

# The Effects of Upzoning Single Family Neighborhoods on Supply and Affordability

Prepared by HR&A Advisors for California Community Builders

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## INTRODUCTION

Zoning reform has been at the forefront of policy conversations in California as the state continues to grapple with its housing affordability crisis.

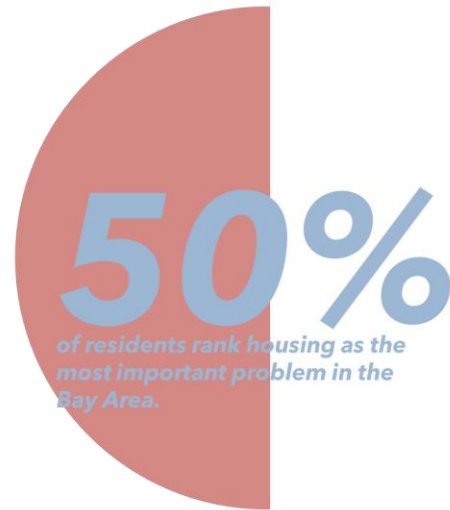
California's housing crisis has grown rapidly over the past decade and has quickly become one of the state's largest policy and political issues. As the housing crisis continues to grow, there have been dozens of policy options that have been proposed as potential solutions. Zoning reform has been at the forefront of policy conversations as a potential tool to combat "exclusionary zoning" – defined broadly as a set of tools used by high-income communities to preclude the development of new housing in their communities. This paper attempts to model the impacts of modestly up-zoning single-family neighborhoods to allow for 2-4 unit buildings in six Bay Area cities to evaluate the effects of this hypothetical policy on **overall supply** and **potential displacement**.

Zoning reform has become a national conversation as it impacts not only neighborhood density and development but issues including racial justice, affordability, transportation efficiency, and the environment. Recent studies have shown that single-family zoning has contributed to the creation of segregated neighborhoods by excluding low-income or non-white residents that cannot afford homeownership or land in areas that were already primarily white. Given the close connection between quality of neighborhood resources and home values,

this has created barriers to opportunity for many of these excluded residents. In recent years, this conversation has begun to shift from hyper-local neighborhood discussions to the state and federal level. In 2019, Oregon became the first state to effectively ban single-family zoning by allowing fourplexes in cities with over 25,000 residents and duplexes in cities with over 10,000 residents. This followed activity at the city level such as a shift away from single-family zoning in Minneapolis in 2018 and Seattle in 2019. Most recently, at the federal level, President Biden's infrastructure plan proposes offering grants and tax credits to cities that change their zoning laws. The conversation has sparked significant debate in California as well with an influx of bills in recent years that propose changes to zoning laws.

Advocates for a ban on single-family zoning argue that allowing for greater density will increase supply by allowing for middle-density development. This will moderate housing prices because developers are able to sell more homes on the same plot of land that would typically sell to one household under single-family zoning. As a result, there are more options for middle- and low-income households. Many advocates also emphasize that increasing housing supply is one necessary step to increasing affordability, but it should be paired with additional subsidies or tools California's housing crisis has grown rapidly over the past decade and has quickly become one of the state's largest policy and political issues.

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Zoning reform has become a national conversation as it impacts not only neighborhood density and development but issues including racial justice, affordability, transportation efficiency, and the environment. Recent studies have shown that single-family zoning has contributed to the creation of segregated neighborhoods by excluding low-income or non-white residents that cannot afford homeownership or land in areas that were already primarily white. Given the close connection between quality of neighborhood resources and home values, this has created barriers to opportunity for many of these excluded residents. In recent years, this conversation has begun to shift from hyper-local neighborhood discussions to the state and federal level. In 2019, Oregon became the first state to effectively ban single-family zoning by allowing fourplexes in cities with over 25,000 residents and duplexes in cities with over 10,000 residents. This followed activity at the city level such as a shift away from single-family zoning in Minneapolis in 2018 and Seattle in 2019. Most recently, at the federal level, President Biden's infrastructure plan proposes offering grants and tax credits to cities that change their zoning laws. The conversation has sparked significant debate in California as well with an influx of bills in recent years that propose changes to zoning laws.

that prevent displacement and fund options with an even deeper level of affordability.

Opponents typically argue that up-zoning will primarily serve high income earners by triggering construction in neighborhoods that are already gentrifying. As a result, it is possible that many older and lower quality housing stock will be replaced, causing displacement, and reinforcing existing income inequalities.

### **Cities that have legalized or are legalizing denser development in single-family neighborhoods:**



## LITERATURE REVIEW

To establish a baseline understanding of housing market dynamics, we reviewed previous studies that estimated (1) the impact of policies and regulations on the housing market, (2) the elasticities of supply and demand for housing, and (3) the filtering of housing submarkets. We also reviewed areas of research that focus specifically on the effects of zoning reform policies on housing affordability. Through this review of literature, we highlighted gaps in existing research and identified theoretical and empirical findings to use as key assumptions in our analysis.

### The Price of Policies and Regulations

The effect of local policies on housing prices is well-documented. Gyourko and Molloy (2015) review this literature and conclude that regulatory policies generally raise prices, reduce construction, and dampen the responsiveness of supply to changes in demand. Specifically, Glaeser and Gyourko (2018) build upon past work to find that the gap between housing price and production cost is effectively a regulatory tax, which – at its existing levels – has cost at least 2 percent of national output (GDP).

Kok, Monkkonen, and Quigley (2014) studied the intra-urban variation in land prices due to a number of factors, focusing specifically on San Francisco. They found that variations in topographic, economic, demographic, and accessibility conditions are strongly associated with land prices. However, even when these conditions are controlled, there is a strong positive correlation between land value and the restrictiveness of the legal and regulatory environment. While this correlation may vary by MSA and to the degree there are “close substitutes” available, in San Francisco, land values are reflected in the

prices of single-family homes, thus showing strict regulations contribute to higher home prices.

Other researchers, as summarized by Been, Gould Ellen, and O’Regan (2018), also show the impact of regulatory restrictions on housing supply, and thus, housing prices. For example, Hilber and Vermulen (2016), find that in areas of England that have stricter regulatory policies, changes in demand leads to increases in local housing prices rather than increases in supply.

Glaeser, Gyourko, and Saks (2005) emphasize that housing prices have been driven not only by rising construction costs and regulatory policies, but also by an increased ability for residents to block new projects and influence local development decisions. The specific nature and extent of these impacts are still largely debated, especially when focusing on idiosyncratic markets or when trying to measure the downstream outcomes of high housing prices. New studies that explore this topic should help to better structure local and national policies that are data-driven and empirically based.

### Supply Impacts

The impacts of supply on housing prices has been well studied, with many empirical research studies showing that additional supply helps moderate increases in housing costs, making housing more affordable. For example, Acsquit, Mast, and Reed (2019) conducted an analysis on how the construction of large market-rate rental apartment buildings in low-income neighborhoods impacts nearby rents and migration. Through this research, they found that new buildings lower nearby rents by 5-7% relative to trend.

Despite this empirical evidence, many are observing increases in new construction in cities paired with rising housing prices, resulting in supply skepticism. Due to the costs of producing housing, many new construction homes serve the medium- or high-income households in the market. This dynamic causes many to question whether building housing that reaches select income groups has any effect on the price of housing in other submarkets. While it can take years for new homes to filter down to a lower price point, the added supply still offsets new demand, thus avoiding impact on all submarkets.

### **Displacement Risks**

Rodriguez-Pose and Storper (2019) argue that zoning reform is a simplistic and flawed policy solution to housing affordability. Specifically, they pose that blanket upzoning would trigger new housing construction where skilled workers want to live, areas that are typically already undergoing gentrification, thus allowing more skilled workers to live in the metropolitan core. As a result, without active policies to help low-income households, blanket upzoning would only serve high income earners and reinforce existing income inequalities. Further, the authors argue that the policies would encourage replacement of older, lower-quality housing stock in highly favored areas, which would actually decrease supply for lower-income households.

These arguments are common among activists against zoning reform. Manville, Lens, and Monkkonen (2019) refuted these arguments by explaining housing prices are driven by the difficulty of producing

housing, rather than the incomes of those buying the housing. Further, the varying construction costs across the country adds additional complexity to the debate. The authors also identify gaps in empirical evidence supporting Rodriguez-Pose and Storper's argument, speaking to the some gaps in the existing literature that lead to unclear impacts, resulting in some of the debate.

### **Local Context**

As mentioned by Manville, Lens, and Monkkonen, the varying housing markets across the country add a level of complexity to analyzing the impacts of zoning reform. For instance, Freemark (2019) studied recent upzonings in Chicago and found that in the short-term, the upzoning resulted in higher property prices, but no additional new housing construction. This study has often been cited as reason to oppose zoning reform policies, including recent statewide zoning legislation. Freemark, however, has since responded to clarify some limitations to the study and to explain the importance of understanding local context. In the case of a recent slate of statewide zoning legislation for instance, zoning reform would have applied to an area broader than Chicago's reform and California's proposed legislation included significantly more protection for renters, low-income residents, and potentially gentrifying areas. This indicates that you cannot use one study to conclude that more housing units and increased density reduces affordability in all cases. Instead, future studies need to build empirical evidence specific to local markets and policies.

## Gaps in Research

Been, Gould Ellen, and O'Regan (2018) pose that a lot of skepticism is due to a lack of specific and concrete answers to concerns related to the distribution of benefits across communities. On concerns regarding displacement, it would be helpful to build a stronger understanding of the extent to which housing filters up or down, and how quickly this occurs. There is also still a lack of understanding on how changes in housing supply affect rents given the stronger focus on for-sale home prices. Some of these gaps are due to lack of data, with a need for more information on how much new construction is built at varying price points and who is buying within each price range. Our analysis will address some of these gaps by focusing on how upzoning impacts differ between high- and low-income neighborhoods, among other equity considerations. This begins to answer some questions on who benefits from a large upzoning and how the impacts vary across population groups.

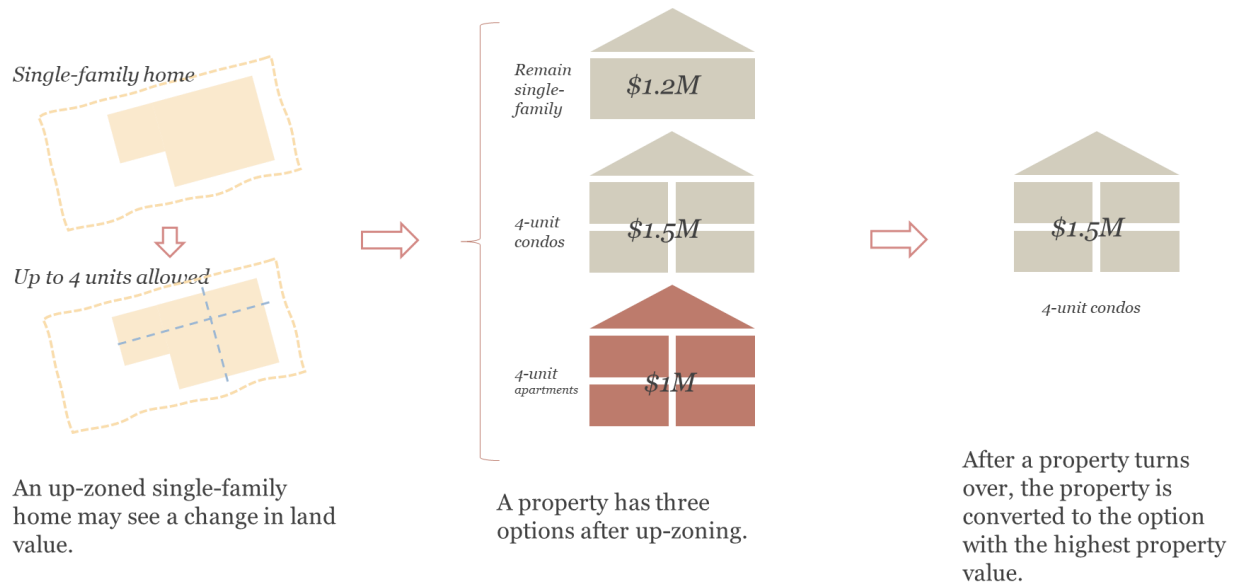
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## METHODOLOGY

Our study begins at a building level, by modeling each owner's decisions in response to changes in zoning and market conditions.



### Property-Level Analysis

The analysis begins at a parcel level, with each existing unit on a single-family parcel assigned the following attributes:

- **Existing Zoning:** What is the zoning as currently exists? As each city in the Bay Area has different zoning guides, we generalize zoning designations into three categories: low-density single-family, medium-density single-family, and high-density single-family.
- **Assessment Value:** The tax assessment for the property—both for the parcel's land and the building value.
- **Owner Type:** The existing owner of the home, whether it is owner-occupied, or renter-occupied. This data is not always available at a tax parcel

level. To assess whether a parcel was owner occupied or renter occupied, we looked at the recorded owner mailing address and compared it to the parcel address. If the mailing address was the same as the parcel address, we assumed the parcel was owner occupied, while if the mailing address was different, we assumed the parcel was renter occupied. To prevent incorrectly identified mismatches between potentially differing address formats, we applied a series of regular expressions to test permutations of address components (e.g. switching out St. for Street). All owners that were listed as LLCs were also assumed to be renters.

### *Owner-Occupied Home*

- Research indicates that existing homes are **price inelastic** (owners are less responsive to price changes).
- Sales are based on demographic and macroeconomic trends (aging, changing family sizes, job changes, etc.)
- Based on sales trends, each home has a 3% independent probability of turning over annually.

### *Investor-Owned Home*

- There is less robust research on the price response behavior of investor-owned homes (renter-occupied homes).
- This project assumes that these owners are more responsive when compared to residents, but only when the margins for selling are outsized compared to normal returns. *A lack of research on this relationship remains a key limitation of our study.*
- Based on these assumptions, each home has a 5% independent probability of turning over annually.

### **Property-Level Analysis (cont.)**

- **Lot Square Feet:** The size of the parcel. This value is used to size overall built square footage when that data is unavailable. An analysis of Bay Area cities with available built square footage data found a high degree of correlation ( $r^2 = 0.85$ ) between lot area and total built square feet.
- **Purchase Year:** The year the building was purchased. This datapoint was used to calculate overall unit turnover.
- **Purchase Amount:** The amount the unit was first purchased for.
- **Built Square Footage Size:** An imputed value based on the average and standard deviation of single-family homes in the city and the parcel's lot square feet.
- **Single Family Price:** The potential price of the unit if it was sold in 2021. This value is based on recently sold single-family homes in the city, normalized to the total land assessment value for each parcel.

was upzoned to have 1 to 3 additional units.

- **Total new unit potential:** based on zoning designation (either 2, 3, or 4 units)
- **Residual Value:** The residual value is calculated for two scenarios—whether the new units are apartments or condominiums. This is explained in detail in the following section.

We then add **market factor** variables to impute the total value of the parcel if it

## Finding Residual Value

In our model, every year, a homeowner has the following choices:

- **Remain in home:** No effect to the overall supply. The probability of this is calculated by the average turnover in units annually. In Los Altos, 3% of owner-occupied units turn over annually, and up to 5% of renter-occupied units turn over. Therefore, the likelihood that there is no effect of up-zoning on a specific parcel is between 95-97%. However, given that landlords are more likely to sell in the case of a large increase in value as a result of up-zoning, the probability of turnover for renter-occupied units **if the project value increases by more than 25% as a result of the turnover** increases to approximately 70%, modeled as a normal distribution with an average of 70% and a 10% standard deviation.
  - For example, if a home value is now \$1.3M instead of \$1.0M due to upzoning, an owner is still as likely to sell as they were previously (3-5% per year in Los Altos).
  - However, if the home is renter occupied, the landlord is modeled to be much more price sensitive as the home is no longer their primary residence, but a performing financial asset that has seen a large one-time increase in value.
  - It is likely there will also be some increase in owner-occupied turnover as a result of a one-time increase in value. However, further research is required to accurately model this effect. *As a result, overall supply is likely*

*undercounted in our model.*

- **Sell and covert to Apartments or Condominiums:** If an owner sells to a developer to redevelop the lot into 2-4 units, the total unit yield of the building increases by 1-3 units overall. This decision is modeled based on the total value of the property based on its highest and best residential use:

- **Apartments:** For each parcel, HR&A calculated the Net Operating Income (NOI) for each potential new unit (total rent less vacancy and operating expenses). The NOI was then divided by the return on cost expected from a developer, estimated to be around 6%, and to get to building value. The total cost of development is then subtracted from the building value to get the **apartment sale price**, or what a developer is willing to pay to build apartments on the property (based on CoStar comparables for multifamily property, with a spread of 175-200 bps over existing capitalization rates).
- **Condos:** For each parcel, HR&A calculated the net proceeds for each potential new unit (total cost of condo less development cost and sale costs). This yields the **condo sale price**, or what a developer is willing to pay to build condominiums on the property.

In the case of a sale, a property can either **convert to apartments**, **convert to condos**, or **remain single-family**, depending on the land values for each property.

## Sample Analysis

As an example, consider the following property in Los Altos:

- 123 Main St, Los Altos, CA
- Owner Occupied, single family home with 1800 SF, **valued at \$1.5M**

Single Family	Condo (3 units)	Apartment (3 units)
	<b>Cost of Construction:</b> <ul style="list-style-type: none"> <li>• \$912,000 for 3 units at 650 SF each</li> </ul>	<b>Cost of Construction:</b> <ul style="list-style-type: none"> <li>• \$855,000 for 3 units at 650 SF each</li> </ul>
	<b>Condo Sale Price:</b> <ul style="list-style-type: none"> <li>• PSF: \$1,005 / SF</li> <li>• <b>Total Value:</b> \$1.97M</li> </ul>	<b>Apartment Sale Price:</b> <ul style="list-style-type: none"> <li>• <b>Rent PSF:</b> \$2.60-\$3.00</li> <li>• <b>Total Value:</b> \$669,000</li> </ul>
<b>Sale value: \$1.5M</b>	<b>Value less Cost: \$1.06M</b>	<b>Value less Cost: -\$186K</b>

This property would be likely remain single-family after it is sold as that remains the financial highest and best use of the land. This is the case in neighborhoods where there is a large discrepancy between condo / multifamily prices and single-family prices. Across Santa Clara County, single-family prices are on average 35% more expensive per square foot, versus condominiums, despite being larger on average. The median condo in Santa Clara County sold for \$850,000 in 2020, compared to \$1.4M for a single-family home.

### Total Development Yield:

After calculating residual values and the highest and best use, HR&A multiplied expected unit yields by the probability of turn over to yield final counts.

**Los Altos Highest and Best Use Results (1-year)**

Type	Result	Unit Yield	Net Change
Single Family Homes	9,570	10,935	-90-100 sf homes
Condos	1,457	275	+276 condos
Apartments	1	0	+ 0 apartments

### Total Development Yield (cont)

HR&A then calculated the yield over the next five years. Development costs were inflated between 3-5% annually over different simulations, while prices were inflated based on the long-term average growth in each market over 2012-2021. The rate of growth was responsive to overall supply—and was decreased proportionally to the new units flowing into the market. However, this is likely a broad simplification of the market. More research or empirical evidence is required to model the change in substitution elasticity between condos and single-family homes, as condos proliferate, and single-family homes become scarcer. As condos become more readily available, apartments are also likely to see less price pressure—even without additional units, as high-income renters are now able to access homeownership in the Bay Area. These relationships will be studied in future iterations of this study.

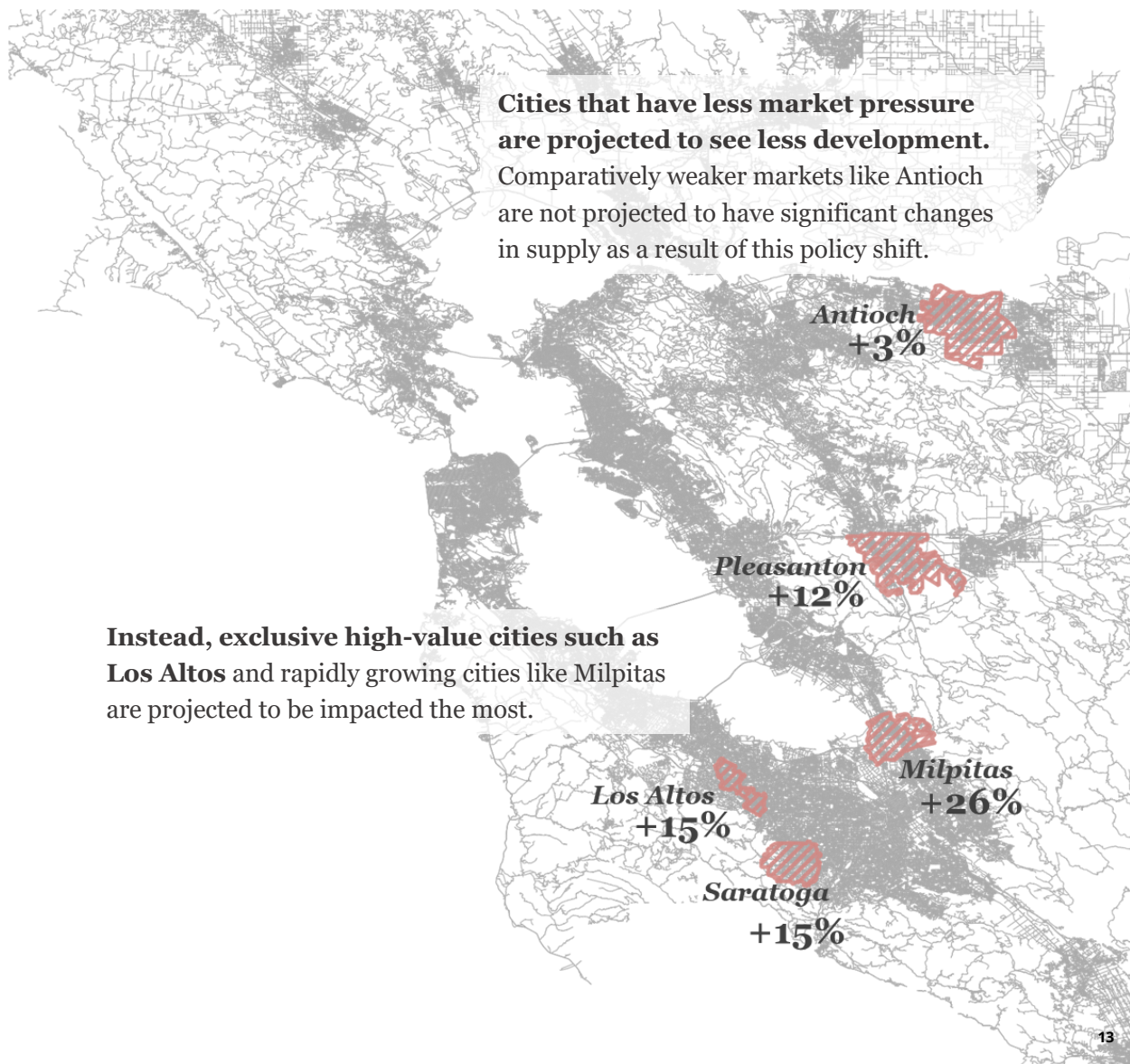
**Los Altos Condos by Year<sup>1</sup>**

<b>Year</b>	<b>New Condos</b>	<b>Loss of Single Family</b>	<b>Net New Units</b>	<b>Cumulative Net New Units</b>
<b>2021</b>	276	(82)	<b>+184</b>	<b>+184</b>
<b>2022</b>	305	(102)	<b>+203</b>	<b>+387</b>
<b>2023</b>	328	(109)	<b>+218</b>	<b>+606</b>
<b>2024</b>	349	(115)	<b>+233</b>	<b>+839</b>
<b>2025</b>	372	(123)	<b>+247</b>	<b>+1,086</b>



## FINDINGS

In the Bay Area, our study shows that up-zoning single-family neighborhoods increases supply by **14% over five years**, significantly more than recent increases in supply.

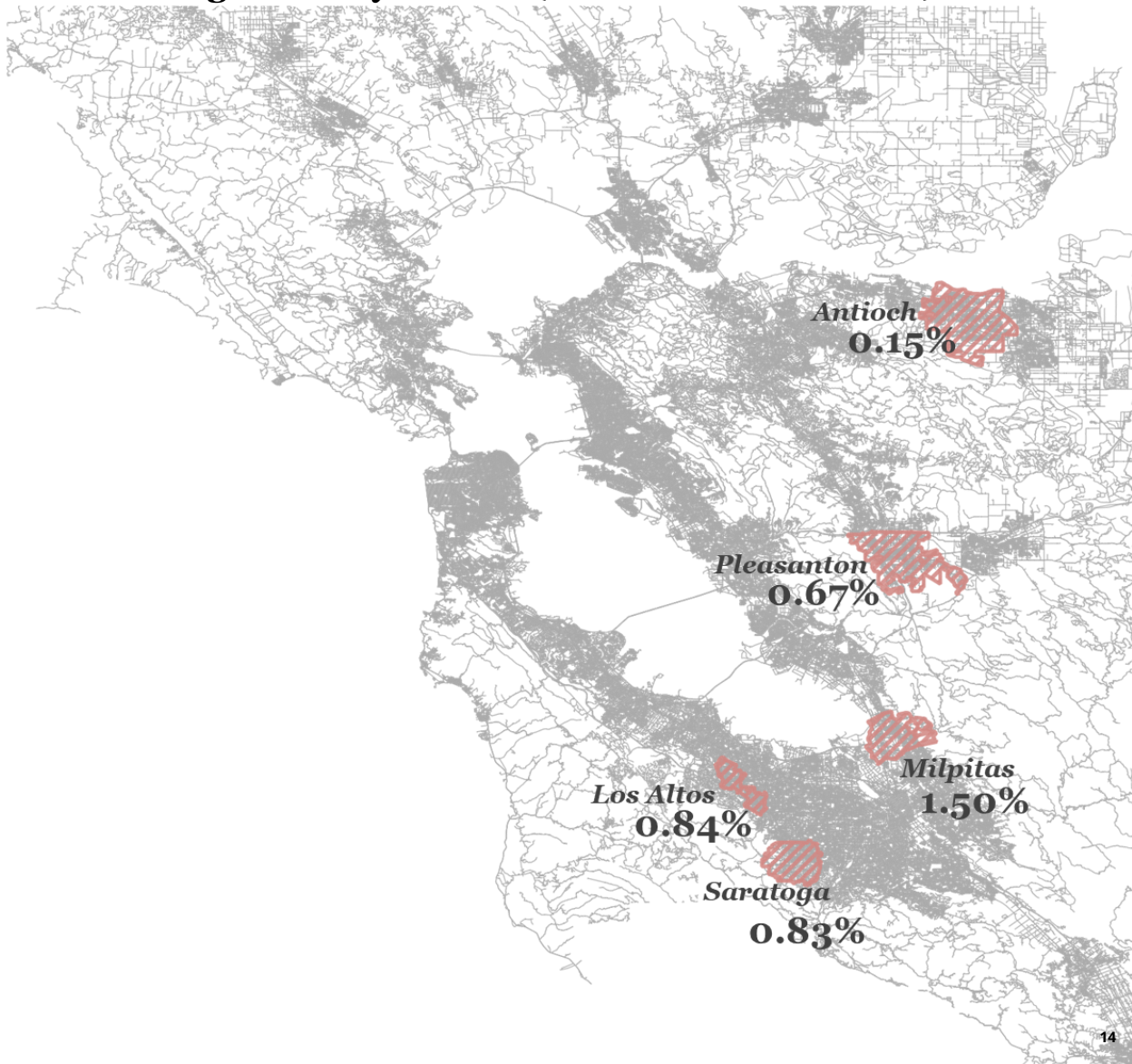


## FINDINGS

Less than 2% of single-family homes are projected to be redeveloped annually across each city.

Due to the up-zoning, one redeveloped single-family unit yields on average 3.25 new units. As a result, only a few single-family units need to be redeveloped to produce a large number of units overall.

### Loss of Single-Family Homes (as share of total stock)



Our findings indicate that over a five-year time-period, up-zoning single-family neighborhoods can have significant impact on the overall housing supply in the Bay Area. Nevertheless, with a few exceptions, this density would be relatively modest and would not drastically alter the fabric of the city’s neighborhoods.

- **On average, the total number of units would increase in each city by 14% over 5 years.** While this is a significant increase, it is in line with other parts of the country that have seen the same rapid increase in the total number of jobs. Currently, the Bay Area has one of the lowest ratios of units created to the number of jobs created in the nation—which directly correlates to increases in housing pressures.

- **Less than 2% of single-family homes are projected to be redeveloped annually across each city.** Due to the up-zoning, one redeveloped single-family unit yields on average 3.25 new units. As a result, only a few single-family units need to be redeveloped to produce a large number of units overall. Less than 2% of single-family homes are projected to be redeveloped annually across each city. Due to the up-zoning, one redeveloped single-family unit yields on average 3.25 new units. As a result, only a few single-family units need to be redeveloped to produce a large number of units overall.

**Projected New Units over 5-years with Upzoning:**

City	Total New Units	Existing Units	Change
Saratoga	1,473	10,106	15%
Pleasanton	2,391	20,260	12%
Milpitas	3,313	12,633	26%
Antioch	754	28,190	3%
Los Altos	1,630	11028	15%

**Share of Single-Family Homes Redeveloped:**

City	Average Annual Production	SF Homes Redev Annually	Share of SF Homes Redev Annually
Saratoga	295	84	0.83%
Pleasanton	478	137	0.67%
Milpitas	663	189	1.50%
Antioch	155	43	0.15%
Los Altos	326	93	0.84%

- Almost all new units are projected to be condos, instead of apartments. This is likely due to the large spike in home prices over the pandemic, which has made condo-delivery appear far more lucrative when compared to rental units. Rents have fallen slightly across the Bay Area since the beginning of the pandemic, while home prices have continued to increase drastically. As the market stabilizes, new units will likely be a more diverse mix between condos and apartments.

**Projected Condo Price vs. Projected Apartment Value**

City	Projected Avg Condo Price	Projected Rents per month	Projected Avg Apartment Value <sup>20</sup>
Saratoga	\$859,818	\$2,564	\$358,960
Pleasanton	\$533,526	\$2,305	\$322,700
Milpitas	\$593,159	\$2,232	\$312,452
Antioch	\$306,108	\$1,796	\$251,427
Los Altos	\$1,060,000	\$3,212	\$449,680

**Notes:**

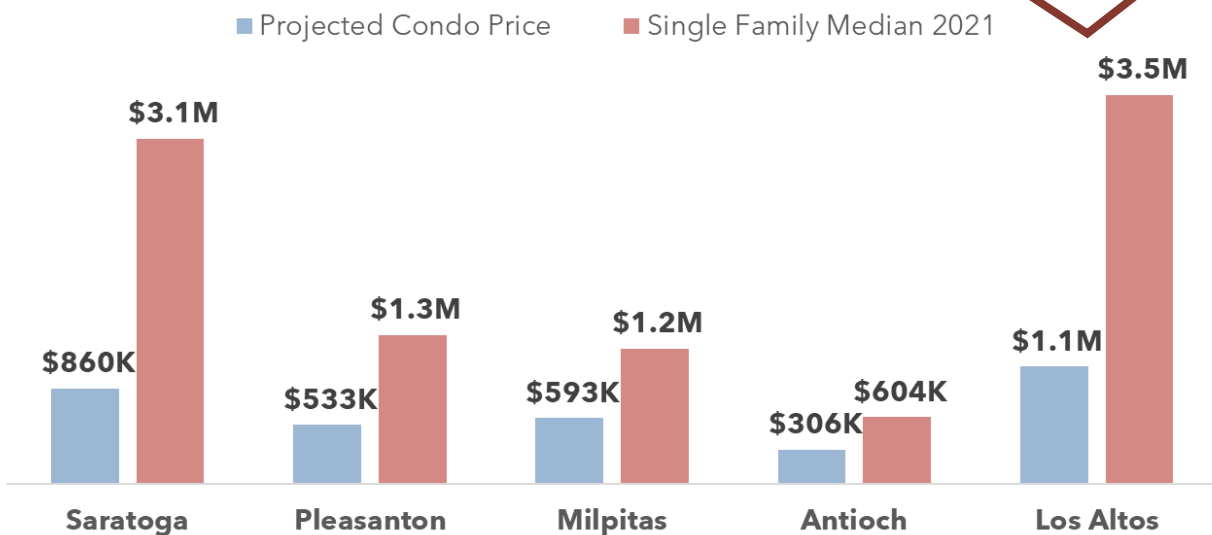
*There are also very few rentals available in parts of the Bay Area like Saratoga and Los Altos that offer a compelling competitive set with the 2-4 unit product modeled here. Actual rents will likely be higher than those projected.*

*Based on 30% operating expenses and a 6% return on cost requirement for the developer.*

## FINDINGS

The homes projected to be built are projected to be more affordable than their single-family counterparts.

### Projected Condo Prices vs. 2021 SF Home Prices



Assuming average 2021 interest and tax rates, a household earning approximately **\$235,000** can afford the payments on a \$1.1M condo. To afford the \$3.5M home, a household would need more than **\$650,000**.

On average, single-family homes are projected to be **2.7x more expensive** than condos.



- Single family homes are on average 2.7 times more expensive than the projected condos that would be built as a result of the up-zoning.** This is one of the largest projected benefits of up-zoning—smaller units densely packed to share the cost of land will result in significant savings for current Bay Area households. While these units are not always affordable to lower-income households, (earning below 60-80% AMI), they serve a much-needed segment of the population who are currently high-income renters, households with annual earnings between \$85,000 and \$200,000 but do not have incomes high enough to support purchasing a home in the Bay Area such as those making more than \$200,000 annually. If these renters are able to afford these homes, there will likely be reduced pressure on the rental market, as these households will not be bidding up prices for lower-income households.
- Currently, homes in areas with the highest opportunity in the Bay Area (school quality, access to jobs, and amenities) require extremely high incomes to be affordable. The estimated income required to purchase a home in Los Altos is approximately \$630,000 annually: higher than the top 1% of all income earners nationally. **The expansion of condos would lower the household income required to about \$200,000 per household.** In other parts of the Bay Area, the household income decreases significantly as well—down to \$120,000 in Milpitas and \$70,000 in Antioch.

### **Incomes Required to Purchase Potential Condos versus Single-Family Homes**

<b>City</b>	<b>Projected Condo Price</b>	<b>Single Family Median 2021</b>	<b>Multiplier</b>	<b>Income Required to Purchase Condo</b>	<b>Income Required to Purchase Single Family Home</b>
Saratoga	\$859,818	\$3,118,346	3.63	\$170,000	\$560,000
Pleasanton	\$533,526	\$1,345,864	2.52	\$110,000	\$250,000
Milpitas	\$593,159	\$1,220,987	2.06	\$120,000	\$230,000
Antioch	\$306,108	\$604,051	1.97	\$70,000	\$120,000
Los Altos	\$1,060,000	\$3,512,466	3.31	\$194,200	\$630,000

## APPENDIX

### Los Altos

Year	Estimated New Condos	Estimated New Apartments	Loss of Single Family	Total SF	Net New Condos	Total Units
2021	276	0	79	10,949	276	11,225
2022	305	0	87	10,862	581	11,443
2023	328	0	94	10,768	909	11,677
2024	349	0	100	10,668	1,258	11,926
2025	372	0	106	10,562	1,630	12,192

### Saratoga

Year	Estimated New Condos	Estimated New Apartments	Loss of Single Family	Total SF	Net New Condos	Total Units
2021	326	0	93	10,013	326	10,339
2022	312	0	89	9,924	638	10,562
2023	291	0	83	9,840	930	10,770
2024	283	0	81	9,759	1,213	10,972
2025	260	0	74	9,685	1,473	11,158

### Pleasanton

Year	Estimated New Condos	Estimated New Apartments	Loss of Single Family	Total SF	Net New Condos	Total Units
2021	432	0	123	20,137	432	20,568
2022	453	0	129	20,007	885	20,892
2023	480	0	137	19,870	1,365	21,235
2024	503	0	144	19,726	1,868	21,594
2025	523	0	149	19,577	2,391	21,967

### Dublin

Year	Estimated New Condos	Estimated New Apartments	Loss of Single Family	Total SF	Net New Condos	Total Units
2021	2,045	2	585	11,763	2,047	13,810
2022	2,069	2	592	11,171	4,118	15,289
2023	2,092	2	598	10,573	6,212	16,785
2024	2,110	2	604	9,970	8,325	18,294
2025	2,121	2	607	9,363	10,448	19,811

### Antioch

Year	Estimated New Condos	Estimated New Apartments	Loss of Single Family	Total SF	Net New Condos	Total Units
2021	0	124	35	28,155	124	28,279
2022	134	2	39	28,116	260	28,376
2023	151	2	44	28,072	413	28,485
2024	166	2	48	28,024	582	28,605
2025	170	2	49	27,975	754	28,729

# APPENDIX

## Milpitas

Year	Estimated New Condos	Estimated New Apartments	Loss of Single Family	Total SF	Net New Condos	Total Units
2021	586	0	167	12,466	586	13,051
2022	623	0	178	12,288	1,209	13,496
2023	661	0	189	12,099	1,870	13,968
2024	700	0	200	11,899	2,570	14,468
2025	743	0	212	11,686	3,313	14,999