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September 17, 2021

Mayor Serratto
City of Merced
678 West 18th Street
Merced, CA 95340

Mayor Serratto and Council:

Re: Council meeting agenda item K4

Thank you for the leadership you demonstrated on September 7th in adopting the staff recommendations on housing policy. The item before you tonight is an extension of that discussion and your leadership is necessary again.

The issue of "enforcement" to achieve attainable housing is not isolated to Merced, all jurisdictions in California are facing this same issue due to forces beyond the control of any local jurisdiction. Cities are addressing this issue with two distinct methods, one of them is to implement price controls on a percentage of new housing, these price controls are sometimes referred to as Inclusionary Zoning. The other method is implementing size control on a percentage of new housing, this method is sometimes referred to as Affordable by Design.

The study we sent you two weeks ago from PLNU highlights the failure of using price controls on housing to achieve more affordability. Tonight, I offer you an example of the success of using size control to increase housing attainability. In the community of Mountain House, located between Livermore and Tracy, they required 10% of all new housing units to be a duplex or Accessory Dwelling Unit (ADU). Ten years after implementing this requirement the free market is now producing over 20% of all new units as duplexes or ADUs. This voluntary increase took a decade to achieve but it has resulted in a booming housing market with diversity and inclusion of small rental units interwoven with ownership units. The exact result I believe you are seeking in Merced.

To further illustrate the problem we face in California and the Central Valley, I am attaching two recent studies from UC Berkeley Terner Center for Housing Innovation. In The Costs of Affordable Housing Production they studied the actual cost of producing an "affordable" unit in California and in the Central Valley. They found that the average cost per door for

"affordable" units is $480,000. In the Central Valley they found producing "affordable" units cost $300 per square foot. Looking at market rate housing construction, not including the cost of land, entitlements, fees or profit, they found the construction costs in the Central Valley to be $250 per square foot.

I've attached a spreadsheet which demonstrates how these costs of production, translate to an "affordable" unit in the Central Valley to be no larger than 940 square feet. To build anything larger than a 940 square foot unit and offer it at an "affordable" price would require the builder to lose money on the unit. Arguably, this could be viewed as a "taking" under the 5th amendment. Also attached is a concurring statement from U.S. Supreme Court Justice Clarence Thomas regarding the issue of IZ and why they did not take up the case of CBIA vs. San Jose.

Using this information, the City of Merced could require (enforcement) 10 percent of all new housing units be 940 square feet or less. Using size control instead of price controls, where it's been done, has proven successful. And it avoids the negative impacts and potential legal hurdles of implementing an IZ policy.

The BIA looks forward to continuing our working relationship with the City of Merced on this and other housing policy issues.

Respectfully,

John R. Beckman
Chief Executive Officer

Merced County Housing Authority

INCOME LIMITS

Effective 4/01/21

Number of Persons in Household	Poverty Guidelines	Extremely Low Income as published by HUD	Very Low Income as published by HUD	Low Income as published by HUD
1	12,880	14,650	24,400	39,050
2	17,420	17,420	27,900	44,600
3	21,960	21,960	31,400	50,200
4	26,500	26,500	34,850	55,750
5	31,040	31,040	37,650	60,250
6	35,580	35,580	40,450	64,700
7	40,120	40,120	43,250	69,150
8	44,660	44,660	46,050	73,600
9	49,200	48,800	48,800	78,050
10	53,740	51,600	51,600	82,550
11	58,280	54,400	54,400	87,000
12	62,820	57,200	57,200	91,450

Median Income for Merced County is: $66,400

Median income for a family of four	30% of monthly income towards housing costs is deemed "affordable" - Annually 30% equals	Broken down to a monthly amount towards housing this is what a household can pay for housing and it is still defined as "affordable"	A monthly mortgage payment with 10% down 30 year fixed rate at 3.8% very low interestrate, paying the "affordable" monthly payment gets a loan amount of:	Using a production cost of $250 per square foot, **not including the cost of land, fees or profit**. The "affordable" loan amount produces a house of this size.
$66,400	$19,920.00	$1,660.00	$280,000	1,120 Sq. Ft. Unit
Low income family of four meidan income				
$55,750	$16,725.00	$1,393.75	$235,000	940 Sq. Ft. Unit

SUPREME COURT OF THE UNITED STATES

CALIFORNIA BUILDING INDUSTRY ASSOCIATION *v.* CITY OF SAN JOSE, CALIFORNIA, ET AL.

ON PETITION FOR WRIT OF CERTIORARI TO THE SUPREME COURT OF CALIFORNIA

No. 15–330. Decided February 29, 2016

The petition for writ of certiorari is denied.

JUSTICE THOMAS, concurring in the denial of certiorari.

This case implicates an important and unsettled issue under the Takings Clause. The city of San Jose, California, enacted a housing ordinance that compels all developers of new residential development projects with 20 or more units to reserve a minimum of 15 percent of for-sale units for low-income buyers. See San Jose Municipal Ordinance No. 28689, §§5.08.250(A), 5.08.400(A)(a) (2010). Those units, moreover, must be sold to these buyers at an "affordable housing cost"—a below-market price that cannot exceed 30 percent of these buyers' median income. §§5.08.105, 5.08.400(A)(a); see Cal. Health & Safety Code Ann. §§50052.5(b)(1)–(4) (West 2014). The ordinance requires these restrictions to remain in effect for 45 years. San Jose Municipal Ordinance No. 28689, §5.08.600(B); Cal. Health & Safety Code Ann. §33413(C). Petitioner, the California Building Industry Association, sued to enjoin the ordinance. A California state trial court enjoined the ordinance, but the Court of Appeal reversed, and the Supreme Court of California affirmed that decision. 61 Cal. 4th 435, 351 P. 3d 974 (2015).

Our precedents in *Nollan* v. *California Coastal Comm'n*, 483 U. S. 825 (1987), and *Dolan* v. *City of Tigard*, 512 U. S. 374 (1994), would have governed San Jose's actions had it imposed those conditions through administrative action. In those cases, which both involved challenges to administrative conditions on land use, we recognized that

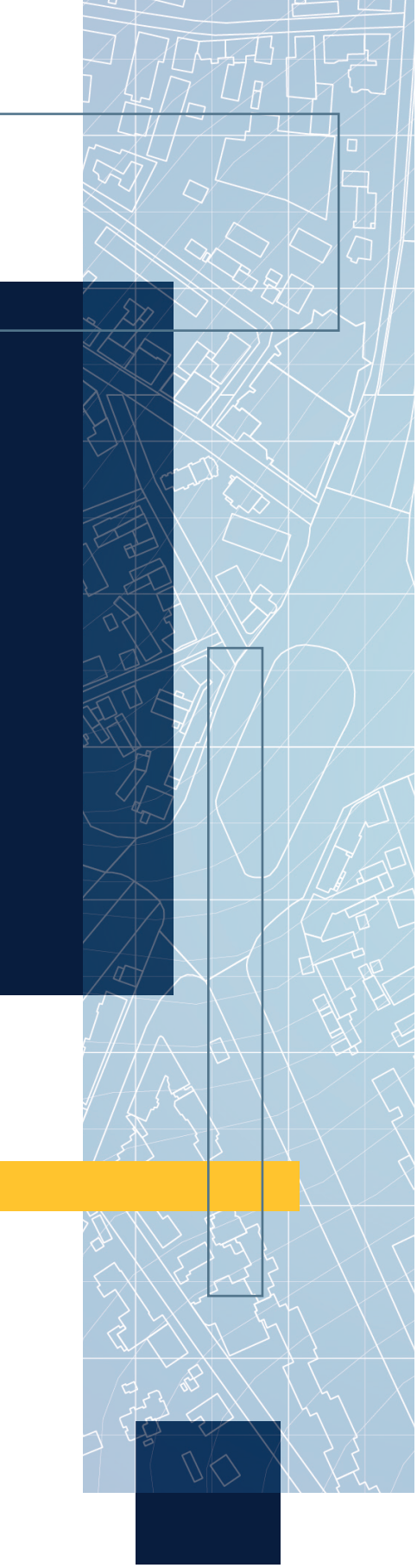
governments "may not condition the approval of a land-use permit on the owner's relinquishment of a portion of his property unless there is a 'nexus' and 'rough proportionality' between the government's demand and the effects of the proposed land use." *Koontz* v. *St. Johns River Water Management Dist.*, 570 U. S. ___, ___ (2013) (slip op., at 1) (describing *Nollan/Dolan* framework).

For at least two decades, however, lower courts have divided over whether the *Nollan/Dolan* test applies in cases where the alleged taking arises from a legislatively imposed condition rather than an administrative one. See *Parking Assn. of Georgia, Inc.* v. *Atlanta,* 515 U. S. 1116, 1117 (1995) (THOMAS, J., dissenting from denial of certiorari). That division shows no signs of abating. The decision below, for example, reiterated the California Supreme Court's position that a legislative land-use measure is not a taking and survives a constitutional challenge so long as the measure bears "a reasonable relationship to the public welfare." 61 Cal. 4th, at 456–459, and n. 11, 351 P. 3d, at 987–990, n. 11; compare *ibid.* with, *e.g., Home Builders Assn. of Dayton and Miami Valley* v. *Beavercreek*, 89 Ohio St. 3d 121, 128, 729 N. E. 2d 349, 356 (2000) (applying the *Nollan/Dolan* test to legislative exaction).

I continue to doubt that "the existence of a taking should turn on the type of governmental entity responsible for the taking." *Parking Assn. of Georgia, supra,* at 1117–1118. Until we decide this issue, property owners and local governments are left uncertain about what legal standard governs legislative ordinances and whether cities can legislatively impose exactions that would not pass muster if done administratively. These factors present compelling reasons for resolving this conflict at the earliest practicable opportunity.

Yet this case does not present an opportunity to resolve the conflict. The City raises threshold questions about the timeliness of the petition for certiorari that might preclude

us from reaching the Takings Clause question. Moreover, petitioner disclaimed any reliance on *Nollan* and *Dolan* in the proceedings below. Nor did the California Supreme Court's decision rest on the distinction (if any) between takings effectuated through administrative versus legislative action. See 61 Cal. 4th, at 461–462, 351 P. 3d, at 991–992. Given these considerations, I concur in the Court's denial of certiorari.



TERNER CENTER FOR HOUSING INNOVATION
UC BERKELEY

A TERNER CENTER REPORT - MARCH 2020

The Costs of Affordable Housing Production: Insights from California's 9% Low-Income Housing Tax Credit Program

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Introduction

In February of 2016, California's Legislative Analyst's Office (LAO) reported that California's shortfall of subsidized housing units—affordable to those who earn 80 percent or less of the median income where they live—was about 1.7 million housing units.[1] The LAO estimated that closing this shortfall through new construction would cost in excess of $250 billion in public subsidies, though the report also noted: "There is a good chance the actual cost could be higher."

That caveat now seems prescient. Between 2016 and 2019, the costs to develop a new affordable unit under the Low-Income Housing Tax Credit (LIHTC) program have increased from $425,000 per unit to more than $480,000 per unit, an increase of 13 percent in just four years (after accounting for inflation). Costs per square foot have increased by 30 percent over the same time period, reaching $700 per square foot in 2019. A report by the federal Government Accountability Office (GAO) found that average development costs for new LIHTC projects in California were the highest in the nation, eclipsing those in New York City.[2]

These escalating costs represent a significant challenge to a state struggling with an affordable housing crisis, and erode the impact of the increased public subsidies directed toward building new housing. Understanding why it costs so much to build new housing can help to identify opportunities for the state and localities to bring down the price of development. In this brief, we analyze the factors that influenced total development costs for new construction projects that were awarded 9% tax credits through the LIHTC program between 2008 and 2019. We also interviewed developers and general contractors to better understand the mechanisms contributing to these cost increases. While the 9% LIHTC program represents only one of the ways that subsidized housing is built in California, the data collected through the application process provide valuable insights into the factors that influence development costs.

The research shows that hard construction costs—specifically the costs of material and labor—are the primary driver of rising development costs. The shortage in the construction labor market and higher prices for general contractors (as well as the subcontractors they hire) is affecting affordable housing development—just as this shortage impacts market-rate development. The research also highlights the importance of other costs, including local development fees, lengthy entitlement processes, parking requirements, prevailing wages or local hire requirements, and state and local design

This report is part of the Terner Center's The Cost of Building Housing Research Series, which examines the different cost factors that layer together to comprise the total costs to build housing in California. Accompanying this report, we have also released The Hard Costs of Construction: Recent Trends in Labor and Material Costs for Apartment Buildings in California, which looks specifically at the factors influencing hard construction costs in both market and affordable developments. Previous studies include Making It Pencil: The Math Behind Housing Development, in which we outline how land costs, construction costs, local fees, and financing costs all contribute to the total development cost for a housing project. In our work on impact fees and development fees, we found that waning tax revenue and the loss of state and federal funding for infrastructure resulted in rising local exactions on new housing. And in Perspectives: Practitioners Weigh in on Drivers of Rising Housing Construction Costs in San Francisco, we examined the ways in which lengthy permitting processes as well as local regulations and requirements can increase the cost of both market-rate and affordable housing projects.

regulations (including those that require more sustainable building techniques). In other words, affordable housing development is not immune to the same cost drivers pushing up the costs of market-rate developments, nor to all the ways building in California is more expensive than in other states. However, the research also highlights that affordable housing developers face a cost that market-rate developers don't: the increased complexity in financing affordable projects and the need to manage multiple funding sources that add requirements and delays to every project.

The report proceeds as follows. First, we describe the data and methodology used in this report. Second, we present findings from the descriptive analysis, interweaving the quantitative and qualitative data to describe the factors that contribute to affordable housing development costs. We then present a multivariate regression model that allows us to assess which factors have a significant effect on costs, controlling for differences in project type and location. Development costs are influenced by what is being built and where—for example, an infill project with 10 stories and underground parking in San Francisco will face different costs than a low-rise building with surface parking in the Central Valley. A regression model allows us to control for those differences and identify the cost drivers more precisely. We conclude with policy recommendations as well as a discussion of the limitations of the current analysis. The solutions are not straightforward, and ultimately require additional data and research on development costs as well as approaches to cost containment that do not forgo the mission of providing high-quality affordable housing.

Methodology

This paper focuses on affordable housing built with Low-Income Housing Tax Credit (LIHTC) financing. Since 1986, the LIHTC program has been the most important source of funding for the construction of affordable housing. In California, more than 225,000 new units have been funded under the LIHTC program; our research has shown that the program contributes significantly to the development of high-quality properties that promote housing stability and economic security for low-income families.[3]

This paper focuses on new construction projects that were awarded 9% tax credits through the LIHTC program between 2008 and 2019.[4] The 9% LIHTC program represents only a slice of the affordable housing units built in California: LIHTC also includes a 4% tax credit program, and subsidized housing can also be funded through federal or state grants or through local inclusionary programs. This means that the results presented here may not apply to all affordable housing developments. However, California's Tax Credit Allocation Committee (TCAC) makes data on 9% projects publicly available, providing an opportunity to study what is influencing the costs of these projects. To collect the data, the Terner Center filtered through and entered data by hand for 724 projects.[5] The data primarily come from submitted tax credit applications, including the information provided in the overview section of the application, the Sources and Uses table—which provides detailed data on the sources of funding and cost line items—and the claimed Basis Boosts.[6] We cross-checked these data against TCAC staff reports on each individual project. If there was a discrepancy

between the information presented in the application and in the staff report, we deferred to the data in the staff report. However, it is important to note that these data reflect the developer's estimates of project costs at time of application, and not the final costs after the development is completed. As a result, the data in this report should be considered conservative estimates of the total costs of development.[7]

The resulting dataset includes 678 new construction projects awarded 9% tax credit funding between 2008 and 2019.[8] Table 1 presents general information about the sample. Approximately 60 percent of the sample constitutes projects designed for families, and the majority (70 percent) are between 40 and 100 units. Approximately 30 percent of the projects are located in Los Angeles, but the sample includes projects across all of California's regions, as well as across all of the years in the sample.

Table 1 also shows the distribution of project characteristics that could influence development costs, including amenities like structured parking[9] or an elevator. Nearly 60 percent of projects included a requirement that contractors pay prevailing wage, 70 percent were assessed local development fees, and almost half included some form of sustainable building techniques, such as energy or water conservation measures or the use of natural materials. More than three-quarters of projects included at least four separate sources of funding.

We also find that more than half (59 percent) of the projects in our sample are sited in either "High Segregation & Poverty" or "Low-Resource" neighborhoods. These designations are based on the 2018 amendments to California's Qualified Allocation Plan (QAP)—the policy document that guides state requirements and guidelines for tax credit projects—and are designed to encourage more development in higher-resource communities.[10] TCAC's decision to incentivize building in higher-resourced neighborhoods is aligned with research that increasingly points to the negative effects of living in neighborhoods characterized by high levels of segregation and poverty, particularly for children.[11]

In addition to the quantitative data analysis, we interviewed 13 affordable housing developers and general contractors in order to better understand the results of the quantitative analysis. Interviews included questions about a) the changing context for affordable housing development in the state, b) the biggest contributors to costs from the respondents' perspective, c) the factors that they felt put up the greatest barriers to cost containment, and d) the approaches they and/or policymakers have taken to bring down the costs of development. Each of the interviews was transcribed and coded to identify common themes from across all 13 respondents.

Table 1: Descriptive Statistics, LIHTC 9% New Construction Projects, 2008 - 2019

Project Type			**Project Characteristics**	
Large Family	412		Prevailing Wage	59.8%
Senior	126		Development Fees	69.5%
Special Needs/SRO	140		Sustainable Construction	41.8%
Number of Units			Structured Parking	32.1%
Small (Less than 40 units)	155		Elevator	39.2%
Medium (40-100 units)	448		**Number of Funding Sources**	
Large (More than 100 units)	50		Less than 4	11.5%
Regional Distribution			4 to 8	79.9%
Capital North	39		More than 8	8.6%
Central Coast	71		**Year of Project Award**	
Central Valley	93		2008	29
Inland Empire	55		2009	52
Los Angeles	191		2010	61
North and East Bay	56		2011	78
Orange	41		2012	64
Rural	32		2013	53
San Diego	54		2014	65
San Francisco	12		2015	61
South and West Bay	34		2016	59
Neighborhood Opportunity Ranking			2017	54
Highest Resource	10.1%		2018	55
High Resource	11.1%		2019	47
Moderate Resource	19.4%		**Total Projects**	678
Low Resource	31.2%			
High Segregation & Poverty	27.9%			

General Trends in Affordable Housing Development Costs

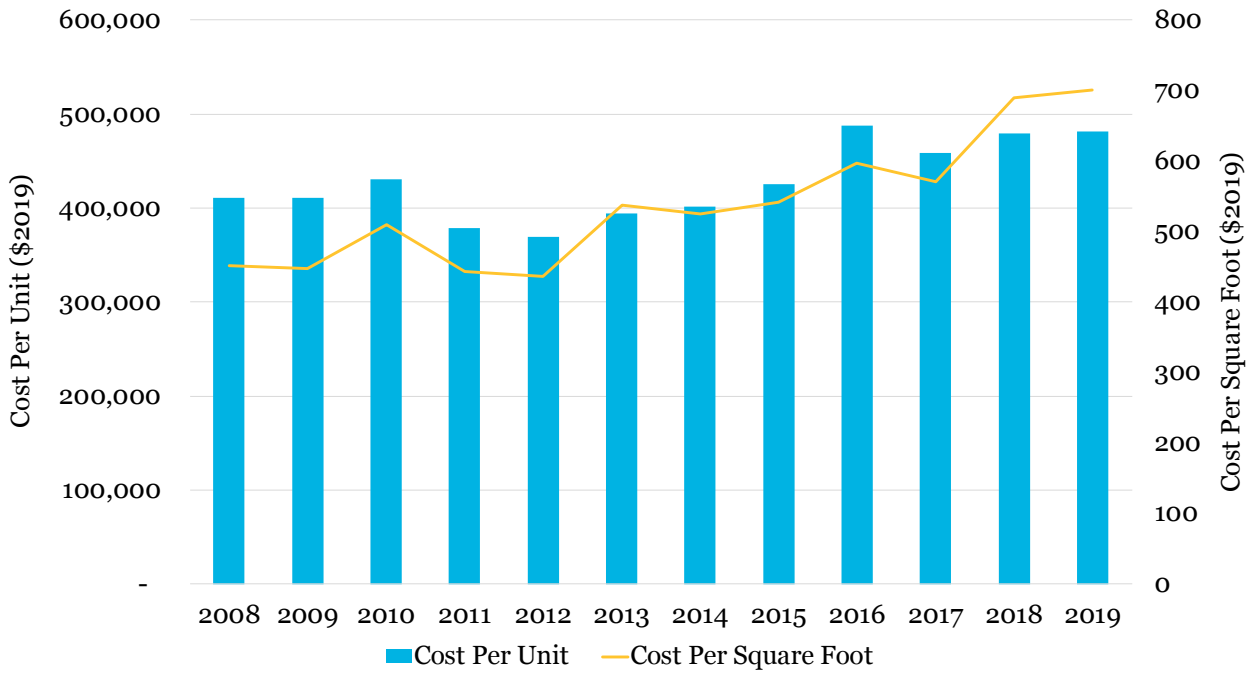
In this section, we present the results of the descriptive analysis, discussing the major cost drivers that have led to significant increases in average LIHTC development costs over time. In all of these analyses, we adjust costs for inflation to 2019 dollars using the Bureau of Labor Statistics' national CPI index for urban consumers. We also present the costs adjusted by unit and by square feet, since these two metrics present slightly different results (as units have generally gotten smaller over time).

Total development costs have risen dramatically since 2008.

Several studies in recent years have pointed to the high and rising costs of LIHTC development in California; our analysis shows that this trend continues unabated. Figure 1 presents data on total development costs from 2008 and 2019, adjusted for inflation and averaged by the cost per unit and the cost per square foot. Since 2008, the average cost per unit of 9% LIHTC new construction increased from $411,000 to $480,000, an increase of over 17 percent. The cost per square foot has risen even more dramatically, from $451 per square foot in 2008 to $700 per square foot in 2019, an increase of 55 percent. (In part, the difference in these two measures relate to what is being developed: in recent years, the number of square feet per unit has gone down, as has the number of bedrooms per unit.)

This increase in costs has material consequences for the supply of new affordable housing—in broad terms, the same amount of public subsidy is now needed to build two units at 1,000 square feet as was needed for three units just 10 years ago.

Figure 1: Total Development Costs, LIHTC 9% New Construction Projects, 2008 - 2019



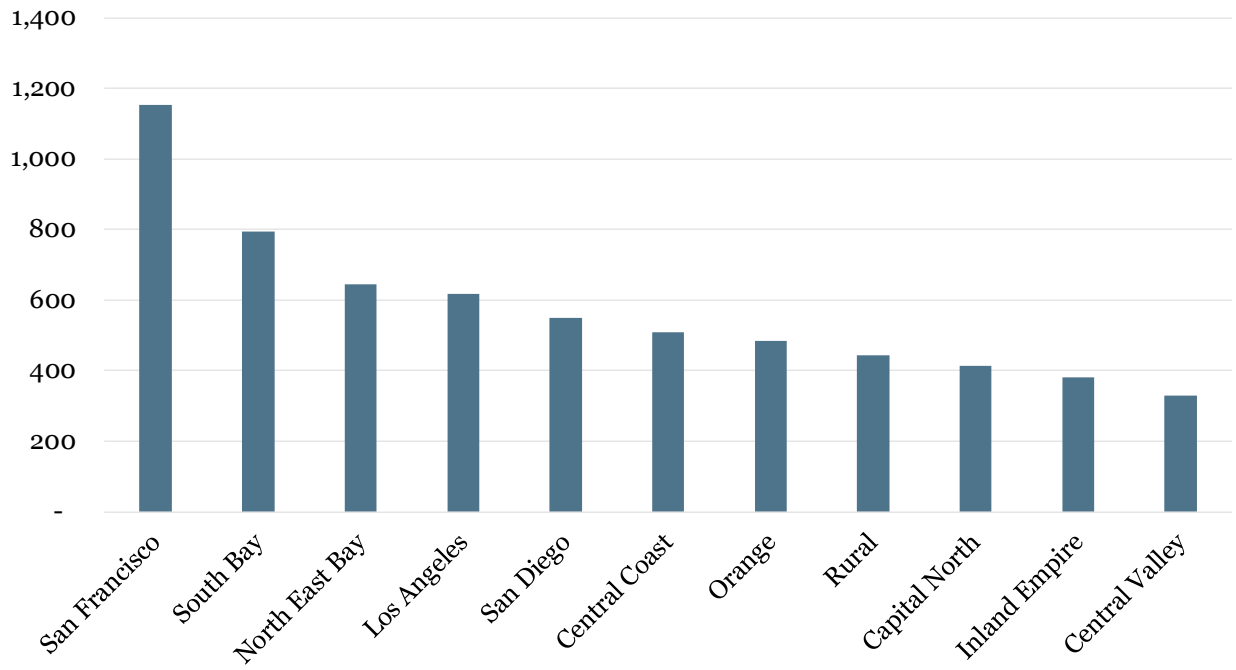
Source: Terner Center Analysis of TCAC 9% LIHTC Project Applications. All figures adjusted for inflation.

Total development costs vary substantially by region, and are most expensive in California's San Francisco Bay Area.

The statewide average in development costs obscures significant regional variation (Figure 2). Projects in San Francisco cost significantly more than in any other part of the state, averaging $1,100 per square foot for all projects built between 2008 and 2019. In contrast, projects in the Central Valley cost approximately $330 per square foot. However, even in the Central Valley, development costs are still higher than the national average—while comparable data are hard to come by, between 2013 and 2017, multifamily developments nationally cost between $148 and $233 per square foot to build.[12]

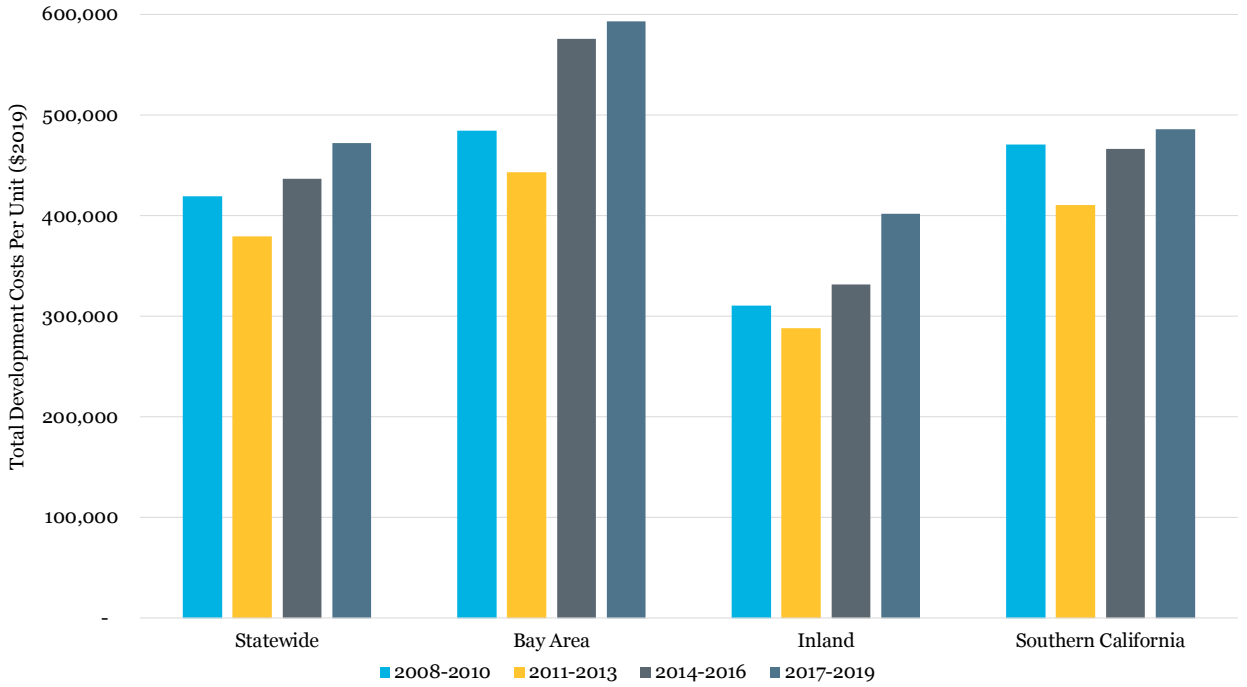
In Figure 3, we present broader regional trends over time, grouping project awards into 3-year intervals that follow broader economic trends.[13] All the regions experienced a decline in total development costs during the 2011-2013 time period, reflecting the economic recession and housing market slowdown in California. Since then, however, costs have only escalated. Statewide, development costs per unit have increased 12.6 percent from 2008-2010 to 2017-2019. Projects in the greater San Francisco Bay Area—which includes Oakland and San Jose—increased by 22.4 percent to an average of almost $600,000 per unit in the past three years. While lower than the rest of the state, inland areas (including the Central Valley, Inland Empire, and rural TCAC regions) experienced the greatest percent increase in development costs since the recession. Projects in these geographies saw a 30 percent increase from 2008-2010 to 2017-2019.

Figure 2: Average 9% LIHTC Development Costs Per Square Foot by TCAC Region, 2008-2019



Source: Terner Center Analysis of TCAC 9% LIHTC Project Applications. All figures adjusted for inflation. Data are presented by square foot in part to account for differences in unit size across regions.

Figure 3: Regional Differences in Total Development Costs Per Unit Over Time



Source: Terner Center Analysis of TCAC 9% LIHTC Project Applications. All figures adjusted for inflation.

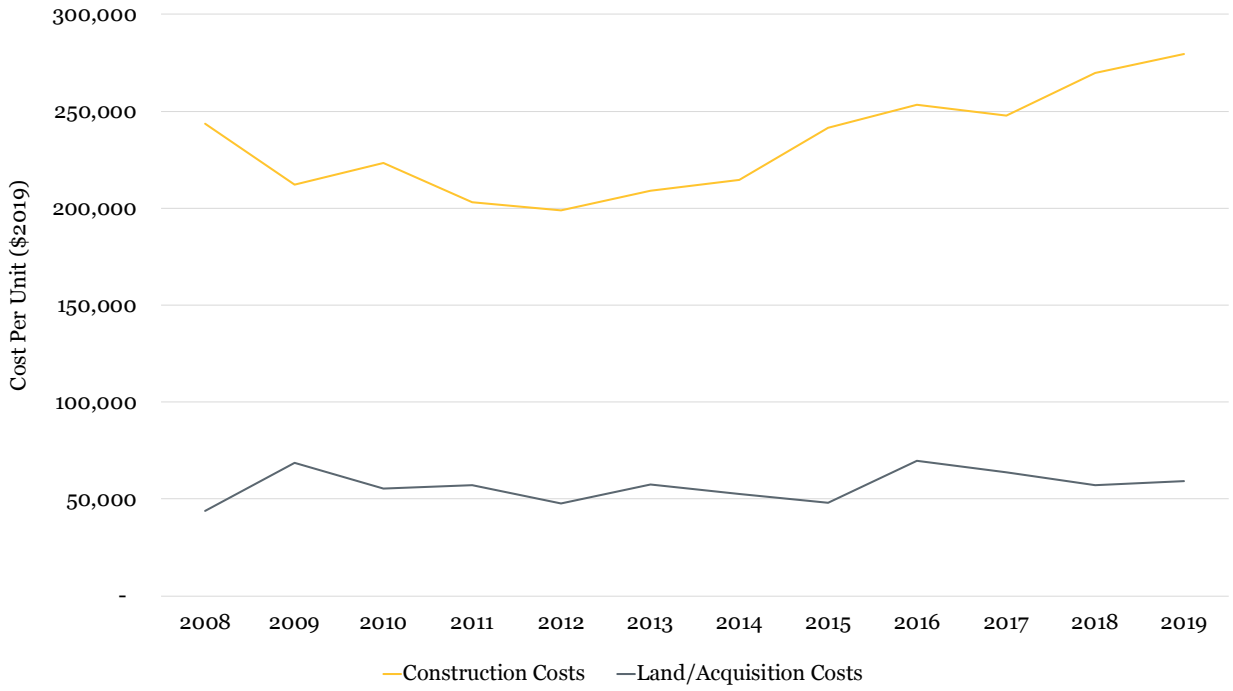
The main driver of these increases is hard construction costs.

Total development costs are made up of a lot of different line items, including land or property acquisition costs, construction costs, architectural/engineering costs, local development fees, as well as fees associated with the "soft" costs of development (e.g., legal fees, appraisals, and insurance). In Figure 4, we compare the change in land costs with the change in hard construction costs over time. Although reporting of land costs can vary across LIHTC projects (since some projects rely on donated land and don't always include the full amount of what that land would cost at market valuation), in general, the reported costs of land acquisition has remained largely flat since the end of the recession.

In contrast, hard construction costs have increased by 40 percent since 2012. Interviews further emphasized the role of construction in driving the upward trend in costs; developers consistently pointed to the bids coming from their general contractors as the key factor contributing to cost increases. One affordable housing developer who works largely in the Bay Area shared that "when I look at all the lines of a pro forma, what has changed most dramatically is the pricing that is coming from the general contractor. Prices have increased nearly 50 percent in terms of the dollars per square foot in the past few years. I don't think that we are designing buildings that look or operate much differently. It's the materials and labor costs coming from the contracting end that have changed."

As we discuss in more detail in the report The Hard Costs of Construction: Recent Trends in Labor and Material Costs for Apartment Buildings in California, it is hard to disentangle the relative contribution of labor versus materials on hard construction costs. For example, a contractor will generally provide a bid sheet with just the total amount it will cost to install the drywall or electrical work on a project. This bid sheet rarely itemizes the share of the costs that are going to labor. Interviews

Figure 4: Trends in Hard Construction and Land Acquisition Costs, California 9% LIHTC Projects, 2008 - 2019



with general contractors suggested that both factors play a role– with tariff battles contributing to increased material costs for lumber and metal—but emphasized that the bulk of the rising costs was coming from labor. Figure 5 displays trends in general contractor wages between 2008 and 2018 for Los Angeles, San Francisco, and California—while increases have been most dramatic in San Francisco, wages overall have increased faster than the cost of inflation.

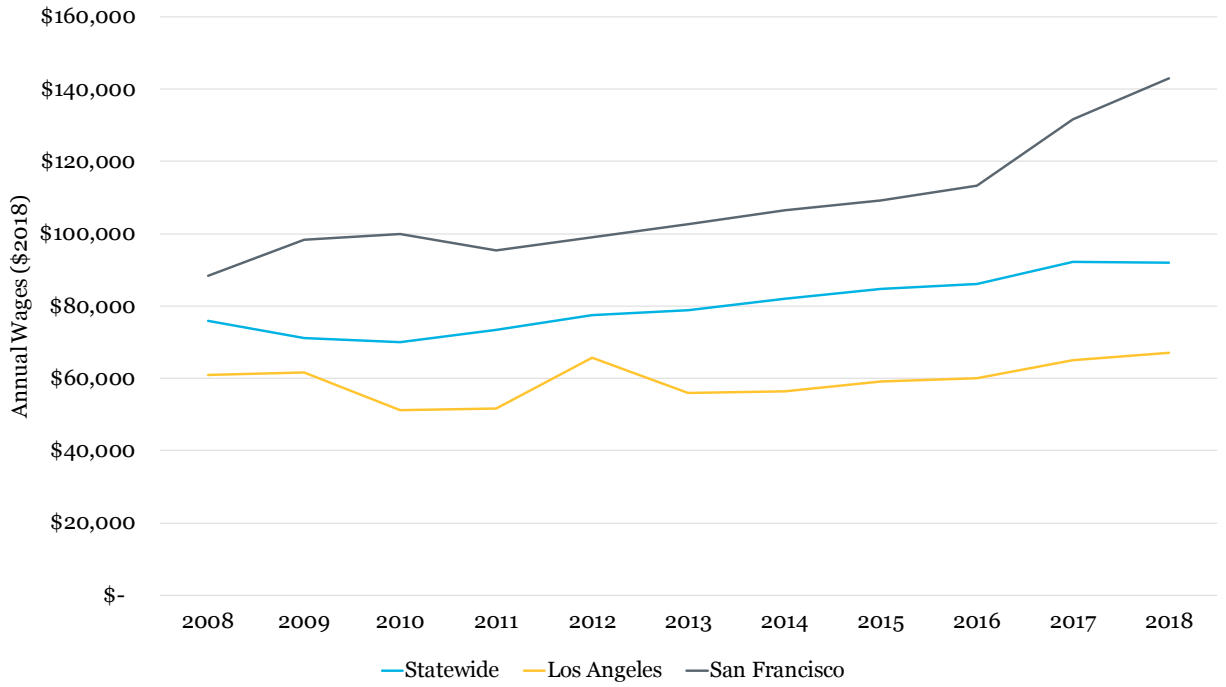
The role of wages in driving cost increases is not unique to affordable housing development. Since the recession, there has been a significant mismatch between the number of permitted units—increasing more than 430 percent between 2009 and 2018—and the growth in the construction sector, where the number of workers has only expanded by 32 percent.[14] General contractors noted that anti-immigration rhetoric, as well as a tight labor market overall, has made it hard to find construction workers, let alone workers with more multifamily construction experience and/or those trained in the specific trades.

Prevailing wage requirements are associated with higher average development costs.

In addition to the general labor market shortage driving up wage costs, affordable housing developments are also often required to pay prevailing wages. Prevailing wages are determined by the California Department of Industrial Relations, and are usually based on rates specified in collective bargaining agreements. Although the LIHTC program does not trigger prevailing wage requirements, LIHTC projects often layer other forms of public funding that do require either federal or state prevailing wage, or they may be subject to local project labor agreements for their construction contracting.[15]

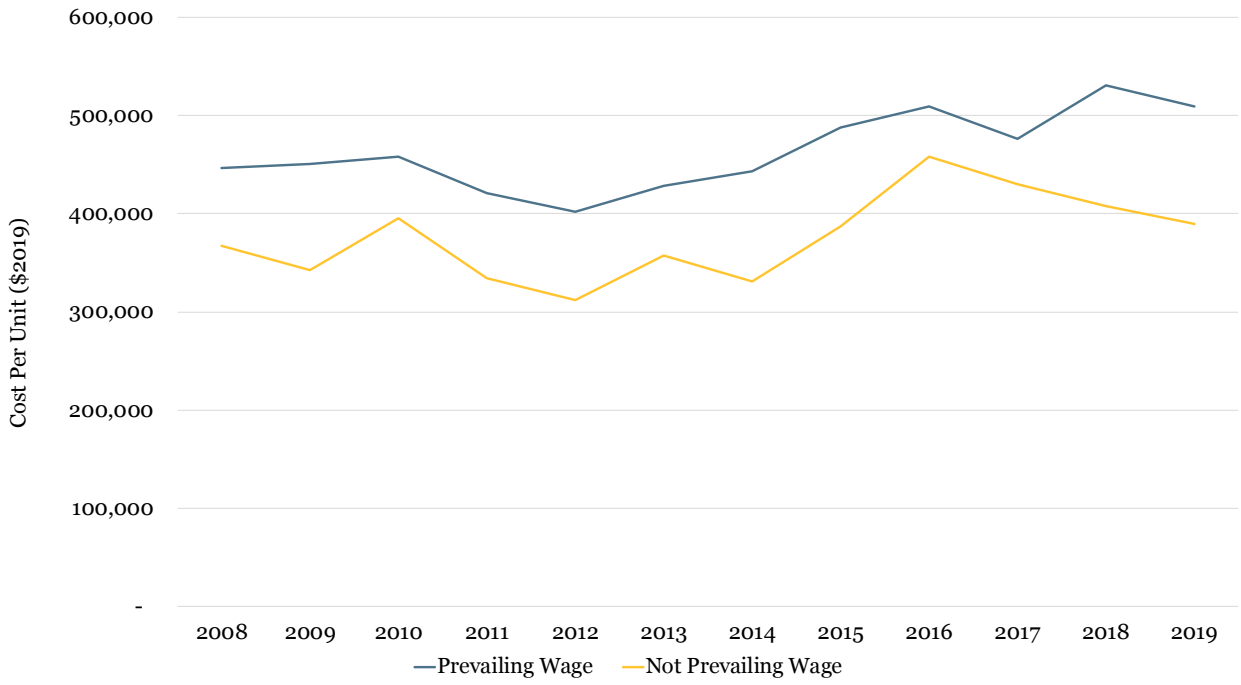
Approximately 60 percent of LIHTC projects awarded funds between 2008 and 2019 were subject to either prevailing wage or local project labor agreements, or both. Prevailing wages tend to be higher than the "open shop" or non-union wages in local markets, though it can depend on the county and the

Figure 5: Average Annual Wages for Residential Multi-Family General Contractors, 2008 - 2018



Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, General Contractors, Multifamily Residential Construction, available online at https://www.bls.gov/cew/. Wages adjusted for inflation.

Figure 6: Trends in Total Development Costs Per Unit in California, by Prevailing Wage, 2008 - 2019



specific trade classification. Because of these higher wage rates, the LIHTC program allows developers to claim a 20 percent increase on their development cost limits if the project includes prevailing wage requirements.

Figure 6 shows that prevailing wage cost more than non-prevailing wage projects, though the difference between these two types of projects varies over time. For example, in 2016 and 2017, the gap between prevailing and non-prevailing wage projects narrowed, in part because open shop construction wages had risen substantially (in part due to the shortage of construction labor).

The gap between market and prevailing wages also varies by region. In the Sacramento region, for example, prevailing wage projects in our sample were 36.4% more expensive than those without prevailing wage, and in the Central Valley, the gap was 27.5%. In contrast, in cities like San Francisco, San Jose, and Los Angeles, which have a larger union presence and higher open shop wages overall, the gap was only around 10 percent.

Prevailing wages increase the cost of development for a number of reasons. Besides paying higher wage rates, prevailing wages trigger additional requirements such as payroll certification that can add to costs. Interviews consistently highlighted that while the higher wages accounted for some of the increased costs, the additional "paperwork and bureaucracy" associated with prevailing wage increases soft costs and may also prevent contractors from taking on a prevailing wage project when demand for labor is strong. For example, contractors who want to take on a state prevailing wage job need to register with the Department of Industrial Relations, which exceeds the requirements under the federal rules set forward in the Davis-Bacon Act. Several developers noted that when "there is a shortage of workers… with prevailing wage, you're probably cutting your vendor pool in half by having a prevailing wage project. Because if ten guys would bid a project, you're probably going to only get 5 that would bid a prevailing wage project." Other developers similarly noted that affordable housing developers are often selecting from a "smaller pool of general and subcontractors because of the prevailing wage or project labor agreement requirements and all the 'headache' and paperwork that comes with that."

The challenges of finding construction workers in a tight labor market can be exacerbated when the project also includes local hiring requirements, such as recruiting from small or minority-owned businesses. These requirements are considered a condition of using public subsidy, but they increase developer costs. An affordable housing developer that builds in multiple states explained, "[Local hire] is what I meant when I said an affordable unit needs to satisfy a lot of policy goals. And they are good goals. But on the implementation end, it does cause these unforeseen situations with limiting the labor pool. Let's say there's 4 to 5 affordable housing developers and we've all been funded with A1 measure funding,[16] and we all break ground pretty much at the same time. So if you're looking for framers, there are only so many small local framers, minority-owned… it's just very difficult to check all the boxes."

General contractors also noted that they can also run into difficulties on prevailing wage projects when government agencies don't approve payments, which means that they prefer to select non-prevailing wage jobs. One said: "The city or county that is funding part of the project has labor compliance on staff, and they won't approve the release of funds for that monthly pay application until all the labor requirements are met. So what happens is that contractors end up going unpaid for weeks and weeks and weeks, while agency staff are trying to sort out some problem with the wage compliance or the labor compliance paperwork, and so, often I just decide, I don't need this headache."

Rising construction costs also contributes to increased contingency and construction financing costs, driving up total development costs.

The rise in construction costs also leads to higher costs related to the interest on construction loans (since the amount that the developer needs to borrow goes up) as well as construction contingency costs. Contingency funds are a requirement of project funders, and refer to the capital a developer sets aside for unexpected expenses during the development process. For example, contingency funds can help to cover unexpected costs associated with land remediation or "a new fee imposed by the city that we hadn't anticipated" as one developer noted. However, rising construction costs are leading developers to turn to their contingency funds more quickly. One developer who works in the LA region noted that: "In a different era, we wouldn't have to dip into our contingency funds and had funding left over at the end of the development process. But in the last 3-4 years, we hardly have any contingency left." Across all the interviews, developers reported that they have needed to increase their contingencies because cost escalations make it more difficult to accurately assess the final costs of development. Several developers also highlighted that utility delays have contributed to projects running up against deadlines and eating into contingency costs. As one explained: "We run into issues with the utilities. We had a project that finished not too long ago, and basically had a 6-month delay based on PG&E not completing its work on time. So we are finding that a lot of our contingency costs are directly related to utilities."

Developers further noted that because of labor market and general contractor shortages, they were running into increased costs related to the deadlines for occupancy imposed by the LIHTC program. The program requires that a project be completed in under two years. "That timing is rushed in a way that is not for market-rate developers. We're often getting bids on plans that aren't 100% finalized, which leads to change orders that can increase costs. There's a premium that you pay for bringing on a general contractor when it's rushed." Other developers noted that they will use contingency funds to pay for overtime so they can meet regulatory deadlines.

Affordable projects face both political and funding constraints in achieving efficiencies of scale.

On average, larger development projects can achieve efficiencies of scale, reducing per unit or per square foot costs. The relationship isn't exactly linear, because high-rise buildings (often referred to as Type I projects) require more steel and concrete than lower-rise buildings and therefore see higher material costs. However, in general, the more units and higher density that is allowed on a parcel will reduce overall project costs for similar types of buildings.

Figure 7: Examples of Average Density 9% LIHTC Projects

Third Avenue Apartments, Walnut Creek

PATH Villas Eucalyptus, Inglewood

Yet, with the exception of infill projects in downtown urban areas, LIHTC developments in California tend to be relatively low density. The average project size for a 9% LIHTC new construction project is less than 55 units and under 3 stories. Density is measured as the number of units per acre of land; for the projects for which these data were available, we found that the average density was 50 units per acre. However, nearly a third of projects were less than 20 units per acre. Figure 7 presents two photos of properties representing the average density (50 units/acre) for LIHTC developments to help visualize the relationship between building density and land use.

Developers pointed to two key reasons for why projects tend to be smaller and lower density. The first factor is local city design requirements and, in particular, ongoing resistance to larger, denser affordable housing developments. As one developer aptly put it: "It is impossible to overstate the continued resistance to new affordable development in most cities in California." Developers noted that they often needed to make concessions to density or design to get through the permitting process, and that this works to limit how many units they can build on the lot.

The second reason has to do with the structure of tax credit financing. To ensure that credits are broadly distributed across the state, TCAC allocates a specific proportion of 9% credits to different regions (and establishes "set asides" for specific policy areas such as special needs

and supportive housing). TCAC also sets a cap on the amount of funding that can be allocated to any one project. However, with development costs rising, the "cap" on funding in the 9% credit program is often too low for larger projects. Developers sometimes split larger projects into multiple phases, and/or propose projects that are smaller than what could be built on the parcel. In Santa Clara County, for example, one developer explained that "we have given up on doing a 9% project that is above 60 units. Because of the cap, we can't propose larger, more efficient projects." Developers also shared that as a result, they have increasingly been turning to the 4% credit program for larger projects.

Developers also noted that larger projects also make it more difficult to find sufficient local gap financing to make a larger project pencil. For example, a developer who builds in the Central Valley explained: "We've settled on the 'sweet spot' of doing between 50-60 units at a time, because that is the only way we can find sufficient gap financing to make a 9% tax credit deal work. The bigger the project, the bigger the gap."

The complexity associated with affordable housing funding streams—as well as the associated programmatic rules—also adds significantly to development costs.

Market-rate projects generally draw on two funding sources: equity from an investment partner and debt in the form of a permanent loan from a bank. In contrast, affordable housing projects require developers to identify a "stack" of capital to close the gap between what they can finance with debt and tax credit equity and what it costs to actually build the development. Developers consistently pointed to this complexity in the interviews as a cost driver, with one explaining: "You usually need at least three public agency loans or grants and tax credits and a regular bank loan. The process of having to apply for all of those is time consuming, and usually the way it works is that there is a leveraging game that they all play. Everyone wants someone else to put money in the project first, and you have to have your local money before you apply for your state money. And obviously you have to have all your other money before you apply for tax credits. So definitely a costly process that comes along with that."

The data from 2008-2019 show that only 11.5 percent of 9% LIHTC projects had fewer than 4 external sources of funding (including tax credit equity), with 80 percent of projects bringing together 4 to 8 sources of funding. Nearly 10 percent of projects relied on more than 8 funding sources. Each of these sources of funding, while necessary for the project to be built, adds to the costs of development. A common theme in the interviews was that the increasing financial complexity of deals was adding significantly to soft costs and, when coupled with long time delays, can affect hard costs as well (particularly in the context of rising construction costs). One developer noted: "Our projects are getting more and more complex over time, which means at a

minimum increased attorney and consultant fees." Developers also noted that syndication costs have increased as financial consultants need to manage multiple funding streams and partners. Another pointed to how this complexity creates a vicious circle of costs: "The increase in costs drives demand to go find more sources of soft financing and that adds to the complexity and layers, and with how many partners are in the deal that have to negotiate final terms, and then you have to deal with HUD, USDA and/or HCD in the same transaction, and all of that adds many more layers of complexity and many more legal counseling parties. Which in turn increases costs." Different regulatory requirements can also lead to delays in agencies (such as California's Department of Housing and Community Development (HCD)) closing out construction loans, which further increases the amount of interest a developer needs to pay on a project.

According to developers, the fragmented nature of public funding has increased in recent years, particularly with the loss of redevelopment in 2012. On the positive side, more cities have stepped in with bond financing, and the state has launched several important new funding programs. Yet this new fragmentation leads to additional complexity. One developer said: "The more public agencies involved, the more complicated it is and the slower it moves." Additional funding sources can also add design or community benefit requirements. As one developer noted: "A lot of cities will add on requirements. They say 'hey, we are putting so much amount of money into this, and we need to be accountable to our tax payers and constituents so if you build this we are expecting you to provide community benefits.' So we add a community room or other amenities, and that makes sense to me, they are all really good things, but it makes our work and our project more expensive."

Complexity in financing for permanent supportive housing—as well as how it is accounted for—is a key factor in increased development costs.

Over the last few years, the state has made funding for permanent supportive housing a priority. Many local jurisdictions have passed bond and other funding measures to address the homelessness crisis. This policy priority has influenced LIHTC awards as well, and an increasing share of TCAC's awards are going to projects that provide housing for individuals and families with special needs or who have experienced chronic homelessness (Figure 8). However, supportive housing tends to be more expensive in terms of total development costs than either family or senior housing.

> Permanent supportive housing is a model that combines affordable housing, health care, and supportive services to help individuals and families become stably and permanently housed. It typically targets people who are experiencing chronic or prolonged homelessness, who have multiple barriers to housing, and who are unable to maintain housing stability without supportive services.

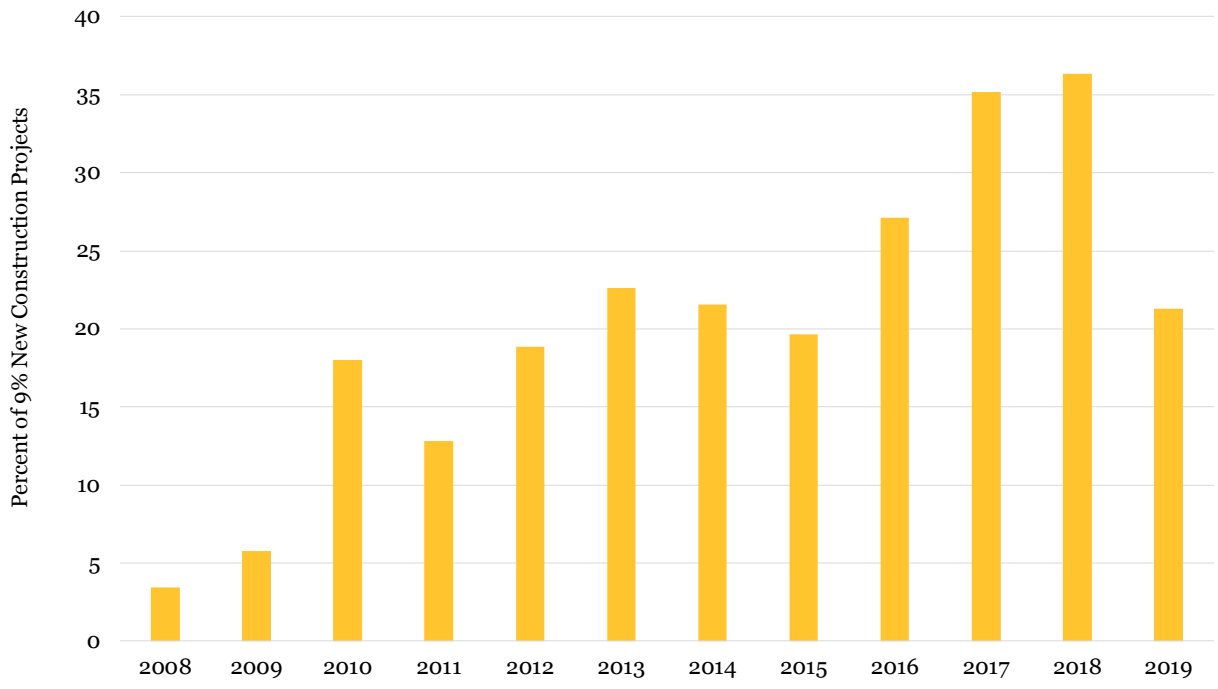
There are three reasons for these higher costs. First, supportive housing projects tend to include smaller units such as studios, which are more expensive to build (since a kitchen and a bathroom are more expensive per square foot than additional bedrooms), and they are also more likely to be located in higher-cost areas like San Francisco or Los Angeles. On average, a supportive housing unit costs $443,990 to build, compared to $435,330 for a family unit and $370,513 for a senior unit; these cost differences are even higher when calculated on

a square foot basis, with supportive housing costing on average $773 per square foot to build compared to $560 per square foot for senior properties and $443 per square foot for family properties. Developers also noted that supportive units often experience more "wear and tear," and that they take this into account when they are designing the project to extend the durability of the units.

Second, supportive housing projects also entail higher operating costs: for example, they require more on-site staff such as security or supportive services, require more capital improvements and renovations over time, and incur higher insurance rates. Developers estimate that operating costs for supportive housing "can be as much as double per unit what a standard family development would be." While counterintuitive, these operating costs show up in total development costs, and explain at least part of the rise in costs in recent years as the state has shifted toward building more supportive housing.[17] In effect, developers capitalize operational reserves into their development costs since the rent payments for supportive housing—if not further subsidized by Project-Based Section 8 vouchers—aren't sufficient to cover operations. For example, a developer in Los Angeles explained that "When you're doing supportive housing and you're serving households at 30 percent of AMI or even lower, if there is no Project-Based Section 8 rental assistance, then you have to capitalize all those operating expenses up front, and it adds significant costs to the project."

Third, funding for supportive housing is particularly fragmented, and often includes public agencies without expertise in housing finance or development. On average, supportive housing projects have more funding sources than either family or senior projects (an average of 6.2 funding sources per project). One developer explained: "Supportive housing funds are more difficult to close. It's not their fault necessarily, but the agencies take longer to close the transaction and longer to convert to permanent financing. So all of that makes it more of a headache to deal with, and increases costs, but we do it because we need the gap financing. But we just know that in advance we are going to have to deal with a more complex transaction and it's going to take longer."

Figure 8: Percent of California's 9% LIHTC New Construction Projects That Are Supportive Housing



Lack of government staff and capacity slows down approvals and can lead to significant time delays, which in turn increases costs.

While hard to quantify, the interviews pointed to a perennial problem in the development process that certainly contributes to the overall costs of development: bureaucratic delays on the one hand and local resistance to the efficient permitting of new buildings on the other. The lack of updated zoning codes in many cities means that every project requires variances of some sort. A developer in Southern California expressed a common concern across the interviews: "Most affordable housing projects in California, because you have such outdated zoning codes, typically need some approval at the city planning level. And many often have to go to a planning commission hearing, and require a lot of time and effort. It is so rare that there is a by-right opportunity. If land use approval processes could catch up to where we need to be to respond to the housing crisis, so we can have by-right opportunities, that would make a huge difference in time and costs." In fact, many developers noted that "the biggest drivers of costs are not necessarily what planning staff add to your project, but rather that you have to go through their process and get stuck in a long development period."

Particularly in an environment in which construction costs are rising, these delays have material consequences. One developer said: "The less time we take in entitlements, the cheaper it is. I know that's very obvious. But on a current project, we've had to redesign the building 4 times. If we had just been able to get through the original designs, not only would we have avoided a lot of the construction escalation costs, but we would have saved hundreds of thousands of dollars on the design piece of it."

While some of these delays are the result of local or political opposition to the project, interviews also highlighted that another problem is the lack of knowledge or sufficient capacity among public agency staff to deal with applications. Especially with newer legislation—like SB35, which provides some streamlining benefits for affordable housing—public agencies may not be familiar with the law, or may not have accounted for it in their permitting processes.

Capacity is also strained by the volume of new construction. One developer noted: "The impact of this big building boom, and what it's done on the staffing and capacity of all these different public agencies has been felt. For example, there aren't enough fire inspectors to go around, there aren't enough staff in the planning departments and the bureau of engineering and building and safety." Developers also noted that in some cities, data on the available parcels for development is outdated, which can also lead to unexpected costs. For example, one developer that focuses in the South Bay noted that "the less cities know about themselves and their land and what's on it, the more expensive it becomes for us. They don't actually know where the utilities are, they don't have full site control, and boundaries are in question. Often utilities work is incomplete, so we are out there doing x-rays or potholing to figure out if a tank is out there."

Cities often add to costs with local design, parking, or environmental requirements.

While some cities have made affordable housing easier to develop, others continue to require significant add-ons that can make building cost prohibitive. Key among these is parking requirements, particularly in infill locations where the parking needs to be located underground. A lot of cities still require 1-2 parking spaces per unit, as well as spaces for guest parking.

Open space requirements can also add on to costs. In the Central Valley, for example, many cities require a significant share of land (e.g., 25 percent) to be devoted to open space, even when the development is located near a park or other greenway. Reducing these requirements can allow for greater density on the existing land, increasing the number of units that the developer can build.

Sustainable building materials or additions (e.g., such as solar or a recycled water system) can also add to costs (Table 2). TCAC allows developers to increase the cost limits that affect the basis on which they request tax credits if their projects include substantial onsite renewable energy generation, if buildings are more energy efficient than state Title 24 standards, if they irrigate with reclaimed water, and/or if they install sustainable building materials such as bamboo or cork.[18]

While many developers noted that these costs can be seen as an upfront investment in longer-term environmental benefits, they nevertheless add to the costs of construction. And, as we also found in our case study of San Francisco,[19] environmental regulations aren't always being thought of in terms of their total costs and benefits. For example, a city's solar requirement may not take into account that the project is a dense, infill development where solar is prohibitively expensive (and could ultimately lead to the project not being built), yet the climate benefits of the project and the reduced car travel garnered by more units being located close to transit could have outweighed the GHG benefits that the solar would have provided.

Developers were particularly concerned about the state's new 2019 energy standards—which went into effect in January 2020—that give local jurisdictions incentives to apply environmental standards beyond state standards. For example, West Hollywood is moving to require that all new buildings must include either solar photovoltaic, solar thermal, or a vegetative roof. The concern relates as much to the increased complexity of the different regulations as to the hard costs. A common sentiment was that to bring down costs, the state needs to "streamline the sustainability requirements rather than making them more onerous," and ensuring that there is better alignment between local, state, and TCAC regulations. Misalignment between local and state regulations, coupled with continual changes to the building code, can also increase costs associated with building inspections, particularly when they require multiple agencies to review the plans or building and/or change orders after something has already been built to an outdated standard.

Table 2: Total Development Costs for Projects with Sustainable Building Techniques, California, 2008-2019

Project Type	Cost Per Unit	Cost Per Square Foot
Project Includes Sustainable Building Techniques	435,262	555
Project Does Not Include Sustainable Building Techniques	418,070	518

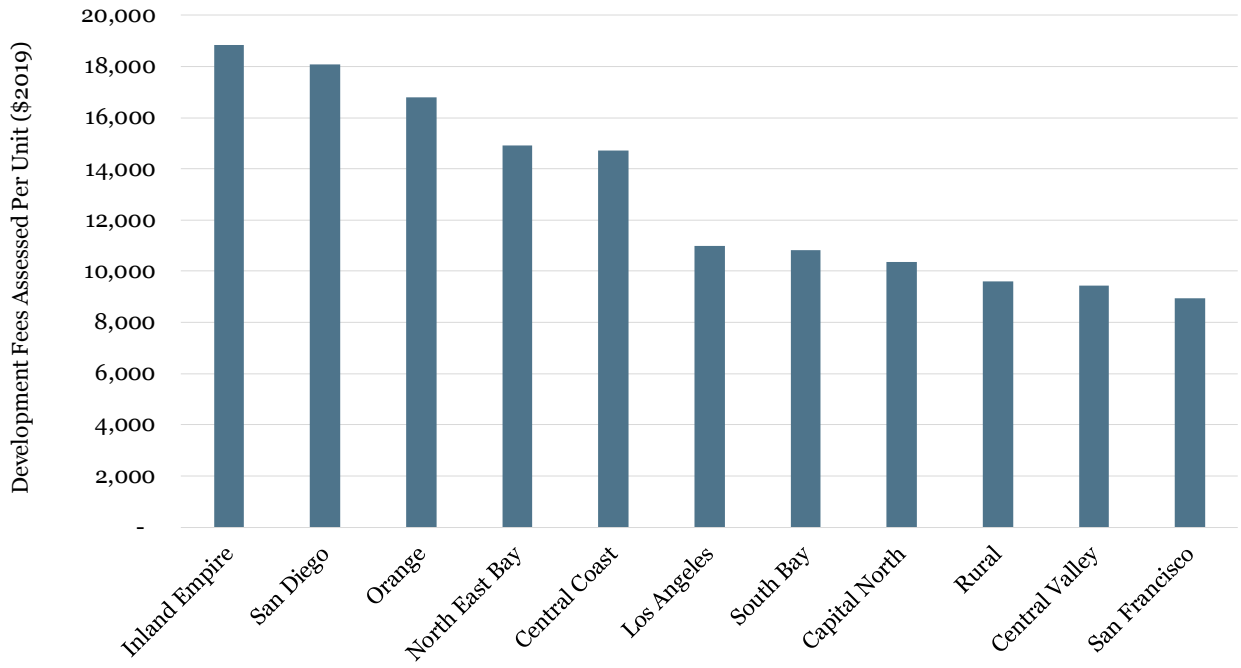
Local development fees have declined in recent years, but there remains significant variability in the amount of fees localities charge on affordable projects.

Recent Terner Center research has highlighted the role that development fees—which cities levy to pay for services needed to build new housing or to offset the impacts of growth on the community—play in driving up the cost of housing in California cities.[20] Interviews with developers highlighted that this cost driver is not limited to market-rate projects—many cities charge fees on affordable projects as well. Approximately 70 percent of the projects in the sample were assessed development fees.

The average fees charged across all the properties was $12,900 per unit. But developers said the amount levied on affordable projects varies from one jurisdiction to another, with certain cities charging "astronomical development fees." We found that of affordable projects assessed fees between 2008 and 2019, 25 percent paid more than $20,000 in development fees per unit and in some cases as much as $45,000 per unit. These fees tend to be higher in suburban communities, with the Inland Empire, San Diego, and Orange County regions charging the highest average fees per unit (Figure 9). Developers also noted that cities are increasingly establishing "community facilities districts", which require ongoing payments that increase operating costs over the long term. For example, one developer who builds in more suburban and exurban regions of the state explained that they are often required to pay for "the streets and street lighting, so new projects are bearing the costs of maintenance for amenities that have historically been the responsibility of local governments. It can be a one-time fee or ongoing maintenance. So you might have a project that ends up paying $10,000 per year for park maintenance for open space outside the boundaries of their project, or street lighting. That's pretty common in the majority of our projects."

While developers noted that some cities had exempted certain fees for affordable housing projects (like park impact fees), other cities have increased their fees "across the board, permit fees, plan check fees, and fees for the

Figure 9: Average Development Fees Assessed Per Unit by TCAC Region



city inspectors to come out. Those have really skyrocketed the past decade, at least 2x. It's a pretty significant increase." Per unit fees for senior projects were only slightly lower than for family projects, though variation across project types was not nearly as significant as across jurisdictions.

Model Results: Key Drivers of Development Costs

As we discuss in the methodology section, none of these cost drivers are independent from one another. For example, multi-story infill developments in San Francisco may be more likely to require an elevator than those in the Central Valley; or projects awarded funding in 2018 may incorporate more sustainable building materials than those awarded funding in 2008. Regression models allow us to consider the various factors that influence project costs at the same time, and can be helpful in isolating which drive up costs more significantly than others.

Table 3 presents the results of a series of models that look at the factors that are associated with higher development costs. We present four separate models—the first two panels present the results on a per unit basis and present the results in dollar amount as well as in percent difference. The second two panels present the results per square foot.

The results largely support the descriptive findings presented above, and show that the rising costs are not just an artefact of differences in building types or location. The key findings from the model are:

- **Project size influences costs.**
  On average, efficiencies of scale translate into a reduction of about $1,162 for every additional unit in a project, or approximately 78 cents per square foot. While not a large dollar figure in relation to total development costs, it suggests that adding even 20 units to a building with only 40 units could result in savings of $20,000 per unit.

- **Permanent supportive housing costs the most to build on a per square foot basis.**
  On average, permanent supportive housing costs $129 more per square foot than senior developments, while family housing costs $52 less per square foot than senior housing. However, when we look at costs per unit, we find that both family housing and supportive housing cost more than senior properties.

- **Even after controlling for what is being built, developments in the San Francisco Bay Area cost significantly more to build than anywhere else in the state.**
  On average, a unit in the Bay Area costs $140,000 more to build than in the state's inland regions, or $226 per square foot. Projects in LA are also more expensive than in the state's inland regions, but the price premium for developing in LA ($64,000 per unit) is less than half than that in the Bay Area. Costs for developments in rural areas are not significantly different than those in the Central Valley.

- **Projects in High Segregation and Poverty tracts cost less than projects in higher resourced neighborhoods.**
  On average, projects in high poverty tracts cost $14,000 or 3 percent less per unit to build than those in higher resource tracts, including those with low- or moderate-resource designations. After controlling for other factors, we do not find a cost difference for developments built in Low Resource, Middle Resource, or High or Highest Resource tracts.

Table 3: Model Identifying Factors that Contribute to Per Unit and Per Square Foot Development Costs, California, 2008 - 2019

	Per Unit Cost				Per Square Foot			
Variables	**$2019**		**Percent**		**$2019**		**Percent**	
Project Size (Number of Units)	-1,162	***	-0.3%	***	-0.78	**	-0.2%	***
Year Awarded Funding (Compared to Projects Built in 2008 and 2009)								
2010 to 2014	-18,883	*	-2.3%		39.04	*	5.4%	
2015 to 2019	49,393	***	13.2%	***	122.54	***	22.4%	***
Type of Development (Compared to Senior Projects)								
Permanent Supportive Housing	23,265	*	5.8%	*	129.39	***	15.8%	***
Family Housing	92,079	***	22.1%	***	-52.63	**	-11.9%	**
Geography (Compared to Inland California)								
Bay Area	140,940	***	32.8%	***	226.83	***	37.3%	***
Los Angeles	64,389	***	18.3%	***	76.13	***	19.4%	***
Rural Counties	-13,238		-1.6%		-56.44		-5.5%	
Opportunity Category (Compared to Other Opportunity Categories)								
High Poverty and Segregation Tract	-16,056	*	-4.2%	*	-3.81		-1.4%	
Project Characteristics								
Project Includes Prevailing Wage	53,390	***	13.4%	***	80.89	***	15.9%	***
Project Includes Structural Parking	35,945	***	7.8%	**	43.88	*	10.2%	**
Project Includes Elevator	38,125	***	8.4%	***	103.76	***	17.1%	***
Project Includes Sustainable Building Materials	17,125	*	3.8%	*	12.05		1.7%	
Project Includes Development Fees	16,313	*	6.3%	**	31.23	*	9.2%	**
Each Funding Source	6,453	**	1.7%	***	2.92		1.3%	*
Intercept	264,025	***	1247	***	313.09	***	574.2	***
Adjusted R-squared	0.5261		0.5491		0.5139		0.5893	
Number of Observations	626		626		590		590	

Source: California LIHTC 9% Projects, 2008 – 2019. All dollar amounts adjusted for inflation.
Notes: *** p < 0.001, ** p < .01, * p < .10 (indicates the significance of the result—estimates without stars are not significantly different from the comparison group).

- **Prevailing wage raises total development costs by approximately $53,000 per unit, or by 13 percent.**
  While the model can't control for quality of workmanship, change orders, or time to completion—things a more trained labor force could help with and bring down costs in the short- and long-term—prevailing wages are associated with higher total development costs.[21]

- **The addition of an elevator and/or structured parking both substantially increase the costs of development.**
  These each add about $35,000 to $38,000 to the cost per unit, or 8 percent, though the impact of an elevator is larger on square foot costs.

- **Projects that include sustainable design features—such as energy conservation measures—also have higher development costs, adding about 4 percent or $17,000 dollars per unit.**
  One limitation of this current analysis is it doesn't distinguish between energy efficiency improvements, water conservation measures, and sustainable building materials (such as cork). Additional research is needed to understand the role that environmental standards play in contributing to development costs, as well as whether the initial investments allow developers to save on operating costs over time (thereby reducing long-term costs).

- **Projects that report paying local development fees are also more expensive per unit, even after controlling for other characteristics.**
  Development fees matter. Cities that impose development fees on affordable projects increase the cost of building by about $16,600 per unit.

- **On average, every additional source of funding on a project is associated with an increase of $6,400 per unit, or 2 percent, in total development costs.**
  While small in comparison to some of the other variables in the model, it nevertheless can translate to significant costs. A project with eight rather than four sources of funding will cost on average $24,000 more per unit, though it is also possible that more expensive projects require more funding sources.

As with every model, these numbers are estimates, and there will be variation across projects in how much could be saved if some of the factors were addressed through policy reforms. (See the Technical Appendix included with this paper for more discussion of the limitations of this model.) Nevertheless, the model suggests areas where policymakers should debate the pros and cons of how particular policy choices influence the costs affordable housing development. There are also opportunities to bring down the costs of development, including lessons learned from what has worked in other states. In the next section, we discuss the policy implications of this research.

Policy Implications

Many of the costs detailed in this study are not unique to affordable housing—rising construction and labor costs, delays caused by lengthy entitlement processes, local development fees and design requirements, and environmental building standards are driving up the costs of market-rate units as well. Ultimately, California will not solve its housing crisis unless policymakers develop a robust pro-housing policy agenda, one that includes streamlining development permits and reforming zoning so that all cities are building their fair share of both affordable and market-rate housing.

However, there is also a need to reduce the costs of building subsidized housing. In the current economic climate, new market-rate construction will not meet the housing needs of families earning below 60 percent of the area median in which they live. In addition, the increasing prevalence of unhoused individuals and families will require substantial investments in affordable housing. State policymakers—as well as many local jurisdictions—have recognized the need to invest in new subsidized housing, and the last four years have seen a significant expansion of funding for affordable and supportive housing through both state legislation and local bond measures. But continuing to spend $700,000 on a unit of affordable housing—with an increasing share of that coming from public subsidies—will make it that much harder to build the supply we need.

Tackling these costs won't be easy. In some cases, the costs are driven by desirable policy goals such as local hiring and living wages, climate change mitigation and resilience, and greater opportunity for residents living in LIHTC buildings. In others, they are the result of a fragmented affordable housing system that has evolved over decades. Undoing those layers of complexity will require more than just tweaking rules here and there. In addition, 9% LIHTC projects are just one slice of the larger affordable housing landscape, so changing the state's QAP will be insufficient to move the needle on costs more broadly. The data presented here are also incomplete, and there are opportunities to dig deeper into final cost certifications and even the applications themselves to better understand what matters most when it comes to costs. In other words, rather than hard and fast recommendations, the ideas in this section are intended to spark discussion for how California can take a leadership role in not only addressing the affordable housing crisis, but also reforming the system so every dollar of public subsidy has the greatest positive impact.

The state should streamline funding and better target its resources to reach households at all AMI levels.

The bureaucratic complexity of financing a 9% LIHTC deal adds considerable cost and time to every project, and contributes to additional "spillover" costs in the form of higher predevelopment and construction loan interest, syndication fees, and legal costs. Moreover, adding state public agencies to the list of stakeholders who need to approve and monitor compliance with grants only adds delays when those agencies are confronting staffing shortages and other capacity constraints. Particularly when it comes to permanent supportive housing—which is often funded by both health and human services and housing agencies—streamlining funding sources, regulations, and reporting requirements could help to reduce costs.

There is also an opportunity to better align the level of funding with need. For example, for some families experiencing housing instability, a grant to cover unexpected expenses, or the preservation of an existing unit, may be sufficient and a more cost-effective way of

preventing homelessness than having the family move into a supportive housing unit. Similarly, market-based subsidies like LIHTC, inclusionary units, and/or a state-level renter's tax credit may be better suited to assist households at 60 percent of AMI, with deeper, government-based funding sources such as project- or tenant-based vouchers targeted at those with lower incomes. In the current environment, these subsidies are often layered to get to desired layers of affordability, but it also means that a larger amount of funding goes to a smaller share of the households who need support. Aligning subsidies to need could expand access to housing stability while ensuring that much needed resources for affordable housing are effectively utilized.

This type of system reform won't happen overnight, and will require more research as well as stakeholder engagement to understand the complete landscape of funding sources and how they could be streamlined. The state could also explore how other states are approaching cost containment to assess which would work in California. For example, in Minnesota, the state housing finance agency coordinates a single RFP, with all state agencies (as well as some local funders such as the Saint Paul Public Housing Agency) committing to use a single application for multiple funding resources. That coordinated process provides funders the flexibility to assemble creative finance packages that best fit each project during the project review and selection processes.[22] While it may not be possible to align all funding sources in a state as large as California (and with such different housing market contexts), consolidating funding sources and reporting requirements at the state level (such as the No Place Like Home Program, the Multifamily Housing Program, and the Infill Infrastructure Grant program) could be a valuable first step. More generally, state policymakers can initiate a process to research and provide recommendations on how to better align funding sources (especially for permanent supportive housing) and reduce the complexity of every deal.

Continue to build on and strengthen the state's Regional Housing Needs Allocation (RHNA) process to ensure that all jurisdictions are planning for and expediting the approval of their fair share of housing for low-income households.

California has long recognized that all cities and regions have a responsibility to plan for and build new housing for households at all income levels; this principle is embedded in the state's Housing Element law and the Regional Housing Needs Assessment (RHNA) process. For too long, these tools have lacked accountability measures, but in recent years, the state legislature has strengthened RHNA as well as the Housing Accountability Act (AB 3194). For example, the current RHNA cycle requires regions to use data to more accurately and fairly reflect job growth and housing needs. SB35 (and SB765) requires cities that do not meet their RHNA goals to provide streamlined, ministerial review of qualifying infill housing projects that include affordable housing. In addition to providing an important tool for affordable housing developers to entitle sites, SB35 has strengthened RHNA reporting requirements and expanded the number of cities that submit annual production reports.

However, a key priority for the state should be to expand pro-housing production strategies and ensure that localities are not putting up barriers to affordable housing developments even if they are technically compliant with their Housing Element. Land use and zoning reform should be part of that effort, as should policies that streamline approval and permitting processes. The state could also play a role in building the capacity of cities to understand how various policy decisions—

including parking requirements and other local design standards such as setbacks and open space regulations—can make projects financially infeasible. Currently, data gaps and the lack of tools to assess how various requirements impact the cost and likelihood of new developments make it difficult to hold local jurisdictions accountable to their RHNA goals. The Terner Center Development Dashboard provides one example of how data and interactive online tools can help to bring transparency to the relationship between housing policies and development feasibility.

While not specific to affordable housing, the legislature also needs to reform how local development fees are assessed. As one interviewee noted, "The system is byzantine. We're asking jurisdictions for funding and going through lengthy funding application processes, and then we get to a point where they are giving us the money but just taking it back through the payment of development fees." Several cities have waived certain impact fees for affordable housing in recent years, a policy that could be adopted more broadly. At a minimum, the state should work to increase the transparency of fees (including utility and school impact fees), tighten oversight of how cities determine the relationship between a project and the fees it is assessed, and explore other local funding options for infrastructure that do not place the entire cost burden on new and affordable housing.[23]

Review and reform the system for determining 9% LIHTC application points and the eligible basis for new projects in the Qualified Allocation Plan (QAP).

While harder to quantify, at least part of the increased costs of development on 9% tax credit projects comes from the requirements to receive funding as set forth in the state's QAP. A common sentiment across the interviews was that the state—and to some extent localities like San Francisco—have increasingly turned to affordable housing to meet an ever expanding set of policy goals, including environmental sustainability, living wages and local jobs, community amenities such as child-care centers and health care clinics, and access to amenity-rich, higher-resourced areas. All of these are worthy policy objectives, yet as these requirements are embedded in the application point system (and are often required for a project application to be competitive) and then incorporated into the cost limits that developers can claim for receiving the credits, the QAP itself becomes a mechanism by which costs escalate. Even over the last ten years, the QAP has expanded the basis limit increase for project amenities, in many cases, without a clear link between the boost and the actual costs. Balancing the short-term costs with the long-term benefits garnered from these upfront investments in affordable housing is far from easy. Current practice appears to favor adding amenities and project requirements without sufficient evaluation or assessment of their benefits, or the tradeoffs they require in terms of additional subsidized units.

However, setting a hard line cost containment threshold is unlikely to solve the problem, and may lead to fewer developments rather than more. Already, developers are running up against the 130% high-cost threshold, which affects the feasibility of potential affordable deals. Nor is directing funding solely to lower cost projects in inland areas a viable solution: the highest cost developments are often located in areas with the greatest affordable housing needs and supply shortages. The data show that costs are driven by multiple factors. Adopting simple metrics such as costs per unit without regard for a much more complex set of factors that go into costs would undermine efforts to build high-quality affordable housing in areas that need it most.

The state should review building code and environmental regulations, and assess the relative costs and benefits of additional regulations against the need for more housing.

As with funding sources, the complexity, ever-changing landscape, and lack of communication across agencies administering environmental and building code regulations adds to total development costs. While the state should be investing in building techniques to mitigate climate change and conserve water, these building features do add costs, and may make subsidized housing increasingly expensive to build. Balancing the costs of these interventions against the need for affordable housing, as well as assessing the relative costs of different building requirements, could help to ensure that there is consensus that these investments are worth making. As the state's new environmental laws go into effect, policymakers may want to explore whether cities should be allowed to require environmental building features that go beyond state standards, particularly if those requirements boost project costs over a specified threshold. Exploring how other states are incorporating environmental goals—for example, levying stormwater fees on all residential properties (new and existing) to more broadly distribute the costs of these new systems—could also distribute the costs more equitably.

Developers also noted the importance of data and analysis to inform which sustainable building techniques and materials garner the most benefits, not only in terms of the environment, but also longer term costs of operating the operators. As one explained: "Life cycle costing would be a really good thing for green improvements. We are very proud of our work to retrofit our older properties because there have been substantial operating cost benefits on those transactions—particularly the less glamorous items such as toilets. Clearer data on costs/benefits and architects who have a better handle on some of the lower cost investments would go a long way to making sure we're spending public subsidies wisely."

Build capacity among developers to reduce costs and promote innovation in the construction industry.

TCAC should increase the transparency and reporting of construction bids, and support smaller developers with data and best practices on how to reduce costs. The lack of publicly available and reliable data on construction costs makes it difficult to know which contractor bids are inflated, a concern raised by the GAO report as well. While larger developers can turn to their own portfolio and find similar projects to compare historical data, smaller developers are often unable to assess whether a sub or general contractor bid is significantly above market. In addition, among larger affordable housing developers we interviewed, many indicated that they had been working to implement cost reduction measures, including beginning the process of value-engineering earlier in the development process and reviewing cost sheets post-completion to assess where inefficiencies emerge. Developers who have internal general contractors—or who work with a construction manager—felt like they were able to estimate and control costs better than those who sought out hard bids only after the design and entitlement process was finalized. Expanding the capacity of both large and small developers to identify cost savings measures and ensure the reasonableness of bids by sharing data and best practices could increase efficiency statewide, and also ensure that all communities and smaller developers benefit from the innovations happening at the project level.

There is also the potential for the affordable housing development community to rely more on industrialized construction, also sometimes referred to as modular or factory-built housing. Industry research suggests that off-site construction can save as much as 20 percent on the cost of building a three or four story wood-frame multifamily development, and shorten the construction timeline by between 40 and 50 percent.

However, industrialized construction still faces barriers in getting to scale, and these barriers are often higher for affordable housing. For example, affordable housing projects face greater financial barriers to using modular units. Modular factories require a large deposit up front in order to cover ordering of materials. While private developers may be able to access more flexible forms of capital, affordable housing developers draw from fewer and more regulated capital sources, limiting their ability to spend earlier in order to save later. The state could help to spur innovation in this area by running a pilot program to create supplemental revolving construction loans for affordable housing developers that make use of offsite technology, in effect seeding the industry to lower costs for subsidized development. The state could also seed industrialized construction more broadly, for example, by setting aside funding to do research and development to improve building techniques and materials, or investing in modular production as an economic development strategy. In the short term, there is also need to educate the affordable housing field (e.g., architects, general contractors, public agency staff) about off-site construction, since it requires that all stakeholders adapt to new workflows and inspection procedures.

In addition to innovations in construction methods, there is a need to increase investment in training programs and grow the construction labor force.

California needs a more robust labor pool to meet the demand for building in the state, especially as the state steps up goals for production. The state (as well as the federal government) could increase support for labor training programs, such as those at community colleges that prepare students for apprenticeship exams. Immigration policy also clearly plays a role in the labor shortage: foreign-born workers made up roughly one quarter of the US construction workforce in 2015.[24]

However, it may also be helpful to conduct more research to understand what barriers workers face in entering these programs and/or the construction industry more generally. Construction jobs can pay living wages (particularly when workers have specialized knowledge or belong to one of the trades), and can also promote entrepreneurialism and small business formation. Yet there are also barriers to entering the construction industry, such as drug testing, inadequate transportation options to worksites, irregular work hours (which can complicate commuting and/or childcare arrangements) and uneven work and income across seasons or business cycles. Understanding which of these factors prevent additional workers from pursuing construction work could help the state identify new programs and/or make existing workforce development programs more effective in expanding access to these jobs for more of California's workforce.

Invest in data and research to better understand the ongoing challenges to building more affordable housing at lower cost.

The analysis in this report is also limited in that it cannot assess all the factors that influence the costs of 9% LIHTC new construction projects, let alone other forms of subsidized housing. Significantly more research is needed to understand the full set of drivers that influence the costs of affordable housing development. We have invested considerable time in inputting and cleaning the TCAC application data, but this process is ongoing, and there is more data to be mined from the applications. We continue to work on this project, and we plan to publish additional briefs in the coming months. For example, we hope to better understand differences in costs between the 4% and the 9% tax credit programs; explore in greater detail the role of specific project characteristics, including different types of sustainable building techniques, on costs; as well as conduct more detailed analysis on the sources of funding and their fragmentation. However, overall, the state should continue to support data collection and research in the housing sector. For example, TCAC could support ongoing research on its LIHTC awards by converting its application and cost certification data into a database format (as opposed to PDFs), and policymakers could continue to support HCD as it builds its RHNA and Housing Element data infrastructure.

Conclusion

California's rising affordable housing development costs stand in direct opposition to its goals in addressing the housing crisis. The research presented here confirms that costs on 9% LIHTC new construction projects have significantly outpaced inflation, meaning that more public subsidy dollars are building fewer and fewer affordable units. Most of the drivers of these costs are not unique to affordable housing—rather, they stem from a tight labor market on the one hand and the challenges of entitling multi-family properties on the other. As long as most of the zoning in the state is limited to single-family homes, building a more balanced mix of units affordable to households at all income levels will be difficult.

However, the analysis and interviews also point to opportunities for how the affordable housing system could be reformed to build more housing more quickly and at a lower cost. As California passes landmark legislation to protect tenants and expand funding for affordable housing, it also needs to take a leadership role in reforming the system so every dollar of public subsidy has the greatest positive impact.

1. California Legislative Analyst's Office. (2016). "Perspectives on Helping Low-Income Californians Afford Housing." Retrieved from: https://lao.ca.gov/publications/report/3345.

2. U.S. Government Accountability Office. (2018). "Low-Income Housing Tax Credit: Improved Data and Oversight Would Strengthen Cost Assessment and Fraud Risk Management." Report GAO-18-627. Retrieved from: https://www.gao.gov/products/gao-18-637.

3. Reid, C. (2018). "The Links Between Affordable Housing and Economic Mobility." Terner Center for Housing Innovation at UC Berkeley. Retrieved from: https://ternercenter.berkeley.edu/links-between-affordable-housing-and-economic-mobility.

4. Future research will extend the cost analysis to the 4% tax credit program and to rehabilitation and preservation projects.

5. While data on these projects are publicly available, they do not exist in a comprehensive database. Instead, they are posted online in a series of individual documents, largely in PDF format.

6. Developers can claim a "boost" to the amount of tax credits they can receive based on certain items in the LIHTC regulations, such as prevailing wage requirements, seismic mediation, sustainable building techniques, as well as being located in certain types of geographies.

7. For approximately 15 percent of the projects, we had data from both the applications and the cost certifications. In about 40 percent of cases, the application and cost certification data were aligned, however, if they were not aligned, the final cost certification data was generally higher.

8. We did not include projects that were funded under the American Recovery and Reinvestment Act (ARRA) of 2009. To help cover shortfalls in LIHTC credit demand due to the recession, ARRA allowed developers to receive grants in lieu of the tax credits, raising concern that these projects may not be the same as those not funded under the grant program. We also could not find applications or staff reports for all the projects.

9. Structured parking refers to either underground parking or parking in podium structures.

10. In the revised California regulations, large family developments (in contrast to projects that focus on senior housing or that are smaller in scale) located in a census tract designated on the TCAC/HCD Opportunity Area Maps as "Highest" or "High" Resource receive an extra 8 points on their application. Although the maps use several different indicators to characterize a tract's resource level, in general "Highest" and "High" resource tracts tend to

be lower poverty, more suburban, and have a greater share of non-Hispanic White households.

11. For example, see Chetty, R., Hendren, N., & Katz, L. (2016). "The Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment." American Economic Review 106, no. 4 (April 2016): 855–902; Ellen, I. G., Horn, K. M., & Kuai, Y. (2018). "Gateway to Opportunity? Disparities in Neighborhood Conditions among Low-Income Housing Tax Credit Residents." Housing Policy Debate 28 (4): 572–91; Galster, G. C. (2012). "The Mechanisms of Neighborhood Effects: Theory, Evidence, and Policy Implications." In Neighbourhood Effects Research: New Perspectives, edited by Maarten van Ham, David Manley, Nick Bailey, Ludi Simpson, and Duncan Maclennen, 23–56. Dordrecht ; New York: Springer Science+Business Media B.V.

12. Fannie Mae (2017). "Multifamily Market Commentary." Washington, D.C. Retrieved from: https://www.fanniemae.com/resources/file/research/emma/pdf/MF_Market_Commentary_031517.pdf.

13. This aggregation allows us to smooth out differences in regions caused by a small number of projects in any one year.

14. Terner Center Analysis of State of California Department of Finance, Construction Permits, Annual data, from 1975, Residential and U.S. Bureau of Labor Statistics Data: Federal Reserve Bank of St. Louis and U.S. Bureau of Labor Statistics, All Employees: Construction: Residential Building Construction in California.

15. Funding sources for affordable projects may trigger state or federal Davis-Bacon prevailing wage requirements, which differ from state level prevailing wage requirements in terms of oversight regulations as well as wage rates. See: California Tax Credit Allocation Committee, California Debt Limit Allocation Committee, Department of Housing and Community Development, California Housing Finance Agency, Newman, M., Shawn, B., & Woodward, S. (2014). Affordable Housing Cost Study. Retrieved from: https://www.treasurer.ca.gov/ctcac/affordable_housing.pdf.

16. Measure A1 was a bond measure in Alameda County that created a new funding source for affordable housing but includes local hiring requirements.

17. More directly, these costs show up in terms of foregone private permanent debt, which is a typical source of financing for family and senior housing projects.

18. This is an incomplete list of sustainable building elements, and regulations have changed over time. Please see TCAC guidelines for a more complete description of sustainable building techniques encouraged through the TCAC point scoring system and basis limit regulations.

19. Reid, C. & Raetz, H. (2018). "Perspectives: Practitioners Weigh in on Drivers of Rising Housing Construction Costs in San Francisco, Terner Center for Housing Innovation at UC Berkeley. Retrieved from: https://ternercenter.berkeley.edu/uploads/San_Francisco_Construction_Cost_Brief_-_Terner_Center_January_2018.pdf.

20. Mawhorter, S., Garcia, D., & Raetz, H. (2018). "It All Adds Up: The Cost Of Housing Development Fees In Seven California Cities." Terner Center for Housing Innovation at UC Berkeley. Retrieved from: https://ternercenter.berkeley.edu/development-fees.; Raetz, H., Garcia, D., & Decker, N. (2019). "Current Practices and Policy Considerations to Improve Implementation of Fees Governed by the Mitigation Fee Act." Terner Center for Housing Innovation at UC Berkeley. Retrieved from: https://ternercenter.berkeley.edu/residential-impact-fees-in-california.

21. Isolating the costs of prevailing wage can be challenging, since prevailing wage projects are different from non-prevailing wage projects. Differences in costs may be attributable to differences we can't measure, and not prevailing wage per se. While it is impossible to control for every factor that influences development costs, we ran additional models using propensity score matching (which helps to reduce these differences) and found the same substantive results, though estimates of the impact ranged from around $40,000 a unit to $55,000 depending on the model specification.

22. Kaplan, M. (2018). "The state's role in financing regional housing priorities: Minnesota's Consolidated RFP." The Brookings Institution. Retrieved from: https://www.brookings.edu/blog/the-avenue/2018/04/16/the-states-role-in-financing-regional-housing-priorities-minnesotas-consolidated-rfp/.

23. See: Mawhorter, S., Garcia, D., & Raetz, H. (2018). "It All Adds Up: The Cost Of Housing Development Fees In Seven California Cities." Terner Center for Housing Innovation at UC Berkeley. Retrieved from: https://ternercenter.berkeley.edu/development-fees.; Raetz, H., Garcia, D., & Decker, N. (2019). "Residential Impact Fees in California: Current Practices and Policy Considerations to Improve Implementation of Fees Governed by the Mitigation Fee Act." Terner Center for Housing Innovation at UC Berkeley. Retrieved from: https://ternercenter.berkeley.edu/residential-impact-fees-in-california.

24. Martín, C. (2016). "Building America: The immigrant construction workforce." Urban Institute. Retrieved from: https://www.urban.org/urban-wire/building-america-immigrant-construction-workforce-0.

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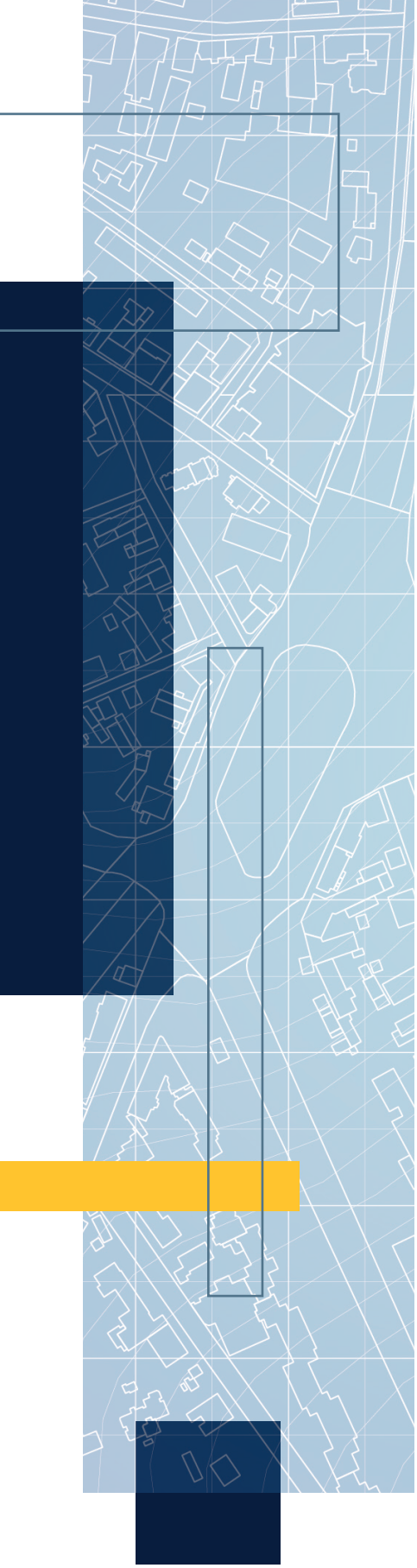
Lastly, we would like to thank all the developers and contractors who took the time to work with us on this project; their knowledge and experience was crucial to our ability to understand the intricacies of the tax credit program and the factors that are impacting affordable housing development in California.



TERNER CENTER FOR HOUSING INNOVATION
UC BERKELEY

A TERNER CENTER REPORT - MARCH 2020

The Hard Costs of Construction: Recent Trends in Labor and Materials Costs for Apartment Buildings in California

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Executive Summary

Against the backdrop of a statewide housing crisis, affordable and market-rate developers have seen increasing development costs, which can hinder the feasibility of new projects and contribute to affordability constraints. The rising cost of building housing is fueled by multiple factors, including land, capital costs, regulations, materials, and labor. In this report, we focus on the subset of these costs that have seen some of the largest escalations in recent years: materials and labor, also referred to as hard construction costs. Hard construction costs comprise more than sixty percent of total development costs. Yet understanding what goes into hard costs is difficult due to the lack of publicly-available, detailed data on specific projects.

To shed light on the drivers of hard construction costs, we compiled and analyzed a unique new dataset of line-item level construction costs for 240 multifamily projects built in California between 2009 and 2018. We find:

- **The per-square-foot hard costs for constructing multifamily housing in California climbed 25 percent over the course of a decade.**

  On average, hard costs per square foot in 2018 were $44 higher compared to 2008-2009, after adjusting for inflation.

- **Cost increases have been most pronounced in the line-item categories for finishes and for wood, plastics, and composites.**

  Detailed data shows that since 2010, wood, plastics, and composites costs rose by 110 percent after accounting for inflation, and finishes costs rose by 65 percent.

- **Trends in both labor and materials have likely contributed to hard cost increases, but do not entirely account for the pace of change.**

  Controlling for key factors, our regression analysis found that projects that began construction between 2016 and 2018 were, on average, $68 more expensive per square foot than projects started between 2009 and 2011.

- **It's more expensive to build in the Bay Area and Los Angeles.**

  Controlling for project characteristics, compared to the rest of the state, average hard costs were $35 more expensive per square foot in the Los Angeles region and $81 more expensive per square foot in the Bay Area. The Bay Area has comparatively higher construction wages than elsewhere in California, which could help to explain the difference in hard costs at the regional level. While we were unable to control for the effects of local regulations, these too could be adding to regional variations in construction costs.

- **Building with concrete and steel costs more.**

  Type I construction (mainly composed of concrete and steel) is significantly more expensive than other construction types. This in turn means that these high-rise buildings are more likely to be financially feasible in markets with high rents.

- **Affordable housing projects cost more on average than market-rate and mixed-affordability projects, but this difference loses significance after controlling for project size.**

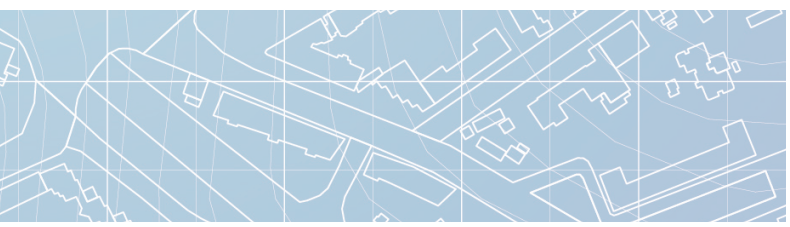
  Controlling for observable cost drivers, affordable projects cost on average $48 more per square foot than market-rate

projects or projects that mix affordable and market-rate units. The significance of this difference disappears when controlling for the size of the project. While more data are needed to tease out the implications of this finding, it suggests that market-rate developers are more likely to realize efficiencies of scale than affordable housing developers because they tend to build larger buildings.

- **Prevailing wage requirements are associated with higher hard costs.**

  Our analysis joins a body of evidence that finds a significant relationship between prevailing wage requirements and higher costs. However, it should be noted that prevailing wage requirements are a policy choice designed to provide public benefit by stabilizing employment and benefits in a high-risk field; those broader benefits would not be captured in an analysis of hard construction data.

Overall, our findings point to the importance of policies that can help to mitigate rising construction costs. Streamlining and bringing more certainty to the permitting and approval processes can mitigate labor and materials cost increases, as well as having the added benefit of bringing down pre-construction and contingency costs. Reviewing regulations and building codes for inefficiencies can also rein in escalating hard costs. Innovative construction techniques that aim to lower costs and increase efficiency—such as industrial and mass timber construction—could benefit from additional state and local support, as could training programs that create a pipeline for talent in the construction industry.



Introduction

The cost of development is often cited as a fundamental obstacle to building more housing in California, especially housing that is affordable to low- and moderate-income households.[1] As the costs to build go up, the rents for those units go up as well. If the costs become too great, rising construction costs can make a project financially infeasible. For example, a multifamily unit that costs $800,000 to build will need to charge approximately $4,000 in monthly rent[2]—a price well over the typical monthly earnings in the state —to cover those costs and meet return on investment requirements for investors.

Many different factors layer together to affect the bottom-line costs of building new housing and whether or not a project will ultimately "pencil": the costs of acquisition (e.g., land and closing costs), hard construction costs (e.g., materials and labor), soft costs (e.g., legal and professional fees, insurance, and development fees), and the costs of conversion once a project is completed (e.g., title fees and the operating deficit reserve). Among these various components of a project's total "cost stack," by far the largest share of a project's total cost comes from materials and labor—or hard costs.

Given the significant role hard costs play in determining the financial feasibility of new housing construction, this analysis focuses on recent trends in materials and labor costs and what might explain them. To better understand these costs components, we collected data from developers, general contractors, and financial institutions for both market and affordable multifamily housing developments that began construction between 2008 and 2018. We created a unique dataset of more than 240 projects throughout the state of California, which includes information on estimated construction costs, final construction costs, construction

This report is part of the Terner Center's The Cost of Building Housing Research Series, which examines the different cost factors that layer together to comprise the total costs to build housing in California. Accompanying this report, we have also released The Costs of Affordable Housing Production: Insights from California's 9% Low-Income Housing Tax Credit Program, which looks specifically at the factors influencing the costs of development for new construction financed through the 9% LIHTC programs. Previous studies include Making It Pencil: The Math Behind Housing Development, in which we outline how land costs, construction costs, local fees, and financing costs all contribute to the total development cost for a housing project. In our work on impact fees and development fees, we found that waning tax revenue and the loss of state and federal funding for infrastructure resulted in rising local exactions on new housing. And in Perspectives: Practitioners Weigh in on Drivers of Rising Housing Construction Costs in San Francisco, we examined the ways in which lengthy permitting processes as well as local regulations and requirements can increase the cost of both market-rate and affordable housing projects.

schedules, and project characteristics (such as size, location, etc.). While other data sources provide insight into broad changes in costs in the form of price indices, or consolidate data to inform cost estimation, our data allow us to review line item costs directly. Our data offer a rare and detailed window into specific factors underlying the hard costs of construction for individual projects. With these data, we are able to trace how hard costs have changed over time, as well as understand which types of costs have seen the steepest increases. The following analysis unpacks these factors and considers state-level approaches to mitigate the rising cost of construction, with the aim of producing more market-rate and affordable housing at lower price points.

Methodology

Detailed data on hard construction costs—also referred to in this analysis as simply "construction costs"—are not publicly available or easily accessible. We reached out to dozens of market-rate and affordable housing developers, general contractors, and financial institutions to request data on housing projects started between 2008 and 2018, including data on estimated construction costs, final construction costs, construction schedules, and project characteristics (such as size, location, etc.). Responses typically came in the form of original project bids, final cost sheets, and final construction schedules. We also collected additional details on each project through a survey completed by the responding organizations. We then digitized PDFs or scanned documents, cleaned, and standardized responses to create a unique database (the "Terner dataset") of more than 240 multifamily projects constructed throughout the state of California.[3] Given the focus of this analysis, the sample only includes data on hard construction costs, and not on other factors considered elsewhere in the Cost of Building Housing Research Series, such as land, financing, and contingency costs.

Defining Construction Costs

According to the data we collected on total project costs, hard construction costs represented more than 60 percent of the total cost of producing a new residential building in California over the past decade.[4]

This analysis reports on bid costs, or estimated project costs, rather than the final construction costs for projects. While this may underestimate final costs, the data from bid sheets were more complete. These bids are

also what are used to determine the amount of subsidy that is needed for affordable projects. To consider the cost of materials and labor at the time of the bid, our analysis categorizes projects based on the year construction began, rather than the date of completion.

The developers and general contractors that provided data for this project track their line item level costs differently, parsing costs at varying levels of detail. In order to standardize our analysis across a variety of line item categories, we coded each line item according to its Construction Specifications Institute MasterFormat division,[5] a standard commonly used in U.S. construction (also referred to in this analysis as CSI divisions or codes). The line items were coded based on keywords, and any remaining line items were coded by hand before the dataset was reviewed a second time to ensure fidelity to the MasterFormat divisions. In a few cases, project line items were broad enough that they incorporated multiple divisions; in those cases we removed the overly broad costs from the line item level analysis, but included the costs when assessing total hard construction costs.

Key Characteristics of Projects in the Terner Dataset

Among the projects included in the Terner dataset, 79 percent are affordable developments, while market-rate and mixed-affordability projects make up 11 and 10 percent of the dataset, respectively (Figure 2). "Mixed" projects, or projects that contain a mix of affordable and market-rate units, tilt heavily towards market-rate: in the typical mixed project, 14 percent of units are affordable. Most projects in our sample are primarily wood construction—39 percent of the projects are type V (i.e., wood construction), while 11 percent are type V over I (i.e., wood over a concrete podium, which is typically a parking structure). Only 6 percent of the projects are type I, or tower construction (i.e., steel and concrete high-rises). Just over one-third of projects (36 percent) did not include data on the construction type. Almost half of the projects in our sample (49 percent) are non-prevailing wage projects, 42 percent adhere to prevailing wage regulations, and 9 percent did not report their prevailing wage status.

Figure 1: Total Development Costs for Multifamily Projects in California (Completed 2010-2019)

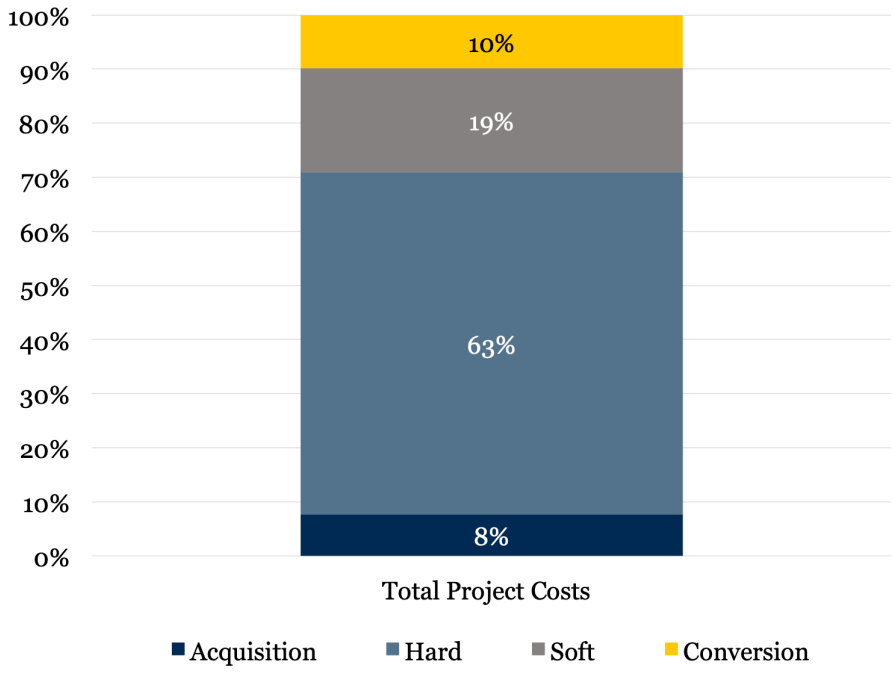


Figure 2: Characteristics of Projects in the Terner Dataset

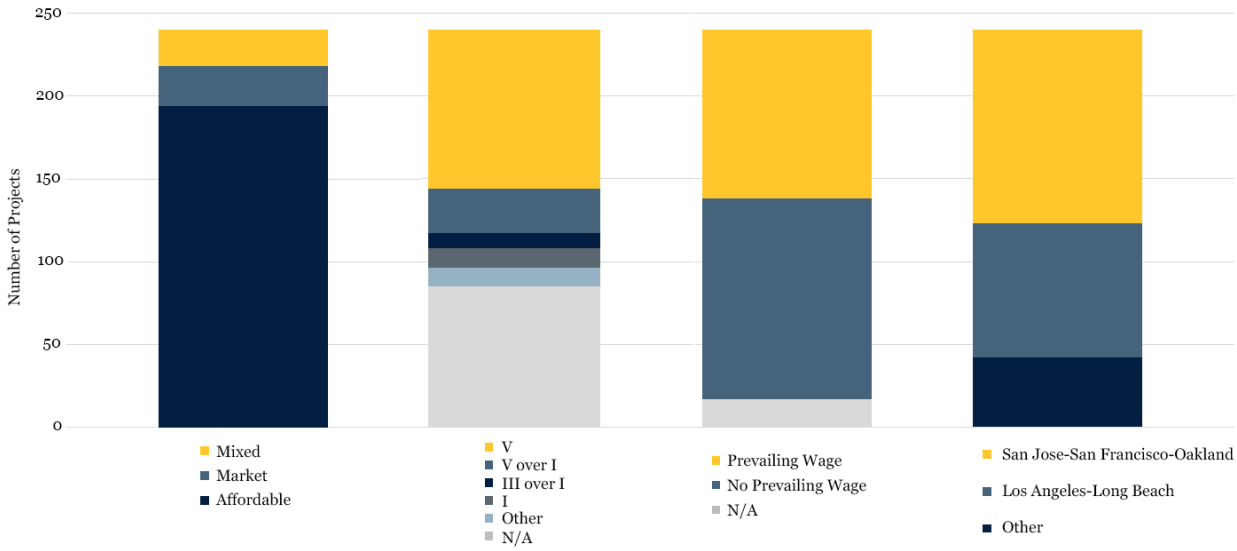


Figure 3: Regions for Cost Analysis

In order to assess regional differences in costs while maintaining the anonymity of respondents, we compared the costs of projects built in the two largest urban centers—the Bay Area and Los Angeles regions—to those built in the rest of the state (Figure 3). Fifty percent of the projects are located within the San Jose-San Francisco-Oakland Combined Statistical Area (CSA), while 33 percent of projects are in the Los Angeles-Long Beach CSA. The remaining 17 percent of the projects are located in the rest of the state.

One challenge in understanding differences in construction costs is that different locations, and/or building types, will influence costs. To account for these differences, we present the results of a series of multivariate regression models that allow us to control for these differences. This approach allows us to examine the independent association of different project characteristics—such as construction type, region, or the year construction started—on overall construction costs.

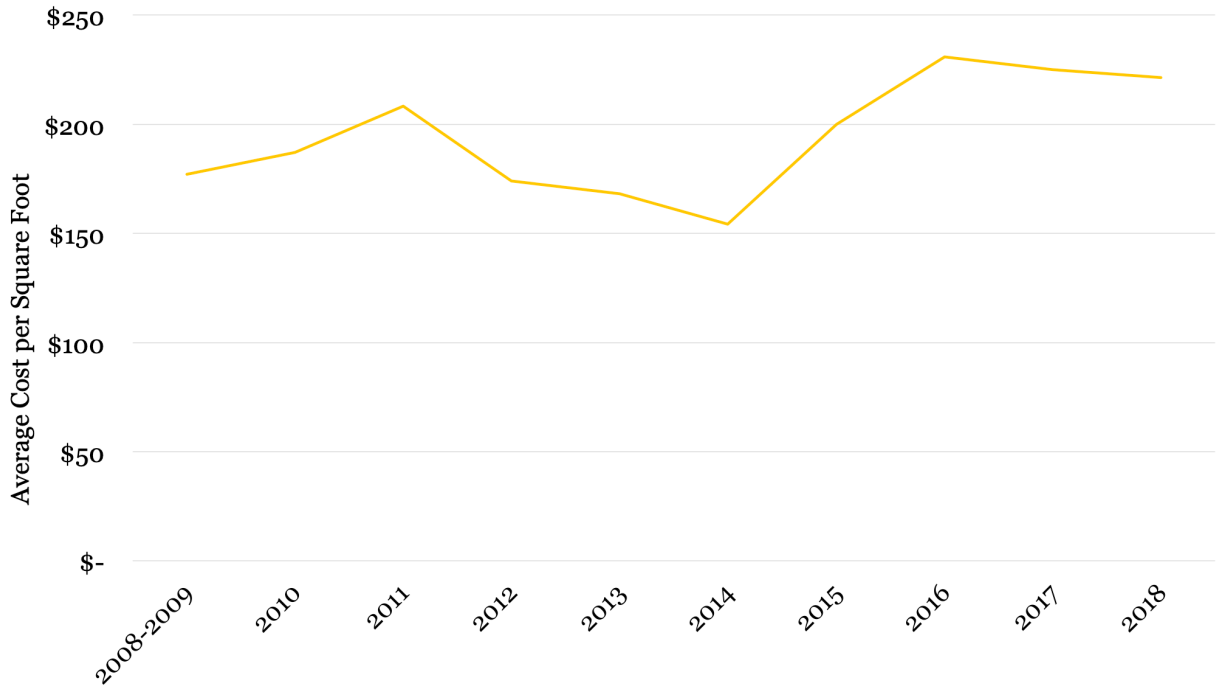
Line Item Data on Rising Construction Costs

The per-square-foot hard costs for constructing multifamily projects in California climbed 25 percent over the course of a decade.

The Terner dataset confirms what construction professionals have reported for years:real construction costs have risen since the recession. A weighted average of hard costs per project square foot, adjusted to 2018 dollars, shows that costs have increased across the state (Figure 4).

In 2008-2009, hard costs averaged $177 per square foot. By 2018 that average had risen to $222 per square foot—a 25 percent increase. While these increases have been felt across the state, costs are highest—and their increases have been most precipitous—in the Bay Area (see Case Study on page 15).

Figure 4: Hard Construction Cost Per Square Foot, California (2018 $)



The cost increases captured in the Terner dataset align with other industry measures of construction costs. The California Construction Cost index, for example, recorded a 24 percent change in costs between 2009 and 2018.[6] Because prices declined following the recession, increases in recent years have registered as much steeper, given that they started from a lower base.[7] Between 2014 and 2018, hard construction costs in California rose almost $80 per square foot, or 44 percent.

Evidence suggests the trend has not abated since 2018. The California Construction Cost Index increased by 3.6 percent in 2019, the highest increase since a 4.4 percent increase in 2016.[8]

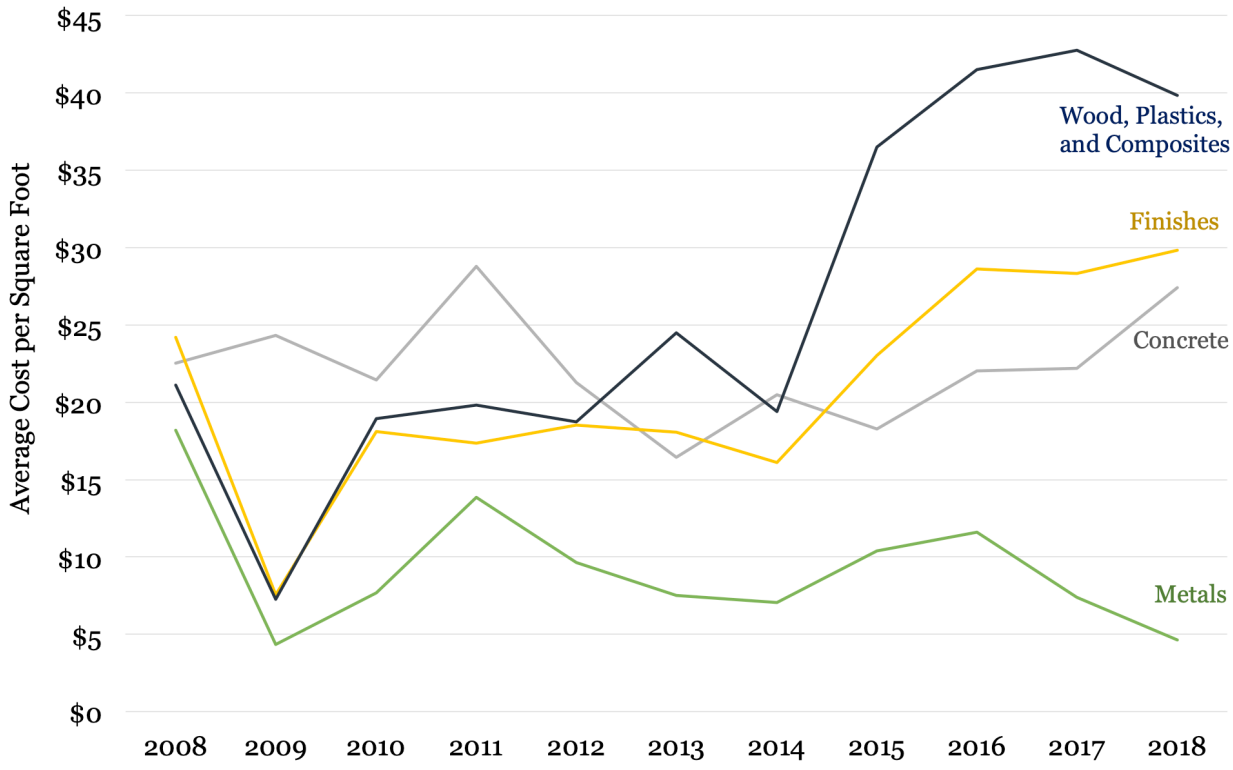
Cost increases have been most pronounced in the line-item categories for wood, plastics, and composites and for finishes.

On any construction project, the largest contributors to hard costs include the following MasterFormat divisions: a) metals, b) concrete, c) finishes, and d) wood, plastics and composites. Metals costs include metal framing, joists, decking, stairs, and railings, among others. Concrete costs cover concrete forming and accessories, concrete reinforcing, cast-in-place concrete, precast concrete, cast decks and underlayment, mass concrete, and concrete cutting and boring. Finishes costs consist of plaster and gypsum board, tiling, ceilings, flooring, wall finishes, painting and coating, among others. Finally, wood, plastics, and composites costs include rough carpentry, finish carpentry, architectural woodwork, structural plastics and composites, and plastic fabrications such as railings and paneling. [9]

Figure 5 documents the trends for each of these line items in the Terner dataset.

Adjusting for inflation, metal costs have remained relatively stable over time, averaging between $5 and $10 per square foot. Concrete, while significantly higher than in 2014, is only slightly more expensive per square foot than it was in 2008. In contrast, by far the biggest

Figure 5: Line Item Construction Costs (2008-2018)



increases have occurred in line-item costs for wood, plastics, and composites, which roughly doubled between 2014 and 2018. These trends remain the same when the sample is isolated to type V—or primarily wood construction—projects, implying the change in line item costs is not driven by changes in construction type over time. Line-item costs for finishes have also climbed well above 2008-levels. It could be that higher construction costs and a hotter housing market have increased spending on finer floor coverings and other finishes to build out more expensive units and meet the expectations of a higher rental or sale price point.

Trends in both labor and materials have contributed to hard cost increases, but do not entirely account for the pace of change.

While we can see which areas have experienced the greatest increases in overall costs, it is not possible to completely disentangle which of these costs are driven by materials and which are driven by labor. General contractors and developers typically only track bundled labor and materials costs at the line item level; for example, they might record the cost of earthwork, but not the overhead for the earthwork subcontractor, or the cost of labor to dig a foundation.

In order to assess the relative role of labor versus materials costs, we compared the changes in line item costs from the Terner Center dataset to publicly available data on materials cost indices and wage rates at the state level.

Wage and Employment Trends

A review of construction wages in California reveals that, while wages have risen in nominal terms, when adjusted for inflation, wages in key construction occupations (those closely associated with the four MasterFormat divisions reviewed above) are generally close to 2006 levels, at the height of the previous building boom. In nominal terms, wages for all construction and extraction occupations in California rose by 29 percent between 2006 and 2018, and by 13 percent since 2010, below the statewide increase in hard costs of 25 percent. In real terms, however, wages have only risen by just 3.4% since 2006.

These averages, however, hide the tightness in the construction labor market in some areas. Since the recession, there has been a significant mismatch between the number of permitted units—increasing more than 430 percent between 2009 and 2018—and the growth in the construction sector, where the number of workers has only expanded by 32 percent. General contractors noted that anti-immigration rhetoric, as well as a tight labor market overall, has made it hard to find construction workers, let alone workers with more multifamily construction experience and/or those trained in the specific trades.

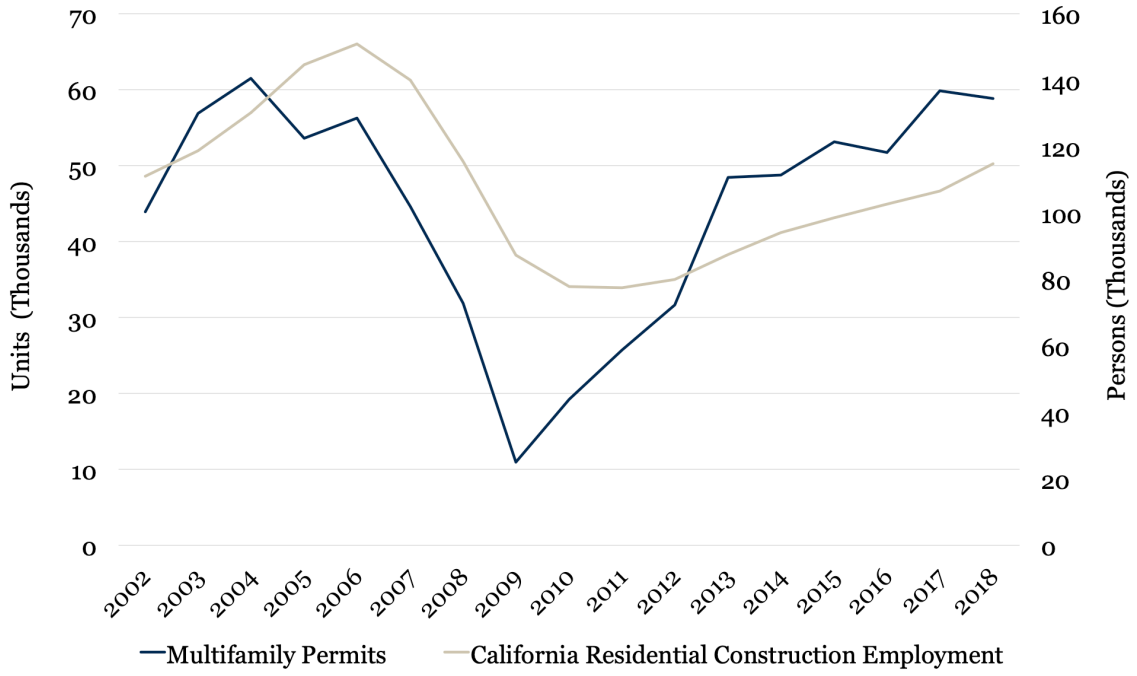
Indeed, surveys of housing developers have consistently listed a shortage of workers as a top concern.[10] For example, in response to a 2019 survey of general contractors in California, more than 60 percent of firms responded that they were "having a hard time filling some or all positions" for craft and salaried workers, reflecting the twin challenge of a constrained labor force at the same time as new development has increased.[11]

Statewide employment data also reveals that certain types of skilled labor are lagging more than others. Employment of carpenters dropped by 30 percent between 2006 and 2018, and reinforcing iron and rebar workers declined by 52 percent over the same period. Similarly, employment of cement masons and concrete finishers decreased by 18 percent and drywall and ceiling tile installers dropped by 23 percent.[12, 13] A survey of California general contractors captured the tightness in the

Table 1: Nominal and Real Hourly Median Wages for Selected California Construction Occupations, and Percent Change in Wages from 2006-2018 and 2010-2018

		California Occupations					
		Construction & Extraction Occupations	Carpenters	Cement Masons & Concrete Finishers	Drywall & Ceiling Tile Installers	Sheet Metal Workers	Structural Iron & Steel Workers
Wages (unadjusted for inflation)	2006	$20.63	$23.50	$19.49	$21.48	$20.93	$25.17
	2010	$23.55	$25.49	$23.10	$23.45	$26.13	$26.47
	2018	$26.56	$27.29	$25.82	$26.78	$25.77	$31.98
	Percent Change, 2006-2018	28.7%	16.1%	32.5%	24.7%	23.1%	27.1%
	Percent Change, 2010-2018	12.8%	7.1%	11.8%	14.2%	-1.4%	20.8%
Wages (adjusted for national inflation)	2006	$25.70	$29.27	$24.28	$26.75	$26.07	$31.35
	2010	$27.12	$29.35	$26.60	$27.00	$30.09	$30.48
	2018	$26.56	$27.29	$25.82	$26.78	$25.77	$31.98
	Percent Change, 2006-2018	3.4%	-6.8%	6.4%	0.1%	-1.1%	2.0%
	Percent Change, 2010-2018	-2.1%	-7.0%	-2.9%	-0.8%	-14.4%	4.9%

Figure 6: Multifamily Permits and Construction Employment in California (2002-2018)



Sources: State of California Department of Finance, Construction Permits, Annual data, from 1975, Residential (units and valuation). Retrieved from: http://www.dof.ca.gov/Forecasting/Economics/Indicators/Construction_Permits/.; Federal Reserve Bank of St. Louis and U.S. Bureau of Labor Statistics, All Employees: Construction: Residential Building Construction in California [SMU06000002023610001A]. Retrieved from: FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/SMU06000002023610001A. January 9, 2020.

labor market across a host of different types of workers: 70 percent or more of respondents noted that it was harder to hire plumbers and pipelayers in 2019 than the year before, and more than 60 percent said the same for roofers, equipment operators-cranes, heavy equipment, drywall installers, sheet metal workers, and cement masons. More than 50 percent of respondents found it harder to hire concrete workers and carpenters, as well as pipefitters/welders, mechanics, and laborers. Perhaps reflecting the increase in iron workers, only 33 percent of respondents noted that the trade was more difficult to hire for than the year previous.[14]

Materials Cost Trends

In order to assess the relationship between materials costs and hard cost line item trends in California, we compared price trends between key materials indices and the Terner dataset (Table 2).

Most key line items tracked closely with their corresponding materials cost indices; finishes, concrete, and metal costs all rose in parallel with materials costs (Table 2). In contrast, wood, plastics, and composites line item costs climbed at a significantly faster rate than the lumber materials index. While the materials index increased by 39 percent between 2010 and 2018, the wood, plastics, and composites line item costs in California housing projects increased by 110 percent over the same period, with costs remaining high after 2014 (Figure 7). As previously noted, real wages for occupations closely associated with the line items reviewed all either dropped or remained relatively flat, leaving a question as to the central driver of increasing costs for wood, plastics and composites.

Table 2: Percent Change in Terner Line Item Costs and Related Industry Indices for Materials

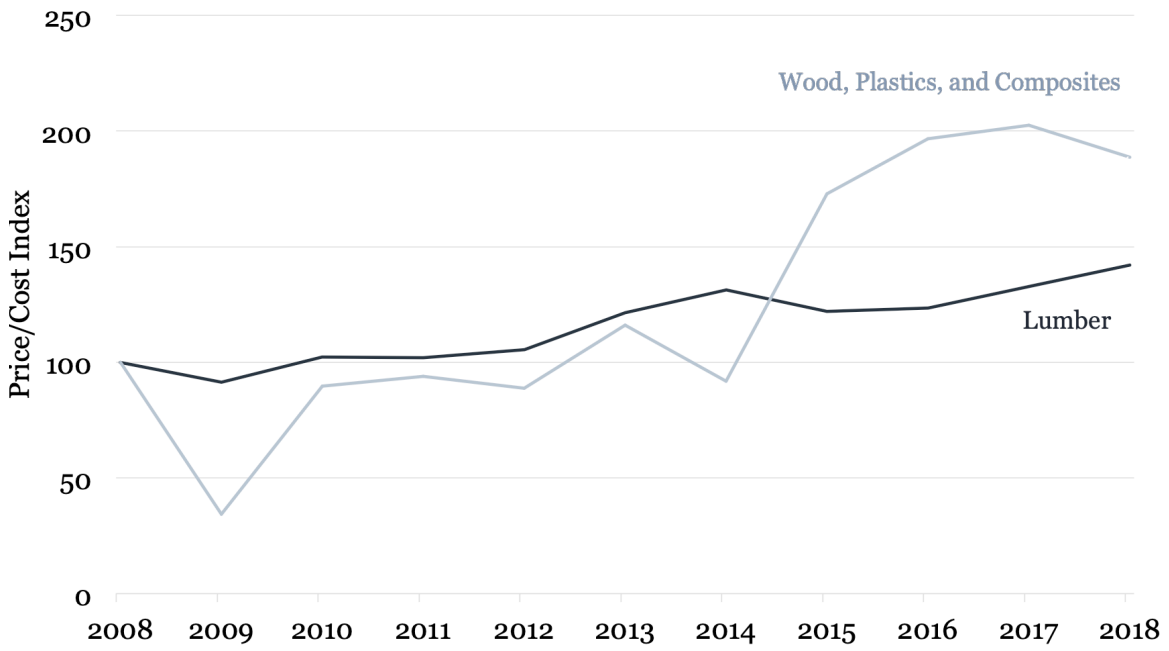
	Percent Change, 2010-2018	
	Terner Data	Industry Index
Concrete	28	25
Finishes/Gypsum	65	66
Metals	-39	8
Wood/Lumber	110	39

Source: Terner Center analysis of U.S. Bureau of Labor Statistics data: U.S. Bureau of Labor Statistics. Producer Price Indexes. Retrieved from: https://www.bls.gov/ppi/.

A number of factors can influence materials costs. Some are macroeconomic forces influenced by global trade patterns and federal policy decisions. For instance, the National Association of Home Builders estimated that the tariffs imposed in 2018 on Chinese imports translated to a $1 billion increase in residential construction costs.[15] Others are shaped by state and local policy decisions—from regulatory requirements to building codes to negotiations around the elements of specific projects—that may dictate the types of materials used in a given project. Although such decisions affect total costs, the impact can be hard to quantify.

Interviews conducted by Terner Center researchers suggested that general contractors and subcontractors are asking for higher levels of overhead, profit, and contingency, in some cases to hedge against risk and costs associated with a restricted workforce, such as losing workers or subcontractors to more profitable projects in the middle of a job. While the structure of the Terner data did not allow us to review profit or contingency separately, San Francisco tied with New York City for the highest contractor's margins in any U.S. city surveyed in the most recent Turner and Townsend survey, at seven percent.[16]

Figure 7: Wood, Plastics, and Composites Line Item Cost Index and Producer Price Index by Commodity for Lumber and Wood Products: Lumber (Base Year 2008)



Source: Terner Center analysis of Terner Center data and U.S. Bureau of Labor Statistics data: U.S. Bureau of Labor Statistics, Producer Price Index by Commodity for Lumber and Wood Products: Lumber [WPU081]. Retrieved from: FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/WPU081, January 9, 2020.

Putting It All Together: The Drivers of Increased Construction Costs

As materials and labor costs have gone up, it is not surprising that overall construction costs have also risen. One possible explanation for the higher costs is that the mix of projects being built has changed over time—for instance, a shift toward more high-rise condominiums that require more expensive construction materials—or that more development is occurring in high-cost markets, where labor costs will be higher.

To understand all the factors that influence construction costs in tandem, we developed a regression model that allows us to assess how each factor influences the bottom-line cost of building. Table 3 presents the results of this analysis, first without controlling for project size (model 1) and then after taking project size into account (model 2).

The key findings are:

- **Hard costs of building housing in California have increased by $68 per square foot, on average.**
  Even accounting for other relevant factors in the model, it is more expensive to build a similarly-sized unit in California compared to a decade ago.

- **It is more expensive to build in the Bay Area and Los Angeles.**
  Controlling for key factors like construction type, prevailing wage requirements, affordability, and year construction started,

Table 3: Model Identifying Factors that Contribute to Per Square Foot Hard Costs, California, 2008-2018

	Per Square Foot	
Variables	**Model 1**	**Model 2**
Project Size (Number of Units)		-0.23***
		(0.09)
Year Construction Began (Compared to Projects Started in 2009-2011)		
Project Started 2007-2008	39.71	59.39
	(42.26)	**(42.36)**
Project Started 2012-2015	9.57	10.00
	(18.16)	**(17.91)**
Project Started 2016-2018	65.46***	67.85***
	(20.18)	**(19.93)**
Type of Construction (Compared to All Other Types)		
Construction Type I	65.06**	70.94***
	(25.69)	**(25.45)**
Region (Compared to Los Angeles)		
San Jose- San Francisco-Oakland	48.94***	46.19***
	(13.18)	**(13.05)**
Other	-30.66*	-35.08**
	(16.80)	**(16.66)**
Project Characteristics		
Project Is Affordable Housing	47.57***	24.27
	(16.97)	**(18.95)**
Project Includes Prevailing Wage	36.41***	30.31**
	(12.95)	**(12.98)**
Constant	127.75***	174.08***
	(23.40)	**(29.06)**
Number of Observations	223	223
R- Squared	0.29	0.31
Adjusted R-Squared	0.26	0.28

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, *p<0.10.

urban areas showed statistically significant cost differences. Compared to projects in other parts of the state, Bay Area projects cost $81 more per square foot to build, and projects in the Los Angeles region cost $35 more per square foot. (See Case Study on page 15 for more on Bay Area costs.)

- **Building with steel and concrete costs more.**
  Type I projects, which are typically over 5-7 stories and constructed with steel and concrete, cost an average of $65 more per square foot than other types of construction, like Type V over I (i.e., wood frame floors over a concrete platform). Type I projects use more expensive components in order to build higher, and are more likely to be found in infill locations, such as San Francisco or Los Angeles, where zoning allows higher density construction. When we also control for the number of units in a project (which reduces costs slightly due to economies of scale), the additional cost of Type 1 projects rises slightly to $71 dollars per square foot.

- **Affordable housing projects cost more on average than market-rate and mixed-affordability projects, but this difference loses significance after controlling for project size.**
  Controlling for year, region, construction type, and prevailing wage requirements, affordable projects cost, on average, $48 more per square foot compared to market-rate projects and projects that mixed affordable and market-rate units. In a companion study, The Costs of Affordable Housing Production: Insights from California's 9% Low-Income Housing Tax Credit Program, we examine the drivers of costs for affordable projects in more detail, and find that funding complexity, including the associated prevailing wage and other local hire requirements, is associated with higher development costs, especially if multiple projects subject to labor requirements move forward simultaneously in a constrained labor market. In order to secure local approvals, affordable housing projects are also often subject to increased design requirements. In some cases, purely aesthetic changes required by a locality can increase the cost of construction, and even result in a reduction in the number of units produced.[17]

  However, once we control for project size, we find that affordable projects are not statistically more expensive than market-rate. This may be in part due to the small sample, but it may also be due to the fact that affordable projects tend to be smaller given that the way affordable units are entitled and financed constrain project size.[18]

- **Prevailing wage requirements are associated with higher hard costs.**
  Both market-rate and affordable projects may be subject to prevailing wage requirements or project labor agreements for their construction contracting. Market-rate projects may adhere to requirements as part of a developer agreement with a locality, for example. Funding sources for affordable projects may trigger state or federal Davis-Bacon prevailing wage requirements, which differ from state level prevailing wage requirements in terms of oversight regulations as well as wage rates.[19]

  Our model found that projects with prevailing wage requirements cost an average of $30 more per square foot than those without wage requirements, after controlling for whether or not a project was affordable, as well as project size, region, construction type, and the year construction started.[20]

  Prevailing wages may increase the cost of construction for a number of reasons.

Case Study: The Bay Area has the highest construction costs in the state.

Hard construction costs have climbed statewide, but they are the most expensive and have risen most dramatically in the San Francisco Bay Area. While normalized statewide costs increased 25 percent between 2008-2009 and 2018, costs for projects in the Bay Area rose 119 percent over the same period, reaching more than $380 per square foot in 2018 (Figure 8).

Figure 8: Construction Costs Per Square Foot, Statewide and Bay Area Weighted Averages (2008-2018)

A number of factors are likely contributing to the rapid escalation of construction costs in the Bay Area. For one, wages are higher in the region, reflecting higher costs of living.[23] In 2018, the San Francisco and San Jose Metropolitan Statistical Areas had the two highest hourly median wages in the state, which could contribute to comparatively higher construction costs overall.[24] However, when adjusted for inflation using the local consumer price index (which takes into account the cost of living in the Bay Area by accounting for changes in gas, shelter, food, energy and other consumer goods), wages in the region have actually fallen in real terms (Table 3). The failure of wages to keep pace with local price increases may contribute to the challenges and delays in attracting labor reported by developers and builders.

Table 3: Percent Change in Median Hourly Wages for Construction and Extraction Occupations in the Bay Area (2009-2018)

Metropolitan Statistical Area	Percent Change in Hourly Wages	
	Unadjusted for Local Inflation	Adjusted for Local Inflation
San Francisco-Oakland-Hayward, CA	7%	-16%
San Jose-Sunnyvale-Santa Clara, CA	15%	-10%

Additional local regulations and lengthy review processes specific to the Bay Area may also add to the cost of construction. For instance, while raw materials costs are relatively similar across the state (notwithstanding variation in transportation costs), local regulations that require certain materials or building components can contribute to the costs of materials.[25] Moreover, workforce procurement rules—such as San Francisco's Small Business Enterprise, Local Business Enterprise, and local hire requirements—reflect worthy policy goals; they may also result in restricting the labor pool for projects, particularly in a region where living costs are so high that few construction workers can afford to live locally.[26] In addition, a recent study found that the average San Francisco project takes 3.8 years to be permitted.[27] While delays in permitting and approval may not affect hard construction costs directly, our previous research found that subcontractor concerns about project timelines and risk can make them hesitant to work in San Francisco, pushing up bids.

Besides setting higher wage rates, prevailing wage triggers requirements such as payroll certification that can add to costs. The same measures may also deter illegal labor practices that would lower costs, such as wage theft and worker misclassifications—construction consistently ranks as an industry with some of the highest number of cases on the U.S. Department of Labor's list of "Low Wage, High Violation Industries," although it is unclear what proportion of those cases represent residential projects.[26, 27] Interviews highlighted that because of the increased demand for labor, it can also be harder to find contractors willing to do prevailing wage jobs. Conversely, labor economists argue that better paying projects are able to attract more productive workers, which can mitigate the cost impacts of prevailing wage requirements.[28]

Ultimately, prevailing wage requirements are a policy choice designed to provide public benefit by stabilizing employment and benefits in a high risk field; those benefits have values not captured in an analysis of hard construction data.

Policy Implications

This report provides a unique look at the role of different line item costs in driving hard construction costs. While state and local policymakers do not control broader labor market trends or the cost of materials, there are a number of levers at their disposal that could help mitigate rising costs, including the following:

Shortening permitting and approval timelines can mitigate costs associated with uncertainties and delays.

Local agencies should consider ways to shorten review and approval timelines, reducing risk for projects. As previously noted, these timelines can be extensive.[29] The process is sufficiently onerous that developers often hire private expeditors to move projects through review in a timely manner.[30] Affordable projects often face more extensive review by more local departments, resulting in longer and more circuitous paths to final permitting and approval.[31] Slowing any project in the pre-construction phase can increase the cost of carrying capital and imperil key funding deadlines, endangering the viability of projects. Increased risk and uncertainty in the approvals process may also convince general contractors and subcontractors to add escalation clauses or to increase contingency costs in their contracts, in order to ensure they can cover future hikes in wages and materials costs if a project is delayed.[32] And, of course, the longer a project takes to move into construction, the higher the likelihood that costs associated with labor and materials have also increased.

Reviewing code for inefficiencies can also mitigate rising construction costs.

Jurisdictions should consider the ways in which overlapping regulations can add to construction costs, and review ways to maintain environmental and safety standards while easing the cost impact for new housing. For example, in our report on construction costs in San Francisco, focus group members suggested that the city could require more advanced air quality ventilators only for lower floors affected by pollution, rather than throughout a building.[33] Small changes can have an outsize impact as jurisdictions aim to meet goals for housing development while continuing to rigorously protect the health and sustainability of their community. Further research is needed on state building codes to determine if there are opportunities to consolidate or improve the efficiency of regulation while achieving the same policy goals.

Increasing support for labor training programs, such as apprenticeships and programs at community colleges, can assist in building and skilling up the construction workforce.

California needs a more robust labor pool to meet the demand for building in the state, especially as the state steps up goals for production. Unions are playing an increasing role in training the construction workforce; empirical studies have found a positive relationship between union coverage and construction worker training.[34] In a 2019 survey by the Associated General Contractors of America (AGC), 47 percent of California contractors reported that they had added or increased their use of unions to provide workers in the past year, the top response.[35]

Vocational training programs also provide an important pipeline for talent; the second most prevalent response to the AGC survey question was "[engaging] with [a] career-building program."[36] These programs, which include classes and academies within high schools and pre-apprenticeship programs, provide students with the skills they need to enter the workforce. The state could consider increasing support for labor training programs, such as those at community colleges that prepare students for apprenticeship exams.

Supporting innovative construction methods and materials could ultimately lead to lower construction costs.

Industrialized construction (IC) has the potential to lower costs and speed construction schedules. A broad category that encompasses firms that produce units, elements, or parts of a building offsite, industrialized construction has garnered attention from venture capitalists, developers, and researchers as a way to improve an industry that has seen productivity decline for decades.[37] California leads the nation in industrialized construction, with at least 31 different companies founded in the state over the last two decades.[38] Our research found that off-site construction can save as much as 20 percent on the cost of building a three or four story wood-frame multifamily development, and shorten the construction timeline by between 40 and 50 percent.[39]

Yet, industrialized construction also faces challenges. As developers and architects begin to work with new construction technology, they are experiencing a learning curve in terms of siting and designing projects to optimize potential efficiencies. General contractors have to adapt to new workflows and scopes of work, which requires coordination and education between developers, contractors, and IC firms. Government actors also have a role to play in smoothing the way for new technology. Currently, the state inspects offsite components while local buildings officials review the completed building for local code compliance, which can cause confusion. The state and local governments can work with firms to bring local inspectors up to speed on the unique approach to building review.

Affordable housing projects face additional financial barriers to adapting IC, because factories require a large deposit prior to construction in order to cover ordering of materials, before or at the time of finalizing a construction loan, even though no work has been delivered to the site. While private developers may be able to access more flexible forms of capital, affordable housing developers draw from fewer and more regulated sources of capital, limiting their ability to spend earlier in order to save later. The state or local governments could address this concern by running a pilot program to create supplemental revolving construction loans for affordable housing developers that make use of offsite technology, in effect seeding the industry to lower costs for subsidized development.

Other technological advances, like mass timber (MT), may also lower costs, but MT has yet to be fully integrated into statewide building codes. MT has drawn attention for its ability to shorten construction timelines (by 15-20 percent, by some estimations),[40] and lower costs. Some have argued that the need for MT is heightened in the face of increased seismic requirements for the 2020 building code, which MT can mitigate by lightening the load of the building.[41]

While states like Oregon have allowed for mass timber to be used in taller residential structures, only one high-rise (eight story) residential building has been built in that state[42] and California has yet to adopt similar code. MT remains cutting-edge in residential construction, but continues to gain traction in the field—the International Code Council adopted changes to the 2021 International Building Code that allow for MT construction up to 18 stories.[43]

Following this determination, California State Assemblymember Frank Biglow introduced Assembly Concurrent Resolution 102 in 2019, which would have "urged the Office of the State Fire Marshal to adopt rules for the use of mass timber products for residential and commercial building construction," but the resolution stalled in the assembly.[44] MT construction could help to lower building costs across the state while providing additional benefits in terms of seismic requirements, and the state should continue to weigh responsible ways to incorporate the material more explicitly in the building code.

Streamlining affordable housing entitlements and funding could help to lower construction costs.

The finding that, on average, affordable units cost more per square foot than market-rate units indicates the need to further examine how affordable housing is permitted and funded. As The Costs of Affordable Housing Production: Insights from California's 9% Low-Income Housing Tax Credit Program shows, while some of the factors influencing the cost of affordable housing are no different from market-rate construction, there are aspects of costs that are unique to affordable projects. Key among these is the fragmented regulatory and funding structure for financing affordable units. Resolving this fragmentation won't be easy, but a valuable first step would be for the state to consider emulating the Minnesota Housing Finance Agency in creating a consolidated Request for Proposals (RFP) for several funding sources, including LIHTC.[45]

National policy changes are also key to reining in hard construction costs.

At a national level, more can be done to lower the cost of materials and expand the construction workforce. As previously noted, some have traced part of the increase in materials costs to increased tariffs; lowering tariffs and promoting the international trade of building materials could mitigate rising material expenses. On the labor side, national immigration policy has direct effects on the construction workforce. According to a recent report by the Pew Research Center, unauthorized immigrants make up 15% of the national construction occupation,[46] and the current administration's actions on immigration have raised concerns about the loss of experienced construction workers.[47] While outside of the purview of state and local policymakers, national level policies represent fundamental tools to lower the cost of hard construction.

Conclusion

California's rising construction costs undercut housing affordability goals and threaten the viability of new housing projects overall. The data confirm that, controlling for key factors, hard construction costs have significantly increased, and certain line items are driving those costs. In a state battling to overcome years of undersupply of housing, policymakers are rightfully invested in tamping down escalating development costs.

While there is no "silver bullet" to lower costs, state and local policymakers have a host of tools at their disposal to mitigate expensive construction. Building regulations and codes, as well as permitting and approval processes, could be reviewed with an eye towards streamlining and lowering the cost of building. Policymakers could consider ways to responsibly support new construction techniques with the potential to increase the sector's efficiency. Supporting the expansion of training and apprenticeship programs could increase the pipeline for much-needed talent. Finally, policymakers could review the way in which affordable housing projects are financed to promote more cost efficient construction. By reining in construction costs, policymakers can build more housing more affordably, broaden the impact of public subsidies for affordable homes, and move forward in alleviating the state's housing crisis.

1. Garcia, D. (2019). “Making It Pencil: The Math Behind Housing Development.” Terner Center for Housing Innovation at UC Berkeley. Retrieved from: https://ternercenter.berkeley.edu/making-it-pencil.

2. According to the U.S. Bureau of Labor Statistics’ Occupational Employment Statistics, in 2018, the median hourly wage for all occupations in the state was $20.40. Assuming an employee earning that wage works 8 hours a day for 20 days in a month, their monthly earnings would be $3,264.

3. We requested data from both single-family and multifamily developers and builders but did not receive any responses from the single-family industry. Single-family cost trends remain an area in need of further research.

4. The majority of the projects for which we were able to collect total project cost data were affordable projects, with a smaller number of mixed-affordable and market-rate projects. No data on total costs was available for solely market-rate projects. Figure 1 displays four project cost categories: 1) acquisition costs, which include land and closing costs, 2) hard construction costs, 3) soft costs, such as legal fees, insurance, professional fees, and development fees, and 4) conversion costs including the conversion fee, the operating deficit reserve, and title fees. This figure includes acquisition costs that were as low as $100 or $0, presumably because land was donated to the project. When those low figures are extracted from the averages acquisition costs rise by 1% to 9% of total project costs, and hard costs drop by the same amount to 62% of total costs.

5. Construction Specifications Institute MasterFormat. Retrieved from: https://www.csiresources.org/home.

6. California Department of General Services. DGS California Construction Cost Index CCCI. Retrieved from:https://www.dgs.ca.gov/RESD/Resources/Page-Content/Real-Estate-Services-Division-Resources-List-Folder/DGS-California-Construction-Cost-Index-CCCI.

7. These data align with those presented in the GAO report on Low-Income Housing Tax Credit (LIHTC) development costs. See United States Government Accountability Office. (2018). Low-Income Housing Tax Credit: Improved Data and Oversight Would Strengthen Cost Assessment and Fraud Risk Management. 16-18. Retrieved from: https://www.gao.gov/assets/700/694541.pdf.

8. California Department of General Services. DGS California Construction Cost Index CCCI. Retrieved from: https://www.dgs.ca.gov/RESD/Resources/Page-Content/Real-Estate-Services-Division-Resources-List-Folder/DGS-California-Construction-Cost-Index-CCCI.

9. See https://www.edmca.com/media/35207/masterformat-2016.pdf for a detailed list of CSI MasterFormat Divisions.

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