Release of the 2014 California Affordable Housing Cost Study

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The California Department of Housing and Community Development ("HCD"), the California Tax Credit Allocation Committee ("TCAC"), the California Housing Finance Agency (“CalHFA”), and the California Debt Limit Allocation Committee ("CDLAC") are pleased to present a large scale housing development cost study intended to measure the factors that influence the cost of building affordable rental housing in California. This study is the first such analysis completed for California since 1996.

Data was collected and analyzed from hundreds of multi-family projects completed in California from 2001-2011. The affordable housing developments analyzed represent a very diverse set of projects that span the state and provide housing to varied types of residents, including single individuals, large families, people with special needs, and seniors. The study analysis employed widely accepted statistical techniques to identify several factors that are correlated with raising or lowering the costs of developing affordable housing in California.

In addition to the empirical analysis of multi-family housing development costs in California, this study also examined the social and economic impact of affordable housing to better understand the indirect benefits from the investment in subsidized affordable housing.

The state housing agencies would like to thank the members of our Advisory Committee, who devoted significant time to the development of the study, its survey instrument, and data analysis. In addition, the state housing agencies would like to thank the members of the housing community that responded to our surveys and questions about their projects.

The high cost of constructing housing in California is an important public policy issue impacting our state’s economic growth, its environment, and the health of its citizens. Policies that can help reduce the costs for the development of affordable housing can result in increased supply, fostering sustainable growth for our great state in the coming decades.

Affordable Housing Cost Study

Analysis of the Factors that Influence the Cost of Building Multi-Family Affordable Housing in California

Contents

Acknowledgements

The report was prepared by the four state of California agencies with responsibility for affordable housing - the California tax credit allocation committee (TCAC), the California debt limit allocation committee (CDLAC), the department of housing and community development (HCD), and the California housing finance agency (CALHFA) - based on analysis conducted by Matthew Newman, Shawn Blosser, and Susan Woodward of the blue sky consulting group. An advisory group consisting of affordable housing developers, advocates and other experts guided the efforts of the study team. A list of Advisory Group members is provided in Appendix 6.

Cynthia Kroll, senior regional economist and executive director for staff research at U.C. Berkeley's Fisher Center for Real Estate and Urban Economics, and Ashok Bardhan, Senior Research Associate at the Haas School of Business at U.C. Berkeley, were engaged by the state's housing agencies to provide a peer review of the research contained in the report. Cynthia and Ashok provided numerous helpful suggestions for ways to improve the report and analysis.

We also received assistance from developers of affordable and market rate housing who offered suggestions, information, and – most importantly – agreed to complete our surveys and provide detailed information about the projects they developed.

In addition, we are grateful to the staff of the state's housing agencies, who provided access to state data, answered questions, helped identify missing or incomplete information and otherwise helped to make sure that this project could succeed.

EXECUTIVE SUMMARY

California's housing costs are among the highest in the nation. For low-income households, high housing costs can lead to problems such as frequent moves that interfere with children's school performance or families forced to live in unhealthy substandard housing.

To reduce the problems associated with high housing costs, federal, state and local governments have created an array of public programs intended to expand the supply of rental housing affordable to low-income California households. By increasing the supply of affordable housing, research suggests that these policies have helped to improve the educational attainment and health of residents while increasing economic activity and reducing social services costs.

These benefits notwithstanding, costs for developing affordable housing have been a subject of interest among policy makers and the public alike. In order to better understand the forces that drive the costs of developing affordable multi-family rental housing in California, the state's four housing agencies - the California Tax Credit Allocation Committee (TCAC), the California Debt Limit Allocation Committee (CDLAC), the Department of Housing and Community Development (HCD), and the California Housing Finance Agency (CalHFA) – joined together to commission a study of this important topic.

Working over the course of a year, the study team collected and analyzed data from hundreds of multi-family projects completed in California during the past decade, resulting in the largest and most comprehensive data set of its kind ever assembled for the state. The efforts of the study team were guided by the leaders of the state's housing agencies as well as by an Advisory Committee, comprised of affordable housing developers, advocates, and other subject matter experts. The affordable housing developments analyzed represent a very diverse set of projects that span the state and provide housing to varied types of residents, including single individuals, large families, and seniors. This diversity notwithstanding, the analysis employed widely accepted statistical techniques to identify several factors that are correlated with raising or lowering the costs of developing affordable housing in California.

The following are the key findings from this analysis:

- Local factors have an impact on costs. Specifically, projects with more community opposition, significant changes imposed by local design-review requirements, or that received funding from a redevelopment agency cost more, adding 5 percent, 7 percent, and 7 percent, respectively, to the cost per unit, on average.
- Certain types of parking can add significantly to development costs. Specifically, projects with podium or subterranean parking cost 6 percent more, on average, relative to other developments without this type of parking.

- Choices made by developers matter. Some developers are able to build less expensive projects than others. Larger developers and developers that employ general contractors have all built projects less expensively relative to comparable developers that don't share these characteristics. However, several factors cause us to question the reliability of this finding. Building quality and durability add to costs. Buildings that are more durable, are more energy efficient, or are built to a high standard of quality cost more to develop. Specifically, for each 10% increase in our quality measure (e.g., from "low" to "medium") costs increased by about 15 percent, on average.
- Affordable housing is characterized by economies of scale, with larger projects costing less per unit than smaller projects. According to our results, for each 10 percent increase in the number of units, the cost per unit declines by 1.7 percent
- Different types of units have different development costs. While it may be obvious, larger units, such as those with 3 or more bedrooms, clearly cost more per unit to develop. Smaller units, such as single room occupancy or "SRO" units, cost less per unit but more per square foot to develop. Specifically, our regression analysis suggests that SROs were approximately 31 percent less expensive per unit to construct relative to large family units, while units for seniors were about 18 percent less expensive per unit relative to large family units.
- Land costs influence the cost of developing affordable housing even when the land costs themselves are excluded from the development cost measure itself. This is true primarily because they indirectly affect the type of project that is built, as developers are more likely to build taller structures that include underground or podium parking on land that is more expensive to purchase.

From these empirical findings some conclusions can be drawn. First, the factors influencing costs are multifaceted, with no single factor explaining all or even most of the cost of developing affordable housing. Therefore, any approach to lowering costs must look across multiple factors, rather than focusing on a single issue. Next, each of the actors in the development process – local communities, developers, state and federal agencies – plays a role in influencing how much a project will cost to develop.

Taken as a whole, however, this analysis suggests that development costs could be lower for affordable housing in California, and that carefully structured incentives in the tax credit award process or other funding processes could lower average costs per unit. There are tradeoffs, however, to simply lowering development costs. For example, the data suggest that building projects to a lower quality or durability standard would cost less. The analysis also suggests that some changes could lower costs without reducing project durability or quality, such as encouraging larger projects that historically have cost less per unit to develop relative to smaller projects. Similarly, our results suggest that some developers built projects less expensively than others even after controlling for building type, quality, and location. If the techniques used by these developers could be identified, encouraged and even replicated by all developers of affordable housing (perhaps by creating stronger incentives for cost efficiency), costs per unit could be lowered while still providing safe, clean and attractive affordable housing to California's most vulnerable populations.

INTRODUCTION

In California, high housing costs are an important economic and public policy issue. Whether the subject is homeowners struggling to make mortgage payments on a single-family home or renters facing the prospect of paying a large portion of their income for rent, high housing costs add stress to tight family budgets and shape decisions about where to live and work. For low-income residents of the state, however, high housing costs may cause bigger problems, pushing some families into unhealthy substandard housing or causing frequent moves which can undermine children's school performance. In response, private builders and public officials alike have sought to develop means of sheltering the state's low-income residents at a reasonable cost. In spite of these efforts, the high cost of developing housing remains an important concern.

To better understand the forces that drive the costs of developing multi-family rental housing in California, the state's four housing agencies - the California Tax Credit Allocation Committee (TCAC), the California Debt Limit Allocation Committee (CDLAC), the Department of Housing and Community Development (HCD), and the California Housing Finance Agency (CalHFA) – joined forces to commission a study of this important topic.

Working over the course of a year, the study team collected and analyzed data from more than four hundred affordable multi-family projects completed in California during the past decade. These projects span the entire state, and include a variety of building types, from large family units with three or more bedrooms to SROs (single room occupancy) consisting of a single room. Data for these projects were collected from the TCAC's records, surveys of developers, and publicly available information from private research institutions, state and federal governmental agencies.

In addition to the empirical analysis of multi-family housing development costs in California, this study also examined the social and economic impact of affordable housing to better understand the indirect benefits from the investment in subsidized affordable housing.

The study team's efforts were guided by the leaders of the state's housing agencies as well as by an Advisory Committee, comprised of affordable housing developers, funders, consultants, and other subject matter experts. Our data analysis was informed by the insights from this group, as well as by a thorough review of the literature on affordable housing. This report presents the results of this year-long research effort.

The Need for Affordable Housing

According to the national Center for Housing Policy, more than a quarter of working renters nationally spend half or more of their income on housing expenses.[1] In California, 34 percent of working renters spent half or more of their income on housing, according to the most recent report from the Center for Housing Policy. Among all 50 states, California has the highest fraction of working renters who spend half or more of their income on housing. The Center for Housing Policy reports that this housing burden worsened during the "great recession" as incomes fell even as housing expenses increased.[2]

In addition to the financial stress that high housing costs can place on households, research suggests that extreme housing burdens undermine educational attainment and are associated with poorer health outcomes and other social pathologies.[3]

In response to these (and other) concerns, federal, state and local governments have developed programs to provide affordable housing for low-income renters. The federal government's approach has generally focused on two avenues: (1) providing vouchers that low-income renters can use help make rental payments to private landlords and (2) providing funding (primarily in the form of tax credits) to increase production of affordable housing.[4]

What is Affordable Housing?

In this report, the term "affordable housing" refers to housing units developed in whole or in part with public subsidies and reserved for low-income residents. For purposes of assessing the social and economic effects of affordable housing, the term is also used to describe housing obtained with vouchers that offer rental assistance to low-income households.

SOCIAL AND ECONOMIC EFFECTS OF AFFORDABLE HOUSING

Each year the state and local communities in California invest substantial resources to help residents find affordable housing.[5] But what does the state get in return for this investment?

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[1] Viveiros, Janet and Maya Brennan, "Housing Landscape 2013." Center for Housing Policy.
[2] As measured by the Center for Housing Policy for the period 2008 to 2011.
[3] See "Social and Economic Effects of Affordable Housing" later in this report for a more compete explanation of these effects.
[4] Federal funding for other programs such as the HOME and CDBG programs has been declining in recent years.
[5] These investments come in the form of foregone tax revenues from tax credit financed projects and tax exempt bonds as well as direct expenditures from local property taxes and other sources.

The potential benefits of affordable housing are very broad, and extend from better school performance to improved health and well-being to increased economic activity. Research also suggests that some specialized types of developments, such as supportive housing that provides social services as well as affordable housing, can provide additional benefits in terms of reduced homelessness and lower costs for medical care and social service programs. Additionally, affordable housing built near transit ("transit oriented development" or TOD projects) can also help to reduce emissions of greenhouse gasses. A significant body of research describes the potential benefits of affordable housing.[6] In this section of the report, we review the published work on the social and economic effects of affordable housing and present the conclusions from this work.

Researchers have documented a wide variety of social and economic effects of affordable housing beyond the cost savings to residents from lower rents. Affordable housing impacts can be divided into three broad categories: education, health, and economic activity. By reducing involuntary resident mobility, whether due to eviction, inability to make rent payments, or a desire to avoid unhealthy or undesirable living conditions, access to affordable housing can produce important benefits for residents in the form of improved school performance and improved health. In addition, affordable housing construction can boost local economic activity through expenditures on construction labor, materials, and services in the local economy.

Education

Research suggests that access to affordable housing may improve educational outcomes among residents to the extent that it reduces involuntary mobility of low-income households. Involuntary mobility can result from a desire to avoid unhealthy or unpleasant living conditions (e.g., from living in substandard housing), eviction, or inability to make unaffordable rent payments.

Social science researchers have suggested a number of ways in which frequent family mobility translates into poor academic performance. Frequent mobility disrupts the social connections among children, parents, and teachers that have been linked to educational success.[7] Changing schools also subjects children to discontinuity in academic and social expectations, requiring an adjustment period during which academic outcomes may deteriorate.[8] In addition, living in substandard housing may

[6] See for example, Brennan, Maya, "Impacts of Affordable Housing on Education: A Research Summary." Center for Affordable Housing (2011).
[7] Swanson 56-57, Burkam (2009), Reynolds, Gruman.
[8] Burkam (2009), Reynolds.

increase exposure to environmental hazards that can worsen health, undermine learning or increase school absenteeism. Finally, homelessness is also associated with poor school performance.

These theories have been tested in numerous studies. Although methodological choices and data sources differ, a substantial body of research has shown a negative relationship between family mobility and educational outcomes. These poor outcomes span grade levels and racial backgrounds, and research suggests they worsen as the frequency of moves increases.[9, 10]

Because family mobility is strongly associated with socio-economic risk factors, such as poverty, parental education, and family structure, recent studies have attempted to establish the causality between family mobility and educational outcomes by looking at longitudinal data and assessing educational outcomes both before and after moving.[11] These studies suggest that family mobility is associated with poorer educational performance among students as measured by overall achievement, likelihood of repeating a grade, and/or likelihood of dropping out.

A 1994 study by the General Accounting Office provides the foundation for many of the subsequent studies on mobility and educational outcomes. This study examined education data for 15,000 third graders across 235 elementary schools. It found that more frequent moves were associated with lower achievement levels in math and reading. Additional moves were also associated with a higher likelihood of repeating a grade. Just 8 percent of third graders who never moved repeated a grade, but 20 percent of those who moved three or more times had to repeat a grade. The study also provided evidence that the likelihood of poor achievement in math and reading goes up with each additional move for all income levels, with the lowest income and most mobile families showing the worst achievement test results.

The GAO study findings are confirmed by a large body of other published work. One such study examined a sample of ninety children who had moved at least once during their first three years of school (kindergarten to second grade).[12] In every grade studied, increased family mobility was associated with lower scores on math and reading tests. A third study looked at the mobility and achievement in a sample of low-income children in Chicago.[13] Using a longitudinal study following children from kindergarten through the seventh grade, the researchers controlled for academic

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[9] Burkham (2009), GAO (1994), and Mantzicopoulos (2000) examined elementary school outcomes. Rumberger (1998) and Swanson (1999) examined high school outcomes.
[10] Temple (1999).
[11] See, for example, Burkam and Reynolds, op. cit.
[12] Mantzicopoulos *et al.*
[13] Temple & Reynolds (1999)

achievement prior to a family's move as well as socio-economic factors. On average, reading and math scores were found to decrease with each successive move, with the worst outcomes for the most frequent movers.

Several other studies examined the performance of students over time to assess the impact of family mobility on achievement. Swanson and Schneider examined longitudinal survey data for a cohort of 25,000 nationally representative eighth graders. The researchers controlled for individual demographic characteristics and examined mobility from a number of perspectives: whether a child moves early or late in high school and whether the move involved a change of school, change of residence, or both. The results suggest that students who moved late in high school performed worse in math, while students who moved early in high school were more likely to drop out.

Burkam *et al*. used longitudinal data to study a cohort of over thirty thousand school children during the period from kindergarten through third grade. The study found that children who moved more than once during the first two years of school performed poorly in school, as did children who moved during kindergarten.

A meta-analysis conducted by Reynolds, Chen, and Herbers in 2009 confirmed the current understanding of the relationship between mobility and educational outcomes. The authors examined sixteen studies looking at the link between family mobility and education success as measured by achievement scores. The studies' combined examination period covers kindergarten through grade twelve. The authors reported that, out of the twelve studies that looked at achievement, ten found increased family mobility is associated with poor outcomes in math and reading scores. They further reported that family mobility at any time in a child's education was associated with decreased school performance.

Impact on dropping out

A number of other studies point to the link between high family mobility and high school completion. Similar to Swanson and Schneider, Rumberger and Larson use National Education Longitudinal Survey (NELS) data to track a cohort of over 11,600 students from eighth grade through two years after scheduled high school completion. Even after taking account of family background and parents' education, they found that children who moved twice or more were more likely to drop out of high school than children who had never moved. Also using NELS data, Teachman *et al.* assessed the likelihood of early drop-out (i.e., before the tenth grade). The researchers found that each change in school is associated with an increased probability of early drop-out, even when controlling for other factors that may influence the drop-out rate.

Impact on Homeless Children

Research suggests that homeless children face numerous obstacles to performing well in school. Specifically, homeless children are more likely to be absent from school, repeat a grade, drop out and perform poorly on standardized achievement tests.[14] To the extent that access to affordable housing reduces homelessness, it has the potential to improve school performance for these children.

Effects of Substandard Housing on Educational Performance

Exposure to environmental hazards such as lead can directly affect children's development while exposure to other hazards such as mold may increase the incidence or severity of asthma, which can increase absenteeism.[15] In both cases, school performance can suffer. To the extent that affordable housing provides access to living environments that reduce or eliminate exposure to these environmental hazards, it can contribute to improved school performance among residents.

Health

Research suggests that access to affordable housing can have an impact on the health outcomes of occupants by reducing exposure to environmental toxins and other hazards and/or by freeing up financial resources to pay for health care services or purchase more nutritious food.

Limiting Exposure to Environmental Hazards

Without a sufficient supply of affordable housing, families may be more likely to live in poor quality housing that presents hazards to their health. Joshua Sharfstein and his co-authors surveyed families qualified for but still waiting to receive Section 8 housing assistance.[16] The results of their research suggest that these families were exposed to higher levels of environmental hazards or other factors that increase the likelihood of injury or otherwise impair health relative to a comparison group. The authors reported that, relative to a comparison group, those awaiting affordable housing were more likely to have encountered rats (35.1% vs. 22.1% in the comparison group), gone without heat (31.0% vs. 18.7%), experienced the absence of running water (24.3% vs. 6.1%), lived with broken toilets (18.9% vs. 5.4%), and seen peeling paint (17.6 vs. 10.8). A comprehensive review of the impact of affordable housing on health by the Center for Housing Policy reports that "well-constructed and managed

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[14] Ernst, Greg and Foscarinis, Maria, "Education of Homeless Children: Barriers, Remedies, and Litigation Strategies." *Clearinghouse Review:* pp 754-759 November-December 1995.

[15] Moonie, Sheniz, et. al., "The Relationship Between School Absence, Academic Performance, and Asthma Status." *Journal of School Health* 78(3): pp. 140-148 (2008).

[16] Sharfstein, Joshua, et. al., "Is Child Health at Risk While Families Wait for Housing Vouchers?" *Am J Public Health*. 2001 August; 91(8): 1191–1192.

affordable housing developments can reduce health problems associated with poor quality housing by limiting exposure to allergens, neurotoxins, and other dangers."[17]

Access to Affordable Housing Can Improve Health Outcomes

A review of recent literature by Acevedo-Garcia *et al.* found that affordable housing policies "may potentially contribute to improving the health of both adults and children."[18] Two of the studies reviewed stand out: one (Katz, Kling) measured a range of physical and mental health outcomes and a second (Leventhal) assessed the mental health of mothers and children. Both studies examined the effects of the Moving to Opportunity (MTO) program, a Housing and Urban Development Department (HUD) experiment in which participants were randomly offered a) the treatment group - a Section 8 voucher valid only in a low-poverty area and housing counseling, b) a Section 8 voucher without geographic restriction, or c) no voucher (though voucher eligibility persisted). In both studies the treatment groups had statistically significant improvements in health outcomes, including fewer accidents, fewer behavioral problems, and greater incidences of feeling calm and peaceful. A similar finding was reported by Harkness and Newman, who examined a sample of 44,000 households in thirteen states and found that poor families that lived in areas with more affordable housing rated their children as having better health than poor families living in areas with less affordable housing.

Access to Affordable Housing Can Free-up Financial Resources

In addition to reducing the threats to physical and mental wellbeing, access to affordable housing can improve health by freeing up financial resources to pay for health care services. Using longitudinal data from the Consumer Expenditure Survey, Levy and DeLeire assessed the spending habits of the uninsured versus the insured, controlling for demographic traits, income, and location. They concluded that the uninsured spend a larger share of income on housing, food, and education than the insured population, suggesting the poor households shift their spending away from buying health insurance to cover expenses for basic necessities. A recent study by the Center for Housing Policy had similar findings, reporting that households that spend more than half their income on housing spend only 4.2 percent of their income on healthcare and insurance compared with the 9 percent allocated by households that spend less than thirty percent of their income on housing. Even after controlling for traits such as family structure, education, location, and race, working families that spend more than half their income on housing spend an average of $683 less annually on healthcare when compared

[17] Cohen, Rebecca, "The Impacts of Affordable Housing on Health: A Research Summary" Center for Housing Policy 2011.
[18] Acevedo-Garcia, Dolores, et. al., "Does Housing Mobility Improve Health?" *Housing Policy Debate*, Volume 15 Issue 1 (2004).

with families that spend less than thirty percent of their income on housing.[19] The authors also report that families that spend more than half their income on housing are less likely to have enough money for food and are less likely to have health insurance compared with families that spend less of their income on housing but are otherwise similarly situated.

Other researchers have observed that poor households must often choose between paying for housing and paying for food. Reviewing data for almost 12,000 children surveyed by the Children's Sentinel Nutrition Assessment Program (C-SNAP), researchers stratified the data by households' food security status to assess the impact of receiving a rent subsidy on birth weight. [20] After controlling for demographic characteristics and participation in other transfer payment programs, the authors found children receiving rent subsidies had higher birth weights compared to similar children in households without rent help. Children without rent subsidies were further found to have a clinically significant lower average birth weight. This suggests that by easing the strain on family budgets imposed by high housing costs, affordable housing enhances poor households' ability to meet the basic nutritional needs of pregnant mothers and their children.

Finally, the impact of family mobility is not just limited to educational achievement scores. Simpson and Fowler used longitudinal data from the National Health Interview Survey to examine the impact of family mobility within a sample of over 10,000 children in grades one through twelve. Even when controlling for demographic characteristics, the researchers found children who moved three or more times had almost double the chances of having emotional or behavioral problems relative to those that never moved, including depression, hyperactivity, peer conflict, and antisocial behavior.

Economics

The principal economic argument in support of affordable housing suggests that investments in affordable housing development increase economic activity, thereby benefiting the state's economy and generating additional tax revenue for the state and local governments.

Impact on the Economy of Construction Expenditures

Housing development generates economic activity directly from construction expenditures as well as from follow-on expenditures by construction workers and firms in the local economy. A number of studies have been conducted that measure the local economic impact stemming from development of affordable housing. These studies suggest that development of affordable housing can generate both

[19] Lipman 2005.
[20] Meyers *et al*. Food security status defined as regular access to an adequate amount of food.

temporary construction related employment and ongoing consumer purchase driven jobs in the local economy. For example, a study by the National Association of Home Builders estimated that construction of a 100 unit LIHTC affordable housing development leads to the creation of 122 jobs related to the construction activity and 30 ongoing jobs related to the purchases made by residents in the local economy.[21] This local economic activity can, in turn, create fiscal benefits for the state and local governments as a result of sales taxes collected on construction materials, income taxes paid by construction and other workers, and corporation or income taxes on profits earned by builders, developers, and other affected firms.

Because much of the direct cost of developing affordable housing is paid for in the form of federal tax credits, a substantial fraction of this economic activity represents additional or new economic activity in California that would not occur in the absence of the affordable housing development. That is, because the development is financed by tax credits, in the absence of such development at least some fraction of these financial resources likely would be paid to the federal government as taxes instead of invested in California's economy. We were not able to identify any studies that directly measured the fraction of spending that represents new economic activity. Nevertheless, given the amount of resources spent each year on development of affordable housing, the effect is likely substantial.

Impact on Regional Competitiveness

Research also suggests that affordable housing can lead to improvements in a local economy to the extent that lower housing costs are viewed as a comparative advantage by employers and workers. According to a report by the Center for Housing Policy, a lack of "affordable housing can affect an employer's ability to attract and retain employees and can thus have implications for regional economic competitiveness."[22] This report goes on to note that access to "affordable housing programs may contribute to employee retention." Therefore, while subsidized affordable housing comprises just one element of an overall housing market, to the extent that it lowers housing costs for local workers it may contribute to improved regional competitiveness.

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[21] These estimates reflect the overall extent of economic activity in a local region and do not necessarily reflect new economic activity, since some portion of the resources devoted to development of affordable housing are shifted from other regions where economic activity would decrease. In addition, the increased local expenditures from residents of affordable housing reflect, at least in part, a transfer from taxpayers who subsidize affordable housing development through higher taxes. See National Association of Home Builders, "The Local Impact of Typical Housing Tax Credit Developments," 2010.

[22] Center for Housing Policy, "The Role of Affordable Housing in Creating Jobs and Stimulating Local Economic Development," 2011.

Impact on Property Values

A common objection to affordable housing projects is that they threaten property values of nearby homes. Although this perception is firmly rooted, it is not firmly supported by empirical studies. In a review of seventeen studies examining the issue, Mai Thi Nguyen finds that current research does not support a definitive conclusion about the relationship between affordable housing and property values.[23] Instead, the impact depends on a range of factors, including the management of the project, the neighborhood in which it is located, and the concentration of affordable developments within a confined geographic area. The study's author notes, for example, that "not only can a well-maintained affordable housing development not detrimentally affect property values, it is conceivable that it can raise property values in neighborhoods, such as those that contain abandoned homes and neglected or physically deteriorating properties." The author further notes that, "when negative effects exist, they are small."

Other Benefits of Affordable Housing

Impact on Social Service Costs

In addition to the impact on jobs and the economy, research suggests that certain types of affordable housing may help to save taxpayer money by reducing the utilization of public services by chronically homeless individuals. Specifically, affordable housing that combines housing with targeted health and social services (known as supportive housing) has the potential both to reduce homelessness and to lower costs for social services programs. According to a 2010 report by Dennis Culhane of the University of Pennsylvania, for example, "there are compelling principles underpinning the concept of permanent supported housing as well as significant evidence of it being both an effective and fiscally sound strategy for reducing chronic homelessness."[24] Examining administrative data from New York City, researchers compared the use of shelters, psychiatric, medical, and veteran hospitals, Medicaid, jails, and prisons by persons with severe mental illness who were housed in affordable housing against the service use of those who were not.[25] With the exception of Medicaid use, the researchers found that use of all other categories of service decreased, with a net reduction of $12,146 of total annual service use per person in affordable housing. These service cost savings covered 95 percent of the

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[23] Nguyen, Mai Thi, "Does Affordable Housing Detrimentally Affect Property Values? A Review of the Literature." Journal of Planning Literature, Vol. 20, Number 1 (2005).
[24] Culhane, Dennis, "Ending Chronic Homelessness: Cost-Effective Opportunities for Interagency Collaboration," Selected Works of Dennis Culhane, 2010.
[25] Culhane *et al*. "Public Service Reductions Associated with Placement of Homeless Persons with Severe Mental Illness in Supportive Housing." University of Pennsylvania ScholarlyCommons (2002).

housing program cost. Similar results were found in a study of supportive housing for chronically homeless alcoholics in Seattle, WA that compared the service use of residents against the service use of those on the waiting list.[26] The researchers of the Seattle study concluded that after just six months in the program, individuals who were placed in housing decreased their alcohol use as well as their use of hospitals and jails.

The reduction in public service use is also found in California. Project 50, a pilot project to house the chronically homeless in Los Angeles, released its cost effectiveness assessment in June 2012. Like the New York and Seattle programs, Project 50 targets the high-risk, chronically homeless and places them into affordable housing paired with social services. One year into the program, the county reported that residents in Project 50 had significantly lower costs for incarceration and medical services, with a $1.2 million decline in total service use. The second year is projected to result in an estimated $2.08 million decline in service use. With these cost savings the county calculates that Project 50 generated a surplus of $4,774 per program participant. The results of these studies suggest that affordable housing for the chronically homeless can serve the interests of residents and taxpayers more generally.

Environmental Impacts

Affordable housing also has the potential to facilitate the accomplishment of other state policy goals, including the reduction in greenhouse gas (GHG) emissions. By constructing housing near transit, transit oriented developments (TOD) can help to reduce GHG emissions by allowing residents to use transit instead of personal vehicles for many of their transportation needs. According to a study by the federal Transportation Research Board, "TODs can contribute toward creating a more sustainable built form, functioning as a counter-magnet to auto induced sprawl."[27] Specifically, the report notes that "research shows living and working near transit stations correlates with higher ridership" and cites a study of TODs in Santa Clara County (among many others) that found "TOD residents patronized transit as their predominant commute mode more than five times as often as residents countywide." According to a study by the Texas Department of Transportation, "moving into TOD decreases VMT [vehicle miles traveled] by an average of 15 percent, or about 3,500 miles per year."[28] These effects may be especially pronounced among the low income residents of affordable housing. According to a report by the California Housing Partnership, "while living in TOD homes increases transit ridership among people of all incomes, low-income people demonstrate the highest transit ridership in TOD

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[26] Larimer 2009
[27] Transportation Research Board of the National Academies, "Transit-Oriented Development and Joint Development in the United States: A Literature Review," *Research Results Digest*, October 2002 Number 52.
[28] Texas Department of Transportation, "Evaluating the Impact of Transit-Oriented Development," 2011.

neighborhoods."[29] Therefore, in addition to the other effects discussed previously, constructing affordable housing as part of TODs has the potential to reduce GHG emissions as a result of increased transit ridership and decreased use of individual passenger cars.

Other policies, such as those that encourage use of environmentally sustainable or energy efficient building materials can also act to help the state achieve important policy goals.[30]

In Sum

In sum, the body of existing social and economic research suggests that access to affordable housing can produce important benefits for California. This research suggests that access to affordable housing can improve educational outcomes, increase health and wellbeing, boost economic activity, and can lower social services costs for state and local governments, among other benefits.

STUDY METHODOLOGY

The principal goals of our empirical analysis were twofold: First, we sought to analyze the factors that influence the cost of building subsidized affordable multi-family housing in California. Second, we sought to compare the costs of building affordable housing to the costs of building comparable market rate multi-family rental housing.[31]

Each of these analyses is characterized by the complex and interactive nature of the underlying factors that can influence costs. For example, projects built in densely populated urban areas may be more expensive than projects built in rural areas. Similarly, larger projects may be less expensive on a per unit basis to construct than smaller projects due to economies of scale. Since larger projects also tend to be built in urban areas, isolating the relationship of economies of scale to cost when looking across diverse geographic regions can be particularly challenging. One approach might be to look only at projects in urban areas. However, this requires sufficient, similar urban projects with which to make comparisons. And, if some of these urban projects confronted other unique challenges, such as significant community opposition, it can become difficult to determine whether it is the extent of community

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[29] California Housing Partnership and TransForm, "Why Cap and Trade Auction Proceeds Should Fund Affordable Homes Near Transit," 2013.

[30] A full life cycle analysis of the impact of energy efficiency and environmentally sustainable building materials and approaches was beyond the scope of this study.

[31] Because of the high degree of variability in costs associated with rehabilitation projects, this study focused on the costs for newly constructed housing units.

opposition or economies of scale that drive a cost differential. When the analysis is broadened to include multiple potential cost factors, the analysis becomes that much more complex.

In order to simultaneously analyze all of the factors that can influence costs, we used the statistical technique known as regression analysis. Regression analysis is commonly used by economists and others when seeking to measure the relationship between one factor (e.g., project size) on another factor (e.g., cost of building affordable housing). One of the important benefits of regression is that it allows the investigator to isolate the relationship between two variables in an environment in which multiple factors are at work. In this way, using regression analysis allows the researcher to measure the impact of project size on the cost of building affordable housing without needing to directly compare otherwise identical projects.

When economists discuss regression analysis results, they typically talk in terms of "controlling" for other factors. "Controlling" could be written as "taking account of." For example, regression analysis can measure the relationship between economies of project size and unit cost while "controlling" for (taking account of) the extent of community opposition, project location, and various other factors. As such, regression analysis can be used to investigate the relationship between project size and project development cost independent of (or while controlling for, or taking account of) other factors that may also be related to cost such as community opposition or project location.

Fine Print

While it has many advantages, regression analysis is also subject to some important limitations. First, while regression analysis can indicate that one factor (e.g., project size) is correlated with an outcome (e.g., lower costs per unit), it generally does not allow for definitive statements about causality. Instead, it simply offers a measure of the relationship between two variables (e.g., larger projects are associated with lower costs per unit), but generally cannot say for certain that one thing causes the other.

Second, a regression analysis result is not a certainty, but instead a statement about likelihood. For example, when a result is said to be "statistically significant," this means that the result is very unlikely to be due to random chance or variations across different samples that may be drawn from an underlying population. And, while regressions can provide point estimates of the extent of the correlation of one variable with another, there is a margin of error around these estimates. Conversely, when a result is described as "not statistically significant," this does not necessarily mean that there is no relationship between the two variables. Instead, it means that, given the limitations of available data and the details of the regression model used, we cannot say with confidence whether the two variables are positively correlated, negatively correlated, or not correlated at all.

Finally, in spite of efforts to collect data on as many relevant factors as possible, a regression analysis may nevertheless fail to capture one or more important factors (e.g., factors that influence development costs may still be excluded from the analysis). To the extent that one or more missing variables is correlated with one of the included variables, it is possible that the coefficient on the included variable is biased (i.e., is not an accurate reflection of the relationship between the included variable and cost, for example). This phenomenon (called “omitted variable bias”) is a pitfall to which any regression analysis potentially would be subject and simply means that the point estimate from the regression analysis may be too high or too low relative to the “actual” value. Nevertheless, we have no reason to believe that omitted variables are biasing the findings; indeed, the results we present reflect findings that are robust across multiple versions of the regression models that we developed.

Data Sources

In order to analyze the factors associated with the cost of developing affordable multi-family housing we relied upon data from three main sources: (1) TCAC data (from the database of project applications as well as the project paper files), (2) data collected from surveys of the project developers, and (3) data from various public sources. Each data source is described in more detail below.

TCAC Data

Applications submitted to the California Tax Credit Allocation Committee represent the primary source of project-specific data.[32] Every developer seeking to use federal housing tax credits to finance a project must submit an application to TCAC. These applications contain important information about a project, such as type and size of the project, project location, developer type and experience, number and type of additional financing sources, and a host of additional project and developer characteristics.

Much of the application information submitted to TCAC is stored electronically in a searchable database. This database constituted the starting point for our analysis. Data were collected for projects approved by TCAC during the period 2001 – 2011. In addition, we limited our analysis to projects that had been completed, or “placed in service,” as of 2012. Examining only projects that were placed in service allowed us to analyze actual construction and other development costs, as opposed to cost estimates or projections. Because of the dramatic changes in the housing market that took place during the “Great Recession” that started in 2008, we sought to analyze projects completed prior to 2008, during what many have described as a housing boom, as well as during and following the Great Recession in order to gain a picture of how costs have changed over time.

[32] Based on interviews with affordable housing experts and consultation with the project sponsors and Advisory Committee members, we determined that the overwhelming majority of affordable rental housing units constructed in the state over the past decade utilized TCAC tax credit financing, among other sources (i.e., very few projects would escape our analysis if we relied on TCAC data as the starting point).

Because the TCAC database contains only portions of submitted application data, we supplemented the TCAC electronic data with information from paper project files. These files contain all of the information originally submitted as part of the application process as well as the final cost certification reports provided by the developer once a project is completed. These final cost certification worksheets contain financial information about each project and are required to be reviewed by an independent auditor. As such, these reports contain the best and most accurate information available about actual final project costs and characteristics.

Developer Surveys

While the TCAC electronic and paper files contain a wealth of information about the individual projects, some information that is relevant to the analysis nevertheless was not included among these sources. Specifically, we sought information about local requirements for design/review, the number of community meetings held to discuss the project, the level of California Environmental Quality Act (CEQA) review required for the project, and the nature of the land purchase (i.e., whether the purchase was an arm's length transaction). We also sought information about the relative quality and durability of the construction materials and techniques employed, as well as the energy efficiency characteristics of the project so that we could accurately compare projects that may vary considerably across quality and durability characteristics. Finally, we collected information about the developers who built these projects, such as the developer's size and experience, the types of on-staff employees, and the strategies used to address cost increases.

Information about these factors (among others) was collected via a survey of affordable housing developers conducted in the fall of 2012.[33] Specifically, a survey request was sent to each developer identified in the TCAC applications approved between 2001 and 2011 (the "Developer Survey"). A second survey was sent to developers of market rate multi-family projects in an attempt to collect information for comparable market rate developments (the "Market Rate Survey"), which was conducted during the winter and spring of 2013.

Public Sources

Finally, project and developer information from the TCAC records and the two surveys was supplemented with publicly available information. This public information included data on construction wage rates from RAND California, income and population density from the Bureau of the

[33] A copy of the survey instrument along with a description of the survey methodology is included in Appendix 3: Developer Survey Instrument.

Census, interest rate data from the Federal Reserve Board, and unemployment rates for each location from the Employment Development Department.

A complete list of public data sources and description for the variables used in the analysis can be found in Appendix 1: Data Descriptions and Summary Statistics.

The Final Data Set

The final data set used for our analysis consisted of 400 multi-family affordable projects that received either 9 percent or 4 percent tax credit awards and had a usable response from the Developer Survey. The final data set also was limited to those projects that involved new construction, excluding any projects that involved the rehabilitation of existing buildings.[34] Figure 14: Compiling the Final Analysis Data Set on page 57 presents additional details on the total number of projects, and the number that were excluded as a result of missing or incomplete survey responses, paper files or other data elements.

Cost Measures

In order to analyze the factors that influence the cost of developing multi-family affordable housing in California, we first needed to determine how the report would express "cost." While this may seem a straightforward matter, the choice of cost measure can have an important impact on the results of any analysis. For example, comparing projects on a cost per square foot basis (without controlling for other factors that influence costs) would likely find that larger units are less expensive to construct relative to smaller units. Thus, a comparison of costs per square foot in one community that had a need for large family housing to the costs in another that had a need for single room occupancy units would presumably find that the costs of developing housing in the first community were lower than in the second. Examining costs on a per unit basis would likely lead to the opposite conclusion. That is, large family units are generally more expensive on a per unit basis than smaller SRO units.

In order to address this issue, we examined costs on a per unit basis while taking account of the number of units and the size of the units in square feet. This approach allows us to measure the impact

[34] Five projects were excluded because they were determined to be extreme outliers in terms of one or more of the cost measures utilized, defined as being more than three standard deviations from the mean for one or more measures of cost (cost/unit, cost/sq ft, etc.).

of the cost factor of interest (e.g., economies of scale) on the cost per unit independent of difference across projects in terms of project or unit sizes.[35, 36]

To determine the cost per unit, we relied upon the certified cost worksheets submitted by TCAC applicants once a project is placed in service. The cost measure we utilized was total development cost net of costs for land acquisition. We excluded land costs because these costs can vary widely and are highly dependent on geography. Land costs were examined separately.[37]

RESULTS

This section discusses the results of our analysis of the affordable housing developments and the factors that are correlated with higher or lower development costs. We first provide an overview from the data, examining the main factors that appear to influence costs and providing some summary statistics on the projects and their associated characteristics. We then present the results of our regression analysis, which suggest that there are indeed a wide range of factors that can influence the costs of developing affordable housing in California. Finally, we look at the range of land acquisition costs associated with affordable housing developments and compare the actual costs for constructing affordable housing to estimated construction costs for comparable apartment buildings in California.

Components of Development Cost

Development costs for affordable housing projects come from a variety of sources. Figure 1 presents data on the various cost components as a percentage of total development cost (net of land). Construction costs are by far the largest category, accounting for 69 percent of total development costs. Demolition/Site Prep and developer fees were the next largest categories, accounting for 8 and 7 percent of total costs, respectively. Local permits and development impact fees comprised 6 percent of total development costs, and costs for architects, engineering and surveys represented 4 percent. Acquisition costs and offsite

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[35] The cost measure used in the regression analysis was defined as the natural logarithm of cost per unit, as discussed in

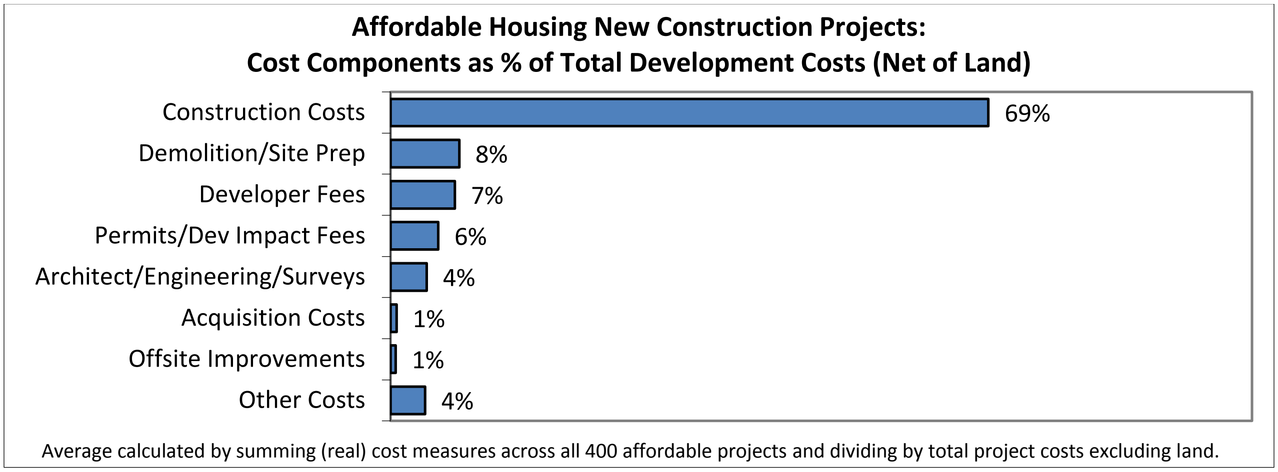
Appendix 4: Detailed Regression Results

[36] To confirm our results, we also examined costs on a per square foot basis and on a per bedroom basis, although results from our regression analysis were generally similar given that we controlled for project square footage and number of bedrooms in our regression models.

[37] Note that, in addition to the regression models discussed below which are based on total development cost per unit net of land cost, we also analyzed total construction cost per unit. This measure excludes land costs as well as site preparation, developer fees, and several other cost categories. Results for the construction cost regression analyses were similar to those results reported for total development cost net of land.

improvements were just one percent of costs, with other costs accounting for the remaining 4 percent of development costs (acquisition cost amounts are as reported on the final cost certifications for included projects. These amounts exclude land costs, which are reported separately on the cost certifications).

FIGURE 1: SOURCES OF DEVELOPMENT COST

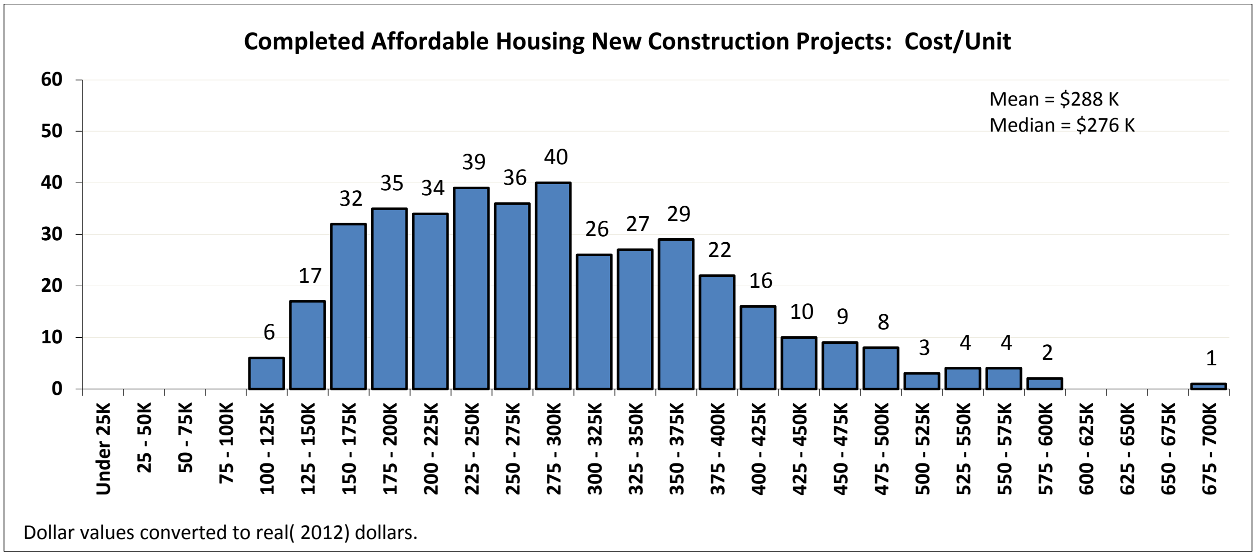


Overview of the Affordable Project Data

The 400 projects included in our analysis represent a very diverse set of housing options. The projects range in size from large, high-rise projects with more than 600 units to single story projects with just a dozen units. More than one-third of the projects reviewed were built with a majority of the units having three or more bedrooms, while other projects were small, single room occupancy developments comprised entirely of studios. In terms of location, these projects span the entire state, including highly developed urban centers as well as rural counties.

Reflecting this diversity, the cost of developing these projects varied widely as well, from about $4 million at the low end to more than $250 million at the high end, when converted to 2012 dollars. Even when viewed on a cost per unit basis, there was a considerable amount of variation in the data, with the least expensive projects costing around $100,000 per unit while the most expensive were $500,000 or more per unit. Figure 2 presents the distribution of projects on a cost per unit basis.

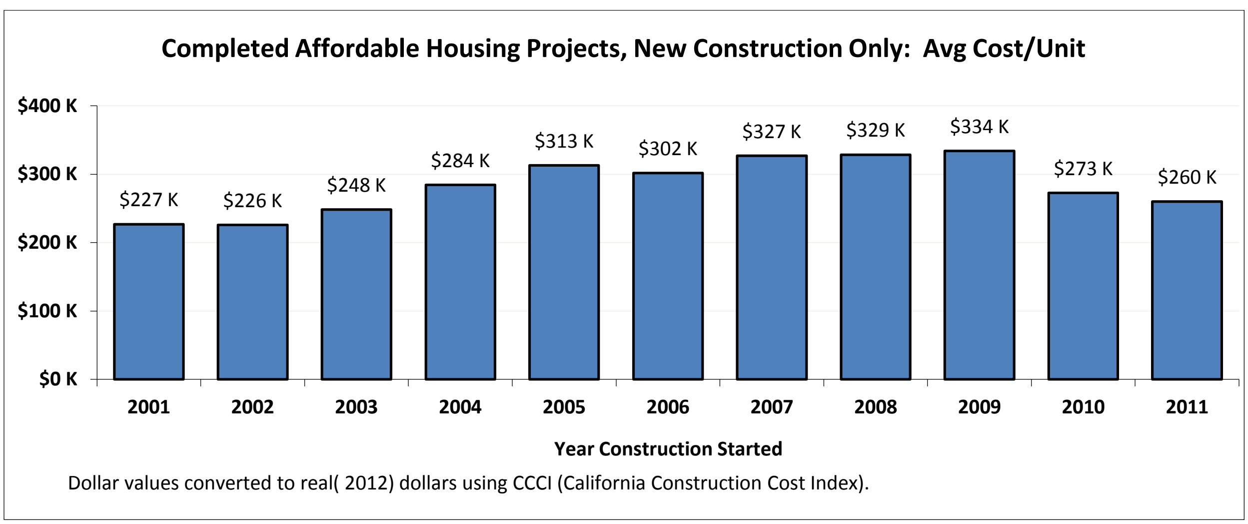
FIGURE 2: COST PER UNIT OF TCAC FINANCED PROJECTS



Costs Have Changed Over Time

The projects in our data set were constructed over a period of eleven years, from 2001 through 2011. During this period, the state's economy experienced significant changes, and the costs of developing affordable housing changed as well. Figure 3 shows the average cost per unit by year for the projects included in the analysis.

FIGURE 3: AVERAGE COST PER UNIT FOR COMPLETED PROJECTS, 2001 – 2011



As the data in Figure 3 indicate, the average cost per unit rose between 2001 and 2009, with a slight dip in 2006. After 2009, however, the average cost per unit for completed projects fell in both 2010 and 2011. Even with the cost declines in recent years, however, the average cost per unit for projects constructed in 2011 was about $33,000 higher in real terms relative to the projects from the beginning of the period, representing an increase of about 15 percent.[38]

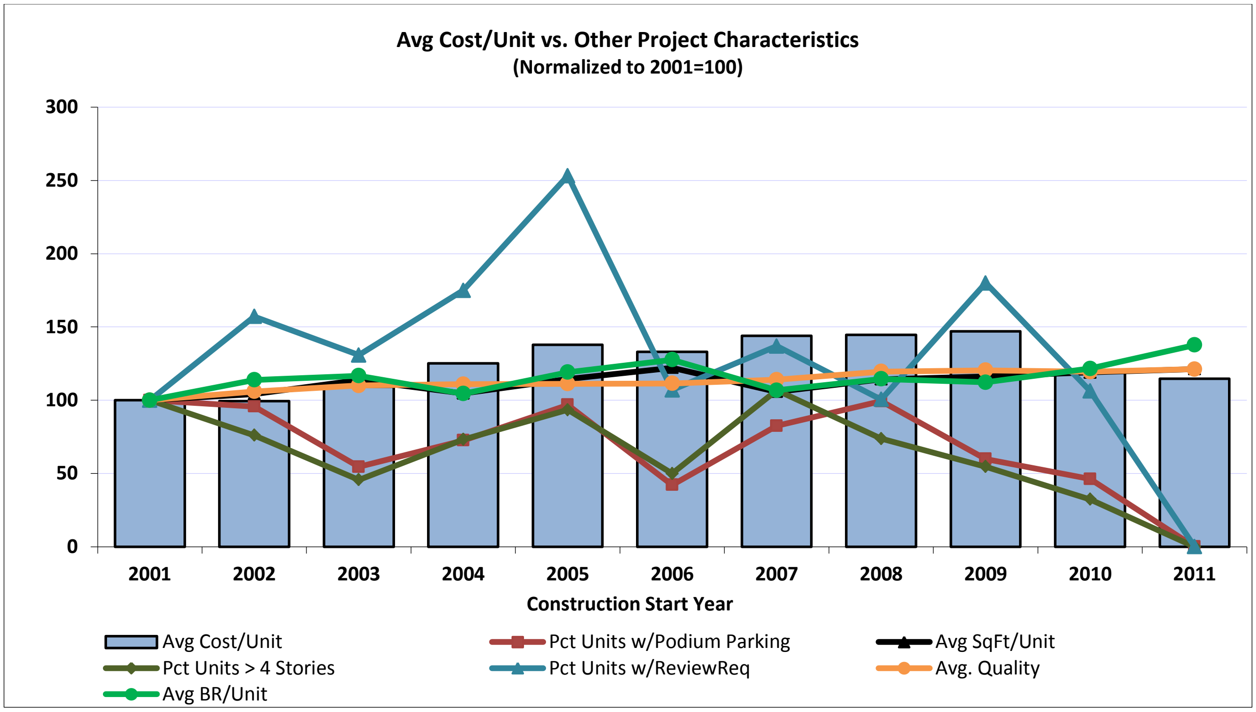
In addition to economic changes, the type of units that received tax credit awards also changed during the study period, although no single factor appears to be responsible for the pattern of cost changes observed. Instead, a combination of multiple factors working in unison acted to influence development costs over the period. For example, the number of bedrooms per unit increased fairly consistently through 2006, which would have acted to increase costs per unit over this period. However, after a brief decline in 2007, the number of bedrooms per unit once again increased during the period 2008 through 2011 even as costs per unit declined. As one might expect, the square footage per unit follows a very similar pattern, increasing through the 2001 – 2006 period, dipping briefly, and then increasing.

The percent of units that were built in projects that were 4 or more stories exhibited a somewhat different pattern, moving up and down through the period 2001 to 2007, where it reached a peak of 46 percent of completed projects. Then, the fraction of projects of 4 or more stories began a decline throughout the remainder of the study period, decreasing as costs were falling. Similarly, the fraction of projects that included podium parking moved up and down during the 2001 to 2008 period, but then began a steady decline, which tracked a decline in cost per unit. Other factors, such as the fraction of projects requiring significant changes as a result of local design review processes also moved in a pattern that loosely tracked cost changes, although the pattern suggests that this factor alone is not responsible for changes in costs over time.

The graph in Figure 4 shows these project characteristics compared to the average cost per unit, with all series normalized to equal 100 in 2001. While these trends may hint at the reasons for changes in costs over time, simply looking at the type of units that were approved cannot fully answer the question of how these changes may have interacted to influence overall project costs or what additional factors are at work to influence costs.

[38] Because these cost figures are net of land costs, and have been adjusted for changes in construction materials and wage costs, they reflect real changes in the average cost per unit over time.

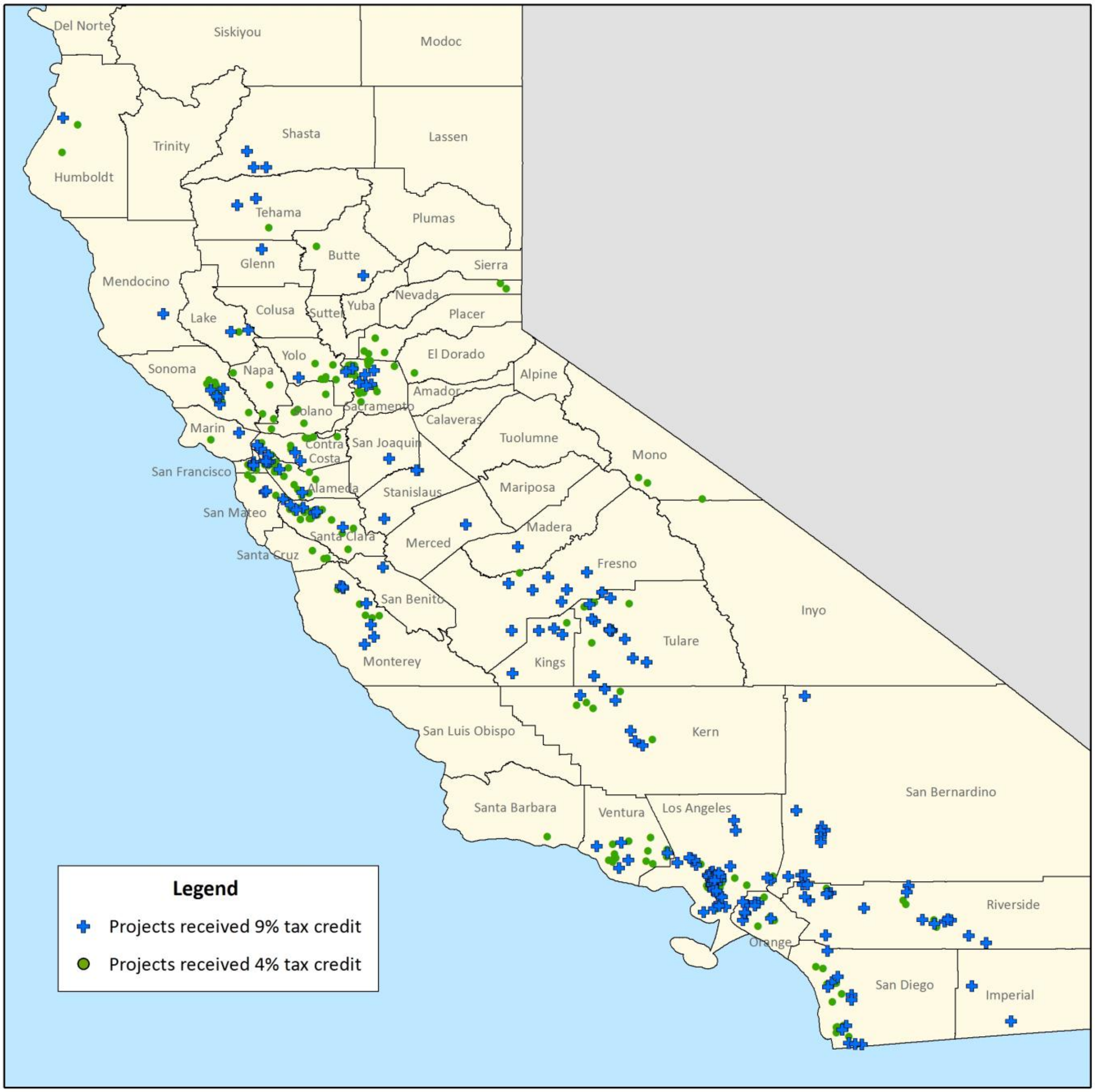
FIGURE 4: PROJECT CHARACTERISTICS BY CONSTRUCTION START YEAR



Location, Location, Location

Figure 5 presents the location of each project included in the study.

FIGURE 5: AFFORDABLE PROJECTS INCLUDED IN STUDY



The California Tax Credit Allocation Committee (TCAC) has divided the state into distinct geographic regions.[39] For the purpose of our analysis we have also used these regions to examine geographic differences in project characteristics and costs. The regions are defined in Figure 6 below.

FIGURE 6: TCAC GEOGRAPHIC REGIONS

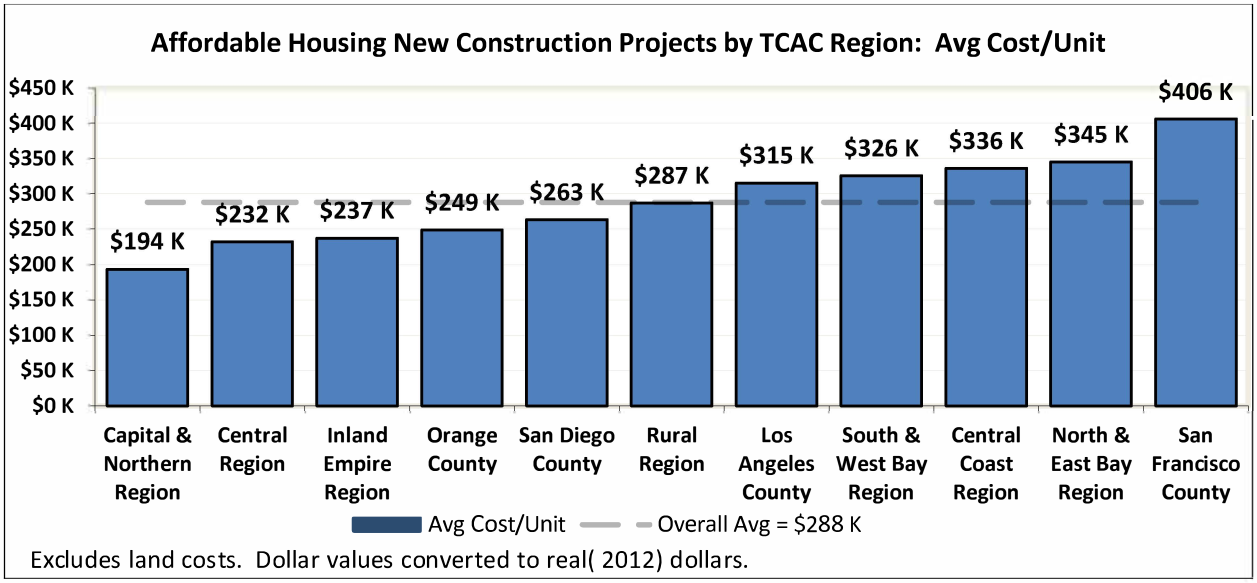
TCAC Geographic Region	Counties
Rural Region	Alpine, Amador, Calaveras, Colusa, Del Norte, Glenn, Humboldt, Inyo, Lake, Lassen, Mariposa, Mendocino, Modoc, Mono, Nevada, Plumas, San Benito, Sierra, Siskiyou, Tehama, Trinity, Tuolumne
Capital and Northern Region	Butte, El Dorado, Placer, Sacramento, Shasta, Sutter, Yolo, Yuba
North and East Bay Region	Alameda, Contra Costa, Marin, Napa, Solano, Sonoma
San Francisco County	San Francisco
South and West Bay Region	San Mateo, Santa Clara
Central Region	Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, Tulare
Central Coast Region	Monterey, San Luis Obispo, Santa Barbara, Santa Cruz, Ventura
Los Angeles County	Los Angeles
Orange County	Orange
Inland Empire Region	Imperial, Riverside, San Bernardino
San Diego County	San Diego

Looking at projects across the state reveals considerable variation in per unit costs depending on where a project is built. Figure 7 presents the average cost per unit by TCAC region for the projects in our sample.[40] As these cost figures demonstrate, the average unit in the most expensive region, San Francisco, was more than twice as expensive to develop as the average unit in the least expensive region, the Capital and Northern Region. While these cost differences in part reflect the type of project, the quality of materials and finishes, and other non-location specific factors, there nevertheless is a considerable degree of variation in costs across locations.

[39] See "California Tax Credit Allocation Committee Regulations Implementing the Federal and State Low Income Housing Tax Credit Laws, California Code of Regulations, Title 4, Division17, Chapter 1" dated May 15, 2013. (http://www.treasurer.ca.gov/ctcac/programreg/20130515/clean.pdf). Note that the apportionment limits additionally divide Los Angeles County into two regions, the City of Los Angeles and the balance of Los Angeles County.

[40] Figures include only projects for which both TCAC and Developer Survey data were available.

FIGURE 7: AVERAGE COST PER UNIT BY TCAC REGION



For example, the regions differed in terms of the type of units that were constructed. Figure 8 provides a summary of selected characteristics broken out by TCAC region. In San Francisco, for example, 100 percent of the units constructed were in projects with 4 or more stories while in the Capital and Northern Region, just 3 percent of units were 4 or more stories. However, the San Francisco unit sizes are quite small relative to other projects, with an average unit having only 1.49 bedrooms, the fewest of any region, and 911 square feet, ranking second only to Orange County in terms of the smallest units constructed.

FIGURE 8: CHARACTERISTICS OF PROJECTS BY TCAC REGION

Region	Avg BR/Unit	Avg SqFt/Unit	Pct Units > 4 Stories
Central Coast Region	2.25	1,147	23%
Rural Region	2.42	1,074	0%
Central Region	2.50	1,070	0%
Inland Empire Region	2.29	1,016	2%
North and East Bay Region	1.92	1,005	38%
Los Angeles County	1.88	981	59%
South and West Bay Region	1.68	931	51%
San Diego County	2.05	924	40%
Capital and Northern Region	1.86	923	4%
San Francisco County	1.49	911	100%
Orange County	1.71	820	15%

Projects also varied in terms of the extent to which they included podium parking (from zero projects in the Rural Region to 82 percent in the South and West Bay Region), provided housing for large families (from 38 percent in San Francisco to 88 percent in the Rural Region), and received redevelopment funding (8 percent in the Central Region to 50 percent in Orange County), among other factors.

As these comparisons demonstrate, a host of factors could potentially influence development costs through time and across regions. A simple review of project characteristics may provide some insight as to what is driving cost differences, but it cannot provide a complete understanding of the extent to which these factors are associated with higher or lower development costs. Instead, we must employ a more robust statistical approach: the regression analysis presented in the following section.

Sorting It All Out: A Statistical Analysis of the Factors that Drive Development Costs

Given the diversity of the types of projects developed over the past decade, talking about the typical or average affordable housing project is of limited use. Each project represents the unique circumstances of the occupants it was intended to house, the time period and location in which it was developed, and the characteristics of and choices made by the developer who built it, among other factors. Nevertheless, careful examination of the data can reveal some insights into the factors that are associated with higher (or lower) costs of developing affordable housing.

In the following sections we discuss the results of our regression analysis, which allow us to measure the cost differentials associated with specific project and developer characteristics while taking account of other cost factors. In interpreting these results, it is important to note that, like the results of any statistical analysis, the coefficients reported are not exact values and are subject to uncertainty.[41] Nevertheless, the results presented below provide a general indication of the direction and extent of the relationship between the factors analyzed and the cost of developing affordable housing. A full description of the regression analysis and the results is provided in

[41] In order to determine if our results were robust, we tested many different versions of our regression model. In a small number of these alternatives, the significance level or size of some of the explanatory variables (e.g., prevailing wages or developer type) decreased. The results presented here, however, were generally robust across many different versions of the regression models we tested, although the exact value of estimates varied across models. Additional details about these alternative regression models is provided in the Appendix.

Appendix 4: Detailed Regression Results.

Project Type and Unit Size

Looking at the size of projects and the type of residents for which they were designed can help to explain a significant portion of the cost variation. The study included project type characteristics in its analysis not only to take account of cost differences due entirely to these factors, but also to indicate the cost differences associated with choices about the type of units and structures built.

Projects built to house large families were the most expensive to build on a per unit basis and the least expensive on a per square foot basis. SROs, on the other hand, were the least expensive per unit, but the most expensive per square foot. Specifically, the regression analysis we present here suggests that SROs were approximately 31 percent less expensive per unit to construct relative to large family units, while units for seniors were about 18 percent less expensive per unit relative to large family units. Thus, for an average project that cost approximately $288,000 per unit, these results suggest that large family units cost approximately $89,000 more to develop relative to an SRO unit and approximately $52,000 more than a senior unit.[42]

The number of stories was also an important cost driver. Specifically, our analysis suggests that, when controlling for other factors, housing units in buildings that were four stories or taller were about 10 percent more expensive to build. For an average project, that translates into an additional $28,000 per unit when compared to projects that were 1 to 3 stories tall.

Building sufficient resident parking is another important determinant of project costs. The type of parking required (either by economic factors, the constraints of a particular project site, or local requirements) matters as well. According to our analysis, projects with underground or podium parking were, on average, more than 6 percent more expensive per unit relative to projects without this type of parking. For the average project, these results suggest that including podium parking added approximately $18,000 to the cost of each unit relative to projects without this type of parking.

Local Factors

The local community in which a project is built can also influence costs. Our analysis sought to examine three potential cost drivers influenced by local circumstances.

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[42] Large family units of three or more bedrooms typically have an additional bathroom as well as additional facilities for children.

First, requirements imposed by local governments can cause a project to be altered, both in terms of appearance and in terms of physical size and other characteristics. Our analysis suggests that changes required by local design and review requirements can add to total development costs (excluding land). Specifically, developers reported that for 33 percent of the projects in our sample, local design review added at least 5 percent to total costs. Our statistical analysis of these projects confirmed that, even when controlling for other factors that influence costs, these projects were on average about 7 percent more expensive to develop relative to projects that did not undergo such extensive locally-required changes.

In addition to requirements imposed by local governments, local community opposition to a development project can also act to delay the project, or even to increase costs to the extent that developers make changes to projects to mollify community opposition. Directly measuring the extent of community support or opposition for a particular project was not feasible. However, we did measure the number of community meetings a developer held, which can serve as a proxy measure for the extent of community opposition. Our analysis indicates that projects with 4 or more community meetings were on average about 5 percent more expensive to complete relative to projects with fewer than 4 meetings. Again, as with all of the findings discussed here, this result held even after accounting for project size, developer type, project location, and other factors that we controlled for in our analysis.

Finally, some of the projects in our sample also received funding from local redevelopment agencies. Our analysis suggests that projects that received this type of funding were about 7 percent more expensive to complete relative to projects without local redevelopment funding. For our typical project, this equals about $19,000 per unit. While receipt of this type of funding would not, in and of itself, cause costs to rise, it is likely that receipt of this funding either (a) allowed developers to add project amenities or otherwise alter a project in ways that increased costs, (b) included its own set of locally-imposed requirements that added to costs, or (c) allowed developers to build projects with higher costs for relocation, demolition, site preparation or environmental mitigation.

Developer Characteristics

The characteristics of the developer can also have an important influence on costs. According to our analysis, projects built by larger developers (those with more employees) were less expensive to develop relative to projects built by smaller developers. Specifically, each 10 percent increase in the number of people employed by the developer is associated with a reduction in costs per unit of 2.5 percent. An examination of the developer data reveals a wide range of company sizes, from developers with just two employees to developers with more than 400 employees. The median developer size in the data was 50 employees.

The organizational structure of the developer also appears to affect costs. Specifically, the regression model presented in this report suggests that for-profit developers were able to build projects less expensively relative to projects developed by governments or non-profits. However, several factors cause us to question the reliability of this finding.[43] First, the size of the effect varied across different versions of the regression model we tested. Second, comments we received from developers suggest that non-profit developers may build projects to a higher quality or durability standard relative to for-profit developers or may choose to take on more difficult and expensive to develop projects. Although we sought to measure quality and durability, it is nevertheless possible that factors which we were not able to measure (omitted variables) are driving the observed cost differential between developer types. As a result, we believe that the finding with respect to different developer types is inconclusive. Additional information is needed to be able to determine which factors related to organizational structure are impacting cost versus other factors such as the type of projects different organizations choose to work on based on an organization's mission.

Further examination of the characteristics of for- and non-profit developers revealed that one difference relates to the type of employees a developer has on staff. Specifically, projects built by developers that employed a general contractor were, on average, less expensive relative to projects built by developers that did not employ a general contractor. While our data do not specifically indicate whether developers used these general contractors to actually construct the projects (i.e., were vertically integrated), to manage design and construction phases of development, or for some other purpose, these results nevertheless suggest that developers that employ general contractors (for whatever purpose) are associated with lower project costs. And, for- profit developers are much more likely to employ general contractors. Some 73 percent of the projects built by for-profit developers in our sample were built by developers who employed a general contractor, compared with just 24 percent employing a general contractor among the projects built by non-profit developers.

Economies of Scale

Because fixed costs can be spread over all of the units constructed, building a larger project can often be less expensive on a per-unit basis. For example, adding an additional story to a project will add units without increasing costs for the roof. The result is that the cost per unit will be lower. Our analysis confirms this effect. According to our results, for each 10 percent increase in the number of units, the cost per unit declines by 1.7 percent. For a typical project, for example, if the number of units increased

[43] We note that most other variables included in the regression results presented here were stable across many different versions of the regression models tested, and therefore are considered to be reliable.

by 10 percent, from 70 to 77 units, our results suggest that the cost per unit would fall by about $5,000, from $288,000 to $283,000.

Our analysis also indicated that economies of scale are present throughout the range of project sizes covered by our data, although they are slightly more pronounced for smaller projects, with the economy of scale effect declining somewhat as project size increases.

Building Quality and Durability

The quality and durability of a building can also have an impact on the costs of construction. All federal, state, and local affordable housing programs require a very long time frame for receiving public funds, usually between 30 to 55 years. Therefore, developers of affordable housing projects focus on building quality and durability to meet regulatory requirements and to reduce long term maintenance and operations costs. In order to measure building quality and durability, we asked developers to evaluate the quality and durability of their projects across six measures:

1. Roofing quality/warranty period.
2. Quality and durability of exterior finishes.
3. Quality and durability of windows.
4. Quality and durability of floor finishes.
5. Bathtub material.
6. Kitchen counter tops.
7. Energy efficiency/energy use.

For each measure, developers were asked to rate the quality according to a three point scale: 1 (low), 2 (medium), and 3 (high). For example, with respect to the quality and durability of floor finishes, respondents were asked to rate the materials used according to the following scale: (1) low = vinyl tile, (2) medium = sheet linoleum, or (3), high = ceramic tile. For each project, a composite score was calculated based on the average score across all reported quality measures. This composite measure was included in our regression analysis. For a complete listing of the survey questions and responses, please see the section "Affordable Housing Developer Survey Summary of Usable Responses" on page 64.

Our results suggest that building quality and durability can a have a large impact on costs. Specifically, for every 10% increase in our building quality score (e.g., from low to medium), the cost per unit increased by 15 percent. For a typical project, this translates to approximately $43,000 per unit.

Many quality and durability improvements included at the time of initial construction can lower ongoing maintenance and repair costs. And, improvements designed to increase energy efficiency can reduce energy consumption and utility bills in future years. A full lifecycle analysis of the overall impact of these factors was beyond the scope of this study. It could, therefore, be the case that these up-front investments more than pay for themselves in lower operation and maintenance costs over time. Nevertheless, increasing building quality and durability also adds to initial development costs, as indicated by the results of our regression analysis.

Determining Impact of Construction Wages on Affordable Housing Costs

The impact of construction wages on the cost of building affordable housing has proven difficult to measure due to a confluence of factors. For public works projects, a classification which applies to some but not all Affordable Housing Projects, California's prevailing wage laws mandate that all bidders use the same legally-established wage rates when bidding. This is intended to ensure that a bidder cannot out-bid competitors simply by paying lower wage rates.[44] In some cases, federal rules require the payment of federal prevailing wages, known as Davis-Bacon prevailing wages. Our data did not allow us to distinguish between whether a project paid one or the other or both of these types of prevailing wages, which is one factor confounding the results surrounding prevailing wages.

The actual cost impact of construction wages varies. Job classifications overlap, and each contractor may use differing combinations of carpenters, concrete workers, sanitation and other skilled workers.

There are also regional differences in wages, in addition to differences due to types of projects and the sources from which they are funded. Most importantly, however, in testing a version of the regression model in which the state was divided into two regions in order to examine the impact of regional variations, we found that the size of the prevailing wage effect varied very widely. As a result the finding with respect to prevailing wages was inconclusive in that the size of the effect varied widely across different versions of the model, suggesting the factors mentioned above or missing variables may be artificially influencing this effect, although further research would be needed to determine the extent and causes of this variation.[45, 46]

TCAC and CDLAC Policies

In addition to the project location, time period, quality and durability, building characteristics and other factors mentioned above, we also investigated whether the state's tax credit allocation system had an

[44] We determined if projects paid prevailing wages by surveying developers. Specifically, developers were asked if either state or federal laws required paying of prevailing wages. Therefore, this result reflects the impact of either federal Davis Bacon or state required prevailing wages

[45] For further discussion of the variations in results, see peer review comments appended to this report.

[46] We note that most other variables included in the regression results presented here were stable across many different versions of the regression models tested, and therefore are considered to be reliable.

impact on per unit costs (net of land). One way to investigate the impact of the tax credit award process is to compare affordable rental housing developments that received tax credits to market rate developments that did not. As discussed later in the "Comparison to Market Rate Projects" section of this report, however, only limited data are available with which to make such a comparison.

An alternative approach is to compare the costs for projects that received 9 percent tax credits to those that received 4 percent tax credits. The 9 percent tax credit process is very competitive, and successful applications must not only meet the minimum qualifications, but also receive the maximum number of available points in each application category. As a result, some applications requesting 9 percent tax credits that achieved a maximum score might still lose in the tie-breaker analysis and not receive an allocation. In contrast, the 4 percent tax credit program has been less competitive, and it has generally been the case that an applicant that achieved an above-average score (but not necessarily a maximum) would qualify to receive 4 percent tax credits. If differences in the application process and scoring system between the 9 percent and 4 percent tax credit programs result in differences in project characteristics beyond those specifically measured in our regression analysis, one would expect to see a difference in development costs among these two types of projects.

The regression analysis, however, indicated no statistically significant difference in per unit costs among 4 and 9 percent tax credit projects, even after taking account of other factors that influence costs. Without controlling for these factors, there are important differences among projects. For example, 9 percent projects are more likely to be built by for-profit developers and are less likely to pay prevailing wages, engage in 4 or more community meetings, have undergone extensive locally imposed design review changes, or include subterranean or podium parking. All of these factors are associated with lower costs – that is, by avoiding the requirement to pay prevailing wages, or construct underground parking, the 9 percent projects on average have cost less per unit than they otherwise would have. On the other hand, 9 percent projects are also more likely to be higher quality, be more energy efficient, and to have larger units, all of which are associated with higher project costs. However, these factors (along with the other factors our regression measures, such as project location and construction year) explain much of the differences in per unit costs. Any remaining differences in the application process or scoring system do not appear to have a significant impact on costs.

It is important to note that this finding applies only to *differences* among the 4 percent and 9 percent application processes. There are many threshold requirements and scoring criteria applied to both the 4 percent and 9 percent awards, and the impact of any such requirement or criteria common to both processes may in fact add to (or diminish) costs, but cannot be tested by this method. For example, to the extent that both processes require or encourage developers to include community rooms or other common area space in their projects, a comparison of 4 and 9 percent projects would not be able to determine the cost impact of such a policy. Similarly, to the extent that both processes encourage developers to construct more energy efficient or more durable structures (since the up-front cost of these investments is partially paid for by tax credits whereas the long term savings accrue to tenants and developers), the impact of the additional costs associated with these investments would not show up as a difference in cost between 4 and 9 percent projects.[47]

Finally, the application process for awarding 9 percent tax credits underwent a number of substantive changes beginning in 2009, including changes to the tie breaker rules which determine tax credit awards in the event of a tie and limitations on the maximum allowable cost per unit. Because the projects in our sample were placed in service prior to early 2012, most of the project applications available for analysis were approved prior to 2009. In fact, of the 400 projects in our final data set, only two 4 percent projects were awarded tax credits during the period 2009 through 2011 (and placed in service by 2012). Thus, our analysis cannot currently provide a basis for evaluating changes to the TCAC sustainability requirements, tie-breaker scoring system, or maximum cost provisions that were implemented during the period 2009 - 2011.

In addition, many of the application criteria refer to location characteristics and amenities, such as the proximity of the housing to health care facilities or public transit routes, or the provision of services such as childcare or job training classes. Because our results consider only development costs net of land, and therefore do not apply either to land cost differences or to costs associated with provision of ongoing services, we cannot quantify the impact of these requirements on development costs. A comparative review of local market land prices could reveal whether limitations placed on siting within a particular market influence development costs. However, such an analysis would need a much larger pool of projects in order to effectively evaluate the relative impact of the large variety of potential cost factors.

Other Factors that May Influence Costs

In addition to the cost drivers discussed previously, we examined several other factors that potentially could be correlated with higher (or lower) cost. However, according to the results of our regression

[47] Previous research has indicated that, by subsidizing construction costs, low income housing tax credits may encourage developers to increase construction costs as a means of decreasing ongoing maintenance expenditures. See Eriksen, Michael D., "The market price of Low-Income Housing Tax Credits," Journal of Urban Economics 66 (2009) pp. 141-149.

analysis, the factors discussed in this section were not in fact found to be associated with changes in per unit costs on a statistically significant basis.[48]

- Winter start date (start during a winter month). We tested whether a winter start was associated with higher costs in order to evaluate whether developers were rushing to start construction in order to meet state requirements, even if this resulted in higher costs. Our results suggest that a winter start is not associated with higher costs (in fact a winter start may be associated with slightly lower costs, perhaps due to lower costs for labor or materials during the low-demand winter months).
- Project duration (time from construction start to placed-in-service date). Although larger, more expensive projects can take longer to build, this difference was not statistically significant once we controlled for other factors such as number of stories or number of square feet.
- Type of California Environmental Quality Act (CEQA) review. The type of CEQA review that a project must undergo can have an important impact on the time it takes to develop a project. Indeed, our review of the data do suggest that projects that required an EIR took longer to complete relative to other projects. However, when controlling for other factors that influenced cost, the level of CEQA review (i.e., exemption, negative declaration, mitigated negative declaration, EIR, or no review) was not associated with higher project costs.
- Number and type of funding sources. With the exception of redevelopment funding, as noted previously, the number and type of financing sources (including state sources from HCD and CalHFA) that a project utilized was not associated with higher (or lower) costs. However, it should be noted the data collected did not include a detailed breakdown of costs that are specifically associated with particular financing sources. For example, costs associated with the legal and administrative review and execution of financing contracts were not broken out from direct costs for securing financing sources. Construction delays and operational costs associated with securing multiple sources of funding were not analyzed.
- Previous developer experience (number of previous projects). While developer size was associated with project costs, the extent of a developer's experience was not a statistically significant predictor of project costs.[49]

[48] Note that this does not necessarily mean that these factors have no impact on cost. Instead, our results suggest that, when controlling for the factors we were able to control for and using the data available to us, we were not able to detect a relationship between these factors and project costs.

- Local government density requirements (density bonuses, density reductions, density maximums). These factors were not associated with higher or lower project costs when controlling for other factors such as local design review requirements and number of community meetings.
- Local hiring requirements. The requirement to hire local construction workers was not associated with higher or lower costs when controlling for other factors that may influence costs, such as prevailing wage requirements or local wage rates.
- Certain location characteristics, such as population density and household income of the census tract where the project was built. In addition to the characteristics of the TCAC region where a project was built, we tested whether the characteristics of the census tract were also important predictors of project cost. These factors were not statistically significant.

Land Costs

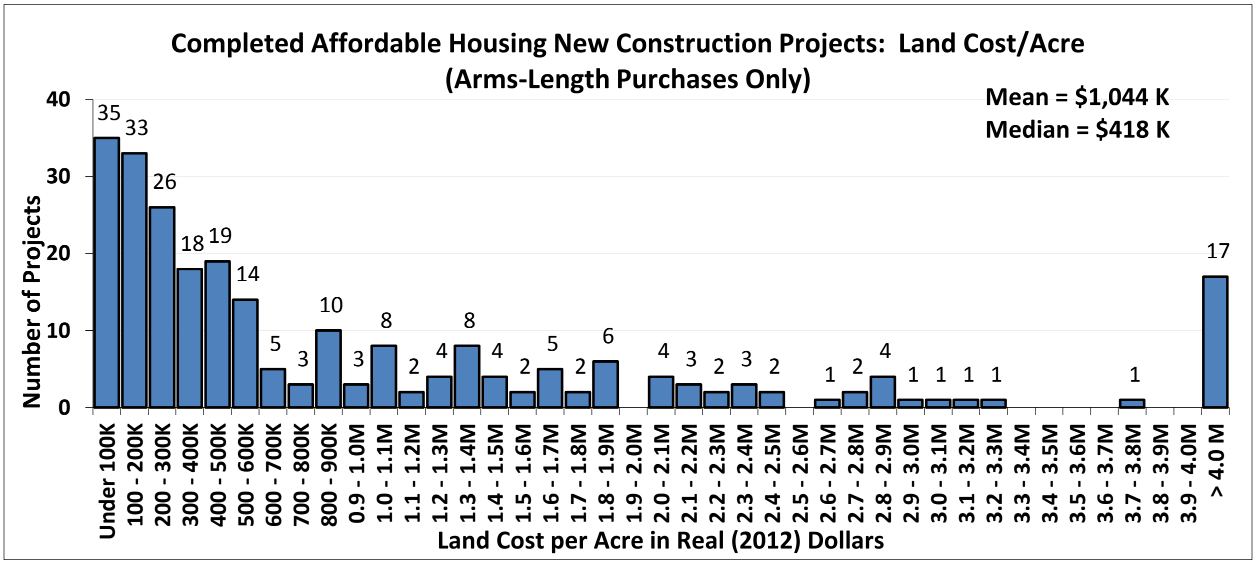
Land costs comprise an important part of the total cost to develop affordable housing. Land costs vary widely across the state as well as within individual jurisdictions as a function of many factors, including parcel size and shape, extent of required site remediation or preparation, proximity to amenities, and a host of other factors. Often the land used for an affordable housing development may be provided at a deep discount, or even for free, by the local jurisdiction, whereas in other cases developers must purchase land in an "arm's length" transaction and pay the full market price. Because of this, we have limited our discussion in this section to only those projects with market rate land values where the developer confirmed that the land was acquired via an arm's-length transaction.

Based on an analysis of the 251 projects included in our sample with confirmed arm's-length land purchases, land accounted on average for slightly less than 8 percent of total project costs. These costs varied considerably across projects when measured on a cost per acre basis, as shown in Figure 9 (next page). Perhaps most telling is the difference between the average value and the median value. The *median* land cost in 2012 dollars for these projects was approximately $400,000 per acre, which means that half of the projects paid more than $400,000 and half paid less than $400,000. The *average* value, however, was just over $1 million per acre, indicating that there were a relatively small number of very expensive land purchases. The graph confirms this, showing that many projects had land costs below $100,000 per acre, with a long "tail" extending to the right of the histogram showing fewer and fewer

[49] It is important to note that our measure of developer experience was gathered for each developer as of 2012, and therefore does not reflect a contemporaneous measure of developer experience at the time a project was completed.

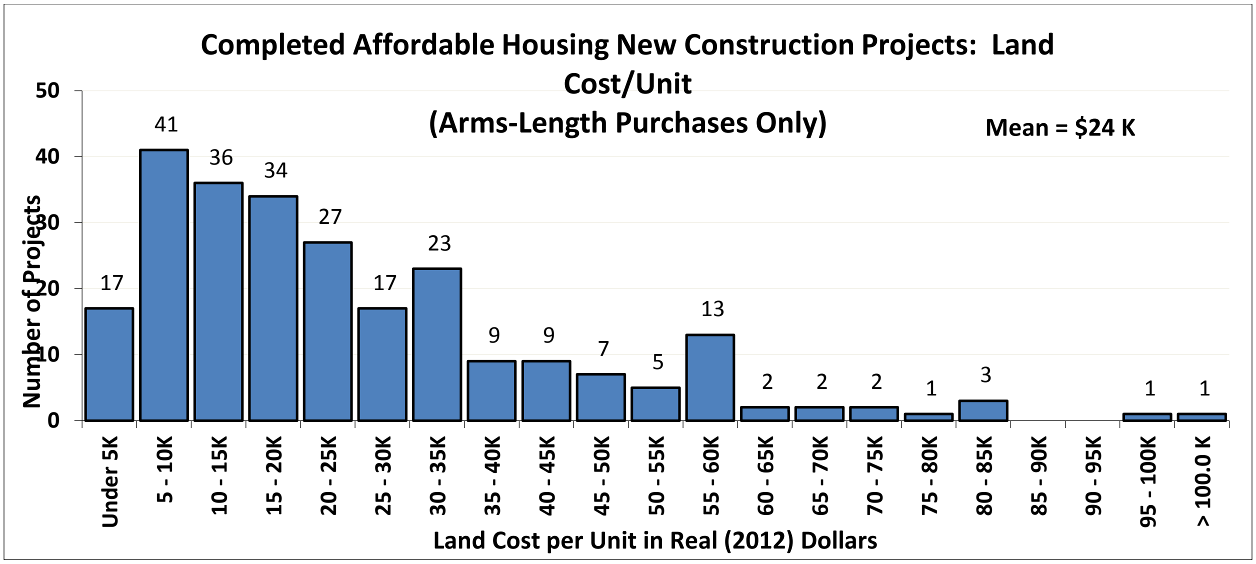
land purchases at the most expensive end of the spectrum. At the highest end of the distribution, there were some 17 projects that paid more than $4 million per acre for land (in 2012 dollars).

FIGURE 9: ARMS-LENGTH LAND COSTS FOR TAX CREDIT FINANCED PROJECTS 2001 - 2011



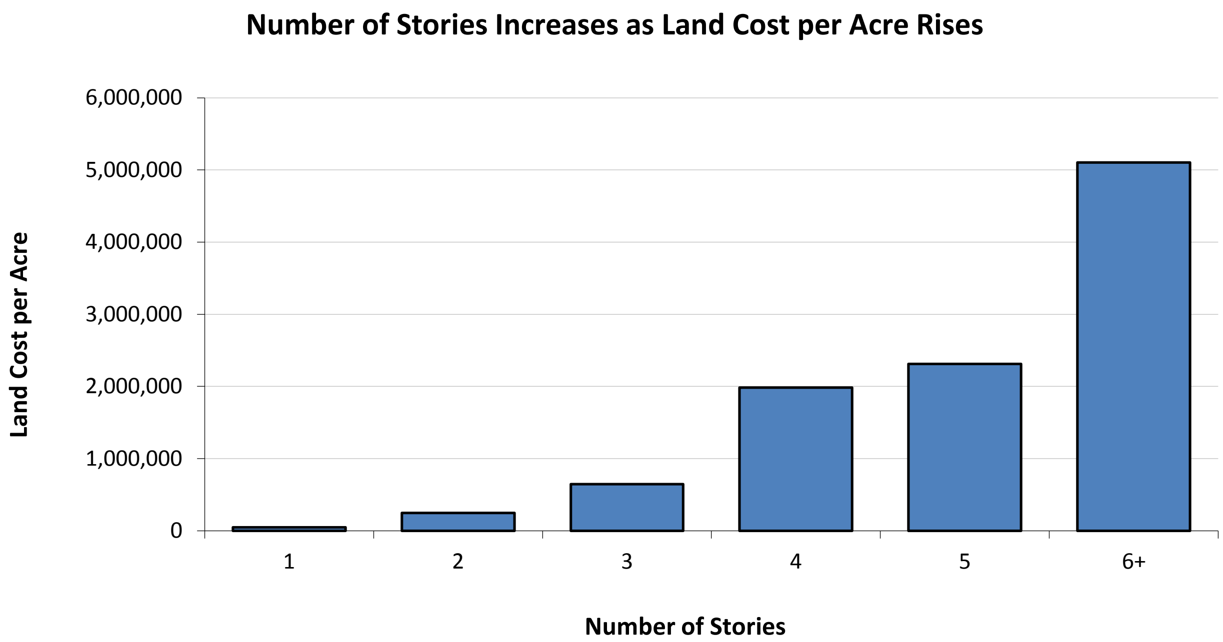
An analysis of the land cost per unit reveals a similar pattern, although the differential between the average and median values is not as pronounced. The average cost per unit was about $24,000 while the median value was just over $18,000, also suggesting that a relatively small number of projects with high land costs are pulling up the average cost per unit reflected in the data. Figure 10 shows the land cost per unit for those projects in our sample with an arm's-length land purchase transaction. As the data indicate, there were a handful of projects with land cost per unit of $60,000 or more. However, the overwhelming majority of projects had land costs below this level, with the most common cost in the $5,000 to $10,000 range.

FIGURE 10: ARMS-LENGTH LAND COST PER UNIT 2001 - 2011



Looking at land cost per unit tells only part of the story of the impact of land cost on development cost, however. While land costs account for just 8 percent of total project costs on average, the true impact of land costs on project costs may be in the ways that it influences choices about what type of physical housing is built. In addition, limitations placed on the choice of land location may influence building type and amenities, as well as contribute to changes in overall project costs. For example, as discussed previously, many state and local housing programs encourage proximity to transit and specified services and amenities. Because our analysis was limited to development costs exclusive of land, we were unable to ascertain whether or to what extent these locational requirements influenced the overall cost of project development. In regions where land costs are higher, for example, developers respond by building taller projects, resulting in denser housing than in areas with lower land costs. Figure 11 shows that, as the land cost per acre rises, so too does the number of stories.

FIGURE 11: NUMBER OF STORIES AS A FUNCTION OF LAND COST PER ACRE



Land costs in real 2012 dollars .

Other building characteristics, such as the presence of podium parking, are also correlated with land costs. For example, just 26 percent of projects with fewer than four stories have podium parking whereas 84 percent of projects with 4 or more stories have podium parking.

As indicated earlier in our regression analysis results, these factors can act to significantly increase costs. Projects with 4 or more stories were, on average, 10 percent more expensive per unit, and projects with podium parking cost 6 percent more to build, all other things equal. Since many projects have both of these characteristics, the total impact on costs per unit of developing a project with high land costs could be very substantial.

Because of both the large variation in land costs and the limited information available about each parcel, we were not able to determine if certain parcel characteristics, such as the presence of certain site amenities, are associated with higher or lower land costs. In addition, because only limited information was available for market rate project land costs, we were not able to determine if affordable developments paid more or less per acre or per unit for land relative to market rate projects.

COMPARISON TO MARKET RATE PROJECTS

In addition to examining the factors that may cause one affordable project to be less expensive relative to another, we also sought to examine whether there are differences in development costs between subsidized affordable projects and market rate rental projects. Unlike the affordable projects financed with tax credits, where a significant amount of data are available in the tax credit applications, only limited data were available for market rate projects.

In order to collect information on development costs for market rate projects, we collaborated with the Urban Land Institute's San Francisco and Los Angeles chapters and directly contacted more than 80 market rate developers. In spite of an outreach effort spanning more than six months designed to increase the survey response rate, just ten developers responded to our survey with usable cost information for some 22 projects. Of these, 9 projects lacked information about building quality or other characteristics, which prevented us from using the responses in a regression analysis. This left just 13 projects with complete information; too few to use in a regression analysis from which reliable results could be obtained.

Nevertheless, we prepared summary statistics from the 22 projects with cost data. An examination of these data suggest that the market rate projects for which we have data are larger (both taller and contain more units) and are more likely to be built in one of the higher-cost TCAC regions. In terms of cost, these market rate projects are slightly more expensive per unit ($300,750 per unit as compared with $287,932 for affordable projects) but slightly less expensive per square foot ($281 compared with $288 per foot for affordable projects).

FIGURE 12: COMPARISON OF MARKET RATE AND AFFORDABLE PROJECTS

	Market Rate	Affordable
Cost per Unit	$300,750	$287,932
Cost per Sq Ft	$281	$288
Percent > 4 Stories	45.2%	7.5%
Percent in 6 Highest-Cost Regions*	71.0%	58.0%
Percent > 100 Units	77.4%	27.0%

* San Francisco County, North & East Bay Region, Central Coast Region, South & West Bay Region, Los Angeles County, and the Rural Region.

Given the very small number of projects for which we have data, any conclusions about cost differences between affordable and market rate projects would be anecdotal at best.

CONCLUSION

During the past decade, tax credits have been used to help finance thousands of affordable housing units. Research indicates that access to safe, healthy and stable housing improves the performance of low-income children in school and the health of residents, while reducing impacts on community services and stimulating the state's economy.

The affordable housing developments we analyzed represent a very diverse set of projects, both in terms of geography and in terms of the types of residents they serve. This diversity notwithstanding, our analysis suggests that there are several factors associated with the costs of developing these essential housing units, including the building characteristics, developer traits, and the local community in which the housing is built.

Key Findings

The following are key findings from our analysis:

- Local factors have an impact on costs. Specifically, projects with more community opposition, significant changes imposed by local design-review requirements, or that received funding from a redevelopment agency cost more, adding 5 percent, 7 percent, and 7 percent, respectively, to the cost per unit, on average.
- Certain types of parking can add significantly to development costs. Specifically, projects with podium or subterranean parking cost 6 percent more, on average, relative to other developments without this type of parking.
- Choices made by developers matter. Some developers are able to build less expensive projects than others. Larger developers and developers that employ general contractors have all built projects less expensively relative to comparable developers that don't share these characteristics.
- Building quality and durability add to costs. Buildings that are more durable, are more energy efficient, or are built to a high standard of quality cost more to develop. Specifically, for each 10% increase in our quality measure (e.g., from "low" to "medium") costs increased by about 15 percent, on average.
- Affordable housing is characterized by economies of scale, with larger projects costing less per unit than smaller projects. According to our results, for each 10 percent increase in the number of units, the cost per unit declines by 1.7 percent
- Different types of units have different development costs. While it may be obvious, larger units, such as those with 3 or more bedrooms, clearly cost more per unit to develop. Smaller units, such as single room occupancy or "SRO" units, cost less per unit but more per square foot to develop. Specifically, our regression analysis suggests that SROs were approximately 31 percent less expensive per unit to construct relative to large family units, while units for seniors were about 18 percent less expensive per unit relative to large family units.
- Land costs influence the cost of developing affordable housing even when the land costs themselves are excluded from the development cost measure itself. This is true primarily because they indirectly affect the type of project that is built, as developers are more likely to

build taller structures that include underground or podium parking on land that is more expensive to purchase. Further analysis would be necessary to determine whether choice of land location influences overall costs.

From these empirical findings some conclusions can be drawn. First, the factors influencing costs are multifaceted, with no single factor explaining all or most of the cost of developing affordable housing. Therefore, any approach to lowering costs must consider multiple factors, rather than focusing on a single issue. Next, each of the actors in the development process – local communities, developers, state agencies – plays a role in influencing how much a project will cost to develop. Local factors, such as the extent of community opposition or support for a project and the actions and requirements of local governments can have an important influence on costs. Choices made by developers about staffing, management, and other factors can also have an important impact on costs, as evidenced by the fact that some developers are able to build projects less expensively than others, even when controlling for project quality and other factors. And, finally, state policies may also influence costs by favoring or encouraging certain types of projects, such as those that are built in certain locations or that obtain large amounts of additional outside funding from entities that may have their own requirements that can add to costs (as was shown for redevelopment agencies).

Taken as a whole, these results suggest that there are opportunities to lower costs. Some of these opportunities have inherent tradeoffs. For example, our results suggest that building projects to a lower quality or durability standard could lower costs, although such a change could also result in higher on-going costs for maintenance and repairs.[50] In other cases, however, our results suggest that cost could be lowered without a clear reduction in project durability or quality. Our results suggest, for example, that economies of scale exist such that building larger projects lowers the cost per unit. And, since some developers are more efficient than others, to the extent that the methods and techniques used by these more cost efficient developers could be encouraged and replicated, overall development costs could be reduced.

To take advantage of these opportunities to lower the cost of developing multi-family affordable housing in California, additional incentives for producing more units at a lower cost could be incorporated into existing state policies. Therefore, to the extent that lowering costs is one of the goals of the state's affordable housing development policy, a greater emphasis placed on cost containment or cost efficiency in the tax credit application, scoring, and award processes has the potential to lower overall development costs.

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[50] Note that a lifecycle analysis of quality and durability measures was beyond the scope of this study.

In addition, many decisions made by developers and local officials can also act to increase costs. While the state has only limited ability to influence these decisions, a greater emphasis on cost efficiency has the potential to encourage both local officials and developers to pursue projects that cost less to develop. Any change in incentives can result in unintended consequences, however. Therefore, any such changes should be carefully designed and implemented, and the projects that emerge from any such new process should be carefully evaluated to ensure that the resulting affordable units meet the needs of the state's low-income residents.

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APPENDIX 1: DATA DESCRIPTIONS AND SUMMARY STATISTICS

The table presented in Figure 13 below provides descriptions of the data collected for our analyses, as well as summary statistics for the projects included in the data set as described on page 23 of the report. As discussed in the report, most of the data items were provided by the TCAC project file (those variables do not have a source cited in the descriptions). Data derived from survey responses are noted as such, as are those data items that were collected from other public sources. The public sources used were as follows:

- Census Data: Data from the 2000 US Census were used to provide the household income and population density for the affordable projects. For household income, the median household income for each census tract was merged with the project data by census tract and stored in the variable "HHIncome". Population density was defined as the census tract total population divided by the land area of the census tract in miles, again merged in by census tract, and stored in the variable "Density." The Census data were downloaded from the Census website at http://www.census.gov/main/www/access.html.

- Construction Wage Rates: RAND California Occupational Wage Statistics. According to RAND, the source for these data is the Bureau of Labor Statistics. The total wages for "Residential building construction" were divided by the corresponding total number of workers to get the county-specific annual wage rates, deflated to 2012 wage rates, and were merged into the project data using county and construction start year. These values are provided in the "WageRates" variable. See http://ca.rand.org/stats/statlist.html Summary for originating data source.

- Unemployment Rate: The State of California's Employment Development Department (EDD) provides annual unemployment rates by county. These data were downloaded from the EDD website and merged with the project data by county and construction start year in the variable "UnempRate." See http://www.labormarketinfo.edd.ca.gov/Content.asp?pageid=131.

- Interest rates: The series "Market yield on U.S. Treasury securities at 10-year constant maturity, quoted on investment basis" was used to provide a measure of interest rates at the time each project was initiated. Annual rates were merged to the project data by construction start year, providing the value for the variable "Int10Yr" for each project. These data were downloaded from the Federal Reserve's website (http://www.federalreserve.gov/releases/h15/data.htm).

- Consumer Price Index: The annual CPI figures were downloaded from the California Department of Industrial Relations (DIR) website, http://www.dir.ca.gov/OPRL/capriceindex.htm. According to the DIR documentation, the data are initially compiled by the U.S. Department of Labor, Bureau of Labor Statistics . The CPI series "CCPI-U = California Consumer Price Index - All Urban Consumers" was merged into the project data by construction start year and was used to deflate land costs into constant

(2012) dollars by dividing the corresponding annual CPI value by the 2012 CPI value, and multiplying that deflator by the nominal land cost.

- Construction Cost Index: The annual California Construction Cost Index (CCCI) was used to convert nominal costs into real dollars. The index was downloaded from the California Department of General Services (DGS) website at http://www.documents.dgs.ca.gov/resd/pmb/ccci/cccitable.pdf. According to the documentation, "The California Construction Cost index is developed based upon Building Cost Index (BCI) cost indices for San Francisco and Los Angeles produced by Engineering News Record (ENR) and reported in the second issue each month for the previous month. The ENR BCI reports cost trends for specific construction trade labor and materials in the California marketplace." The index reports annual percent change based on December-over-December values. The December index values were merged with the project data by construction start year and were used to deflate all development costs except for land into constant (2012) dollars by dividing the corresponding annual CCCI value by the 2012 CCCI value, and multiplying that deflator by the nominal cost value.

FIGURE 13: SUMMARY STATISTICS FOR FINAL DATA SET

Variable	Description	Num Non-Missing	Min	Max	Mean	StDev
Pct4	Dummy = 1 if project is a 4% tax credit project	400	0.00	1.00	0.50	0.50
Pct9	Dummy = 1 if project is a 9% tax credit project	400	0.00	1.00	0.51	0.50
CostReal_Tot	Total project cost (excluding land) in real (2012) dollars	400	3,962,024.36	251,170,499.00	22,178,105.55	17,934,317.91
CostReal_Const	Total new construction cost in real (2012) dollars	400	2,511,551.71	180,518,189.50	15,402,645.38	13,358,796.10
CostRealTot_BR	Total project cost (excluding land) per bedroom in real (2012) dollars	400	45,686.69	465,057.26	152,887.46	71,169.62
CostRealTot_SqFt	Total project cost (excluding land) per square foot in real (2012) dollars	399	98.94	621.68	287.85	96.57
CostRealTot_Units	Total project cost (excluding land) per unit in real (2012) dollars	400	101,497.42	689,177.04	287,931.79	103,792.48
Num_Stories	Number of stories for project (if multiple bldgs, max number of stories)	390	1.00	23.00	2.99	1.63
Stories_4Plus	Dummy = 1 if Reg_Num_Stories >= 4	390	0.00	1.00	0.24	0.43
SqFt_Total	Total square footage of project (including parking)	400	11,700.00	772,521.00	91,436.71	66,611.16
SqFt_NetParking	Total square footage of project EXCLUDING parking	399	11,700.00	592,194.00	81,303.71	54,766.66
SiteAcres	Site size in acres	398	0.19	20.19	3.72	2.95
Units_Tot	Total number of units for project	400	12.00	665.00	82.77	58.17

Variable	Description	Num Non-Missing	Min	Max	Mean	StDev
Bedrooms	Total number of bedrooms for project (studios counted as 1BR, 4+ counted as 4BR)	400	20.00	938.00	163.34	109.75
SubParking	Dummy = 1 if project had subterranean or podium parking	399	0.00	1.00	0.38	0.49
Elevator	Dummy = 1 if project included at least one elevator	400	0.00	1.00	0.44	0.50
Density	Density for census tract per 2000 census	367	16.42	96,847.87	7,589.44	10,899.68
HHIncome	average household income for census tract per 2000 census	365	10,959.00	108,365.00	40,733.47	19,075.53
Int10Yr	Rate of Federal Annual 10-Year Constant Maturity for year construction started	400	2.78	5.02	4.22	0.53
UnempRate	CA EDD unemployment rate for county for year construction started	400	3.40	22.40	7.07	3.14
WageRates	RAND average annual real wages for "Residential building construction" industry, for county and year construction started	398	26,668.56	74,455.37	51,297.40	9,158.67
DDA_QCT	Dummy = 1 if project located in DDA (Difficult Development Area) or QCT (Qualified Census Tract)	400	0.00	1.00	0.70	0.46
Duration	Duration of construction for project in months (earlier of construction start or June of earliest application year, until placed-in-service date)	399	6.00	50.00	22.79	6.47
HT_AtRisk	Dummy = 1 if housing type is specified as "At Risk"	398	0.00	0.00	0.00	0.00
HT_LgFamily	Dummy = 1 if housing type is specified as "Large Family"	398	0.00	1.00	0.69	0.46
HT_NonTarget	Dummy = 1 if housing type is specified as "Non-targeted"	398	0.00	1.00	0.03	0.16
HT_SRO	Dummy = 1 if housing type is specified as "SRO" (single room occupancy)	398	0.00	1.00	0.02	0.14
HT_Senior	Dummy = 1 if housing type is specified as "Senior"	398	0.00	1.00	0.21	0.40
HT_SpecialNeeds	Dummy = 1 if housing type is specified as "Special Needs"	398	0.00	1.00	0.06	0.24
Type_2Plus_Elev	Dummy = 1 if building type is 2-plus stories with elevator	400	0.00	1.00	0.44	0.50
Type_2Plus_NoElev	Dummy = 1 if building type is 2-plus stories without elevator	400	0.00	1.00	0.37	0.48
Type_Condo	Dummy = 1 if building type is Condominium	400	0.00	1.00	0.00	0.05
Type_Coop	Dummy = 1 if building type is Coop	400	0.00	0.00	0.00	0.00
Type_Detached	Dummy = 1 if building type is detached	400	0.00	1.00	0.02	0.13
Type_Garden	Dummy = 1 if building type is garden apartment	400	0.00	1.00	0.31	0.46

Variable	Description	Num Non-Missing	Min	Max	Mean	StDev
Type_SFH	Dummy = 1 if building type is single family home	400	0.00	1.00	0.01	0.09
Type_Townhouse	Dummy = 1 if building type is townhouse	400	0.00	1.00	0.08	0.27
Funding_Redev	Dummy = 1 if project received Redevelopment Agency Funds (set-aside)	400	0.00	1.00	0.34	0.48
Lenders_NumTot	Number of lenders for project - construction loans and permanent financing	399	1.00	22.00	4.12	2.50
DevType_ForProfit	Dummy = 1 if developer is for-profit (from survey)	398	0.00	1.00	0.46	0.50
DevType_Govt	Dummy = 1 if developer is government agency (from survey)	398	0.00	1.00	0.03	0.18
DevType_NonProfit	Dummy = 1 if developer is non-profit (from survey)	398	0.00	1.00	0.48	0.50
DevType_Other	Dummy = 1 if developer is some other type (joint venture, etc.) (from survey)	398	0.00	1.00	0.02	0.14
DevType_OtherG	Dummy = 1 if developer is either government agency or "other" (from survey)	398	0.00	1.00	0.05	0.22
DensityMax	Dummy = 1 if project built at local government imposed density maximum (from survey)	316	0.00	1.00	0.57	0.50
DensityReduced	Dummy = 1 if project density reduced due to local government restrictions according to developer (from survey)	333	0.00	1.00	0.07	0.25
DensityBonus	Dummy = 1 if project received a density bonus beyond the zoned maximum (from survey)	312	0.00	1.00	0.28	0.45
PW	Dummy = 1 if project paid prevailing wages (from survey, supplemented by application data)	354	0.00	1.00	0.63	0.48
HiringReq	Dummy = 1 if local hiring requirements/goals influenced hiring decisions for project (from survey)	335	0.00	1.00	0.34	0.47
ReviewReq	Dummy = 1 if developer believed local review requirements added more than 5% to contstruction costs relative to original design (from survey)	348	0.00	1.00	0.32	0.47
Meetings_None	Dummy = 1 if number of community/neighborhood meeings for project = "none" (from survey)	361	0.00	1.00	0.15	0.36
Meetings_1to3	Dummy = 1 if number of community/neighborhood meeings for project = "1 - 3" (from survey)	361	0.00	1.00	0.50	0.50

Variable	Description	Num Non-Missing	Min	Max	Mean	StDev
Meetings_4Plus	Dummy = 1 if number of community/neighborhood meeings for project = "more than 3" (from survey)	361	0.00	1.00	0.35	0.48
CEQA_None	Dummy = 1 if CEQA review for project = "None" (from survey)	330	0.00	1.00	0.02	0.15
CEQA_EIR	Dummy = 1 if CEQA review for project = "EIR" (from survey)	330	0.00	1.00	0.09	0.29
CEQA_Exempt	Dummy = 1 if CEQA review for project = "Exemption" (from survey)	330	0.00	1.00	0.13	0.34
CEQA_MND	Dummy = 1 if CEQA review for project = "Mitigated Negative Declaration" (from survey)	330	0.00	1.00	0.51	0.50
CEQA_NegDec	Dummy = 1 if CEQA review for project = "Negative declaration" (from survey)	330	0.00	1.00	0.24	0.43
SiteMitigation	Dummy = 1 if project site required mitigation for soil or ground water contamination (from survey)	342	0.00	1.00	0.21	0.41
Artifacts	Dummy = 1 if project site contained historic artifacts or structures that needed to be preserved (from survey)	360	0.00	1.00	0.04	0.19
Qlty_Average	Average value of seven quality measures listed below (bathtub, countertops, energyeff, exterior, floor, roofing, and windows)	371	1.20	3.00	1.99	0.24
Qlty_Bathtub	Quality measure for bathtub (1=low (fiberglass), 2=medium (enameled steel), 3=high (enameled cast iron) (from survey)	368	1.00	3.00	1.08	0.31
Qlty_CounterTops	Quality measure for kitchen counter tops (1=low (laminate), 2=medium (cast synthetic or tile), 3=high (stone, granite) (from survey)	358	1.00	3.00	1.49	0.79
Qlty_EnergyEff	Quality measure for energy efficiency (1=low (met 24 standards), 2=medium (exceeded standards up to 25%), 3=high (exceeded standards by 25%+) (from survey)	356	1.00	3.00	1.79	0.61
Qlty_Exterior	Quality measure for exterior finishes (1=low (stained plywood), 2=medium (prefinished fiber cement), 3=high (cement plaster/stucco) (from survey)	370	2.00	3.00	2.80	0.40
Qlty_Floor	Quality measure for floor finishes (1=low (vinyl tile), 2=medium (sheet linoleum), 3=high (ceramic tile) (from survey)	355	1.00	3.00	1.84	0.49

Variable	Description	Num Non-Missing	Min	Max	Mean	StDev
Qlty_Roofing	Quality measure for roofing (1=low (10-yr warranty), 2=medium (15-yr warranty), 3=high (20-yr warranty) (from survey)	356	1.00	3.00	2.91	0.32
Qlty_Windows	Quality measure for windows (1=low (basic aluminum sliders), 2=medium (vinyl or PVC sliders/casement), 3=high (composite wood clad) (from survey)	358	1.00	3.00	1.96	0.30
ConstYr_2001	Dummy = 1 if construction started in 2001	400	0.00	1.00	0.05	0.21
ConstYr_2002	Dummy = 1 if construction started in 2002	400	0.00	1.00	0.11	0.31
ConstYr_2003	Dummy = 1 if construction started in 2003	400	0.00	1.00	0.10	0.30
ConstYr_2004	Dummy = 1 if construction started in 2004	400	0.00	1.00	0.16	0.37
ConstYr_2005	Dummy = 1 if construction started in 2005	400	0.00	1.00	0.13	0.33
ConstYr_2006	Dummy = 1 if construction started in 2006	400	0.00	1.00	0.12	0.32
ConstYr_2007	Dummy = 1 if construction started in 2007	400	0.00	1.00	0.12	0.32
ConstYr_2008	Dummy = 1 if construction started in 2008	400	0.00	1.00	0.09	0.29
ConstYr_2009	Dummy = 1 if construction started in 2009	400	0.00	1.00	0.05	0.21
ConstYr_2010	Dummy = 1 if construction started in 2010	400	0.00	1.00	0.08	0.28
ConstYr_2011	Dummy = 1 if construction started in 2011	400	0.00	1.00	0.01	0.07
TCAC_Rgn_Rural	Dummy = 1 if county in TCAC "Rural" region	400	0.00	1.00	0.04	0.20
TCAC_Rgn_CapNorth	Dummy = 1 if county in TCAC "Capital and North" region	400	0.00	1.00	0.12	0.32
TCAC_Rgn_NEBay	Dummy = 1 if county in TCAC "North and East Bay" region	400	0.00	1.00	0.17	0.37
TCAC_Rgn_SWBay	Dummy = 1 if county in TCAC "South and West Bay" region	400	0.00	1.00	0.08	0.28
TCAC_Rgn_SF	Dummy = 1 if county in TCAC "San Francisco" region	400	0.00	1.00	0.03	0.18
TCAC_Rgn_Central	Dummy = 1 if county in TCAC "Central" region	400	0.00	1.00	0.12	0.33
TCAC_Rgn_CenCoast	Dummy = 1 if county in TCAC "Central Coast" region	400	0.00	1.00	0.09	0.28
TCAC_Rgn_InlandEmp	Dummy = 1 if county in TCAC "Inland Empire" region	400	0.00	1.00	0.09	0.28
TCAC_Rgn_LA	Dummy = 1 if county in TCAC "Los Angeles County" region	400	0.00	1.00	0.17	0.38
TCAC_Rgn_OC	Dummy = 1 if county in TCAC "Orange County" region	400	0.00	1.00	0.04	0.18

Figure 14 below provides a summary of how the final data set was compiled based on the availability of data from the various sources.

FIGURE 14: COMPILING THE FINAL ANALYSIS DATA SET

Projects	Description
995	New construction projects awarded tax credits and placed in service between 2001-2011.
430	565 projects were excluded because they did not receive any survey response from the Developer Survey.
400	30 projects were excluded from analysis data set due to missing or incomplete TCAC files or other data issues.
400	**Final analysis data set contained 400 projects.**

APPENDIX 2: COMPARISON OF SAMPLE TO POPULATION

For the purposes of conducting our analyses we were limited to including only those 400 projects that had complete project files and for which we received the additional required information from the Developer Survey. These 400 projects are not the entire universe of completed projects that were awarded tax credits and did not involve the rehabilitation of existing structures – indeed, there are in fact a total of 995 such projects that meet the same criteria. To examine whether or not the projects that were available for our analyses were indeed representative, we compared those used to the larger full population for those dimensions that could be compared using the electronic TCAC data available for all project, such as the type of project, the type of tax credit and year it was awarded, and its location. Figure 15 below provides a summary of this comparison.

FIGURE 15: COMPARISON OF ALL PROJECTS TO PROJECTS INCLUDED IN ANALYSIS

	2001-2011 Awarded, Placed in Svc, New Construction (995 Projects)	Included in Analysis (400 Projects)		2001-2011 Awarded, Placed in Svc, New Construction (995 Projects)	Included in Analysis (400 Projects)
Housing Type			***Tax Credit Awarded***		
Large Family	63.5%	68.3%	4%	50.3%	49.5%
Special Needs	4.4%	5.8%	9%	49.7%	50.5%
Senior	23.9%	20.5%			
SRO	2.7%	2.0%	***Tax Credit Award Year***		
Non-Target	5.0%	2.8%	2001	10.7%	9.0%
At Risk	0.0%	0.0%	2002	13.9%	11.8%
Other/NA	0.4%	0.8%	2003	15.4%	14.0%
			2004	11.7%	11.5%
TCAC Geographic Regions			2005	12.3%	13.0%
Capital & Northern Region	8.8%	11.8%	2006	11.7%	12.3%
North & East Bay Region	13.8%	16.5%	2007	9.6%	9.0%
San Francisco County	3.2%	3.3%	2008	6.6%	8.8%
South & West Bay Region	7.4%	8.3%	2009	7.1%	9.8%
Central Coast Region	7.5%	8.5%	2010	1.1%	1.0%
Central Region	14.4%	12.3%	2011	0.0%	0.0%
Los Angeles County	19.4%	17.3%			
Orange County	4.2%	3.5%			
Inland Empire Region	10.1%	8.8%			
San Diego County	7.9%	5.8%			
Rural Region	3.2%	4.3%			

As the table above suggests, the sample of projects used in our analyses is very similar to the larger universe in almost all respects. The distribution by type of housing provided is very comparable, with both showing approximately 2/3 of the projects being housing for large families projects, 20-25% constructed specifically for seniors, etc. The split between projects receiving 4% tax credits and those receiving 9% tax credits is also almost identical. The same is true for the regions in which the projects where built, as well as the year in which the TCAC credit was awarded.

In spite of the similarity among the groups of projects, it is important to note that our data do not represent a truly random sample of projects from the potential universe of projects completed. Instead, it reflects the projects for which complete data (including survey responses from developers) were available. It is therefore possible that there is some systematic bias in the data. This possibility notwithstanding, the comparison of our data to the larger universe of projects suggests that the sample used in our analyses is in fact representative and unlikely to exhibit these types of biases. Because of this, we are confident that the results presented here apply not only to the projects examined but also to the entire universe of affordable projects awarded tax credits during the 2001 to 2011 time period.

APPENDIX 3: DEVELOPER SURVEY INSTRUMENT AND RESPONSES

Affordable Housing Developer Survey Instrument

Affordable Housing Developer Survey

The California Housing Finance Agency ("CalHFA") along with the California Department of Housing and Community Development ("HCD"), the California Tax Credit Allocation Committee ("TCAC"), and the California Debt Limit Allocation Committee ("CDLAC") are undertaking a large scale, affordable housing development cost study designed measure the factors that influence the cost of building affordable housing in California.

This survey seeks to collect some information about the organizations that develop affordable housing in California and also asks for some information about the projects you have built in the state over the past decade. We have attempted to make the survey as short as possible by only asking for information that cannot be obtained from any other source.

This project is very important not only to the State of California, but to the entire affordable housing community and the populations we all serve. Additional information about the project can be found at the project website.

For questions about this survey, please contact Maziar Movassaghi, HCD Assistant Deputy Director, at (916) 327-3822 or via email at mmovassaghi@hcd.ca.gov or Matthew Newman, Principal at Blue Sky Consulting Group, at 510.654.6100 x202 or via email at mnewman@emailbluesky.com.

Contact Information:

Below, we have entered your contact information as it appeared on your organization's most recent TCAC application. Please update this information if it is out of date or if you (the person filling out this survey) are not the contact person listed on the TCAC application.

Your name: ______________________ Your e-mail address: ____________________

Please tell us about your organization:

1a.	Which of the following best describes your organization?	• For profit company • Non profit entity • Government entity If other, please specify: _____

1b.	How many people are employed by your organization?	1
1c.	How many affordable multi-family housing projects has your organization developed over the past 10 years?	2
1d.	How many market rate multi-family housing projects has your organization developed over the past 10 years?	3
1e.	Which of the following does your organization employ in house to assist with the development process? (please check all that apply)	☐ Architects ☐ Engineers ☐ Property Managers ☐ Real Estate Acquisition professionals ☐ General Contractors ☐ None of the above
1f.	In general, if project costs increase or available funding decreases at any point during the development process, which of the following strategies does your organization typically employ to address the issue? (select all that apply):	☐ Reduce the number of units in the project ☐ Increase the amount of rent per unit (or otherwise reduce affordability) ☐ Eliminate project amenities such as day care centers or community rooms ☐ Obtain additional equity ☐ Reduce developer profit/developer fees ☐ Value engineering ☐ Reduce or eliminate landscaping, furnishings, or other "optional" project features ☐ Utilize Contingency ☐ Other, please specify: _______

Project Name: _____________ Project City:_________________ TCAC Application Year: _________________

3a.	In what year and month did or will construction start?	Year: _________ Month: __________
3b.	Was or will the project be built at local government imposed density maximum?	○ Yes ○ No ○ I don't know
3c.	Was the project density reduced due to local government restrictions?	○ Yes ○ No ○ I don't know
3d.	Did the project receive a density bonus beyond the zoned maximum?	○ Yes ○ No ○ I don't know
3e.	Did or will the contractor who built this project pay prevailing wages?	○ Yes ○ No ○ I don't know

3f.	Did or will a local hiring requirement or goal influence hiring decisions for this project?	Yes No I don't know
3g.	Did or do you expect locally imposed requirements for design/review or requirements imposed to mitigate community opposition to the project add more than 5% to construction costs relative to the architect's original design?	Yes No I don't know
3h.	How many community or neighborhood meetings were held or do you expect to hold regarding the project?	• None • 1 –3 • More than 3
3i.	What type of CEQA review did or will the project undergo?	• Exemption • Mitigated negative declaration • Negative declaration • EIR
3j.	Did or will the project site require mitigation for soil or ground water contamination?	Yes No I don't know
3k.	Does the project site contain historic artifacts or structures that need or needed to be preserved?	Yes No I don't know
3l.	Was the project site acquired (or do you expect it to be acquired) through an "arm's length" transaction (i.e. the purchase price reflected the market value of the site)?	Yes – the project site was or will be acquired through an "arm's length" transaction No – the project site was or will be donated, partially paid for by others, or otherwise not acquired via an "arm's length" transaction I don't know
3m.	Which building code construction type applies to this project?	• Type I (fire resistive) • Type II (non-combustible) • Type III (ordinary) • Type IV (heavy timber) • Type V (wood frame) • Other

The questions in the section below are designed to measure the quality and durability of the construction techniques and materials used (or to be used) to build each project. For each project characteristic listed in the table below, please choose the option that most closely matches the construction characteristics of the listed project. If the precise construction method or material for a project is not listed, please choose the option that most closely matches that actual method or material used.

4a.	Roofing quality/warranty period.	(low – 10 years, medium – 15 years, high – 20 years)
4b.	Quality and durability of exterior finishes.	(low – stained plywood or similar, medium – prefinished fiber cement siding or similar, high – cement plaster (stucco) or similar)
4c.	Quality and durability of windows.	(low – basic aluminum sliders, medium – vinyl or PVC sliders or casement windows, high – composite wood clad casement)

4d.	Quality and durability of floor finishes.	(low – vinyl tile, medium – sheet linoleum, high – ceramic tile)
4e.	Bath tub material.	(low – fiberglass, medium – enameled steel, high – enameled cast iron)
4f.	Kitchen counter tops.	(low – plastic laminate, medium – cast synthetic or ceramic time, high – stone (e.g. granite)
4g.	Energy efficiency/ energy use.	(low - met title 24 energy efficiency standards in place at time of construction, medium - exceeded standards by up to 25%, high - exceeded standards by more than 25%)
4h.	Did or will the project include gas lines to each unit for appliances or heating?	○ Yes ○ No ○ I don't know

Affordable Housing Developer Survey Summary of Usable Responses

SURVEY QUESTION	SUMMARY OF RESPONSES	Developers	Projects
1a. Which of the following best describes your organization?	For profit company	24	184
	Non profit entity	37	193
	Government entity	6	13
	Other	2	8
	(No Response)	1	2
1b. How many people are employed by your organization?	Up to 5	9	21
	6 - 10	9	32
	11 - 25	11	63
	26 - 50	14	81
	51 - 100	9	75
	> 100	14	112
	(No Response)	4	16
1c. How many affordable multi-family housing projects has your organization developed over the past 10 years?	Up to 5	13	23
	6 - 10	13	35
	11 - 25	23	133
	26 - 50	13	128
	51 - 100	3	55
	> 100	2	11
	(No Response)	3	15
1d. How many market rate multi-family housing projects has your organization developed over the past 10 years?	None	53	275
	1 - 3	9	82
	4 - 6	1	19
	7 - 10	2	6
	> 10	1	2
	(No Response)	3	7
1e. Which of the following does your organization employ in house to assist with the development process? (please check all that apply)	Architects	13	87
	Engineers	9	27
	Property Managers	38	206
	Real Estate Acquisition professionals	34	243
	General Contractors	27	169
	None of the above	16	59
1f. In general, if project costs increase or available funding decreases at any point during the development process, which of the following strategies does your organization typically employ to address the issue? (select all that apply):	Reduce the number of units in the project	19	135
	Increase the amount of rent per unit (or otherwise reduce affordability)	16	82
	Eliminate project amenities such as day care centers or community rooms	22	83
	Obtain additional equity	42	236
	Reduce developer profit/developer fees	60	375
	Value engineering	63	357
	Reduce or eliminate landscaping, furnishings, or other “optional” project features	39	192
	Utilize Contingency	59	335
	Other	12	75

SURVEY QUESTION		RESPONSE SUMMARY	Projects
3a.	In what year and month did or will construction start?	(see summary at end of appendix)	
3b.	Was or will the project be built at local government imposed density maximum?	Yes	179
		No	137
		I don't know / No Response	84
3c.	Was the project density reduced due to local government restrictions?	Yes	22
		No	311
		I don't know / No Response	67
3d.	Did the project receive a density bonus beyond the zoned maximum?	Yes	88
		No	224
		I don't know / No Response	88
3e.	Did or will the contractor who built this project pay prevailing wages?	Yes	222
		No	132
		I don't know / No Response	46
3f.	Did or will a local hiring requirement or goal influence hiring decisions for this project?	Yes	114
		No	221
		I don't know / No Response	65
3g.	Did or do you expect locally imposed requirements for design/review or requirements imposed to mitigate community opposition to the project add more than 5% to construction costs relative to the architect's original design?	Yes	112
		No	236
		I don't know / No Response	52
3h.	How many community or neighborhood meetings were held or do you expect to hold regarding the project?	None	55
		1 – 3	179
		More than 3	127
		No Response	39
3i.	What type of CEQA review did or will the project undergo?	Exemption	44
		Mitigated negative declaration	169
		Negative declaration	78
		EIR	31
		NA / None	8
		No Response	70
3j.	Did or will the project site require mitigation for soil or ground water contamination?	Yes	71
		No	271
		I don't know / No Response	58
3k.	Does the project site contain historic artifacts or structures that need or needed to be preserved?	Yes	14
		No	346
		I don't know / No Response	40
3l.	Was the project site acquired (or do you expect it to be acquired) through an "arm's length" transaction (i.e. the purchase price reflected the market value of the site)?	Yes	291
		No	86
		I don't know / No Response	23

SURVEY QUESTION		RESPONSE SUMMARY	Projects
3m.	Which building code construction type applies to this project?	Type I (fire resistive)	7
		Type II (non-combustible)	3
		Type III (ordinary)	16
		Type IV (heavy timber)	3
		Type V (wood frame)	308
		Other	20
		No Response	43
4a.	Roofing quality/warranty period. low = 10 years medium = 15 years high = 20 years	low	4
		medium	24
		high	328
		No Response	44
4b.	Quality and durability of exterior finishes. low = stained plywood or similar medium = prefinished fiber cement siding or similar high = cement plaster (stucco) or similar)	low	0
		medium	73
		high	297
		No Response	30
4c.	Quality and durability of windows. low = basic aluminum sliders medium = vinyl or PVC sliders or casement windows high = composite wood clad casement)	low	24
		medium	326
		high	8
		No Response	42
4d.	Quality and durability of floor finishes. low = vinyl tile medium = sheet linoleum high = ceramic tile	low	77
		medium	259
		high	19
		No Response	45
4e.	Bath tub material. low = fiberglass medium = enameled steel high = enameled cast iron	low	340
		medium	25
		high	3
		No Response	32
4f.	Kitchen counter tops. low = plastic laminate medium = cast synthetic or ceramic tile high = stone (e.g. granite)	low	251
		medium	40
		high	67
		No Response	42
4g.	Energy efficiency/ energy use. low = met title 24 energy efficiency standards in place at time of construction medium = exceeded standards by up to 25% high = exceeded standards by more than 25%	low	111
		medium	207
		high	38
		No Response	44
4h.	Did or will the project include gas lines to each unit for appliances or heating?	Yes	241
		No	101
		I don't know / No Response	58

Response Summary for Question 3a: In what year and month did or will construction start?												
Month	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**TOTAL**
Jan	1	5	-	5	2	4	4	-	1	2	1	**25**
Feb	-	6	7	5	3	4	7	6	3	9	1	**51**
Mar	-	2	3	3	6	3	2	1	2	2	-	**24**
Apr	-	1	2	5	2	6	5	3	5	3	-	**32**
May	-	3	4	1	2	2	5	1	-	3	-	**21**
Jun	-	2	2	3	3	3	3	4	1	4	-	**25**
Jul	-	-	2	3	3	-	4	1	1	3	-	**17**
Aug	3	2	-	1	1	3	2	5	4	3	-	**24**
Sep	2	2	4	8	4	4	2	-	-	-	-	**26**
Oct	2	5	3	5	5	6	7	5	-	3	-	**41**
Nov	5	1	2	6	10	6	1	8	2	1	1	**43**
Dec	4	3	2	6	1	2	3	1	-	-	-	**22**
Month N/A	1	2	5	7	3	1	-	1	-	-	-	**20**
Total	**18**	**34**	**36**	**58**	**45**	**44**	**45**	**36**	**19**	**33**	**3**	**371**
No Response*	**1**	**7**	**4**	**7**	**5**	**2**	**2**	**-**	**1**	**-**	**-**	**29**

*Projects with no reponse are listed by the year of the approved TCAC Application.

APPENDIX 4: DETAILED REGRESSION RESULTS

The results of the regression model we discuss in the text are presented in Figure 16 below. For a detailed description of the variables see Appendix 1: Data Descriptions and Summary Statistics.

FIGURE 16: REGRESSION RESULTS - BASIC REGRESSION

Dependent Variable:	log_CostRealTot_Units		
Number of Observations	284	R-Squared	0.8042
Dependent Mean Value	12.4801	Adjusted R-Squared	0.7729

Explanatory Variable	Coefficient	T-Statistic		Explanatory Variable	Coefficient	T-Statistic	
Intercept	9.9006	7.9427	**				
Stories_4Plus	0.0955	2.4284	**	Year construction started (excluded = 2001)			
log_SqFt_NetParking	0.2579	3.9217	**	ConstYr_2002	(0.0832)	(1.3292)	
log_Units_Tot	(0.4153)	(6.3258)	**	ConstYr_2003	(0.0462)	(0.6119)	
PW	0.1113	3.9734	**	ConstYr_2004	(0.0042)	(0.0643)	
SubParking	0.0630	1.9104	*	ConstYr_2005	(0.0052)	(0.0766)	
Int10Yr	(0.0492)	(0.7263)		ConstYr_2006	0.1322	2.0105	**
UnempRate	(0.0024)	(0.2629)		ConstYr_2007	0.1941	3.0065	**
Log_WageRates	0.1048	1.0414		ConstYr_2008	0.0858	0.9693	
Log_Dev_Employees	(0.0251)	(2.6982)	**	ConstYr_2009	0.1211	1.1218	
Funding_Redev	0.0666	2.6358	**	ConstYr_2010	0.0333	0.3098	
Qlty_Average	0.1489	2.7719	**				
ReviewReq	0.0663	2.2900	**	TCAC Region (excluded = Central Region)			
Pct9	(0.0402)	(1.5956)		TCAC_Rgn_Rural	0.1604	2.5704	**
Meetings_4Plus	0.0485	1.9371	*	TCAC_Rgn_CapNorth	0.0442	0.7855	
				TCAC_Rgn_NEBay	0.3241	4.8579	**
Developer Type (excluded = "For Profit")				TCAC_Rgn_SWBay	0.3016	4.1627	**
DevType_NonProfit	0.0939	3.5660	**	TCAC_Rgn_SF	0.4855	4.3591	**
DevType_OtherG	0.1272	2.4565	**	TCAC_Rgn_CenCoast	0.1944	3.4458	**
				TCAC_Rgn_InlandEmp	0.1077	2.0526	**
Housing Type (excluded = "Large Family")				TCAC_Rgn_LA	0.1774	2.9427	**
HT_NonTarget	0.0215	0.3179		TCAC_Rgn_OC	0.1331	1.2566	
HT_SRO	(0.3120)	(3.0711)	**	TCAC_Rgn_SanDiego	0.1975	2.5722	**
HT_Senior	(0.1775)	(4.9702)	**				
HT_SpecialNeeds	(0.0930)	(1.6814)	*				

** Indicates statistical significance at the 95% confidence level.

* Indicates statistical significance at the 90% confidence level.

The dependent variable for the regression is the natural log of the real cost per unit for each project.[51] Values of continuous explanatory variables were also logged. This transformation enables the coefficients on the explanatory variables to be interpreted as the percent change in the cost measure.

In addition to the results presented above, we also tested a number of additional specifications designed to measure the impact of potential cost drivers identified by the state's housing agencies or the project advisory group (see regression results above for more information). None of these additional factors added to the explanatory power of the base model, met the threshold for statistical significance, or was found to be sufficiently robust across different specifications. Therefore these additional variables were not included in the final model presented above. Among the specifications we tested were models including a range of interaction terms including the interaction of prevailing wages and project duration, non-profit developers and duration, non-profit developers and prevailing wages, and non-profit developers and 4 or more community meetings. None of these interaction terms was statistically significant in our models. However, in a small number of these specifications, including an interactive term (though not significant) decreased the significance level of the prevailing wage or the non-profit developer variable. This can occur when two variables are correlated, but also could be an indication of omitted variables. For example, anecdotal evidence suggests that non-profit developers may build projects to a higher level of quality or durability relative to their for-profit peers. Although we sought to measure quality and durability via a developer survey, it is nevertheless possible that unmeasured quality or durability differences exist. It is also possible, for example, that non-profit developers take on projects with more community opposition or projects that are more complex or expensive to develop relative to their for-profit peers. Again, we sought to measure the extent of community opposition and other project characteristics; however, imprecision in these measures may limit the ability of our data to fully capture their effects. Therefore, additional research into the underlying reasons for the potential cost differences between for-profit and non-profit developers may be warranted.

Finally, we tested the impact of different developer characteristics and economies of scale by (a) including interaction terms for developer type and "employs a general contractor" and (b) removing the control for project square feet, respectively. Other aspects of the base model remained the same.

[51] In addition to the log of cost per unit, we also examined costs on a per square foot, per bedroom and overall basis, and obtained largely similar results in each case.

APPENDIX 5: COMPARISON TO CONSTRUCTION COST ESTIMATES

Although a direct comparison between actual affordable and market rate projects would provide the most useful basis for analysis, lack of available data prevents such a comparison. In order to at least shed some light on the relative cost of building affordable housing, we developed a comparison between actual and estimated construction costs. Specifically, we compared the actual construction cost information for affordable projects to an estimate of construction costs based on information from the construction cost estimation service RS Means.

RS Means is a national cost estimation firm that provides printed and software resources for use in estimating construction costs. Using the RS Means "QuickCost Estimator" we developed construction cost estimates for a sample of 150 affordable projects and compared the results to actual costs from the cost certification worksheets submitted by developers to TCAC. The QuickCost Estimator uses a limited set of inputs to prepare a cost estimate for a given project. Specifically, for each project, information can be entered about the type of project (e.g., 1 – 3 story apartment, 4 – 7 story apartment, or 8+ story apartment), size of project (measured in square feet) and project location (based on zip code). In addition, we adjusted the results to reflect whether union or open shop labor was used for each project.[52] The output of the QuickCost Estimator shows a low, medium, and high estimated cost (corresponding to the 25th, 50th, and 75th percentile of estimated project construction costs).

The results of a comparison of actual affordable projects with the RS Means "QuickCost Estimator" indicate that the cost per unit of the actual affordable projects of all sizes included in the analysis fall between the 50th and 75th percentile of estimated project construction costs .

[52] In order to adjust the QuickCost Estimator results for union vs. open shop labor, we calculated the average union cost differential based on (the more detailed) RS Means per square foot cost estimator and applied the result to the QuickCost Estimator results, which use union labor as the default assumption.

APPENDIX 6: PROJECT ADVISORY COMMITTEE MEMBERS

The following individuals participated in the project Advisory Committee and guided the efforts of the study team.

1. Alice Carr - Chase, Community Development Real Estate Group
2. Arjun Nagarkatti - AMCAL Multi-Housing, Inc.
3. Dora Leong-Gallo - A Community of Friends (ACOF)
4. Doug Pingel - Self-Help Enterprises
5. Doug Shoemaker - Mercy Housing
6. Douglas Guthrie - Housing Authority, City of Los Angeles
7. Dr. Carol Zabin, PhD - University of California Berkeley Labor Center
8. Jack Gardner - The John Stewart Company
9. Jeanne Peterson - The Reznick Group
10. Jim Silverwood - Affirmed Housing Group
11. Joel Rubenzahl - Community Economics, Inc.
12. Lauar Archuleta - Jamboree Housing
13. Matthew Franklin - Mid-Pen Housing
14. Michael Lane - Non-Profit Housing Association of Northern California (NPH)
15. Pat Sabelhaus - Law Offices of Patrick R. Sabelhaus
16. Paul Beesemyer - California Housing Partnership Corp.
17. Shamus Roller - Housing California
18. Stacie Altmann - RBC Capital Markets
19. Susan Friedland – Satelite Affordable Housing Associates
20. Todd Fabian - National Equity Fund, Inc.
21. William Leach - Palm Communities
22. William Witte - Related California

APPENDIX 7: ABOUT THE BLUE SKY CONSULTING GROUP

This report was prepared by the four State of California agencies with responsibility for affordable housing: the California Tax Credit Allocation Committee (TCAC), the California Debt Limit Allocation Committee (CDLAC), the Department of Housing and Community Development (HCD), and the California Housing Finance Agency (CalHFA) based on analysis conducted by Matthew Newman, Shawn Blosser, and Susan Woodward of the Blue Sky Consulting Group. Paul Waszink provided expert advice on cost estimation and construction cost drivers generally. Tim Gage provided strategic guidance for the project.

The Blue Sky Consulting Group is a public policy and economics consulting firm specializing in strategic and analytical services for public, not-for-profit, and private sector clients. Blue Sky's team of subject matter experts and staff come from the highest levels of government, academia and the private sector to assist clients with strategic or analytical challenges across a broad range of practice areas. The firm offers a range of strategic and analytical services to clients; at the core of these services lies an ability to provide non-partisan and rigorous analysis to help clients address complex challenges.

The firm was founded in 2005 by Tim Gage and Matthew Newman. Tim Gage is a highly-regarded public servant, having spent over 24 years as a fiscal advisor with both houses of the California Legislature and as the Director of the California Department of Finance. Mr. Gage received a Bachelor of Arts degree in Philosophy with honors from Harvard College and a Master of Public Policy degree from the Goldman School of Public Policy at the University of California at Berkeley. Matthew Newman was the founding Executive Director of the California Institute for County Government, a nonpartisan public policy research institute. Previously, Mr. Newman worked as a Senior Consultant for LECG, an international economics and public policy consulting firm, and as a Policy Analyst for California's Legislative Analyst's Office. Mr. Newman is a Phi Beta Kappa, magna cum laude graduate of the College Honors program at the University of California at Los Angeles and holds a Master of Public Policy degree from Harvard University's Kennedy School of Government.

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