



# Solving the Housing Affordability Crisis

How Policies Change the Number of San Francisco  
Households Burdened by Housing Costs

October 2016

## About the Bay Area Council Economic Institute

Since 1990, the Bay Area Council Economic Institute has been the leading think tank focused on the economic and policy issues facing the San Francisco/Silicon Valley Bay Area, one of the most dynamic regions in the United States and the world's leading center for technology and innovation. A valued forum for stakeholder engagement and a respected source of information and fact-based analysis, the Institute is a trusted partner and adviser to both business leaders and government officials. Through its economic and policy research and its many partnerships, the Institute addresses major factors impacting the competitiveness, economic development, and quality of life of the region and the state, including infrastructure, globalization, science and technology, and health policy. It is guided by a Board of Trustees drawn from influential leaders in the corporate, academic, non-profit, and government sectors. The Institute is housed at and supported by the Bay Area Council, a public policy organization that includes hundreds of the region's largest employers and is committed to keeping the Bay Area the world's most competitive economy and best place to live. The Institute also supports and manages the Bay Area Science and Innovation Consortium (BASIC), a partnership of Northern California's leading scientific research laboratories and thinkers.

## Authors

Jeff Bellisario - Vice President, Bay Area Council Economic Institute  
Micah Weinberg, Ph.D. - President, Bay Area Council Economic Institute  
Camila Mena - Research Analyst, Bay Area Council Economic Institute  
Lanwei Yang, Ph.D. - Consulting Economist

## Cover Photo Credit

Mission Bay by The Registry, Bay Area Real Estate



---

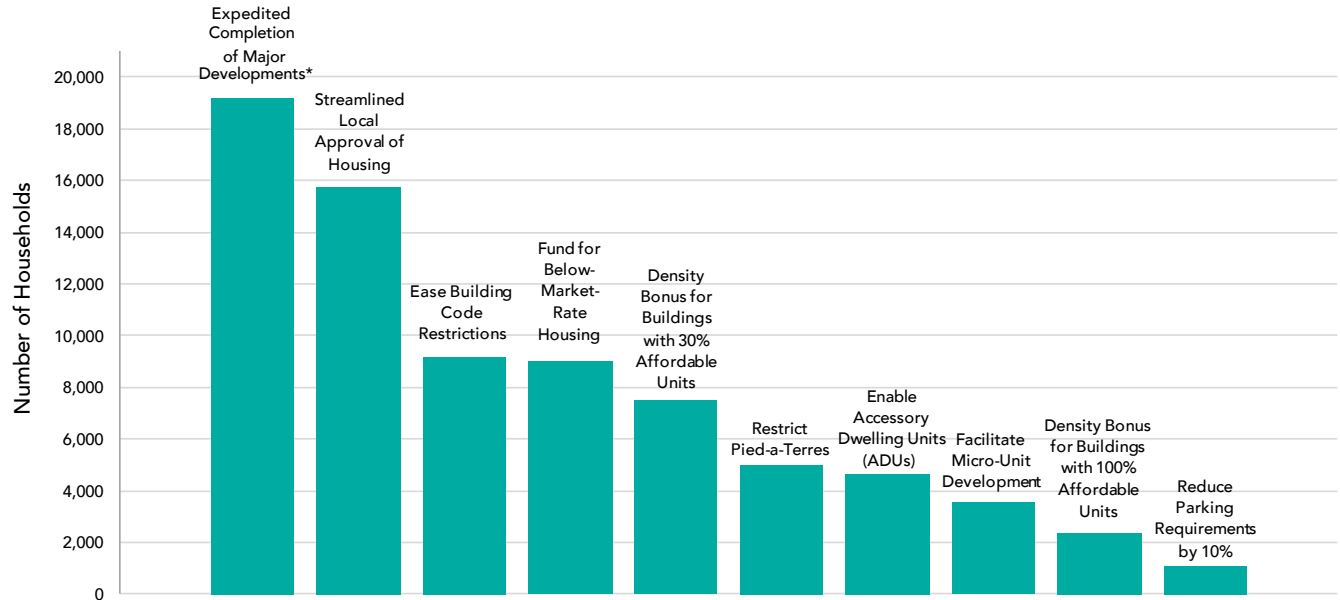
## **TABLE OF CONTENTS**

Executive Summary	3
Public Policy and the Bay Area's Housing Crisis	5
Overview of Methodology	7
Twenty Policies Impacting Housing Affordability in San Francisco	9
Technical Appendix	25

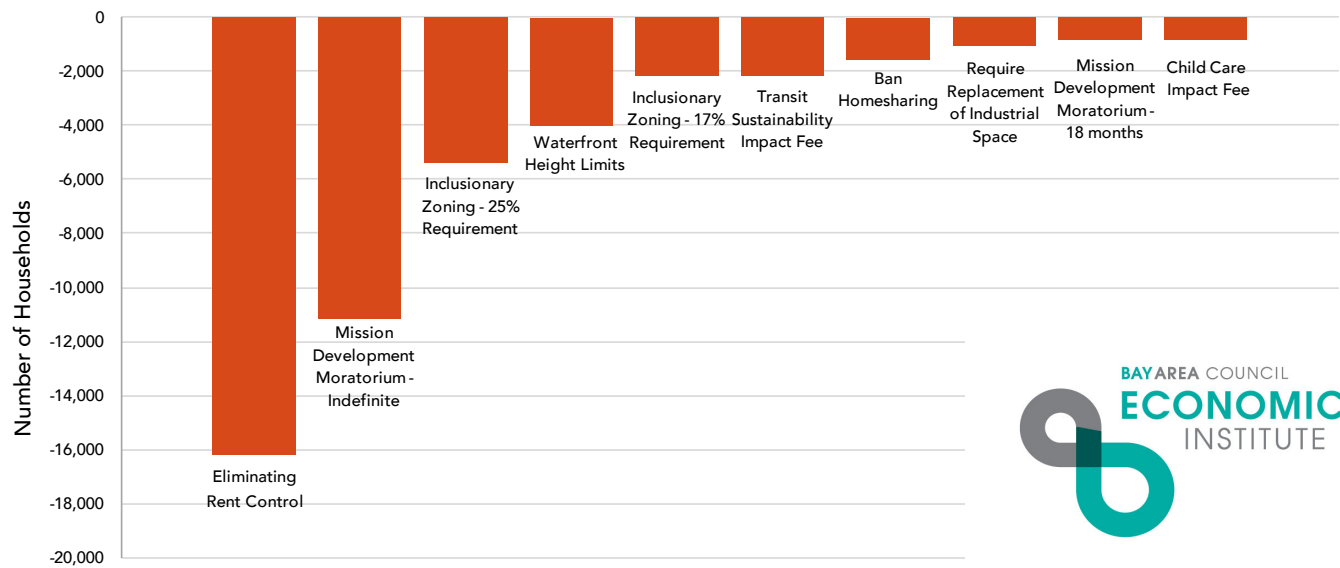
---

# How San Francisco Policy Choices Change the Number of Households Burdened by Housing Costs

## Top Ten Policies that Increase Affordability ...



## Top Ten Policies that Worsen Affordability ...



\*Major developments include the Hunters Point Shipyard, Mission Rock, Treasure Island, and Park Merced projects.  
 Housing cost burden is defined using the conventional measure of households spending more than 30% of their income on rent or mortgage payments.

# Executive Summary

Housing affordability in San Francisco has reached a crisis point. With rents and home prices spiraling upward since the Great Recession, there has been no shortage of policy proposals envisioned to alleviate the city's affordability problem. This analysis is the first to evaluate these proposals alongside each other using a consistent and comprehensive method to gauge their impact on affordability for individuals and families.

To help policymakers focus on real solutions to the housing crisis, this report compiles a list of 20 housing-related state and local policies—some that have been implemented and others that have only been considered—and analyzes their impacts on net affordability, measured in the number of households that move above or below a 30% housing cost-to-income ratio.

**There are three key takeaways from this analysis that policymakers, opinion leaders, and the interested public should keep in mind:**

## 1. Policy matters

Demand for housing in San Francisco continues to intensify as the city produces jobs and economic growth at a rate above the national average. Employment in the city has grown by over 123,000 from 2009 to 2015, an increase of 22%. And in 2015, the San Francisco metropolitan area grew its gross domestic product by 4.1% while other U.S. metros averaged 2.5% growth.<sup>1</sup> While demand has been the leading cause of high housing costs in the city, we show that state and local housing policies also have considerable effects on affordability. The Obama White House has called out the importance of housing policies that provide affordable housing for working families. It recently released a toolkit primarily aimed at breaking down barriers to new housing construction.<sup>2</sup>

## 2. Building all types of housing is still the best way to alleviate housing cost burdens

Increasing the supply of housing, through completing large planned housing developments or reducing administrative barriers to creating new homes, drives the largest gains in affordability. There is an immediate impact of such policies and that impact grows over time. We estimate that expediting completion of four major planned housing developments would create affordability for 19,154 households and streamlining local approval of housing would create affordability for 15,763 households. In both of cases, reduced housing cost burdens are associated with lower overall prices as a result of expanded supply as well as the creation of below-market-rate housing.

## 3. It is not just about increasing supply, the overall impact on affordability matters

Some analyses look only at the impact of supply on price, others just at the provision of below-market-rate housing or at the income people derive from short-term rentals or accessory dwelling units. A policy's impact cannot be understood, however, unless all factors related to affordability are considered together:

- **The type of housing supply that a policy creates is critical.** Supply alone will not help the most vulnerable San Francisco households. Units that are explicitly rented below market rates or that are affordable by design (e.g., micro-units) contribute



directly to a lower housing cost burden for the families that reside within them. Rent-controlled apartments also often provide below-market-rate housing units. Eliminating rent control in the city would move 16,222 households out of affordability.

- **Income effects must be considered.** For example, homesharing may remove a small number of units from the long-term rental market, but this effect is swamped by the number of people who derive income from these rentals and hence are themselves able to achieve affordability. Banning homesharing, therefore, would be a net negative and create 1,556 more San Francisco households that are cost burdened. Similarly, enabling accessory dwelling unit (ADU) construction unlocks rental income opportunities for homeowners and promotes affordability by creating both new housing supply and new income streams.
- **Some policies intended to increase affordability have the opposite effect.** The practice of requiring market-rate developments to include a certain percentage of below-market-rate units is a

dangerous game. Set the percentage too high and the city ends up with fewer total units, which drives up costs for everyone. The San Francisco market is strong enough that it can sustain this approach of taxing housing to produce housing, but an increase of the inclusionary zoning rate from the base 12% on-site requirement to even 17% will create a housing cost burden for 2,196 households.

**The lack of housing affordability results in more than just San Franciscans paying high percentages of their income on rents and mortgages.** It causes families to be pushed out of job markets in search of affordable housing, increases displacement, and impacts the environment by elongating commutes. A more comprehensive measure of affordability would include transportation costs as well, so moving far away from a job is not a good solution.

Fortunately, policy choices can play a critical role in housing affordability. We have identified policy benefits, trade-offs, and unintended consequences—all of which should be carefully considered as the city works to address its housing affordability crisis.



A view of San Francisco from the Outer Richmond

Source: Jeremy Brooks / Made in San Francisco

# Public Policy and the Bay Area's Housing Crisis

**Housing affordability is the Bay Area's biggest obstacle to sustained economic growth that results in shared prosperity.** High housing costs have a number of negative impacts on the Bay Area economy. These effects can range from businesses being unable to attract new employees, to increased traffic congestion on regional transportation systems as workers move away from job centers in search of affordable housing. Additionally, high housing costs have contributed to 20.6% of Californians living below the adjusted poverty line, the highest percentage of any state in the country.<sup>3</sup>

**Bay Area housing costs have historically been among the highest for any region in the country.** Affordability concerns have grown coming out of the Great Recession, with both rents and home prices escalating quickly. Average rental costs for the region now top \$2,500 per month and the median single-family home price reached \$841,500 in the second quarter of 2016. Nearly half of the region's renters are considered burdened by housing costs, as the percentage of Bay Area renters spending more than 30% of their income on rent increased from 28% to 49% from 2000 to 2014.<sup>4</sup>

**The issue of housing affordability is most acute in San Francisco.** The California Association of Realtors reports that only 13% of San Francisco households can afford to purchase the median priced home,<sup>5</sup> far below the 57% affordability average for the U.S. as a whole. In San Francisco, the median home sales price of \$1.29 million in April 2016 set an all-time high, while the median one-bedroom apartment rental cost of \$3,590 prices many would-be residents out of the market. High home prices and rental costs are also pushing many San Francisco workers to leave the city in search of affordable housing.

**An inability for the city to increase its housing stock has exacerbated a supply and demand mismatch.** San Francisco's strong economy—the city has added over 123,000 jobs from 2009 to 2015, an increase of 22%—is a clear contributor to Zillow's San Francisco Home Value Index increasing by 60% since the end of 2009. However, housing production has failed to match the city's economic growth, with only 11,000 units added to the city's housing stock over that same period, according to the San Francisco Housing Inventory. For comparison, San Francisco permitted just 193 housing units per 1,000 new residents from 2012 to 2013, which amounts to roughly half the national average over this period (384 new units per 1,000 new residents).<sup>6</sup> The city is growing jobs much faster, but housing units more slowly, than the rest of the U.S.

**This underbuilding has resulted in a housing supply that cannot adequately meet demand.** The housing affordability challenge in San Francisco has been decades in the making and cannot be solved overnight. However, the policy actions that the city takes will have immediate and long-term impacts on real people, and they can create additional housing costs in some cases or improve affordability in others.

**In San Francisco, the blame for unaffordability has been spread widely.** Developers cite impact fees for adding costs to projects, neighborhood groups say market-rate housing production is driving up prices and driving out long-time residents, the California Legislative Analyst's Office (LAO) identifies costly and lengthy permitting processes leading to underbuilding,<sup>7</sup> and housing advocates claim that short-term vacation rentals are eating away at the available housing stock.

In the last five years, policymakers and voters have considered numerous local and state policies, ordinances, and ballot measures that would impact the supply of housing available for renters and homeowners. Some of these policies are now law, while others never reached a vote. From these policy initiatives and a review of the housing literature, we have created a broad list of issue areas that can have an impact on housing affordability in San Francisco:

- **Inclusionary zoning requirements**
- **Length of permitting time**
- **Minimum parking requirements**
- **Density bonuses**
- **Impact fees on development**
- **Restricting non-primary residences**
- **Alternative unit designs**
- **Affordable housing finance**
- **Moratoriums on market-rate residential construction**
- **Restricting homesharing**
- **Restricting development of industrial space**
- **Completion of major projects**
- **Building height limits**
- **Rent control**
- **Building codes**

This report details 20 key San Francisco housing policy proposals in each of the above areas, quantifies their impact on housing production and housing prices over 20 years, and calculates the change in the number of San Franciscans that would be able to afford to live in the city under the policy. In doing so, we will categorize the relative magnitude of each policy's individual effect on affordability. We do not take into account interaction effects among multiple policies.

Critically, we measure the impact on affordability along a number of dimensions in order to calculate the net impact of policies. For example, inclusionary zoning ordinances may depress overall housing production by increasing overall construction costs, therefore, increasing the price of housing citywide and making housing unaffordable for some at the margin. But they also create a number of below-market-rate units that are affordable for others. It is this net impact in which we are interested.

This study is intended to inform the public as it guides policymakers toward choices that will increase overall affordability. We hope to build consensus among housing stakeholder groups around the policies that are most effective in increasing net affordability for San Franciscans. It is not the intention of this report to advocate for any of these policies, rather to objectively analyze the scale of their potential impacts.



# Overview of Methodology

This analysis scales the impacts of different policy interventions on net affordability of housing within San Francisco. Consistent with the literature and the housing analyses performed by the San Francisco Controller's Office of Economic Analysis and others, we define housing as all owner-occupied and rental units within the city.

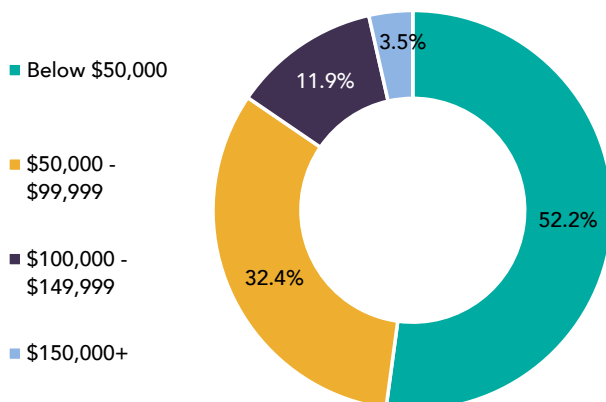
We have created a static model that geographically isolates San Francisco, and therefore excludes the possibility of induced demand or supply changes brought on by lower or higher prices. This could cut either way in terms of affordability: even more people may choose to live in San Francisco were prices lower; if regulations were streamlined, even more supply may be created driving prices even lower. And we do not evaluate, for example, the option that San Franciscans have of seeking more affordable housing outside the city's borders. Ultimately, there is no strong basis in the literature that would allow us to model induced demand or supply and maintain comparability across policies.

As our net affordability metric, we use the conventional measure of the percent of income spent on housing. Housing expenditures that exceed 30% of income have historically been viewed as an indicator of an affordability problem.<sup>8</sup> According to the 2014 American Community Survey one-year estimates, 37.3% of all San Francisco households (or 131,843 households) are considered housing cost burdened at the 30% cost-to-income threshold. Of those households spending more than 30% of their income on housing costs, 52.2% earn less than \$50,000 per year and 84.6% earn less than \$100,000 per year. So the households who will benefit or struggle as a result of the policy choices we analyze are working- and middle-class families, not at the top of the income distribution.

We focus the analysis on three main channels through which housing policies can affect affordability:

1. **Policies may restrict or expand housing supply, changing the market price of housing**
2. **Policies may provide access to below-market-rate housing for a subset of the population**
3. **Policies may augment or suppress income-generating opportunities for residents**

**Income of San Francisco Households Burdened by Housing Costs**



**Note:** Housing cost burden is defined using the conventional measure of households spending more than 30% of their income on rent or mortgage payments.  
**Source:** 2014 American Community Survey, one-year estimates  
**Analysis:** Bay Area Council Economic Institute

**To quantify the first channel, supply,** we approximate the number of market-rate units that a particular policy will remove from or add to the San Francisco housing market. An established estimate of the elasticity of housing demand and supply converts this quantity change to a price effect. Then, we assume that this price change affects all households uniformly along the cost-to-income distribution to assess the change in the number of housing-cost-burdened households. This assumption helps to simplify complicated housing market economics, and it is also consistent with the fact

that the run-up in housing costs has been felt across the entire income distribution.<sup>9</sup>

To determine the elasticity of housing demand and housing supply, we leverage the framework created by the San Francisco Controller's Office of Economic Analysis in its September 2015 report, "Potential Effects of Limiting Market-Rate Housing in the Mission."

The Controller's Office equation presents the impact of a supply change on price as a function of the price elasticities of supply and demand (shown below).

$$\left(\frac{\Delta p}{p}\right) = \frac{\left(\frac{\Delta Q_s}{Q_s}\right)}{\epsilon_s - \frac{1}{\sigma_d}}$$

From the Controller's report: "The price effect is therefore a function of the percentage reduction in the city's housing stock, the price elasticity of supply (0.02),<sup>10</sup> and the inverse elasticity of demand (-1.41). The price effect—the final percentage change in housing prices—equals the percentage change in housing supply, divided by 0.02 – (1/-1.41), or 0.73."

For the existing supply of housing, we use 382,550 units, as found in the city's most recent Housing Inventory Report. Because we analyze percentage changes in housing stock based on this current number, the effects outlined for each policy should be considered as if their entire impact was felt today. Alternatively, the impacts could also reflect the results of a policy being in place for the previous 20 years with their effects analyzed using today's market characteristics.

Of the analyses that have considered the impact of policy on housing prices, many take into account how zoning, fees, or other requirements impact the cost of the units that are *actually* built. This misses the fact that

many projects are never constructed due to fees, local opposition, or other factors. We analyze how policies can impact broad affordability in San Francisco through the supply of units. For example, local zoning regulations can impact overall unit construction by making it financially feasible or infeasible for developers to make investments. These units gained or lost affect housing affordability, as a lack of housing production has been directly connected to higher prices.<sup>11</sup>

**To quantify the second channel, access to below-market-rate housing,** we approximate the number of people benefiting from the addition or subtraction of below-market-rate housing—defined as subsidized units available only to households with incomes below certain area median income thresholds. We assume that all of the beneficiaries of below-market-rate housing would be cost-burdened if not for access to below-market-rate housing. For housing policies that result in a change in housing production, we assume that 12% of the new or reduced housing stock is or would have been set aside for below-market-rate housing. This is consistent with the city's current on-site inclusionary housing program.

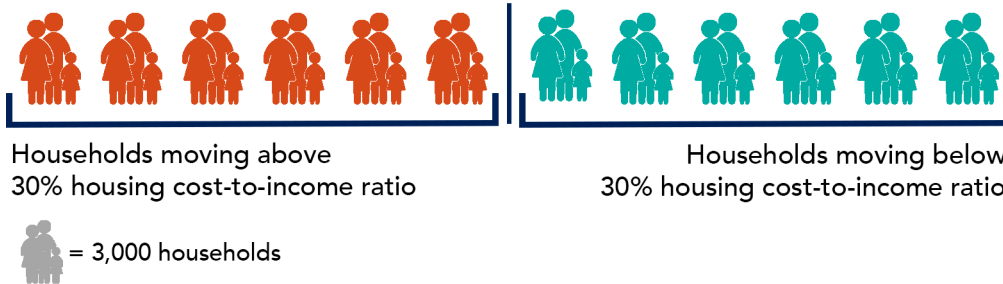
**To quantify the third channel, income,** an important channel for homesharing and ADU regulation, we estimate the number of existing households impacted by the policy and their average annual income from homesharing or ADU rental. Given limited data availability, we assume the homeowners that are involved in the homesharing market or that would construct an ADU are evenly distributed across income brackets. Then, we randomly assign this income change across the distribution to calculate the mean change in the number of housing-cost-burdened households.

More detail on our methodology is available in the [Technical Appendix](#) at the back of this document.

# Twenty Policies Impacting Housing Affordability in San Francisco

The following list organizes proposed or enacted public policies by their impact on net housing affordability in San Francisco. Each policy's effects are divided into the three channels (where applicable) to arrive at a total change in the number of households able to affordably live in San Francisco. Those policies that produce the largest positive effect on affordability (i.e., moving the

most people below the 30% housing cost-to-income threshold) are listed first, and those policies that are most detrimental to affordability (i.e., moving the most people above the 30% housing cost-to-income ratio) are listed second. **TEAL** corresponds to affordability improvements, and **RED** is used for negative affordability effects.



SmartSpace SoMa, the first pre-fabricated micro-unit development in the U.S.

Source: Panoramic Interests



## TOP TEN POLICIES THAT INCREASE AFFORDABILITY

### COMPLETION OF MAJOR DEVELOPMENTS

Expedited development of four housing developments across the city that will produce over 25,000 total units of housing

19,154

households able to afford to live in San Francisco



**POLICY:** San Francisco currently has four major projects in its housing pipeline. The Hunters Point Shipyard development will create 10,500 units; the Treasure Island development will produce 7,637 units; Park Merced is slated to construct 5,679 units; and Mission Rock will build 1,500 units. Together, these mega-projects will add over 25,300 units to San Francisco’s housing stock. While all remain in planning or early construction phases, units can be delivered quickly if remaining approvals are not met with delays.

**SUPPLY CHANNEL:** Of the 25,316 units planned, we estimated 18,595 market-rate units will be

built over 20 years within these developments. Adding this number to San Francisco’s existing housing stock produces a price decline of 6.66%, which enables 12,433 households to cross below the 30% cost-to-income ratio.

**ACCESS CHANNEL:** Each of the four developments will include a percentage of below-market-rate units (32% at Hunters Point Shipyard, 25% at Treasure Island, 15% at Park Merced, and 40% at Mission Rock), allowing an additional 6,721 households to move into a housing cost-to-income ratio deemed affordable.



A rendering of the planned Mission Rock development

Source: San Francisco Giants

**LENGTH OF PERMITTING TIME**

**Governor Brown's Streamline Affordable Housing Proposal**

**15,763**

households able to afford to live in San Francisco



**POLICY:** In Governor Brown's most recent budget, his Streamline Affordable Housing Proposal would have accelerated the permitting process for certain developments. While his proposal was never voted on, it would have reduced the barriers that the California Environmental Quality Act (CEQA), NIMBYism, and prolonged local approval processes pose.

Under the proposal, infill, multi-family developments that conform with existing general plan and zoning rules would qualify for by-right approval if 20% of the units are set aside as affordable for low-income households. Projects that go through the by-right process would be exempt from CEQA review and cities and counties would be given 30 days for review.

**SUPPLY CHANNEL:** The Legislative Analyst's Office found that California's coastal metros take about two and a half months longer, on average, to issue a building permit than in a typical California inland community or the typical U.S. metro (seven months compared to four and a half months).

We assume average permitting time in San Francisco is reduced by one-third under the Governor's proposal and employ a model created by UC Berkeley's Turner Center for Housing and Innovation. This model incorporates research from the literature,<sup>12</sup> pro forma financial estimates of planned units, and interviews with developers and planners, to calculate a probability that a planned development will actually be constructed.

Within the existing housing pipeline, consisting of current development applications, an additional 6,224 units would be constructed if permitting times were reduced by one-third, according to the Turner Center model. We extrapolate this number to 20 years using a multiplier of 3.33 to find total new units of 20,743 over the 20-year period.<sup>13</sup>

Assuming 20% of the units under the by-right policy language would be below-market-rate (the proposal did have a separate 10% affordability threshold for transit-oriented developments), the policy would create 16,594 new market-rate units and decrease prices by 5.94%. This price change would allow an additional 11,614 households to move to the affordable side of the cost-to-income ratio.

**ACCESS CHANNEL:** In addition to the market-rate units, 4,149 households would have access to below-market-rate housing, therefore moving them from the unaffordable category to the affordable category.



## BUILDING CODES

### Ease restrictive building codes for new residential construction

9,164

households able to afford to live in San Francisco



**POLICY:** Building regulations—also known as building codes—serve to protect public safety, increase energy efficiency, and improve accessibility. They can also increase the cost of new construction and rehabilitation. California, and in-turn San Francisco, has some of the most restrictive codes in the nation.

**SUPPLY CHANNEL:** Various studies have attempted to quantify the effect of building codes on construction costs and home prices. All have found that more stringent code requirements increase both costs and price. The most comprehensive analysis compared

1,100 metropolitan regions and found that regions with more restrictive codes had prices 4.9% higher than those that did not.<sup>14</sup>

We apply this price effect estimate to San Francisco and forecast that 9,164 households in San Francisco will no longer be cost burdened over 20 years if building codes are relaxed. Our estimate is likely conservative, as in the years since the comprehensive analysis, building codes in California have become increasingly restrictive.

## AFFORDABLE HOUSING FINANCE

### San Francisco Affordable Housing Trust Fund

9,000

households able to afford to live in San Francisco



**POLICY:** In November 2012, San Francisco voters passed Proposition C, which authorized the creation of a Housing Trust Fund. By setting aside general fund revenue (through the Redevelopment Agency tax increment) and dedicating it to affordable housing creation and preservation, the Housing Trust Fund will capture \$20 million in year one and increase to \$50 million annually over time. These funds will be invested in affordable housing production and housing programs over the next 30 years through the Housing Trust Fund.

**ACCESS CHANNEL:** Estimates from the city show that Housing Trust Fund money will be used to develop more than 9,000 units of permanently affordable housing for residents whose income is 60% or below the area median. This estimate assumes that funds will be leveraged by developers with Low-Income Housing Tax Credits and other state and federal subsidies to cover the \$591,000 average cost per unit for affordable housing construction in San Francisco.<sup>15</sup> Given that all of these units will be below-market-rate in nature, 9,000 San Francisco households will gain an affordable living situation.

**DENSITY  
BONUS**

**Affordable Housing Bonus Program for buildings with 30% below-market-rate units**

**7,501**

households able to afford to live in San Francisco



**POLICY:** The Board of Supervisors voted down an Affordable Housing Bonus Program (AHBP) proposed by Mayor Lee in June 2016. Projects that include 30% or more affordable units for low- and middle-income households would have been able to build more residential units up to an additional two stories than currently allowed under existing zoning regulations.

**SUPPLY CHANNEL:** The San Francisco Planning Department estimates that there are over 240 sites in the city with zero housing units or that are underdeveloped. If developed under current standards, the city estimates that these parcels could hold a

maximum of 900 new affordable units. The Planning Department found that an additional 4,600 market-rate units could be built given the density bonus increases.<sup>16</sup> This additional supply would create a 1.65% decrease in price, which would push 3,501 households across the affordability threshold.

**ACCESS CHANNEL:** In addition to the market-rate units, 4,000 more households would have access to below-market-rate housing, according to the Planning Department, moving them from the unaffordable category to the affordable category.



A Bay Area accessory dwelling unit (ADU)

Source: HDR Remodeling

## RESTRICTING NON-PRIMARY RESIDENCES

### Restrict all non-primary residences in San Francisco

5,020

households able to afford  
to live in San Francisco



**POLICY:** Restricting ownership of second homes (commonly referred to as pied-a-terres) is a popular topic in regions with high housing costs. Denmark, Norway, and Switzerland all limit second-home ownership in some way, Australia limits foreign ownership, and Vancouver recently adopted an additional 15% property transfer tax for foreign buyers. In San Francisco, questions periodically arise regarding the number of non-primary residences in the city and their effect on the housing market.<sup>17</sup>

**SUPPLY CHANNEL:** For the purpose of this analysis, “non-primary” residences are defined as

those used for seasonal, recreational, or occasional use. In 2014, the American Community Survey estimated 7,474 such units existed in San Francisco—less than 2% of the housing stock. A complete ban on non-primary residences would result in an increase in the supply of housing equal to the number of non-primary units.

We use this estimate to forecast an increase in housing supply of 7,474 units. This supply increase corresponds to a 2.68% uniform reduction in prices across the city, moving 5,020 households across the affordability threshold. We assume all newly-returned units are market-rate units, thus there is no access effect.

## ALTERNATIVE UNIT DESIGNS

### Allowing Accessory Dwelling Units (ADUs) to be built on all properties zoned for residential use

4,636

households able to afford  
to live in San Francisco



**POLICY:** San Francisco planning code allows the construction of ADUs—also known as in-law units—in District 3 (North Beach) and District 8 (Castro) and in buildings undergoing seismic retrofits. In July 2016, the San Francisco Board of Supervisors passed an amendment that now allows ADUs to be constructed on all properties zoned for residential use. The recent passage of California Senate Bill 1069 also reduces impediments to ADU construction by lowering up-front fees to owners and by limiting parking requirements.

**SUPPLY CHANNEL:** The San Francisco Planning Department estimates there are 37,000 parcels

within San Francisco that can add at least one ADU under allowable densities. We assume that it is unlikely that all of these eligible parcels will hold an ADU within the next 20 years, and instead consider research conducted around five East Bay BART stations. In a survey of 400 homeowners conducted in 2012, 10% of homeowners said they either planned on constructing an ADU or had tried and failed to build one.<sup>18</sup>

We apply this 10% estimate to the 37,000 eligible parcels, to forecast an increase in housing supply of 3,700 units over 20 years. This supply increase corresponds to a 1.32% uniform reduction in prices across the city, moving 3,155 households across the affordability threshold.

We assume that all ADUs are market-rate units (though their size makes them relatively more affordable), therefore there is no access effect.

**INCOME CHANNEL:** Homeowners that construct ADUs will benefit from rental income. Because ADU construction in San Francisco was only recently legalized, we use Seattle (which began promoting ADUs in 2005) as a comparable. A survey of Seattle ADU owners found average monthly rents of \$1,500

per unit.<sup>19</sup> With San Francisco rents roughly 1.77 times as high as those in Seattle, we conservatively estimate average ADU rents in San Francisco at \$2,660 per month, or \$31,920 annually.

With a high-end for ADU construction costs of \$250,000,<sup>20</sup> we also estimate yearly expenses of \$17,590 (if amortized over 20 years at 3.5%). Given the net annual income of \$14,330, another 1,481 households are able to afford to live in San Francisco below the 30% cost-to-income ratio.

## ALTERNATIVE UNIT DESIGNS

### Facilitating development of more micro-units in San Francisco

3,542

households able to afford to live in San Francisco



**POLICY:** In 2011, the Board of Supervisors passed legislation enabling the construction of micro-units, or efficiency dwelling units. The legislation allows for units as small as 220 square feet comprised of 150 square feet of living space, plus a bathroom and kitchen.

Other high-demand housing markets, including New York, Boston, Portland, and Seattle, have also made zoning changes to allow for micro-unit development. Allowable sizes average approximately 350 square feet. Micro-units generally rent for about 20% to 30% less than a regularly-sized unit, although they rent at a higher rate on a per-square-foot basis, making them viable investments for developers.<sup>21</sup>

While examples of micro-unit development at scale do exist in San Francisco,<sup>22</sup> their growth has yet to accelerate due to parking requirements, unit-mix requirements, and indoor common space requirements.<sup>23</sup>

**SUPPLY CHANNEL:** According to the 2014 American Community Survey, 13.3% of San Francisco's existing housing stock has no bedrooms (i.e., studio

apartments). We assume that this same proportion can be applied to new housing development. The Housing Inventory Report shows San Francisco has built an average of 1,520 housing units annually over the last 20 years in buildings with more than 10 units. Using these estimates, we project that the city will add 202 studio units annually.

If all planned traditional studio apartments (at 650 square feet) were instead built as micro-units (at 325 square feet), San Francisco could increase its unit supply by 202 annually. Over a 20-year period, micro-unit development could add 4,040 units to the city's housing stock—3,555 of which would be market-rate units. This supply increase creates an overall price decrease of 1.27% and moves 3,057 people into an affordable housing cost-to-income ratio.

**ACCESS CHANNEL:** Given an inclusionary zoning requirement of 12%, 485 below-market-rate units would also be created as micro-units, and an additional 485 households would be able to access housing affordable for their incomes.

**DENSITY  
BONUS**

**Affordable Housing Bonus Program for buildings with 100% below-market-rate units**

**2,400**

households able to afford to live in San Francisco



**POLICY:** Although the 30% density bonus program did not pass, the Board of Supervisors did approve an Affordable Housing Bonus Program in June 2016, but one that only provided a density bonus for buildings with 100% below-market-rate units. Under the legislation, developments offering units affordable to those earning less than 80% of the area median income can obtain a 30-foot increase in height bonus, or three stories.

**ACCESS CHANNEL:** Given that the policy only applies to buildings with 100% below-market-rate units, no new market-rate units will be constructed and there is no supply channel effect.

We calculate the access channel effect by first estimating the number of units built in San Francisco in 100% affordable buildings. In San Francisco's 2015 Housing Inventory Report, approximately 1,000 units were new construction in a 100% affordable building; 1,350 units in 100% affordable buildings were in the pre-construction phase; and 1,167 units were in preliminary planning. Assuming that approximately one-third of all these planned projects are constructed within the

year, we estimate that 1,200 units of below-market-rate housing are constructed within entirely below-market-rate buildings each year.

We note that the 1,200 annual construction estimate is likely aggressive given that the 2015 data is taken from the top of the real estate market. Extrapolating this number to 20 years of construction yields 24,000 total below-market-rate units impacted by the policy. Because the density bonus will not apply to those units built following the demolition or conversion of other residential units, we estimate that buildings with only 12,000 units (half of the original estimate) will qualify for the bonus over 20 years.

If these buildings utilize the density bonus to build 20% more units on average,<sup>24</sup> an additional 2,400 below-market-rate units will be constructed when compared to expected development in absence of the 100% Affordable Housing Bonus Program. With each of these units defined as affordable, 2,400 households will achieve a housing cost-to-income ratio below 30%.



## PARKING REQUIREMENTS

### Loosening of Minimum Parking Requirements Across San Francisco

1,115

households able to afford to live in San Francisco



**POLICY:** San Francisco currently has one of the most progressive parking policies in the entire nation. In many areas close to transit, parking is not required to be built with new housing and a maximum number of spaces per unit is enforced. However, many residential areas continue to have a parking requirement with any new construction.

Reducing parking requirements by one space can reduce housing construction costs by \$38,000,<sup>25</sup> as parking garages are expensive to build and take the place of space that could be used for a more productive (and lucrative) housing unit. In Oregon, state transportation policy requires local jurisdictions to reduce the number of parking spaces per capita in order to improve opportunities for transit.<sup>26</sup> We model just a 10% reduction in parking space requirements that would be applied uniformly across San Francisco.

**SUPPLY CHANNEL:** Using the housing development model produced by UC Berkeley's Terner Center for Housing and Innovation, we forecast that a 10% reduction in parking requirements would allow an additional 342 housing pipeline units to be produced. As these units only encompass those that are currently planned, we extrapolate to 20 years using a 3.33x multiplier. Over 20 years, a reduction in parking requirements can produce a total of 1,139 units, 1,002 of which would be market-rate units. This change in housing supply yields a 0.36% decrease in housing prices and allows 978 households to move below the 30% cost-to-income threshold.

**ACCESS CHANNEL:** At a 12% inclusionary requirement, further loosening parking requirements will result in an additional 137 below-market-rate units. Assuming all below-market-rate units are filled by households that otherwise would not be able to comfortably afford to live in the city, 137 households would move into a housing cost-to-income ratio deemed affordable.

## TOP TEN POLICIES THAT WORSEN AFFORDABILITY

### RENT CONTROL

#### Elimination of Rent Control in San Francisco

16,222

households unable to afford to live in San Francisco



**POLICY:** The economic literature shows that imposing rent control causes market inefficiencies and worsens affordability by limiting new housing production.<sup>27</sup> Currently, rent control in San Francisco applies only to rental units in multi-family buildings that have a certificate of occupancy before June 1979, and not to new construction. We model elimination of this current rent control policy, which has *not* been proposed in the city.

Because few jurisdictions have imposed and then ended rent control policies, we use Massachusetts—where residents voted to eliminate rent control in November 1994—as a case study. Boston, Cambridge, and the suburb of Brookline saw their rent control policies end in 1995. Cambridge, which had roughly 16,000 rental units under rent control, reported that nearly 40% of tenants in regulated apartments moved out after rent control ended.<sup>28</sup> City officials concluded that decontrolled rents overall jumped by more than 50% between 1994 and 1997 (from an average of \$504 per month to \$775).

**SUPPLY CHANNEL:** Studies have found that the end of rent control in Massachusetts is associated with no significant change to actual housing production (which is logical because rent control did not apply to new buildings), though it did cause a 6% increase in the probability that a unit goes onto the rental market.<sup>29</sup>

In San Francisco, there are currently 20,440 underutilized units according to the American Community Survey (ACS). This number includes those units that are vacant and those that are used for only

seasonal or occasional use. We apply the 6% increase in probability that a unit is placed on the rental market to these units to find a supply increase of 1,226 units. This supply change produces a 0.44% negative price impact, which would allow an additional 978 households to live in San Francisco affordably.

**ACCESS CHANNEL:** While the end of rent control will have a small, positive supply shock, this effect is far outweighed by the loss of affordable units. A recent SPUR analysis found that the city has a total of 172,000 rent-controlled units.<sup>30</sup> Because rent control policies do not set aside units for households based on their incomes, we cannot simply use the number of rent-controlled units lost for the access channel. Instead, we segment households in regulated units by their housing cost burden using data from 1998, the most recent information available.

The San Francisco Affordable Housing Study from 1998 found that one-third of all households occupying rent-controlled units were paying more than 30% of their income on rent. However, these renters would remain housing-cost burdened after an end to rent control. Our affordability metric focuses on the change in affordability, thus we look at the percentage of renters paying between 25% and 29% of their income on rent. In 1998, this number was 10%, and we apply that same percentage to today's rent-controlled units—10% of the 172,000 existing units equals 17,200 households. We assume an end to rent control will push all of these 17,200 households above the 30% affordability boundary.

**MISSION  
MORATORIUM**

**Indefinite moratorium on market-rate development in the  
Mission District**

**11,177**

households unable to afford  
to live in San Francisco



**POLICY:** San Francisco voters defeated a ballot measure in November 2015 that would have halted construction in the Mission neighborhood for 18 months. However, nothing legally prevents the city from changing land use controls to effectively prohibit new market-rate housing in the Mission indefinitely.

additional \$1,794 per year for housing, on average. We assume that of the 15,000 units zoned for development in the Mission, 12% would be below-market-rate, leaving 13,200 market-rate units unbuilt. This disruption in supply would increase prices by 4.73% and move 9,377 households into the unaffordable category.

**SUPPLY CHANNEL:** The San Francisco Controller's Office found that an indefinite prohibition on market-rate housing construction would lead to higher housing prices. If the city never built the 15,000 new units that are zoned for development in the Mission, future renters and homeowners could pay an

**ACCESS CHANNEL:** Below-market-rate housing units would compose 12% of all unbuilt units in the Mission, or 1,800 units. Assuming each unit would have been occupied by a household currently paying more than 30% of their income on housing, an additional 1,800 households would not be able to access housing affordable for their incomes.



New construction at 299 Valencia added 36 units to the Mission District

Source: SF New Developments



**INCLUSIONARY  
ZONING**

**Increase affordable housing requirement for private developers to 25% of total units constructed**

**5,408**

households unable to afford to live in San Francisco



**POLICY:** Proposition C gives the Board of Supervisors the ability to alter inclusionary zoning requirements through ordinances. While no exact increase has been put in place, a 25% inclusionary policy is the top end currently being modeled in the city’s research, a roughly two times increase from the existing 12% on-site inclusionary policy.

**SUPPLY CHANNEL:** The San Francisco Controller’s Office has an analysis showing that a 25% inclusionary zoning requirement (there are on-site and off-site building and fees that allow for compliance) would cause overall housing development to fall by 25%. Below-market-rate housing development would increase, while market-rate construction would fall.

Based on modeling from the Controller’s Inclusionary Housing Working group, a 25% inclusionary requirement would yield a reduction in the expected housing supply of 7,849 units. This number is composed of 9,977 market-rate units not built and 2,128 additional units of below-market-rate housing constructed between 2017 and 2031. The reduction in market-rate unit development across the city yields an overall price increase of 3.57%. This price increase would shift 7,536 households into an unaffordable housing cost-to-income situation.

**ACCESS CHANNEL:** Below-market-rate housing development has a positive impact on affordability. The units built with the 25% inclusionary requirement will give 2,128 more households access to housing under the 30% cost-to-income ratio.



The planned Treasure Island development will include 25% below-market-rate units

Source: TIDA

**BUILDING  
HEIGHT LIMITS**

**Waterfront development above height limits must have voter approval**

**4,005**

households unable to afford to live in San Francisco



**POLICY:** Proposition B passed in June 2014. The measure requires voter approval for any future construction projects on the San Francisco waterfront that exceed existing height limits found in the zoning and construction code of the city.

**SUPPLY CHANNEL:** The Department of Elections estimated that 3,690 units would be delayed, reduced, or not built if the proposition passed. We assume that half of these units, or 1,845 would not be constructed. This estimate takes into account only developments within the application pipeline. To forecast a 20-year impact, we multiply by 3.33 (our estimate for the number of full turns of the pipeline in

the 20-year period) to find a negative supply impact of 6,144 total units. Of these, 5,406 would be market-rate units. Not constructing these units creates a 1.94% price increase and keeps 3,267 households from acquiring housing at an affordable level for their income.

**ACCESS CHANNEL:** An additional 738 affordable units would never reach construction if zoning height changes were brought to voters. Assuming each unit would have been occupied by a household currently paying more than 30% of their income on housing, an additional 738 households would not be able to access housing affordably.

**INCLUSIONARY  
ZONING**

**Increase affordable housing requirement for private developers to 17% of total units constructed**

**2,196**

households unable to afford to live in San Francisco



**POLICY:** Proposition C, passed in June 2016, amended the city charter to increase affordable housing requirements for market-rate developments with 25 or more units. While no exact increase has been put in place, a 17% inclusionary policy is the bottom end currently being modeled in the city's research.

**SUPPLY CHANNEL:** According to the Controller's Office model, a 17% inclusionary zoning requirement would yield an overall housing production decrease of 13.5%, or 4,245 units. Included in this analysis is decreased market-rate unit production of

5,096 units compared to the expected amount of building before the passage of Proposition C. This reduction of supply produces a housing price increase of 1.82%, which has negative affordability effects for 3,048 households in San Francisco.

**ACCESS CHANNEL:** The increased 17% inclusionary zoning requirement will also yield 852 additional units of below-market-rate housing, which will give 852 more households access to housing under the 30% cost-to-income ratio.



**IMPACT FEES**

**Transit Sustainability Fee in San Francisco**

**2,160**

households unable to afford to live in San Francisco



**POLICY:** Despite opposition from developers, the Board of Supervisors passed a Transit Sustainability Fee in 2015. The per square foot fees approved include \$7.74 for smaller residential projects, which is 25 percent of the total amount that could be legally charged, according to the nexus study.

**SUPPLY CHANNEL:** Using the weighted average of the type of units built from the San Francisco Housing Development Report, an average unit is 1,209

square feet. The legislation will create \$9,350 in cost to construct the average unit.

A review of the literature shows that impact fees raise the price of new housing by about 166% the amount of the fee.<sup>31,32</sup> Thus, the Transit Sustainability Fee adds \$15,500 to the price of new units. With median home prices of \$1.29 million in San Francisco, the fee raises existing prices by 1.2%. The price increase would cause 2,160 households to move above the 30% housing cost-to-income ratio.

**RESTRICTING HOMESHARING**

**Outlawing private short-term home rentals**

**1,556**

households unable to afford to live in San Francisco



**POLICY:** Several recent local policy proposals have sought to restrict homesharing and short-term home rentals (Proposition F in San Francisco in 2015 and a 2016 proposal that called for homesharing companies to be fined \$1,000 per day per unit for listing units that were not lawfully registered in San Francisco). To assess these policies' potential effect on housing affordability, we model the most extreme scenario, an outright ban—Berlin, New York State, and Santa Monica have implemented such bans. While no equivalent San Francisco policy has been proposed, we find that even the most extreme policy would have a negative effect on housing affordability because the elimination of income would increase the number of people burdened by housing costs.

**SUPPLY CHANNEL:** While Airbnb is one of multiple homesharing companies in San Francisco, it is the only one to publish its rental data. Publicly-available data from Airbnb shows 9,448 active listings managed by 7,046 hosts as of March 2016. Of those listings, 3,812 were private rooms or shared spaces and 5,636 were entire home listings.

To calculate the supply impact of a full homesharing ban, we rely on an analysis completed by the San Francisco Chronicle in 2015,<sup>33</sup> which found that 352 entire homes were rented on Airbnb as full-time vacation rentals. We assume all 352 of these entire home listings would immediately return to the traditional rental market under a full ban. To calculate

the 20-year impact of a homesharing ban, we apply the annual growth rate in the number of San Francisco tourists from 2009 to 2015, 3.5%,<sup>34</sup> to find a long-term effect of 680 units.

With this information, we find that a homesharing ban would push San Francisco housing market prices down by 0.24% over 20 years. Given this price change, 918 households would cross the 30% affordability threshold.

**INCOME CHANNEL:** Under a full ban scenario, we assume all other listings would not return to the traditional rental market and their hosts would not be able to recoup their Airbnb income. Many hosts use their income to pay mortgage or rental payments, effectively allowing them to maintain their residence within San Francisco.

We again apply a 3.5% growth rate to the number of hosts to find that 13,340 hosts would lose income under a full ban (7,046 hosts growing at 3.5% annually results in 14,020 total hosts in 20 years; however, 680 would still receive income by returning their homes to the traditional rental market).

Using data collected within San Francisco, the average annual income for Airbnb hosts is estimated at \$13,000.<sup>35</sup> Assuming that hosts are randomly distributed among the population of San Francisco, we find that 2,474 households would become housing-cost burdened without their income from Airbnb.

**INDUSTRIAL SPACE**

**Requiring replacement space for industrial use**

**1,053**

households unable to afford to live in San Francisco



**POLICY:** The November 2016 ballot will include a measure requiring projects that seek to convert or demolish existing space used by production, distribution, repair (PDR) in order to build a greater amount of office space or housing, to obtain a conditional use authorization from the Planning Commission. These projects would also be required to provide a certain amount of new space to replace the PDR or community space that is converted or demolished.

**SUPPLY CHANNEL:** The San Francisco Controller’s Office found that the provision of replacement space is likely to support employment in the PDR and community sectors of the city’s economy,

while curtailing the development of new housing and office space. Approximately 450 housing units would not be constructed according to the analysis over five years. We extrapolate these findings out to 20 years to find that 1,800 units would not be constructed. Of these, 1,584 potential market-rate units would be impacted, causing 837 households to become cost burdened through a 0.57% price increase.

**ACCESS CHANNEL:** Below-market-rate housing units would compose 12% of all unbuilt units under this policy if passed, or 216 units. Assuming each unit would have been occupied by a household currently paying more than 30% of their income on housing, an additional 216 households would not be able to access housing affordably.

**MISSION  
MORATORIUM**

**18-month moratorium on market-rate development in the Mission District**

**871**

households unable to afford to live in San Francisco



**POLICY:** San Francisco voters defeated a ballot measure in November 2015 that would have halted construction in the Mission neighborhood for 18 months.

**SUPPLY CHANNEL:** The San Francisco Controller’s Office found that an 18-month moratorium on market-rate housing construction would impact 780 units currently in the construction pipeline. We assume that of these 780 units zoned for development in the Mission, 12% would be below-market-rate, leaving 686 market-rate units unbuilt. Through a decrease in supply,

this policy would increase prices by 0.25% and move 777 households into the unaffordable category.

**ACCESS CHANNEL:** Below-market-rate housing units would compose 12% of all unbuilt units in the Mission, or 94 units. Assuming each unit would have been occupied by a household currently paying more than 30% of their income on housing, an additional 94 households would not be able to access housing affordable for their incomes under the 18-month moratorium.

**IMPACT  
FEES ON  
DEVELOPMENT**

**Child Care Fee in San Francisco**

**837**

households unable to afford to live in San Francisco



**POLICY:** In January 2015, the Board of Supervisors adopted a citywide requirement for new residential developments to pay a Child Care Fee. The ordinance requires a \$0.91 fee per square foot for new buildings with between one and nine units, and a \$1.83 fee for new buildings with 10 or more units.

**SUPPLY CHANNEL:** For this policy, we were able to directly calculate a price impact using existing research, which shows a correlation between impact fees, reduced rates of construction, and higher home prices.<sup>36</sup> This allowed us to bypass the equation that translates a change in supply to a change in price. Using

the weighted average of the type of units built from the San Francisco Housing Development Report, an average unit is 1,209 square feet. The legislation will create \$2,213 in cost to construct the average unit in a building with 10 or more units.

A review of the literature shows that impact fees raise the price of new housing by about 166% the amount of the fee.<sup>37,38</sup> Thus, the Child Care Fee adds \$3,673 to the price of new units. With median home prices of \$1.29 million in San Francisco, the fee raises existing prices by 0.28%. The price increase would cause 837 households to move above the 30% housing cost-to-income ratio.

# Technical Appendix

A key feature of this analysis is the conversion of housing price shifts to a change in the number of households able to affordably live in San Francisco.

To calculate this change, we utilized the 2014 sample of the American Community Survey, focusing on households in San Francisco that paid for housing in that year. To identify households burdened with unaffordable housing, we constructed a measure of monthly housing costs ( $hc$ ), which equaled gross rent for renters and owner costs for homeowners, and used this variable to generate a new measure ( $h$ ) of the burden of housing costs as a proportion of household income ( $m$ ):

$$h = \frac{hc}{m}$$

Households that do not pay for housing (e.g., outright owners, renters with non-cash rent, homeless) and households with negative or unavailable income were dropped. This sample was also truncated at  $h = 1$ , where housing costs are greater than total income.

Using the definition of housing affordability as housing costs that are 30% or less of income, we found that 36.7% of households in the remaining sample, or 102,059 households, have unaffordable housing ( $Q_{NA} = \#$  households where  $h > 0.3$ ). This number differs from the 131,843 reported by the American Community Survey due to the exclusions we have made, making our methodology conservative from the outset.

To quantify the impacts of the various policies on the affordability of housing on San Francisco households, we took the estimated percentage change in housing prices due to each policy ( $p$ ) and adjusted housing costs for all households in the sample to calculate a post-policy housing cost-to-income ratio,  $h'$ .

$$h' = \frac{hc(1 + p)}{m}$$

Using this new cost-to-income ratio, we found the number of households cost burdened after the policy ( $Q'_{NA} = \#$  households where  $h' > 0.3$ ) and calculated the number of households acquiring or losing affordable housing as a result of the policy:  $\Delta = Q_{NA} - Q'_{NA}$ .

Some policies include an explicit provision for a number of below-market-rate housing units. Assuming that families in need of affordable housing all sort into these below-market-rate units, we determine the number of households acquiring or losing affordable housing.

A select number of policies have implications for household income. In these cases, the housing cost-to-income ratio was recalculated by adjusting household income. We randomly assigned the average monthly income from an income-generating policy ( $m_p$ ) to the proportion of households expected to earn income from that policy and recalculated the housing cost-to-income ratio:

$$\hat{h} = \frac{hc}{m + m_p}$$

Using  $\hat{h}$  we can determine how many households had unaffordable housing after the income-generating policy ( $Q^{\wedge}_{NA} = \#$  households where  $\hat{h} > 0.3$ ). Since this exercise involved random assignment of income, we repeated it 10,000 times and took the average of the results to generate an estimate of the post-policy number of households with unaffordable housing. By comparing the base number of households with unaffordable housing to the post-policy number, we forecasted the number of households acquiring or losing affordable housing ( $\Delta = Q_{NA} - Q^{\wedge}_{NA}$ ).

## ENDNOTES

1. Data taken from the U.S. Department of Commerce, Bureau of Economic Analysis. "Gross Domestic Product by Metropolitan Area, 2015," September 20, 2016.
2. The White House Housing Development Toolkit, September 2016. Accessed at: [https://www.whitehouse.gov/sites/whitehouse.gov/files/images/Housing\\_Development\\_Toolkit%20f.2.pdf](https://www.whitehouse.gov/sites/whitehouse.gov/files/images/Housing_Development_Toolkit%20f.2.pdf).
3. Data taken from U.S. Census Bureau, Table 4, Number and Percentage of People in Poverty by State Using 3-Year Average Over: 2013, 2014, and 2015.
4. Data taken from U.S. Census Bureau, five-year American Community Survey estimates.
5. California Association of Realtors. "Housing Affordability Index – Traditional." Accessed at: <http://www.car.org/marketdata/data/haitraditional/>.
6. Zillow. "Low Housing Supply Squeezes Affordability," March 27, 2015 [Press Release].
7. "California's High Housing Costs: Causes and Consequences," California Legislative Analyst's Office, March 17, 2015.
8. While combining housing and transportation costs presents a more accurate measure of affordability, data limitations have made the creation of a new threshold difficult. See: "Housing Affordability: Myth or Reality?" Wharton Real Estate Center Working Paper, Wharton Real Estate Center, University of Pennsylvania, 1992.
9. Quigley, John M. and Raphael, Steven. "Is Housing Unaffordable? Why Isn't It More Affordable," *Journal of Economic Perspectives*, vol. 18, no. 1 (2004).
10. The inclusion of the supply elasticity component in the equation for the Mission District is due to the fact that reduced building in one San Francisco neighborhood will create higher prices overall and spur more building by developers in other parts of the city. While the citywide policies studied in this analysis are not subject to these "local effects" (i.e., we are not taking into account increased building in Oakland due to higher regional prices caused by reduced supply in San Francisco), we have chosen to keep the supply elasticity component within the equation due to its small size. Given that our goal is the scale the impacts of housing policies, and not to perfectly predict their affordability impacts, utilizing the same equation across all policies allows us to achieve comparability. The 0.02 value for supply elasticity was calculated using historical data, which shows that developers have largely not responded to housing price movements—possibly due to the policies in place that constrain building.
11. Glaeser, Edward L. and Gyourko, Joseph. "The Impact of Building Restrictions on Housing Affordability," *Federal Reserve Bank of New York Economic Policy Review*, June 2003.
12. Research finds that a 1% increase in expected approval times results in a decrease in the probability of development by 0.94%. See: Wrenn, Douglas H. and Irwin, Elena G. "Time is Money: An Empirical Examination of the Effects of Regulatory Delay on Residential Subdivision Development." December 2014. Accessed at <http://dx.doi.org/10.2139/ssrn.2583481>.
13. The average permitting times for new buildings over 250,000 square feet in San Francisco is 71 months, and we assume that the entire pipeline is turned over every six years (either constructed or not built)—resulting in 3.33 pipeline turnovers over 20 years.
14. Noam, Eli. "The Interaction of Building Codes and Housing Prices." *Columbia Institute for Tele-Information*. 1983. Accessed at: <http://www.citi.columbia.edu/elinoam/articles/TheInteractionofBuildingCodesandHousingPrices.pdf>.
15. Cost estimate taken from the Governor's May 2016 Revised Budget Proposal. Accessed at: <http://www.ebudget.ca.gov/2016-17/pdf/Revised/BudgetSummary/HousingandLocalGovernment.pdf>.
16. "Affordable Housing Bonus Program, CPC Informational," San Francisco Planning Department, November 5, 2015.
17. "Non-Primary Residences and San Francisco's Housing Market." San Francisco Bay Planning and Urban Research, October, 2014.
18. Chapple, Karen et al. "Yes in My Backyard: Mobilizing the Market for Secondary Units." Center for Community



## ENDNOTES, CONTINUED

- Innovation, June 2012. Accessed at: <http://communityinnovation.berkeley.edu/reports/secondary-units.pdf>.
19. Young, Bob. "Big interest in little backyard houses: Will Seattle ease the rules?" *The Seattle Times*, December 19, 2015.
  20. Brown, Martin J. and Palmeri, Jordan. "Accessory Dwelling Units in Portland, Oregon: Evaluation and Interpretation of a Survey of ADU Owners." Prepared for the State of Oregon Department of Environmental Quality. June 2014. Accessed at: <http://www.deq.state.or.us/lq/sw/docs/SpaceEfficient/adusurveyinterpret.pdf>.
  21. Urban Land Institute. "The Macro View on Micro Units," 2014. Accessed at: [http://uli.org/wp-content/uploads/ULI-Documents/MicroUnit\\_full\\_rev\\_2015.pdf](http://uli.org/wp-content/uploads/ULI-Documents/MicroUnit_full_rev_2015.pdf).
  22. Developer Panoramic Interests has constructed or planned for multiple micro-unit projects in the South of Market area. At 38 Harriet, Panoramic Interests has constructed a 23-unit building featuring apartments that are 295 square feet.
  23. Gabbe, C.J. "Looking Through the Lens of Size: Land Use Regulations and Micro-Apartments in San Francisco." U.S. Department of Housing and Urban Development, Office of Policy Development and Research, *Cityscape: A Journal of Policy Development and Research*, vol. 17, no. 2 (2015).
  24. Three Mission District projects are taking advantage of the 100% Affordable Housing Bonus Program: 1296 Shotwell Street (96 units), 1950 Mission Street (160 units), and 490 South Van Ness (72 units).
  25. Shoup, Donald. "The High Cost of Minimum Parking Requirements." *Transport and Sustainability*, Volume 5. 2014. Accessed at: <http://shoup.bol.ucla.edu/HighCost.pdf>.
  26. Fung, Esther. "More Developers Kick Parking Lots to the Curb," *The Wall Street Journal*, September 13, 2016.
  27. Gyourko, Joseph and Linneman, Peter. "Equity and Efficiency Aspects of Rent Control: An Empirical Study of New York City." *Journal of Urban Economics*, vol. 26, pp. 54-74 (1989).
  28. Autor, David H., Palmer, Christopher J., and Pathak, Parag A. "Housing Market Spillovers: Evidence from the End of Rent Control in Cambridge, Massachusetts." *Journal of Political Economy*, vol. 122, no. 3 (2014).
  29. Sims, David P. "Out of control: What can we learn from the end of Massachusetts rent control?" *Journal of Urban Economics*, vol. 61, pp. 129-151 (2007).
  30. Metcalf, Gabriel. "8 Ways to Make San Francisco More Affordable: Proposals to solve the housing affordability crisis," *SPUR*, February 11, 2014.
  31. Blanco, Hilda et al. "The Effect of Impact Fees on the Price of New Single-family Housing." *Urban Studies* Vol. 41. June 2004.
  32. Rosenthal, Larry A. and Quigley, John M. "The Effects of Land Use Regulation on the Price of Housing: What Do We Know? What Can We Learn?" U.S Department of Housing and Urban Development. 2005.
  33. Said, Carolyn. "The Airbnb Effect," *San Francisco Chronicle*, July 12, 2015. Accessed at: <http://www.sfchronicle.com/airbnb-impact-san-francisco-2015/#1>.
  34. The 3.5% annual growth is calculated using estimates from the San Francisco Travel Association. In 2009, 15.4 million tourists visited San Francisco. In 2015, that number had increased to 18.9 million.
  35. Lackner, Abby et al. "The Airbnb Community in San Francisco." *Time*. June 2015. Accessed at: <https://timedotcom.files.wordpress.com/2015/06/the-airbnb-community-in-sf-june-8-2015.pdf>.
  36. Skidmore, Mark and Peddle, Michael. "Do Development Impact Fees Reduce the Rate of Residential Development? Growth and Change," vol. 29, pp. 383-400 (1998).
  37. Blanco, Hilda et al. "The Effect of Impact Fees on the Price of New Single-family Housing." *Urban Studies* Vol. 41. June 2004.
  38. Rosenthal, Larry A. and Quigley, John M. "The Effects of Land Use Regulation on the Price of Housing: What Do We Know? What Can We Learn?" U.S Department of Housing and Urban Development. 2005.



## **Bay Area Council Economic Institute**

353 Sacramento Street, Suite 1000, San Francisco, CA 94111

Phone: (415) 981-7117 | Fax: (415) 981-6408

[www.bayareaeconomy.org](http://www.bayareaeconomy.org) | [@bayareaeconomy](https://twitter.com/bayareaeconomy) | [bacei@bayareacouncil.org](mailto:bacei@bayareacouncil.org)