambara 2016).

## Appendix E: Residential Instability Outcomes Before and During the Pandemic, by Subregion

### Appendix Figure E-1

Percentage of Bay Area Residents Who Shifted from Low-Density to High-Density Households, Households with New Delinquencies, and Residents Who Became Low-SES in 2019 and 2020, by Subregion



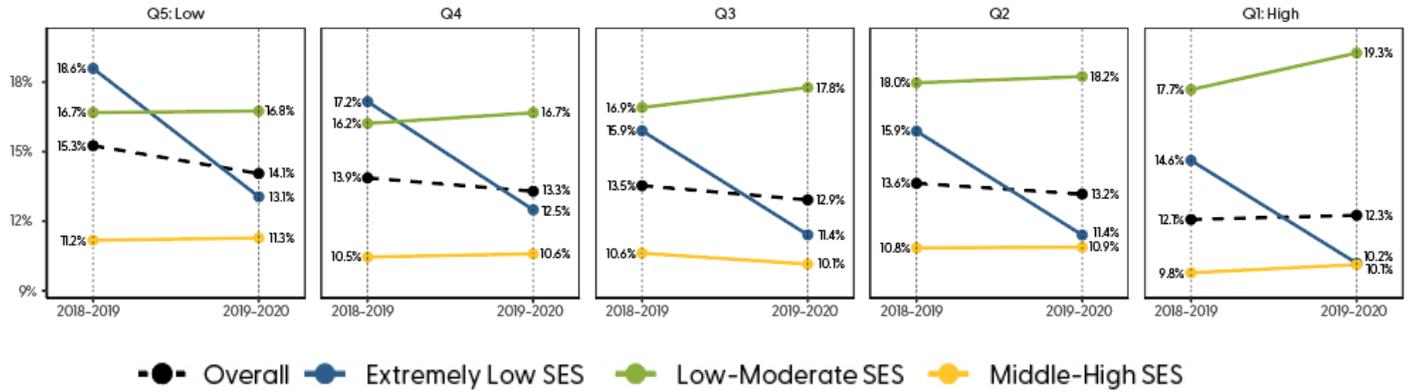
Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax Data.



## Appendix F: Residential Instability Outcomes Before and During the Pandemic, by Neighborhood Income Quintile

### Appendix Figure F-1

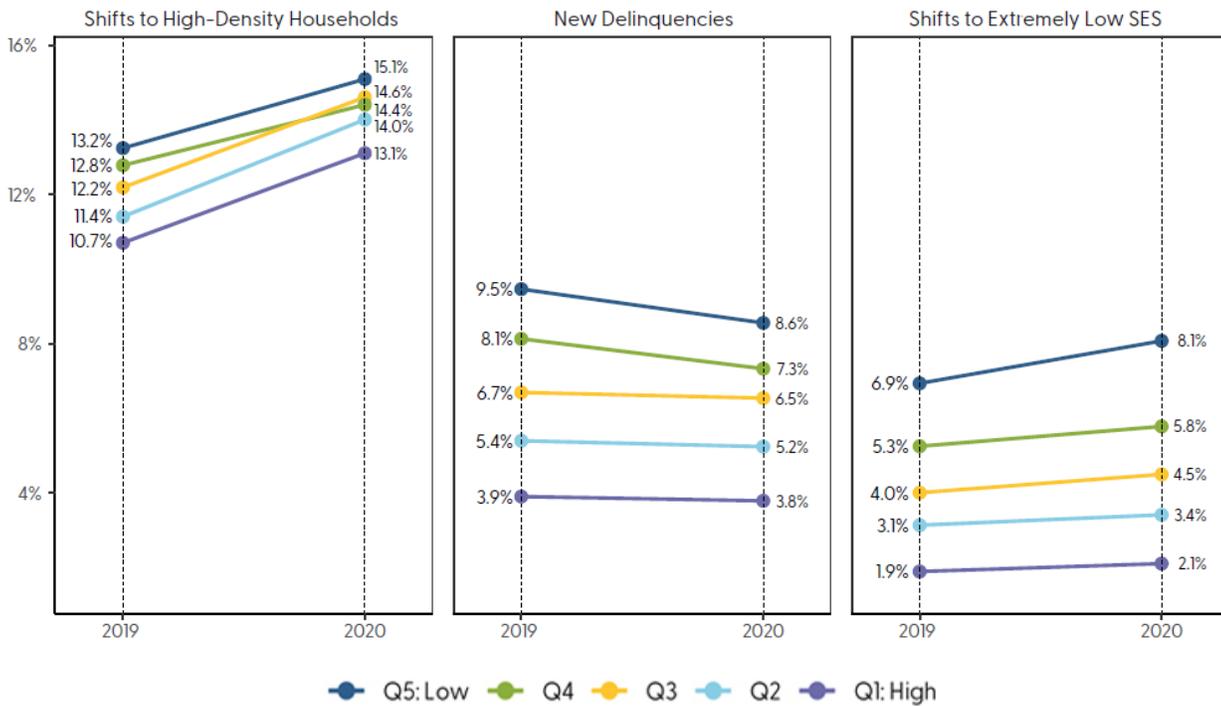
Percentage of Bay Area Residents Who Moved in 2018–2019 and 2019–2020, by Neighborhood Income Quintile



Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax Data.

### Appendix Figure F-2

Percentage of Bay Area Residents Who Shifted from Low-Density to High-Density Households, Households with New Delinquencies, and Residents Who Became Low-SES in 2019 and 2020, by Neighborhood Income Quintile

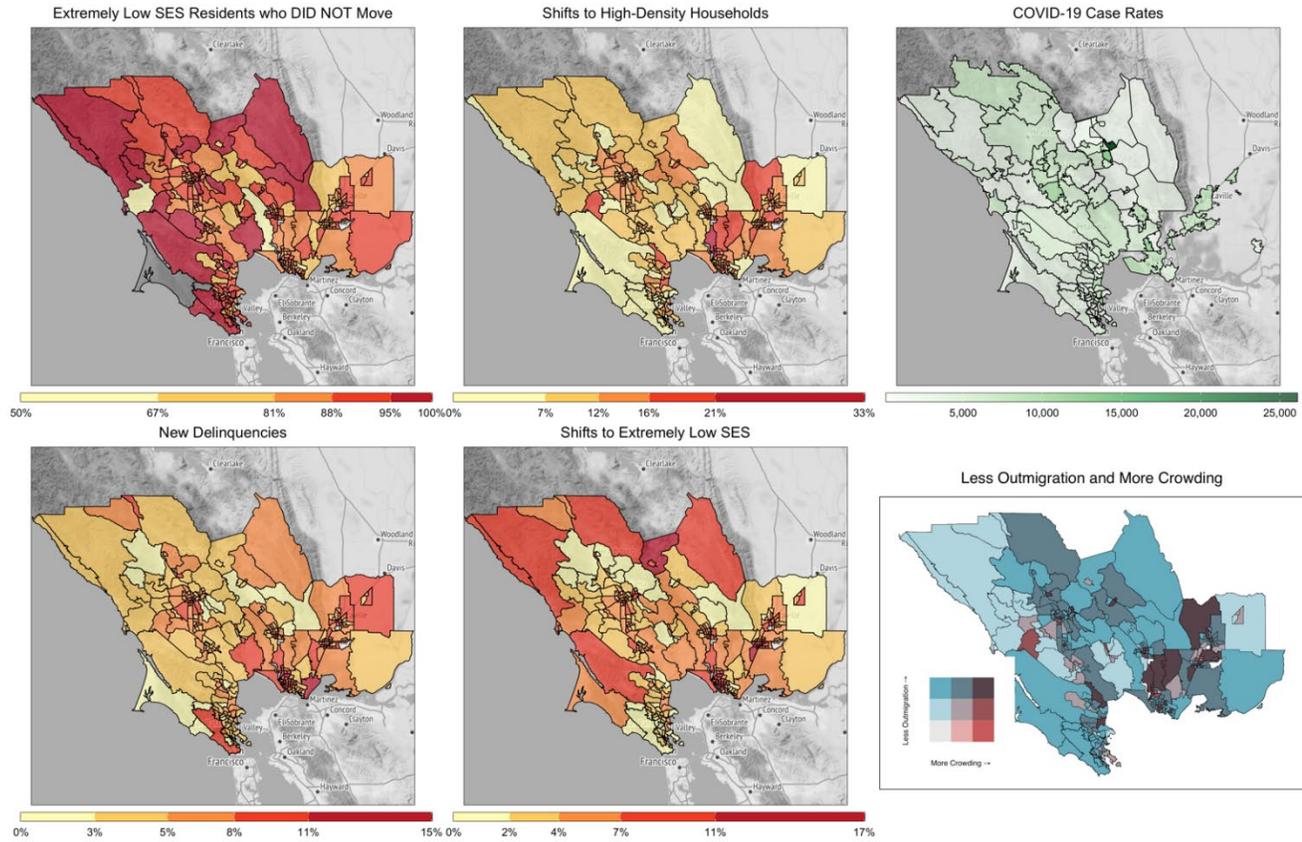


Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax Data.

## Appendix G: Vulnerable Neighborhoods

### Appendix Figure G-1

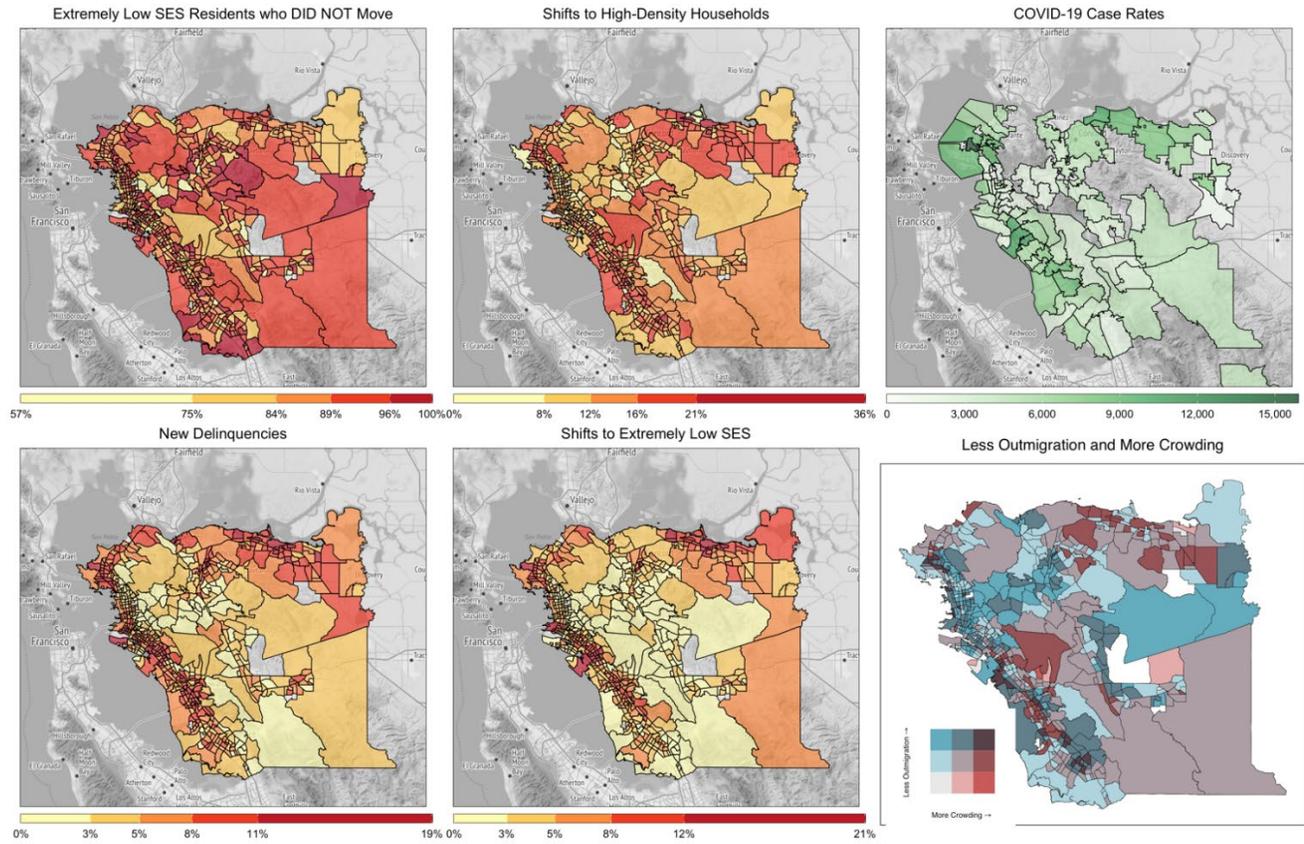
North Bay: Percentage of Extremely Low-SES Residents Who Did Not Move, Residents Who Shifted into High-Density Households, Households with New Delinquencies, Residents Who Became Low-SES, COVID-19 Rates, and Relationship Between Immobility and Crowding, 2019–2020



Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax Data.

## Appendix Figure G-2

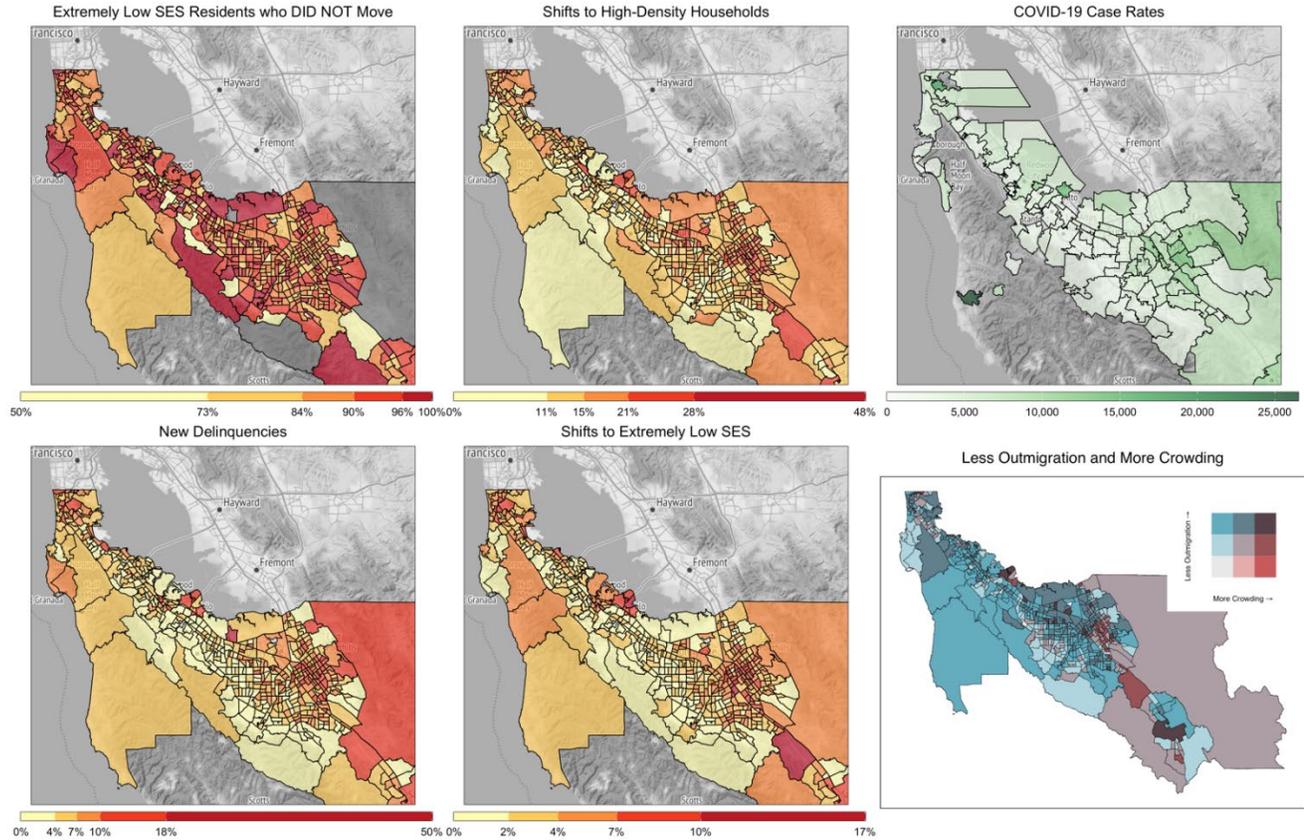
**East Bay: Percentage of Extremely Low-SES Residents Who Did Not Move, Residents Who Shifted into High-Density Households, Households with New Delinquencies, Residents Who Became Low-SES, COVID-19 Rates, and Relationship Between Immobility and Crowding, 2019–2020**



Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax Data.

### Appendix Figure G-3

**South Bay: Percentage of Extremely Low-SES Residents Who Did Not Move, Residents Who Shifted into High-Density Households, Households with New Delinquencies, Residents Who Became Low-SES, COVID-19 Rates, and Relationship Between Immobility and Crowding, 2019–2020**



Source: Federal Reserve Bank of New York Consumer Credit Panel/Equifax Data.



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