Irrational Market:
Facts and Fiction Behind Affordable Housing in the San Francisco Bay Area

by

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IRRATIONAL MARKET:

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ABSTRACT

This thesis explores the belief that affordable housing has a negative impact on surrounding housing values. Currently, the San Francisco Bay Area is experiencing a housing shortage. The results of this housing crunch are most acutely felt by low income families who can no longer afford to live in the region. The housing shortage also threatens to undermine the economic competitiveness of the San Francisco Bay Area as it becomes increasingly difficult for employers to attract employees due the area's high cost of living. In order to solve the housing shortage, affordable housing needs to be developed on a regional scale, in both urban and suburban areas. However, affordable housing developers often face extreme opposition to new developments. The most common argument against affordable housing is the belief that housing for low income families will lead to property and neighborhood degradation, resulting in decreased housing values. Through a rigorous quantitative analysis this thesis argues that the introduction of an affordable housing development into a neighborhood does not reduce surrounding housing sales prices.

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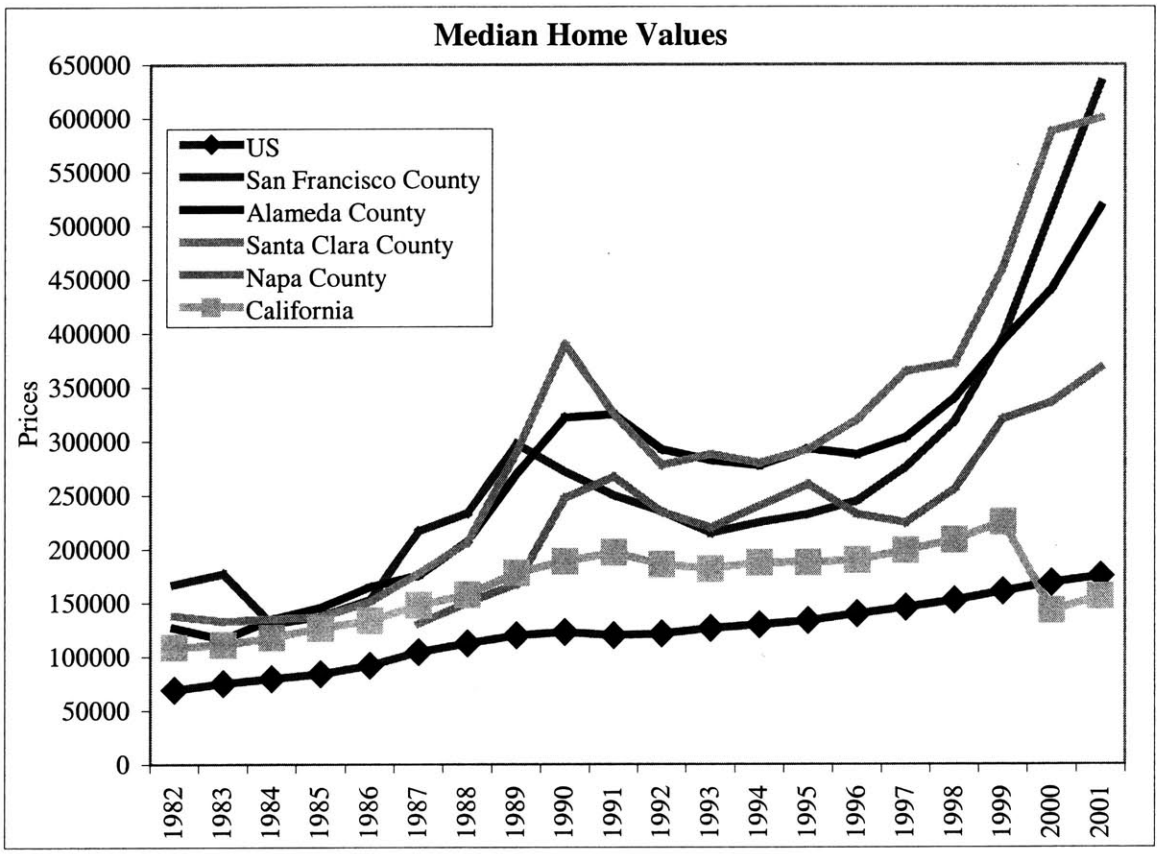
INTRODUCTION

Over the last thirty years, the San Francisco Bay Area[1] (Bay Area) real estate market has more or less followed the cyclical nature of the national economy. As Figure 1 demonstrates, these cycles have resulted in sharp increases in real estate values approximately once per decade.

Figure 1



Source: Construction Industry Research Board and US Census Bureau

Consistent with this pattern, the demand for housing and concomitant real estate values in the San Francisco Bay Area have rebounded from the recession of the early 1990's to reach unprecedented levels.

[1] Bay Area includes the following nine counties: Alameda County, Contra Costa County, Marin County, Napa County, San Francisco County, San Mateo County, Santa Clara County, Solano County, and Sonoma County.

The most recent increase in housing values, however, is different from previous cycles in which high real estate values were followed by subsequent increases in housing development. Throughout the past decade, California housing development has not kept pace with housing demand. According to Business, Transportation, and Housing Secretary Maria Contreras-Sweet, the results of the most recent report, *The State of California's Housing Markets 1990-1997*, reveals that unlike California's experience following the recessions of earlier decades, housing construction has not led the economic rebound nor spiked back following the recession of the early 1990s[2]. This has resulted in a housing shortage, particularly acute in the Bay Area. Contreras-Sweet says "California is projected to outpace the rest of the nation in jobs, income, and population growth during the next ten years. However, the State's ability to sustain its economic expansion is threatened by continuing housing affordability and supply problems.[3]"

The housing shortage in the Bay Area threatens to undermine the economic growth of the region. The problems of the Bay Area's housing shortage have had a detrimental effect on the ability of employers to attract new employees. This is particularly evident in Santa Clara County. For the past ten years, Silicon Valley has been the center of the high-tech boom. With the highest number of patents issued in the world, the home of Stanford University and the birthplace of new technologies, this area has grown into a major employment center. However, the Silicon Valley's economic prosperity is being jeopardized by the lack of housing and high costs of living for Silicon Valley employees. This has deterred many potential employees from living and working in the area. The severity of these issues is acknowledged by the Silicon Valley Manufacturing Group. Representing over 190 of Silicon Valley employers who provide nearly 275,000 local jobs, The Silicon Valley Manufacturing Group has

[2] California Department of Housing and Community Development, Statewide Housing Plan web site.
[3] Ibid.

developed a Housing and Land Use Committee, which works to increase housing production in the Silicon Valley[4].

Additionally, The Bay Area Council, which was founded in 1945 as a business-sponsored, CEO-led, public-policy organization, and has a membership base of over 275 major employers throughout the Bay Area region, has identified through a quantitative and qualitative analysis the comparative economic advantages of the Bay Area in relationship to other regions (Bay Area Economic Profile 1996, 1999, 2002). In these studies they have found that the primary challenges to sustained economic prosperity for the region among other things is: Education Performance and Workforce Preparation, Transportation and Mobility, and Housing Affordable to the Workforce. As the Bay Area Council explains, "Our ability as a region to attract new business and highly-skilled workers, and to keep existing businesses here is impaired by the scarcity of affordable housing in the Bay Area—the most expensive housing market in the country.[5]"

The Bay Area's limited housing options has put a severe strain on low and moderate-income families who can no longer afford housing in the Bay Area and are forced to move to other regions. These families play an important role in the Bay Area's economy. According to the Bay Area Council, "as the region continues to enjoy unprecedented prosperity, Bay Area employers face major challenges: Increased difficulty of employee recruitment and retention; Increased pressure on wages because of a lack of affordable housing; and Employee productivity lost from escalating traffic congestion. All of these have real costs associated with them that impact business operations.[6]" In addition, the lack of affordable housing also raises issues of social, educational and economic equity in the Bay Area.

Many economists, academics and professionals tout the efficiency of the real estate market. Following along Adam Smith's laissez-faire theory of the

[4] Silicon Valley Manufacturing Group website.
[5] Bay Area Council website.
[6] Bay Area Council website.

"invisible hand," the real estate market is often considered a rational market; one that demonstrates how demand guides the most efficient distribution of resources. However, this thesis will show that the residential real estate market in the San Francisco Bay Area is anything but rational. Not only is the supply of housing not responding to increasing market demand, but also, major factors leading to the supply constraint are based on irrational fears relating to affordable housing and a misunderstanding of its importance for the Bay Area region.

In the Bay Area, housing developers, particularly those building affordable housing, often face local barriers and extreme neighborhood opposition to new developments. This hinders the amount of development produced throughout the region. The obstacles that affordable housing developers face, as they attempt to increase the number of affordable housing units, often stem from fictional and sometimes irrational fears of the effects of affordable housing on surrounding neighborhoods. One of the most consistent criticisms of new affordable developments is the claim that affordable housing will reduce surrounding real estate values. However, a widely held belief by affordable housing developers, city planners and housing advocates is that common fears of neighborhood and property value degradation associated with housing targeted to low income families are misplaced. Therefore, in order to solve the housing shortage throughout the Bay Area, housing advocates and developers need to explore and address neighborhood perceptions of affordable housing.

Additionally, though a housing market functions on a regional scale, neighborhoods and local municipalities act in their own self interest, deterring the development of additional housing. This has contributed to the limited housing stock throughout the region. The current conditions of the Bay Area real estate market have had devastating impacts on low-income families who can no longer afford to live in the Bay Area and are forced to move to other regions.

My thesis will attempt to separate the facts from the fiction behind affordable housing in the Bay Area. Through three case studies, this thesis explores the claim that subsidized housing negatively impacts surrounding housing prices. Debunking the myths at a local level is a necessary step in finding a regional solution for affordable housing.

The first chapter of this thesis delves into the existing obstacles to affordable housing in the Bay Area. It further demonstrates how it is in the Bay Area's best interest to solve the affordable housing shortage on a regional scale. The second chapter lays out the history and context of the Bay Area residential market. By showing the current condition of the demand and supply of housing, the implications for affordable housing are better understood. The third chapter outlines the research methodology of this report. The fourth chapter is a quantitative analysis in which I will analyze housing sales data, both before and after the construction of an affordable housing site to see if, in fact, affordable housing has a negative effect on surrounding real estate values. Finally, I conclude with my findings and recommendations.

A REGIONAL PROBLEM WITH A REGIONAL SOLUTION: AFFORDABLE HOUSING IN THE BAY AREA

Background

The shortage of housing in the San Francisco Bay Area[7] is a nationally recognized problem. The results of limited housing options are felt most acutely by low and moderate income families who can no longer afford housing in the Bay Area and are forced to move to other regions. These families play an important role in the Bay Area's economy. High housing costs and constrained housing production limit the region's ability for economic growth and decreases the quality of life for its residents.

As the name suggests the "Bay Area" functions as an interdependent region. The housing problem in the Bay Area, therefore, needs to be addressed on a regional scale. Despite the generally accepted need for affordable housing, however, many affordable housing developers in California find it difficult to build low and moderate income housing they are capable of delivering. This is due to a number of obstacles including local bureaucratic approval processes, scarcity of developable land, limited financing subsidies, and high construction costs. Perhaps the most significant barriers to developing affordable housing, however, are zoning regulations that restrict density and limit housing types and citizen and neighborhood opposition to new affordable housing developments.

Because municipalities rely on property taxes to provide public services and education, local jurisdictions have fiscal disincentives to build affordable housing. The tax revenue generated from residential developments, particularly

[7] Bay Area includes the following nine counties: Alameda County, Contra Costa County,, Marin County, Napa County, San Francisco County, San Mateo County, Santa Clara County, Solano County, and Sonoma County.

affordable housing developments, is less than the fiscal costs associated with providing public services to the residents of the development.

Politically, support of affordable housing is disadvantageous to local regulatory agencies as approval often faces extreme opposition from local constituencies. Neighbors of potential affordable housing sites are fearful that subsidized housing will negatively impact their neighborhood and (more importantly) will be reflected in reduced property values. Lengthy public entitlement processes and contentious community participation efforts stretch development time schedules, increase development costs and reduce the overall production of housing. This chapter will examine these two obstacles as well as why it is in the Bay Area's best interest to solve the affordable housing shortage throughout the region.

Fiscal Zoning

In 1956, Charles Tiebout wrote the article "A Pure Theory of Local Public Expenditure." In this famous piece, Tiebout introduced a theory that ties together property taxes and local decision making. This theory , now referred to as the "Tiebout model," has become the cornerstone of public finance and land use literature. The Tiebout model hypothesizes that there is an efficient market for local public services. It further theorizes that households move to communities where the cost of services, in the form of property taxes, corresponds to an acceptable level of public services. Residents then "vote with their feet" by choosing a community that offers the optimal level of services for the right price. Tiebout's theory helps provide an understanding of local public finance, and its impact on land use planning and zoning. The only way for communities to increase local revenue and improve local services is by increasing their property tax base. As a result, attention towards revenue generating land uses guide zoning and development approval decisions as local governments and communities weigh the impact of new development on local finances.

In the groundbreaking book, *Opening Up the Suburbs*, the renowned economist Anthony Downs expands the Tiebout model to explain how individual municipalities make land use decisions based on their fiscal interests. Whenever a family moves into a new area and sends several children to public schools, the increased expense of educating that family's children and providing local services is larger than the local tax revenue gained from property taxes on its housing units. The family, in essence, has created a small "instant deficit.[8]" This results in higher taxes for all existing residents. Such instant deficits can be caused by the introduction of any new family, wealthy or poor. However, the greater the number of school aged children in the in-coming household, and the smaller the assessed value of the housing unit, the larger the instant deficit. Hence bigger average deficits are caused by smaller houses and multi-family developments[9]. Therefore, municipalities have a fiscal disincentive to build affordable housing.

In mid-1990s, Minnesota State Senator and Director of the Metropolitan Area Research Corporation, Myron Orfield offered a new framework for analyzing regional social, fiscal and economic conditions in his book *Metropolitics.* Using a series of indicators on race, income, poverty, crime, school performance and spending, affordable housing, property values, job creation and tax capacity, Orfield systematically compared all the communities in the Twin Cities region of Minneapolis and St. Paul, Minnesota. Then, in order to connect his findings to local development patterns, Orfield presented his findings spatially using Geographic Information Systems (GIS) maps[10]. In 1998, Orfield conducted a similar analysis for the San Francisco Bay Area. In this report, Orfield found increasing polarization between low tax base and high tax base municipalities. He wrote, "When the property tax is a basic revenue source for local governments with land-planning powers, fiscal zoning occurs as jurisdictions compete for property wealth. Through fiscal zoning, cities deliberately develop

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[8] Downs, Anthony, *Opening Up the Suburbs.*
[9] Ibid.
[10] Orfield (1997), *Metropolitics.*

predominantly expensive homes and commercial industrial properties with low service needs and limit less costly housing and entry to the community by the people who normally buy it.[11]" "As the property tax base expands in high property-wealth areas and their housing market remain exclusive, these areas, such as the hill cities northwest of San Jose and the fast-growing communities of the East Bay (in eastern Contra Costa and Alameda Counties), become both socially and politically isolated from regional responsibilities.[12]" He notes that as a result, affordable housing in the Bay Area tends to be concentrated in inner cities and older suburbs with low tax bases.

Because municipalities are reliant on property taxes to provide public services, municipalities act in their own self-interest. Acting in isolation, Bay Area municipalities discourage the development of low and moderate income housing for fear of an immediate tax deficit. It is important, however, to look past the immediate fiscal results. I would argue that the impact of a regional housing shortage has a long term effect on the region's ability to grow economically and that this has a long term direct impact on a municipalities' ability to increase its tax revenue. In addition, the instant deficit associated with affordable housing developments are often mitigated through a series of impact fees, exactions and state funds. Additionally, evidence has shown that in certain areas, real estate values actually increase in areas that value income and racial diversity. This is capitalized into higher housing prices which in turn increases a city's tax base[13]. Yet suburbs in the Bay Area continue to zone to exclude multifamily developments and small housing units from their communities.

Neighborhood Opposition

Little can bring a community together better than a perceived threat to its integrity. Neighbors of potential affordable housing sites state that subsidized

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[11] Ibid.
[12] Myron Orfield, *San Francisco Bay Area Metropolitics: A Regional Agenda For Community and Stability*, May 1998.
[13] Fischel, William, *Homevoter Hypothesis.*

housing will negatively impact their neighborhood resulting in decreased quality of life and in reduced property values. Because elected and appointed officials in American municipal governments have it in their interest to reflect the will of their communities vocal neighborhood opposition to a development has the ability to prevent a new affordable housing project from being built. Even if a project eventually receives development approvals, neighborhood opposition creates lengthy public entitlement processes and contentious community participation efforts, stretching development time schedules, increasing development costs and reducing the overall production of much needed affordable housing.

The claim that affordable housing will reduce surrounding real estate values is not typically based on statistical evidence, but instead usually stems from negative preconceptions about affordable housing and the tenants who live there. Other complaints about affordable housing often voiced at community meetings consist of increased traffic congestion, architectural and design criticisms, fear of increased crime, and a concern over the excessive use of resources such as police services and public schools.

Many affordable housing developers have attempted to assuage neighborhood fears about affordable housing by mitigating potentially negative impacts. Often, a rigorous design process is undertaken to incorporate affordable housing sites into the architectural fabric of the surrounding neighborhoods. Also, density levels are sometimes reduced to minimize traffic concerns and maintain the characteristics of the surrounding community. However, although these measures may be influential in creating higher quality developments, neighbors opposed to affordable housing often maintain that real estate values will be negatively effected. Neighborhood opposition tends to be strongest in suburban communities, where the perception of affordable housing contrasts most sharply to notions of living in a high-end low density neighborhood that values open space.

A good example of obstructive strategies and their effects on affordable housing projects is the Strobridge Court Apartments, a development whose history was fraught with neighborhood disputes and court battles. In 1993, The Alameda County Board of Supervisors adopted revisions to the Castro Valley Central Business District Specific Plan that included converting parking into a mixed-use commercial or higher density residential development. After the adoption of the Specific Plan in 1993, a citizen's committee was convened with members from the community--the Municipal Advisory Council (MAC), BART, Chamber of Commerce, and county staff to look at a joint development of the BART site. From these meetings a Request For Proposal was issued and BRIDGE Housing Corporation (BRIDGE) was chosen as the developer.

BRIDGE, along with BART leaders, met several times with neighborhood residents and attended numerous meetings as well as two public hearing with the Castro Valley Municipal Advisory Council prior to Planning Department approvals to develop the concept of Strobridge Court Apartments. From the beginning, BRIDGE was met with resistance. As the Daily review wrote, "A clear majority of residents who spoke during the two meetings held this summer by the Castro Valley Municipal Advisory Council opposed the apartments. Most said they fear that subsidized, low-rent apartments at a BART station would draw troublemakers from other cities and reduce nearby property values.[14]" Additionally, MAC was initially concerned about the adequacy of parking related to the project itself. In response to these concerns BRIDGE amended its parking levels. With the changes to the parking levels, MAC voted in favor of the development. Subsequently, the Planning Director approved the project. Yet residents appealed the decision. Neighborhood residents organized as the Castro Valley Citizen's Committee and handed out flyers that which stated, "We're fighting back! They stuck us with the downtown Castro Valley BART station! We're not going to let them stick us again with this 96 unit low-

[14] Greg Bardsley, Daily Review. August 30, 1995.

income housing project??!!" In addition articles were written in local papers and money was raised to help fund the appeal.

Following this appeal, the Planning Commission held two public hearings. One of these, with more than 500 vocal opponents, lasted for over four hours as residents both in favor and in opposition gave testimony. At the end, the Planning Commission voted 7-0 to approve the project and uphold the Planning Director's actions. Again, the residents appealed. Residents raised concerns about parking as well as the effects the project would have on neighborhood character. The Board of Supervisors heard from traffic engineers, lawyers, community members, BRIDGE and BART, and rejected the resident's appeal. Residents still did not give up. The Castro Valley Citizens Committee sued Alameda County Board of Supervisors, BRIDGE Housing Corporation, and BART in the Alameda County Superior Court, claiming that the Alameda County Supervisor's approval of the project would reduce parking below limits that were outlined in the Specific Plan. In her ruling Judge Margulies rejected the communities' claim and stated that the citizen's group could not link the development of Strobridge and the Supervisor's approval of the project to the reduction of parking spaces in the neighborhood. The project finally began construction in March of 1996, three years after BRIDGE was awarded the Request for Proposal.

The delay in developing Strobridge Court Apartments is a perfect example of the effects that neighborhood opposition has on affordable housing development in the Bay Area. The citizen's concern about the impact of Strobridge on the surrounding area caused a delay in the creation of much needed affordable housing in the region. Three years of community meetings and court battles caused BRIDGE Housing Development three years of staff time, attorney fees, foregone development and increased development costs. Yet Strobridge Apartments, as shown in the quantitative analysis has had only positive effects on surrounding real estate values. As evidenced latr in this thesis, since the introduction of Strobridge into the neighborhood, surrounding

housing prices have risen dramatically, trending identically to the overall market. Additionally, Strobridge Apartments has provided 66 units of housing, affordable to low income families and seniors who otherwise may not be able to afford a quality place to live within the Bay Area region.

Regional Responsibility

As a result of both strong neighborhood opposition and exclusionary zoning laws in suburban communities, affordable housing in the Bay Area has been concentrated in lower income communities and central city locations. But, a housing market functions on a regional scale. A housing shortage in one city will cause spillover demand in neighboring jurisdictions. As an example, if a family is searching for a new home, they will often choose to locate close to their place of employment. If the jurisdiction in which their job is located does not have sufficient housing options, the family is forced to look to another area to meet their housing need. Crucial to resolving a regional problem is the recognition that a metropolitan area is socially and economically unified. Jurisdictions within a region are interdependent parts of a single whole. Therefore, it is naive for any city or town to believe that they can behave autonomously in relation to all or any of the other parts[15].

Though every Bay Area municipality shares in the region's economic prosperity and growth, not all Bay Area jurisdictions are assuming the responsibility for providing housing for those families shut out of the housing market. By extension, Bay Area jurisdictions that benefit from the overall growth of the region can be seen to have a responsibility to share in the provision of housing for people who work and maintain the regional economy. Without the provision of housing throughout the region, the Bay Area will not be able to sustain its economic activity as households will be forced to move where housing options are both available and affordable. Currently, affordable housing options are concentrated in central cities and low-income areas that no longer

[15] Downs, Anthony. *Opening Up the Suburbs.*

correspond to the location of appropriate employment opportunities. A problem that results from concentrated areas of affordable housing is the inability for low-income workers to find housing near their jobs.

The Bay Area is made up of several economic hubs. With multiple job centers, housing needs to be distributed in areas throughout the Bay Area where both job and service opportunities exist. John Kain, an economist at Harvard, has argued that there is a "spatial mismatch" between affordable housing and available jobs. His theory shows that American cities are undergoing transformations from centers of goods and production to centers of information processing. The economic backbone of cities that was once made up of blue-collar jobs has either disappeared or moved out to the suburbs, if not abroad. Therefore, central city low-skilled manufacturing jobs are no longer available. In addition, many neighborhood retail businesses that once served the middle class in the city have relocated to the suburbs to follow the movement of these households[16]. The spatial mismatch theory states that it is not necessarily the lack of jobs that is the problem, since central city population growth has been as slow as central city job growth. The problem is that the percentage of central city jobs with high educational requirements is increasing, while the average education level of central city residents is dropping. The exodus of low-skilled jobs to the suburbs disproportionately effects central city low-income households, particularly minorities, who often face a more limited choice of housing in high job growth areas and face a lack of transit services from the urban center to the suburbs.

Unemployment in the Bay Area is spatially concentrated in low-income and central city neighborhoods while job opportunities for them are growing fastest in higher income suburbs. Therefore it seems clear that more effective linkages should be established between these two areas. Anthony Downs, of the Brookings Institute, points out that there are three ways to do this: 1) locate more jobs near low-income neighborhoods, 2) provide better transportation for

[16] Rosenbaum, James. *Housing Policy Debate*, 1992.

central city workers to reach suburban jobs, and 3) provide suburban housing opportunities for low-income households. In reality, the first two, even with the creation of Empowerment and Enterprise Zones that encourage investment in low-income communities, are not likely to occur on a big enough scale to cope with this problem. Additionally, the larger the future growth of suburban employment and the farther the edge of new suburban developments are situated, the harder the first two objectives become. Therefore, the most effective short term solution, and perhaps the only feasible long-run solution, is to make more suburban housing available to low income households and households of various income levels[17].

In addition to the spatial mismatch that often exists between jobs and affordable housing, studies have shown that creating mixed income communities benefits overall regions by de-concentrating poor households and providing better employment and educational opportunities for the poor. The most well known and most studied case of mixed income communities is the Gautreaux experiment. Based on the 1976 court order in the case of Hills v. Gautreaux, 425 US 284 (1976), thousands of single parent black families living in Chicago's public housing were given the opportunity to live in predominantly white middle class suburbs. The Gautreaux experiment randomly selected poor families, out of a pool of over 5,000, to live in affluent suburbs that were more than 96% white while the other families moved to poor neighborhoods that were more than 90% black. James Rosenbaum and colleagues from Northwestern University have intensively studied the Gautreaux families. His research established that the low-income women who moved to the suburbs clearly experienced improved economic and educational opportunities. The suburbanites were about 25% more likely to be employed after the move. Rosenbaum found that the children of the suburban movers dropped out of high school less frequently than the city movers (5% vs. 20%). These students also maintained similar grades to the city students, despite higher standards in suburban schools. Third, the children who

[17] Downs, Anthony. *Opening Up the Suburbs.*

moved to the suburbs were significantly more likely to be on college track (40% vs. 24%) and went to college at a rate of 54% compared with 21% who stayed in the city. Of those youth not attending college, 75% of the suburban youth were fully employed as compared to 41% of the city youth. Additionally, suburban youth had a significant advantage in job pay and were more likely to have jobs with benefits. Finally, of those youth attending college, 27% of the suburban youth were in four-year colleges as compared to 4% of the city youth[18].

In Anthony Downs book, *Opening Up the Suburbs*, he deftly notes an additional problem that results from city and suburban housing polarization. Throughout American history the notion of economic upgrading in the form of housing has been a long-standing ideal. This notion is based on the belief that low-income households can somehow generate the initiative and the money needed to move into better conditions. Most people recognize the desirability of this process. However such upgrading is impossible unless relatively low-income households can move into predominantly middle-income areas. This process implies a whole series of neighborhoods with varying economic levels to form a socioeconomic ladder that families can climb. A family moving into a new area is often trying to improve their conditions by seeking better housing and surroundings. If households with relatively low incomes are denied entry at any level on the ladder, the process will stop working effectively. Unfortunately, the current conditions of the Bay Area's many neighborhoods link quality of housing and environment with income and wealth. Most of the higher rungs on this socioeconomic ladder and many middle ones are located in the suburbs[19].

As a result of neighborhood opposition and fiscal disincentives, residential developments particularly multi-family, are not permissible under many local zoning codes throughout the Bay Area This leads to an affordable housing shortage. Low income families find themselves forced to move out of the region where the cost of living is lower or in areas of pre-existing poverty.

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[18] Rosenbaum, James. *Housing Policy Debate*, Volume 6 Issue 1, 1995.
[19] Downs, Anthony. *Opening Up the Suburbs*.

This concentrates poverty in areas that are least equipped to deal with the fiscal needs of low income families, resulting in reduced access to both economic and educational opportunities. If affordable housing were provided throughout the region, it would accomplish several goals: a reduction in the concentration of poverty and racial segregation, stem the polarization occurring between the region's communities, allow workers to live closer to their jobs reducing congestion on roadways, preserve valuable open space and natural amenities, and allow households to remain in their communities as their financial situations change.

It is important to note that the arguments for the development of affordable housing in suburban communities by no means implies that affordable housing should not be built in inner cities and other locations. This is merely an exploration of the benefits of a more equitable distribution of the region's affordable housing need throughout the Bay Area.

The following chapters will examine the facts and the fiction gehind affordable housing in the Bay Area. In chapter 2, I will examine the history of the Bay Area residential real estate market and the implications of a supply constrained market on affordable housing. With these facts as the basis, I will quantitatively analyze the claim that proximity to affordable housing has a negative impact on surrounding real estate values.

NO PLACE TO LIVE:
THE STORY OF THE BAY AREA HOUSING MARKET

Background

The San Francisco Bay Area is in the midst of a housing crisis. As discussed in the last chapter, the lack of affordable housing throughout the Bay Area, is a regional problem that must be solved on a regional scale. To better understand the current conditions of affordable housing, it is necessary to recognize the history and context of the overall Bay Area residential real estate market. This chapter explores the changes in both the demand and supply of Bay Area housing and their implications on the regional market.

Bay Area Housing Demand

Housing demand is generated by, among other things, employment growth, economic changes and household income within a market. In addition, population growth and natural demographic changes that result in shifts in the number of households, household size and household configurations influence the demand for housing.

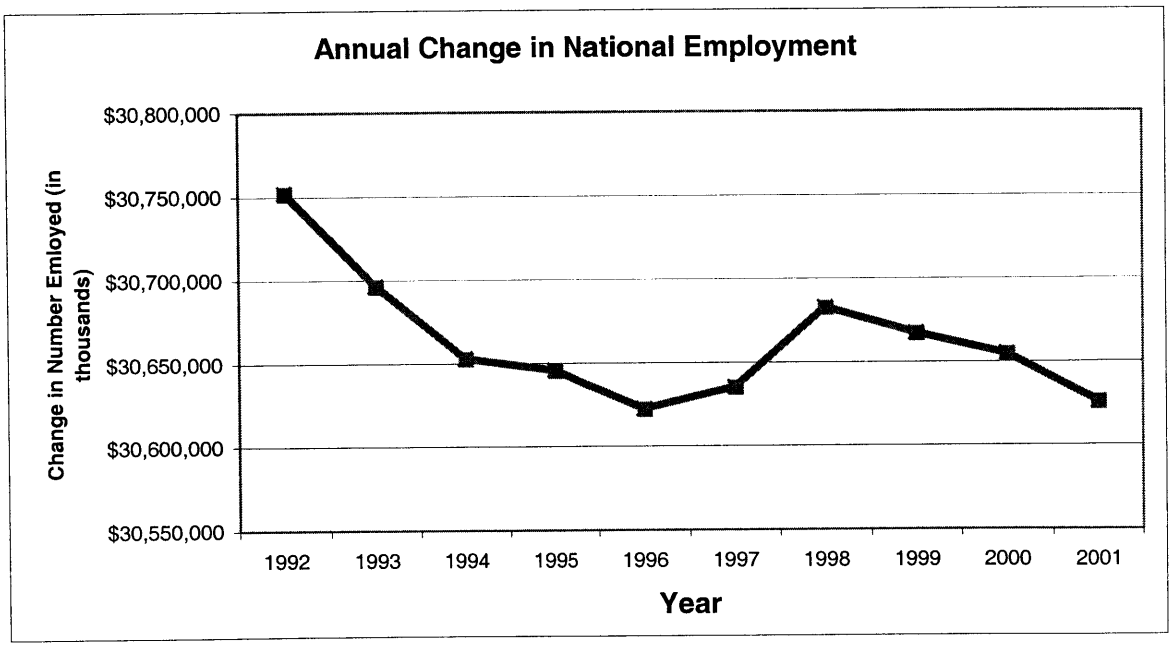
Coming out of the 1980's, the United States was entering what would become a deep recession. California was no exception. Between the beginning of 1990 and the end of 1993, overall employment in California declined by nearly 3%, a loss of approximately 176,000 jobs [20]. In the Bay Area, the outlook was similar. Between 1990 and 1991 employment dropped by over 2.5% and unemployment hovered around 7%. Unlike other parts of the nation, regions of California, though initially hit harder, were able to recover relatively quickly. Between 1994 and 1997, employment in California grew by over 1.1 million and

[20] California Department of Housing and Community Development , *The State of California's Housing Markets 1990-1997.*

the State's unemployment rate fell from a high of 9.7% in January 1993 to about 4.7% by the end of 2000.[21] During the same period the national unemployment rate dropped from 7.3% to 4%, only a 3% decrease as compared to a 5% change in California. A large part of California's quick economic turn-a-round was due to the strength of the Bay Area economy. Because Bay Area employment was strong prior to the recession, its economy was positioned to rebound faster than other regions. As Figure 2 below demonstrates, national employment levels did not begin to rise until 1996.

In the Bay Area, however, the tide began to turn in 1992. By 1995, the rate of change increased to over 2.4% and would continue to rise precipitously. In fact, between both 1996 and 1997, and 1999 and 2000, employment grew by over 4%.

Figure 2



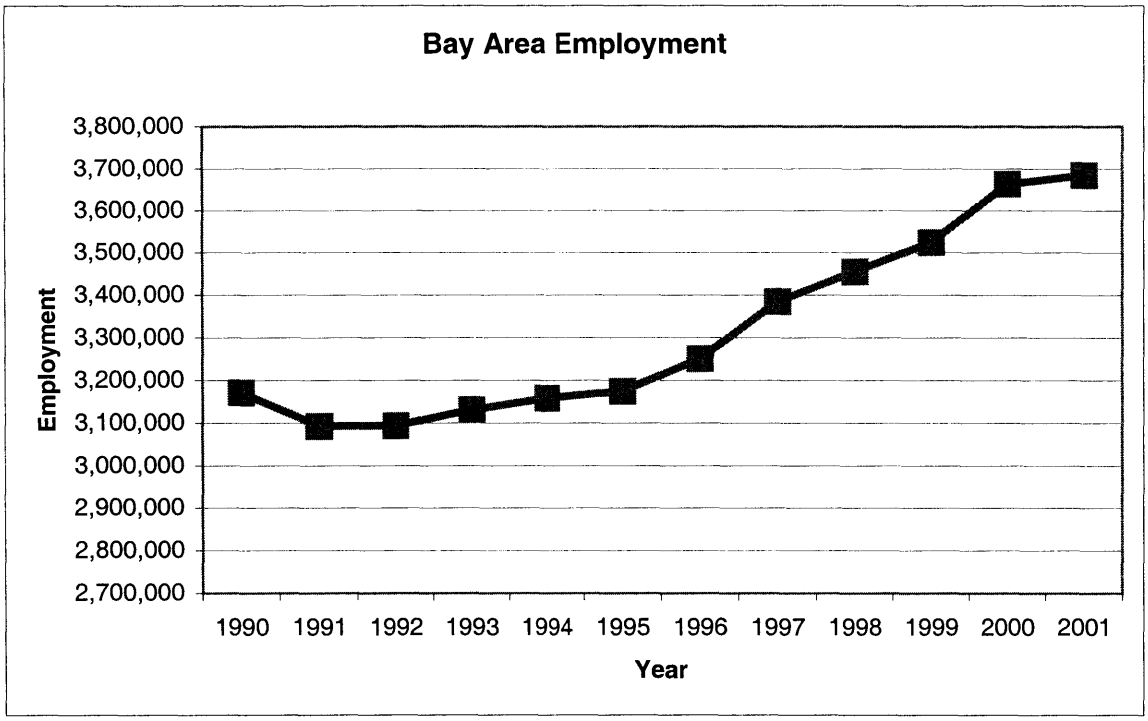
Source: US Bureau of Labor Statistics

As a result of the sudden unprecedented growth of the technology industry, the Bay Area employment market has rebounded rigorously from the

[21] Ibid.

recession of the early 1990s. Figure 3 traces employment growth over the last decade. The number of jobs in the Bay Area, between 1990 and 2000, has increased from 3,206,080 to 3,753,670, a 17% jump. And though the Bay Area's current employment rates have recently declined, analysts estimate that the number of jobs will continue to grow, at a slower pace of 4%, for a total of 3,933,870 jobs by the year 2010[22].

Figure 3



Source: U.S. Bureau of Census and Real Estate Center at Texas A&M University.

Related to employment, housing demand is generated by income patterns. While other factors heavily impact household decisions, the ability of households to demand housing is influenced by underlying income characteristics of residents in the region[23]. Household income influences the quantity, tenure, quality and type of housing demanded. The Bay Area has always been characterized as a region with relatively high per capita income. In

[22] ABAG Projections 2002.
[23] Department of Labor Statistics.

fact, between 1990 and 1997, Bay Area per capita income averaged 35% higher than statewide averages[24].

Prior to the recession of the early 1990s, Bay Area per capita income was growing rapidly. Between 1980 and 1985 it increased by 15% and between 1985 and 1990 it increased by 9%. Even during the recession, per capita income in the Bay Area continued to rise, though slowing to a growth rate of 1.8% between 1990 and 1995.[25] As mentioned above, as the Bay Area economy emerged from the recession, employment levels sky rocketed. Most of these jobs were in the high paying technology sector resulting in the mean household income in the Bay Area to grow substantially. In 1990 the average household income was $76,200. By the year 2000 the average had risen to $93,800, a 23% increase. Though this is high, during the same period, the National Consumer Price Index rose by almost 32%. This demonstrates that, though per capita incomes are rising in the Bay Area, they are not rising at the same level as inflation. So, as incomes are rising for many Bay Area residents, the buying power that that income yields is lower than it was in 1990. The Association of Bay Area Governments projects that the mean household income in the Bay Area will grow to $100,400 by the year 2010. It remains to be seen how this projected income ill compare to the Consumer Price Index.

Another important factor in housing demand is the number of people in a residential market. For the past 60 years, the Bay Area population has been climbing at rapid rates as Figure 4 illustrates.

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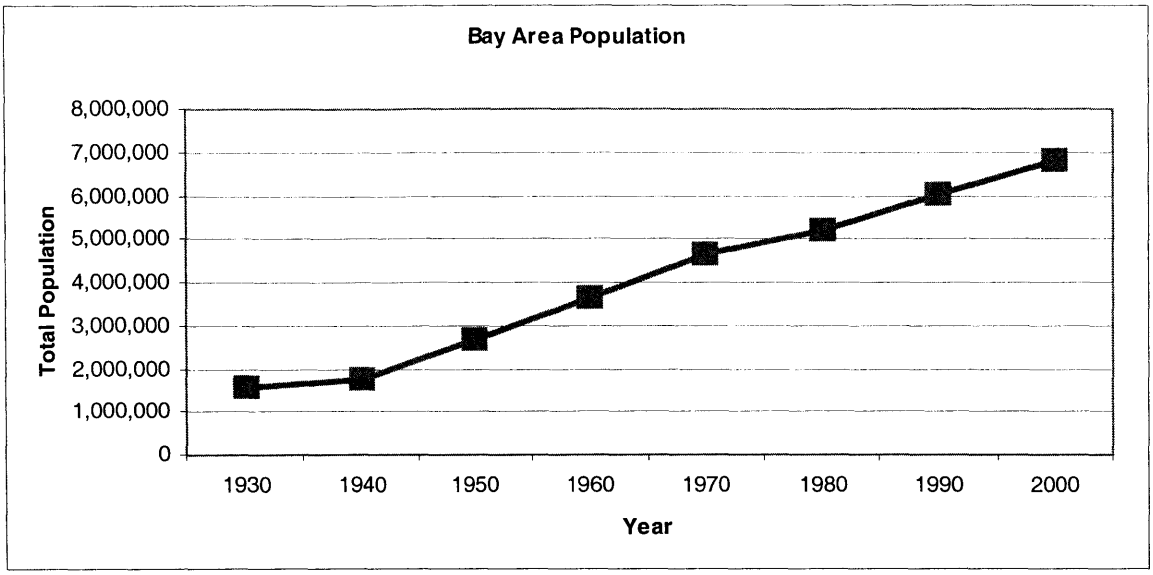
[24] California Department of Housing and Community Development , *The State of California's Housing Markets 1990-1997.*
[25] Ibid.

Figure 4



Source: U.S. Department of Commerce, Bureau of the Census (Note: 1930 Population Figures are from 1980 Census Population)

Like most of California, the Bay Area's recent population growth is due primarily to the in-migration of new residents. As a result of the booming California economy, and the growth of the dot.com industry, the Bay Area has seen a sharp insurgence of jobs with concomitant increased incomes. This, combined with population and household growth has increased the need for housing.

The State of California's Housing Markets 1990-1997 estimates that approximately 40% of the Bay Area's increase in population during the 1990's was migration induced. Natural demographic changes have also stimulated the Bay Area's total population growth. Between 1990 and 2000, the Bay Area's total population grew from 6,023,577 to 6,783,760, almost a 13% increase[26].

[26] US Census 1990 and 2000

Figure 5

Bay Area Total Population

Year	Population	% Change
1930	1,578,009	-
1940	1,734,308	9.9
1950	2,681,322	54.6
1960	3,638,939	35.7
1970	4,630,576	27.3
1980	5,179,759	11.9
1990	6,023,577	16.3
2000	6,783,760	12.6

Source: U.S. Department of Commerce, Bureau of the Census (Note: 1930 Population Figures are from 1980 Census Population)

As Figure 5 indicates the Bay Area's percent population increase in the 1990s was by no means higher than previous decades; the Bay Area population has been growing at high levels throughout its history. Though the Bay Area population is expected to continue to grow, ABAG has projected that the percent increase will level off at approximately 11% between 2000 and 2010[27]. This is still an increase of over 745,000 people.

As population in the Bay Area grows, so do the number of households in need of housing. The demand for housing in the Bay Area is correlated with the number of households in the region, as well as the changes in demographics that influence the size and make-up of households. In 1990, there were 2,245,865 households living in the Bay Area. This number grew to 2,466,019 by the year 2000, almost a 10% increase[28].

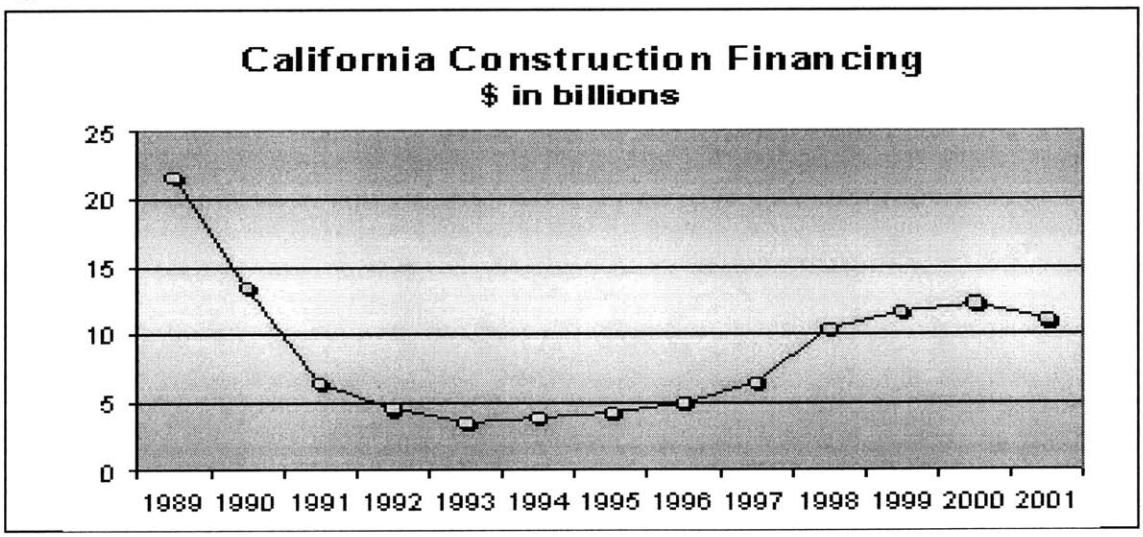
[27] ABAG Projections 2002.
[28] Ibid.

Bay Area Housing Supply

Whereas the demand for housing in the Bay Area has grown precipitously over the last decade, the supply of housing has not kept apace. Change in housing stock is a slow process due primarily to the lag between market demand shifts and the necessary development and construction period. A good reflection of changes in housing supply can be derived from the number of building permits issued and the number of demolitions in a housing market. Permits are a good indicator of increases in housing stock while demolition is an indication of the number of buildings removed from the housing stock.

It is difficult to speculate why housing construction in the Bay Area did not rebound after the recession. Within the financial industry, the 1990s brought about a movement away from real estate and into the high tech industry. As Figure 6 illustrates, access to financing for real estate development was limited as financial institutions were still reeling from the overbuilding of real estate in the late 1980s.

Figure 6

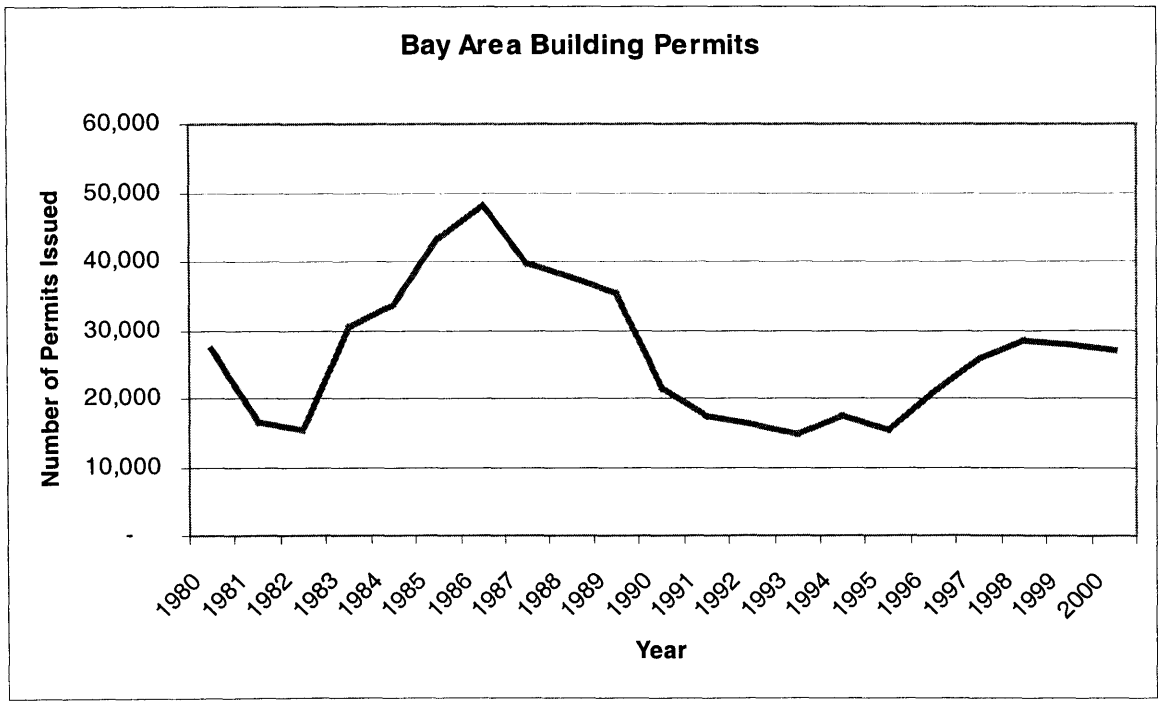


Source: Data Quick Real Estate News Website

In addition, the Bay Area's increasingly rigid entitlement processes and strict zoning regulations reduced the number of real estate projects and increased overall project time lines. Furthermore, the Bay Area's geography limits the amount of developable land available for new development.

During the recession of the 1990s, the Bay Area's construction activity decreased drastically. As Figure 7 demonstrates, after peaking in 1986 with 48,033 residential building permits issued, permitting fell to a low of 14,741 in 199329. Between 1985 and 1989 the average annual number of residential permits issued was close to 41,000. Between 1990 and 1994 the average was only 17,400. Even as the Bay Area emerged from the recession, permitting levels lagged behind. Between 1995 and 1999 the average number of annual residential permits issued was 23,600. This is still 42% lower than the average number of residential permits issued at the end of the 1980's[30].

Figure 7



Source: U.S. Bureau of Census and Real Estate Center at Texas A&M University

[29] ABAG website: Residential Building Permit Data.
[30] Ibid.

The Bay Area had very little permitted demolition of residential buildings during the 1980s and the 1990s. Between 1980 and 1989, 10,857 structures were taken out of the housing supply, this was less than .5% of the annual housing market. Between 1990 and 1994, 1,205 residential building were removed which totals less than .1% of overall housing per year. This has resulted in only a small fraction of the Bay Area housing being taken out of the housing market[31]. It is unclear whether this has led to a deteriorated housing stock and substandard housing options or whether a small number of permitted demolitions results in an increase of rehabilitated structures. It is also important to note that housing demolitions do not include residential buildings that reach functional obsolescence or are destroyed by fire, flood or other natural disasters. In fact, the Oakland/Berkeley fire on October 20,1991 resulted in the destruction of 3,229 structures and damaged another 2,992[32] none of which are recorded as demolished buildings.

Bay Area Housing Market

Housing construction in the Bay Area has significantly lagged behind demand. This has led to a severe housing shortage, with low vacancy rates, high housing prices and an extremely tight rental market for multi-family apartments.

Vacancy rates are a good indication of the strength of a real estate market. If vacancy rates are low, households must compete against one another for available housing, bidding up the cost of a vacant unit. With high vacancy rates, landlords and sellers are often forced to reduce the price of their available housing to lure prospective tenants and buyers to their unit. In the Bay Area, vacancy rates are extremely low placing upward pressure on the cost of housing. During the recession years of the early 1990's, vacancy rates steadily increased

[31] California Department of Housing and Community Development ,*The State of California's Housing Markets 1990-1997.*
[32] United States Global Change Research Program website.

but remained low relative to the state and national rental vacancy rates. Between 1992 and 1997, California's rental vacancy levels averaged 7.6%, while the national vacancy rate was slightly higher. During the same time period, the Bay Area's rental vacancy rate averaged approximately 5%[33] while vacancy rates for ownership units was approximately 1.55%[34]. Since then, vacancy rates in the Bay Area have continued to decline. Sources consistently place estimates for the Bay Area regional housing market below 5% in 1997, with both San Francisco and San Jose rental vacancy rates well below 4% since 1995[35]. In 2000, ABAG estimated vacancy levels for ownership units at less than 1% and at approximately 2.5% for Bay Area rental housing. This is substantially lower than the national rental vacancy rates that have ranged from 7.4% to 8.8% between 1995 and 2000[36].

As vacancies remain low, the price of housing in the Bay Area escalates. Increasing housing demand in a supply contained market has led to escalating rising housing prices. The Bay Area single family housing market has always been relatively high compared to national and California averages. In 1990 the median sales price for a home in the United States and California was approximately $79,100 and $120,500 respectively[37]. In the Bay Area, the median price for a home ranged from three to five times the national home price with a low of $265,862 in Contra Costa County to a high of $395,995[38] in Marin County. The Bay Area, like all of California, experienced a decline in median housing sales prices between 1990 and 1993. However, it did not experience the gravity of the recession as did other regions in California. By the end of the 1990s prices in the Bay Area had risen significantly. In Santa Clara, San Mateo and San Francisco counties, after adjusting for inflation, median existing home

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[33] Ibid
[34] California Department of Housing and Community Development , *The State of California's Housing Markets 1990-1997.*
[35] Ibid.
[36] US Census Bureau website
[37] 1990 and 2000 Census.
[38] California Department of Housing and Community Development , *The State of California's Housing Markets 1990-1997.*

prices between 1990 and 1997 rose by 10%, 7.3% and 7.5%, respectively[39]. In 1997, new home prices in San Francisco and San Mateo rose to the greatest extent in the State (42.1% and 19.6% respectively)[40]. According to the California Association of Realtors, in 1997 the median price of an existing Bay Area home was $292,610, in contrast to $186,490 statewide and $124,100 nationally[41].

To gauge the health of the overall housing market, it is important to look at the multifamily housing market as part of the dynamics of the single family housing market. As a result of high single family housing prices, the natural movement of households out of multifamily rental developments and into single family homes has been slowed. This has resulted in spillover demand for multifamily housing throughout the Bay Area.

Building permit activity by sector can help to evaluate the current conditions of both the single family and multi family housing supply. As mentioned above, the number of building permits issued in the Bay Area has remained relatively depressed since the 1980's. Additionally, as the number of building permits issued has declined, the concentration of these permits towards single family dwellings has increased. As Figure 8 below illustrates, the percentage of building permits issued for multi family housing dropped to an average of 28% between 1992 and 1996. Since then the percentage of permits issued for multi-family development has hovered around 38%[42].

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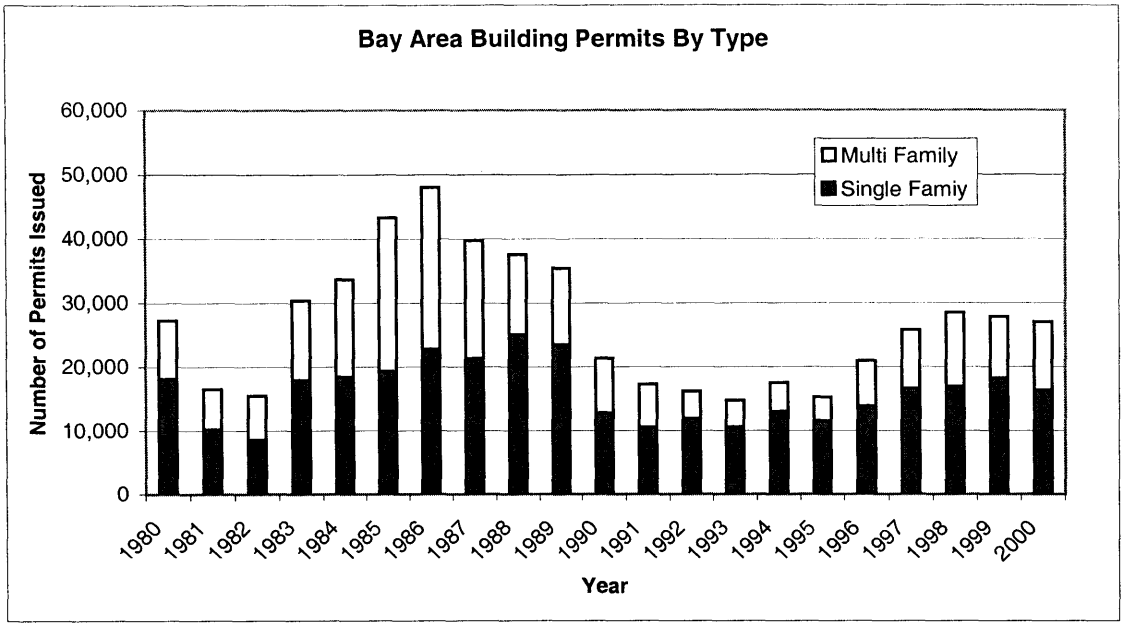
[39] Ibid.
[40] Ibid.
[41] ABAG website. *The Price of Imbalance.*
[42] U.S. Bureau of Labor Statistics and Real Estate Center at Texas A&M University website.

Figure 8



Source: U.S. Bureau of Census and Real Estate Center at Texas A&M University

Stagnant and in many areas decreasing multifamily construction has created a multifamily market that has remained relatively unchanged for the past decade. This has led to an extremely tight rental market, and increasing rental rates. Even during the recession of the 1990s, rents in the Bay Area were amongst the highest in the country. In 1990 the average Bay Area rent was $756 as compared to the national average of $374 and the California average of $612[43]. As a result of the recession, average rents declined slightly during the mid 1990s to a low of $661 in 1996[44]. However, rents levels did not stay low for long. Between the end of 1995 and the third quarter of 1997, rents rose an average of 33.3 percent in San Francisco, 29.1 percent in Santa Clara County, 24.6 percent in San Mateo County, and 16.9 percent in Marin County[45]. In total, over the last decade, rent levels throughout the Bay Area region have grown by over 30 percent [46].

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[43] 1990 and 2000 Census.
[44] California Department of Housing and Community Development , *The State of California's Housing Markets 1990-1997.*
[45] Realfacts. Posted on ABAG's website, *The Price of Imbalance.*
[46] California Law Project. *Locked Out: California's Affordable Housing Crisis.*

Bay Area Housing Affordability

The housing shortage in the Bay Area has significant implications for the quality of life for Bay Area residents. The Bay Area has always been an expensive place to live. In 2000, all five Bay Area Metropolitan Statistical Areas were listed by the National Homebuilders Association within the top ten "Least Affordable Metro Areas in the US." Households living in the Bay Area are paying the price for being in a region with a high locational value. Employment opportunities, educational institutions, cultural diversity, moderate climate, natural resources and aesthetics, among many other reasons, make the Bay Area an attractive area to live. Many people choose to move to the Bay Area with the understanding that the cost of living is high relative to other regions in the country, and perhaps more importantly, high relative to family incomes. However, many Bay Area families do not have the choice to be selective. Low income and moderate income families cannot always move to areas with lower costs of living. High Bay Area housing costs for both owners and renters is placing an increased burden on the income levels for these families.

The shortage in housing is most severely felt by very low and low income families whose incomes are not rising at the same level as housing expenses. In San Francisco, for example, between 1989 and 1998 apartment rents increased by 38% while the income of the median renter household increased by only 9.6% and the median income of households with children increased by only 6.3%[47]. In Santa Clara County, the 2000 Fair Market Rent (FMR)[48] for a two bedroom apartment was $1,221, a level that is only affordable to families earning at least $48,840 per year—more than the earnings from four full-time minimum wage jobs. The charts below demonstrate the discrepancy between the Area Median Income of households in the Bay Area Metropolitan Statistical Areas and the prevailing rental rates. As can been seen in Figure 9,

[47] Ibid.

families that are working and earning the national minimum wage cannot meet housing expenses in the Bay Area. Even the cheapest housing in Santa Rosa, CA, demands that a minimum wage earner work 85 hours per week in order to afford a studio apartment. According to the Federal definition of affordability, housing has become unaffordable[49] for the majority of Bay Area households. In 1998, according to the US Department of Commerce, over 40% of families in San Francisco, San Jose and Oakland paid more than 30% of their income towards housing costs while over 20% paid over 50% of their income. As can be seen by the wage levels in Figure 10, employees who provide basic services necessary for the quality of life in the Bay Area, such as teachers, firefighters, receptionists and retail clerks are being priced out of the market[50].

Figures 9

Work Hours/Week Necessary at Minimum Wage to Afford:					
Location	Zero Bedroom FMR	One Bedroom FMR	Two Bedroom FMR	Three Bedroom FMR	Four Bedroom FMR
California	80	94	118	162	187
Oakland, CA *	101	122	153	210	250
San Francisco, CA	131	170	215	295	312
San Jose, CA *	139	159	196	269	302
Santa Rosa, CA	85	97	126	175	206
Vallejo-Fairfield-Napa, CA	87	98	120	167	197

Source: California Law Project

[48] The Federal Department of Housing and Urban Development (HUD) determines Fair Market Rents for federal housing assistance purposes. The FMR estimates the dollar amount at below which 40% of standard quality rental housing units rent.

[49] Federal standards define housing as affordable if it costs no more than 30% of a family's income.

[50] California Law Project. *Locked Out: California's Affordable Housing Crisis.*

Figure 10

Hourly Wage Needed to Afford (@ 40 hrs./wk)					
Location	Zero Bedroom FMR	One Bedroom FMR	Two Bedroom FMR	Three Bedroom FMR	Four Bedroom FMR
California	$12.47	$14.66	$18.40	$25.23	$29.14
Oakland, CA *	$15.75	$19.06	$23.90	$32.77	$39.13
San Francisco, CA	$20.52	$26.58	$33.60	$46.08	$48.77
San Jose, CA *	$21.75	$24.79	$30.62	$41.96	$47.13
Santa Rosa, CA	$13.35	$15.13	$19.62	$27.27	$32.17
Vallejo-Fairfield-Napa, CA	$13.54	$15.38	$18.75	$26.04	$30.73

Source: California Law Project

The extensive economic and population growth over the last decade has resulted in dramatically increased housing prices and rents. While the demand for housing has escalated, the production of housing has trailed behind. The upward pressure on housing prices and rents make it extremely difficult for many families to find housing in the communities in which they work, grew up, or choose to live. In fact, many low income families are forced to move out of the region in search of more affordable housing, hurting the economic competitiveness of the Bay Area. Because the market supply is not responding adequately to rising prices, real estate developers, city planners and policy makers need to address the obstacles that are inhibiting the production of affordable housing. Some of the problems in the Bay Area are unavoidable, due to natural limits on land. However, a significant barrier to affordable housing development is the time and costs associated with responding to neighborhood opposition to new developments. Because residents are often concerned that affordable housing will negatively impact surrounding real estate values, the following chapters explore whether or not this is the case, describing first, the quantitative research methodology used and finally, the analysis and conclusions.

QUANTIFYING THE FEAR:

TESTING THE IMPACT OF AFFORDABLE HOUSING ON SURROUNDING HOUSING PRICES

Background

Residents in predominantly single-family neighborhoods, particularly in suburban locations, are often the source of the strongest opposition to new affordable housing developments. Resistance to new developments is based on a variety of issues. Sometimes neighbors are nervous about the architectural quality of the proposed project. Often concerns regarding increased traffic or negative environmental impacts are the basis for opposition. The most frequent arguments against affordable housing can be summed up as the belief that housing for low income families will lead to neighborhood degradation, reducing the value of surrounding real estate. Neighborhood opposition tends to be the most intense against multifamily, rental, affordable developments. These developments are not only more dense, but stereotypes about low income families and renters fan neighborhood fears about declining property values. This is overwhelmingly the case in suburban, owner occupied real estate markets, where the perception of multi family rental affordable housing developments contrasts strongly to notions of living in a high-end neighborhood. To reduce time and costs associated with neighborhood opposition in these markets affordable housing developers need an effective tool to educate neighbors on the real results of affordable housing. Using three multi-family, rental, affordable housing developments in single family neighborhoods throughout the San Francisco Bay Area, I will examine the claim that proximity to affordable housing has a negative impact on surrounding housing sales prices.

Case Study Selection

For the purposes of this study, I chose case studies that are the most controversial and often engender the greatest opposition. These developments tend to be multifamily, rental projects in neighborhoods comprised primarily of single family owner occupied housing. Additionally, the three case studies are all affordable, with 100% of the units reserved for residents earning less than 50% to 80% of the Area Median Income. The three case studies were also selected based on their location in areas that are sufficiently dense so as to have enough housing sales records for a rigorous quantitative analysis.

All of the case studies I have chosen were built and are managed by BRIDGE Housing Corporation (BRIDGE), the largest nonprofit affordable housing developer in California. BRIDGE has an excellent reputation for building and managing high quality affordable housing and has won numerous national and international awards. BRIDGE has extensive experience building a variety of housing projects ranging from mixed income developments, elderly housing, transit-oriented developments, urban infill projects, rental and owner occupied housing, to suburban housing developments. It has also been a leader in creating affordable housing in high cost areas throughout the Bay Area region. By focusing on BRIDGE properties, I am guaranteed a certain standard of development, management and design that may not exist with other developers. Though BRIDGE has established a solid reputation for developing high quality projects, they still face neighborhood opposition to new developments.

The three case studies included in this report are Ohlone Court Apartments and Almaden Lake Apartments in San Jose, Santa Clara County and Strobridge Court Apartments in Castro Valley, Alameda County.

Literature Review

The methodology used to analyze whether or not affordable housing has an impact on surrounding home sale prices was developed based on comparable studies and a literature review. Since the 1960's, many scholars have questioned the impact of public and affordable housing on surrounding real estate values. The overwhelming majority find that there is no statistically significant impact of affordable housing on their surroundings. Indeed, some studies, (DeSalvo 1974; Nourse 1963; Warren, Aduddell, and Tatalovich 1983) concluded that there was a positive impact on surrounding property values.

To date, there have been two literature reviews completed in California on the impact of affordable housing on surrounding property values. "Affordable Housing: The Impact on Property Values—A Survey of the Literature" was written by Jeff Leary for the California Redevelopment Association in 1999. A decade earlier, "The Effect of Subsidized and Affordable Housing on Property Values: A Survey of Research" was completed in 1988 by the California Department of Housing and Community Development. The literature reviews reveal that of the 46 studies reviewed, all but one conclude that there is no statistically significant impact of affordable housing on surrounding real estate values[51].

The most common methodology used in the literature is the hedonic pricing model. The hedonic technique, pioneered by Griliches (1971) and further formalized by Rosen (1974), is a regression analysis that utilizes a series of independent variables to explain variation in pricing. The price index holds constant all of the characteristics of a house other than the "pure price change." The first step in an hedonic price model is to identify variables such as dwelling size and location that are correlated to housing prices. The second step is to develop a regression equation that assigns a coefficient to each variable being

[51] One contrasting report was written by Guy, Hyson and Ruth (1985) in which property values were found to negatively impact surrounding real estate values.

measured. The coefficient reveals the significance of each variable on the price variation of a house, keeping all other variables constant.

A study conducted for BRIDGE Housing Corporation in 1993 by John Landis and Paul E. Cummings used a hedonic price model, including three location variables. Each variable represented distance from an affordable housing site. The hedonic price index in this model is to "hold constant" other determinants of value, such as size and year of sale, to analyze the impact of location on the price of a home. The study tested the hypothesis that if affordable housing has a negative impact on surrounding real estate values then houses located more proximate to an affordable housing site should reflect greater negative impact on housing sales prices. The study found that distance from an affordable housing site is a statistically insignificant variable in explaining variation in housing sales prices.

Of the studies I reviewed, the majority (Cummings and Landis, Guy et al, Warren et, al, etc.) employ the hedonic price model, using distance from an affordable housing site as an independent variable within the model. Though, as mentioned above, the studies reveal an insignificant impact of affordable housing on surrounding real estate prices, this methodology over-simplifies the complexity of housing markets. It is unrealistic to believe that the distance from a site can be isolated as an influential variable without considering numerous other variables that are unaccounted for in the pricing models. In the Landis and Cummings study, the hedonic price model within four of the six case studies could explain less than 48% of the variation in housing sales prices.

Other studies looking at the effects of affordable housing on neighboring housing values compare statistics of an impact area - a neighborhood with affordable housing – to a comparable neighborhood considered the control area, where there is no presence of affordable housing. This methodology also presents problems because real estate markets are local

and it is often difficult to compare characteristics across different neighborhoods, without considering distinct variables that influence each neighborhood.

A quantitative methodology used by some researchers tracks property values of an "impact area" compared to citywide trends in property values. Housing statistics such as sale and resale trends, median housing prices, and local price indexes are analyzed over a period of time and compared.

Qualitative studies conducted on the subject of affordable housing on surrounding neighborhoods include two studies (Briggs et al, Grier Part 2) in which surveys were distributed to record the impressions of neighbors of affordable housing developments versus control groups.

Research Methodology

For this study I have chosen a quantitative research approach. The central component to this methodology is the hedonic price model in which each home is considered "a composite good or bundle of services". In the hedonic model, recorded home sales prices act as the dependent variable, which is the product of the quantity of independent variables attached to the property and the price of these housing services summed over all structural characteristics of the property[52]. The derivative of the housing price function with respect to an individual attribute may then be interpreted as the implicit price of that attribute (Rosen 1974).

By using a hedonic price model, I create a price index for a "constant quality house" and trace housing sales trends before and after the introduction of an affordable housing development. This allows me to generate and then compare housing trend lines in both the case study "impact area" and "market area" over time. Based on the literature consensus, I have recorded housing prices as natural logarithms. This functional form helps to interpret the findings more easily, as the coefficients of the variables can be interpreted as the

percentage change in price resulting from an additional unit of an independent variable.

The sale price of a house takes into account the anticipated resale value into the future. Therefore many believe that the negative impact of affordable housing begins prior to the construction of the development when the neighborhood and potential buyers become aware that affordable housing is slated to be built within the area. As a result, I have determined the "introduction" of affordable housing to be the year in which the project was given the "go ahead" either through city council or the local planning board, or when the neighbors became sufficiently aware that an affordable housing project was being built in their neighborhood. Because housing markets do not have perfect information, the impacts of affordable housing may not be felt at the exact time of the introduction. More realistically if there is an effect on surrounding housing prices, the effect will take place over a number of years subsequent to the introduction. In addition, because real estate markets are constantly evolving, it is difficult to isolate the impact of one event on housing prices. The impact of the introduction of a new affordable housing site on surrounding prices can only be determined over a few years when other outside factors are less likely to have impacted the residential real estate market. Therefore, the most relevant data for this analysis are the housing sales trends over the years just after the introduction of a new affordable housing site, a period of approximately three to four years.

To assess the impact of time on surrounding home sale prices, compare the differences in prices of homes in proximity to an affordable housing site "impact area," and the home sale prices of the wider "market area." Using the recording date as a proxy for time, I include the recording date in the form of independent dummy variables within the hedonic model. The coefficients of the dummy variables can be interpreted as the difference in log price between the year that the sale was recorded and a base year. I then examine the magnitude

[52] Ellen, et al. " Building Homes, Reviving Neighborhoods," 2001.

of the difference between the "impact area" and "market area" and assess whether or not this difference correlates with the introduction of affordable housing into the "impact area."

The purpose of the comparison is not to isolate the effect of affordable housing on surrounding real estate values per se as many previous studies have attempted to do, but instead it is to examine the pattern of general house price movements over time. Because real estate markets are complex, it is unreasonable to assume that a single characteristic in a pricing model can explain overall market changes in housing values. Therefore, I am isolating the effect of time on price variation to allow for a comparison of overall price trends. If, in fact, affordable housing has an effect on an "impact area," it can be assumed that the "impact area" will trend differently from the overall "market area" over the three to four years after the introduction of the affordable housing site.

Impact and Market Areas

The three case studies chosen for the purposes of this report were selected based on both their project level characteristics (all affordable, multi-family rental, etc.) as well as their surrounding neighborhood characteristics (located in a single family, owner occupied neighborhood). For each case study, I have identified a project "impact area." The impact areas are defined as the area close enough to the affordable housing development so that the single family houses are considered within the identical real estate market as the affordable housing development. All of the impact areas are within a ¼ to ½ mile radius from the affordable housing development. In determining the impact areas, it was essential to consider physical and geographical elements of each neighborhood. Through site visits and aerial photos, impact areas were selected that are contiguous to the affordable housing site and do not include large physical separations such as freeways, major arteries, etc.

To compare the results of affordable housing in surrounding single family homes, the impact areas are compared to larger "market areas". A market area is the overall real estate market in which the case study is located, excluding the housing sales within the impact area. The idea of the market area is that it represents the general trends and price movements that would occur in the impact area if the affordable housing site was not built. In general, the wider market area is considered to be at the City level. Two of the case studies, however, are located in the City of San Jose, which, because of its size, is often divided into North, Central and South San Jose. Both Almaden Lake Apartments and Ohlone Court Apartments are located in the market area considered South San Jose. This area has been defined and described to me by both San Jose City Planning officials as well as local real estate brokers as a distinct market area.

Research Data

In the reports and studies that I have reviewed, single family home values were gathered using a variety of data sources. Tax assessment data as well as housing sales transaction data are the most commonly used sources for studies measuring housing price changes. There are advantages and disadvantages related to each data source. On the one hand tax assessment data contains the most consistent housing characteristic data and is the most readily available. However, tax assessment data does not necessarily reflect market housing values particularly in California where Proposition 13 has limited tax assessment rate increases. In addition, assessments are typically performed every three to five years, which creates a lag in recording changes in specific properties and may inadequately reflect changes to structural characteristics and dwelling quality.

Transaction data, however, do not often include property characteristics and therefore, would not be useful in the creation of an accurate *hedonic* pricing model. In addition, transaction data are obtained from deed transfers recorded

by local governments and can be difficult to acquire. Transaction data also includes arms-length transactions in which the recorded prices are lower than market values because of a relationship between buyer and seller.

Another data source is the Multiple Listing Services (MLS) generally provided by real estate agents. According to economist Henry Pollakowski, "local MLS data sets have received greater attention because their inclusion of structural characteristics permits the construction of quality-adjusted house price indices.[53]" However, because MLS data are often used and distributed by real estate agents, these records are not used over long time intervals and therefore do not contain records for a sufficient number of years.

As a result of the shortcomings of the various data sources, I chose to use an outside vendor that combines both transaction data as well as tax assessment data[54]. The success of this report was dependent on accurate data reflecting housing values over an extended period of time. In order to create a hedonic pricing model, the data have to contain housing characteristics for each single family home. I used an outside vendor, First American Real Estate Solutions (First Am), the nation's largest supplier of real estate data, to collect housing sales records that combined both price records as recorded by title companies and housing characteristics information as recorded through City Assessors. An outside vendor also helped ensure the objectivity and consistency of the data records.

With mapping software I delineated both impact and market areas. Using these delineations, First Am accumulated the "recent sales" along with their housing characteristics for all the single family homes within these areas. "Recent Sales" are those sales most recently completed for each home. As an example, if a home was sold in 1985 and again in 1998, only the 1998 sale was included in the data set. This resulted in omitted cases from years further back in

[53] Pollakowski, "Data Sources for Measuring House Price Changes," 1995.
[54] Ibid.

time and an increase in data for more recent years[55]. Unfortunately the quality of the data is based on the accuracy and method in which each jurisdiction reports its sales records. As a result many of the records had inconsistent information for each variable. This was taken into account throughout the regression analysis. Additionally, many of the sales records included in the data set were not "arm's length" transactions. Because these transactions can skew the mean housing prices of an area, I have attempted to remove these records from the data set. This was accomplished through an extensive data cleaning process in which clear outliers were eliminated.

The elimination of outliers was determined based on numerous analyses of the data. Through a variety of descriptive statistics it became clear that some of the houses within the data set contained characteristics that were aberrations from the rest of the houses. For example, houses that were extremely large with over 20 bedrooms or had a lot size considerably greater than two standard deviations from the average lot size, were eliminated from the price model. With the help of scattergrams and other graphical devises, as well as quantitative testing, the records were narrowed down to a clean data set.

Hedonic Model

The hedonic model uses housing sales price as the dependent variable. The purpose of the independent variables is to isolate the effect of time on the sales price by keeping constant those independent variables that have a strong impact on price variation. The hedonic models are revised through a rigorous process to reduce the standard errors of the variable coefficients and thereby increase the statistical significance of the independent variables. Time, as independent variables, is entered into the equation in the form of dummy variables. This means that the influence of time on housing prices is always related to a base case, which is not included within the regression model.

[55] The use of Recent Sales data is not ideal for a time series analysis. However given the feasible alternatives the data provided by First American was the most economical and reliable.

Choosing a base year for analysis varies from cases study to case study depending on when the affordable housing site was built. In most cases, the base year is five years prior to the "introduction" of the affordable housing site. However, because of sample size constraints he base year in some cases consists of a combination of sales records over several years. This is necessary to stabilize the standard errors of the coefficients and develop a more accurate price model.

In addition to the dummy variables used to explain time, the independent variables used within the regression model vary for each case study. The process for determining these variables is not straightforward. It involves a series of trial and error to determine which variables are strong predictors of housing price variation. By including only those variables that have an important impact on price, I create a price model that more accurately reflects the influence of time on housing prices, while keeping the quality of the house constant.

The independent variables used within the hedonic model are inherent characteristics to each house. Living Area (LIVAREA) is the square footage of the home. All else being equal, I predict that the effect of square footage on housing prices will be positive. The larger the house, the higher the price. Lot Area (LTArea) is the square footage of the housing lot, the land where the house is situated. Similar to living area, I believe that the relationship between lot size and housing prices is also positive. All else constant, a house on a large plot of land will be worth more than a house on a small plot of land. However, because I hypothesize that both Living Area and Lot Area do not have a linear relationship to housing price, I have also included quadratic terms for these two characteristics. In other words, though I believe both living area and lot area have a positive relationship on price, I believe that their impact on price increases at a decreasing rate. Therefore, I include the square of the living area (LVAREASQ) and lot area (LTAREASQ) within the regression models. I predict that the relationship between these quadratic terms and housing price to be

negative, based on my assumption that living area and lot area have a positive relationship to housing prices at a decreasing rate.

In all cases, independent variables were also used to describe the number of bedrooms (BR) and the number of bathrooms (BA). The relationship between Bedrooms, Bathrooms and price is not so straightforward. Because, the amount of living area is held constant, it is not clear that an increase in the number of bedrooms or bathrooms represents a larger house and therefore a higher price. A high number of bedrooms and/or bathrooms could mean a more cramped living environment. I predict that it will differ in the various case studies.

Another independent variable used within the regression model was age (Age). All else being equal, I would predict the relationship between age and housing price to be negative. As houses get older home values decrease.

Finally, other independent variables such the existence of a swimming pool (SWIM) , and number of fireplaces (FIRE) were also included within the model if they were useful in determining price variation. For these independent variables I predict that their relationship to price is a positive one. By adding an amenity to a house such as a pool, it increases the value of the home.

In many cases, dummy variable categories were created for the independent variables. This technique was used to help capture more variation in housing prices and to account for non-linear relationships. For example age categories were developed to explain price variation for houses built over different time periods. As is the case for all dummy variables, when categories were created, the coefficients are relative to a base case. Further information regarding the regression models is included in the analysis of the case studies.

The following chapter reviews the individual case studies and the results of the quantitative research.

MODELING THE IMPACT:

AN ANALYSIS OF AFFORDABLE HOUSING AND SURROUNDING SINGLE FAMILY HOME PRICES

Background

Through a rigorous quantitative analysis, this chapter reviews three affordable housing developments built and managed by BRIDGE Housing Corporation to test whether or not the introduction of an affordable housing site has had a negative impact on surrounding home prices. The case studies are located throughout the San Francisco Bay Area and contain 100% of their units reserved for low and moderate income residents.

The central component to this quantitative analysis is a hedonic price model. Using a hedonic model, a price index is created, based on a regression equation, for a "constant quality house." The price index allows for a comparison of housing prices, tracing average housing sales prices in each case study's "impact area" and "market area" over time. The hedonic model is a regression equation in which recorded home sales prices are the dependent variable and housing characteristics and sales dates are included as independent variables. The recording dates of the housing sales are included in the hedonic model in the form of independent dummy variables. Keeping all of the other variables constant, the coefficients of the dummy variables can be interpreted as the difference in log price between the year that the sale was recorded and a base year. Based on the consensus of the economic literature, housing prices are recorded as natural logarithms. This allows the coefficients to be interpreted as the percentage change in price resulting from an additional unit of an independent variable. The regression equations are revised through a careful process to reduce the standard errors of the coefficients and increase the statistical significance of each variable.

The price index allows for price trend lines to be developed and compared for both the "impact area" and "market areas." Any differences between the "impact areas" and "market areas" can then be analyzed to assess whether or not the price trends have changed over time and whether or not the change is correlated with the introduction of affordable housing into the "impact area." To determine whether or not the observed differences between the impact and market areas are statistically significant, the distance between the coefficients must be at least two standard deviations (two standard errors) apart. If, in fact, affordable housing has had an effect on an "impact area," it can be assumed that the impact area will trend differently, at a statistically significant level, from the overall market area during the three to four years subsequent to the introduction of the affordable housing site.

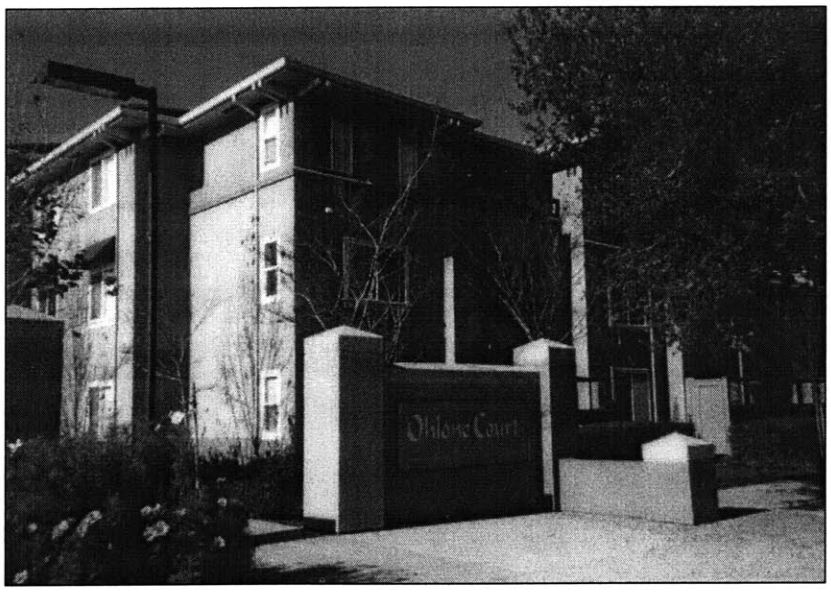
In this report, all three case studies had reliable hedonic models in which the majority of the independent variables were significant in explaining price variation. With small standard errors of the coefficients, the movement of price over time could be isolated and price trends between "impact areas" and "market areas" compared. Brief profiles of the case studies as well as the hedonic model results are described below.

Case Study Results and Analysis

Ohlone Court

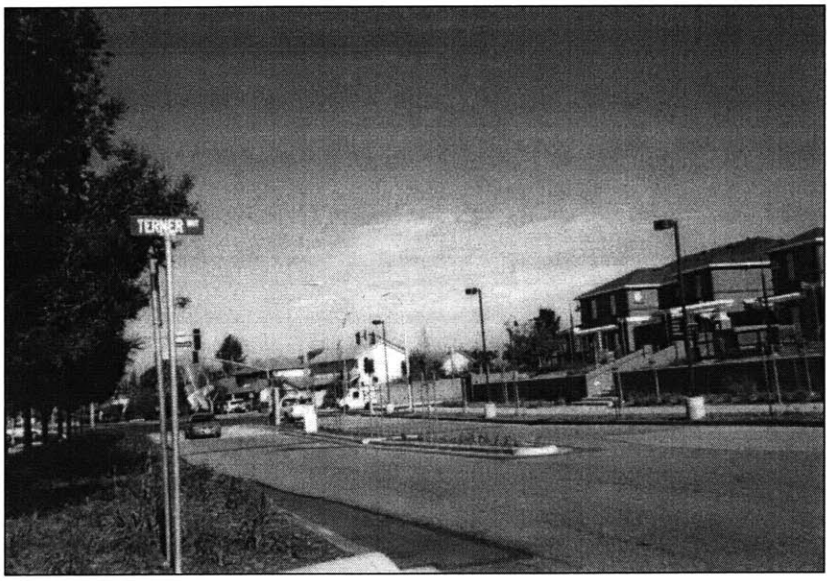
Ohlone Court Apartments (Figure11) was built in 1997. The project consists of 135 units affordable to families earning less than 50% of the Area Median Income.

Figure 11: Entrance to Ohlone Court Apartments



The site for Ohlone Court Apartments is located just north of the Almaden Valley area of Southern San Jose. It is adjacent to a light rail stop and within ½ mile of major transportation corridors including Route 85 (east-west) and Route 87 (north-south). Chynoweth Avenue and Winfield Boulevard bound the property. Across from both of these streets are mature neighborhoods consisting of predominantly single-family homes built in the 1960's and 1970's. (Figure 12).

Figure 12: Single Family Homes surrounding Ohlone Court Apartments

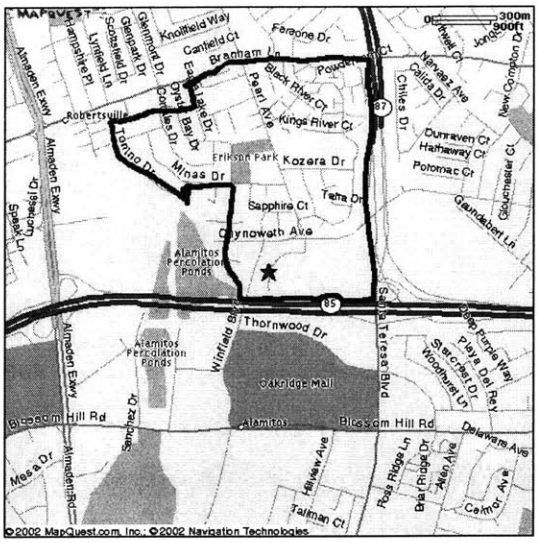


BRIDGE Housing Corporation leased approximately half of a 10.5-acre site owned by the Cilker Family Trust to develop this transit-oriented village. Master planned along with a 204 unit market-rate development, the Ohlone Court development consists of eight buildings. The units are grouped in two and three story wood frame with stucco exterior buildings at grade and are organized around parking courts. Covered parking is provided in garages. The buildings are single-loaded, three story configurations with access from the courtyard on the first level and a "catwalk" on levels two and three. In addition to amenities including laundry rooms in each building courtyard, a community building, pool area, tot-lot, and private open space areas, each unit also has a patio or balcony.

Ohlone Court Apartments- Impact Area

Bounded on the South by Highway 85 and Santa Teresa Boulevard to the East, the "Impact Area" around Ohlone Court Apartments consists of those houses located to the North and Northwest of the site (Figure 13). Most of the homes are located in a dense neighborhood across from Chynoweth Boulevard. About ¼ mile to the North is a small park, Erickson Park. Because it is relatively small and within walking distance from the affordable housing site, the houses surrounding the park are still included in the impact area. All of the homes are within ½ mile from Ohlone Court Apartments.

Figure 13: Ohlone Court Apartments Impact Area



The regression model for Ohlone Court Apartments Impact Area included 295 sales records. The hedonic model was successful in reducing the standard errors of the coefficients resulting in a tight fit to the price model. This is evident by the consistently similar standard errors of coefficients for the year variables. The hedonic model was successful in explaining 86.5% of the variation in housing prices. The homes included within this sample averaged almost 27 years old. The houses sold in Ohlone's Impact Area, between 1990 and 2001, had an average of 6.86 total rooms, 3.4 bedrooms and 2.6 bathrooms. The average lot size for these homes was 3,494 square feet and the living area was approximately 1,566 square feet. The average sales price during this period was approximately $280,950. For further descriptive statistics please refer to Appendix II.

It is important to remember that the data used for this analysis was based on "recent sales." As a result, in years further back there are fewer sales transactions recorded in the data set. As a result, in order to have a sufficient sample size, the base year for the regression analysis is a combination of records from 1990-1992. The hedonic price model results for Ohlone Court

Apartment Impact Area are shown in Tables 1 and 2 (definitions of the independent variables can be found in Appendix I):

Table 1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.930[a]	.865	.857	.12629

a. Predictors: (Constant), AGE, BR3MORE, YR98, YR97, LTAREA, YR9394, YR01, YR9596, SWIM, YR00, BA3MORE, FIRE1, YR99, LVAREASQ, LTAREASQ, LIVAREA

Table 2

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	11.330	.214		53.064	.000
	LIVAREA	8.645E-04	.000	.772	2.970	.003
	BA3MORE	-3.93E-02	.029	-.058	-1.347	.179
	FIRE1	-7.54E-03	.023	-.011	-.322	.747
	LTAREA	8.310E-05	.000	.556	3.419	.001
	SWIM	.105	.033	.080	3.240	.001
	YR9394	1.001E-03	.034	.001	.029	.977
	YR9596	-2.73E-02	.032	-.029	-.857	.392
	YR97	.149	.034	.129	4.337	.000
	YR98	.297	.032	.295	9.155	.000
	YR99	.423	.031	.484	13.564	.000
	YR00	.625	.031	.698	20.360	.000
	YR01	.727	.034	.669	21.585	.000
	LVAREASQ	-1.99E-07	.000	-.588	-2.298	.022
	LTAREASQ	-4.83E-09	.000	-.275	-1.864	.063
	BR3MORE	-2.57E-02	.042	-.017	-.609	.543
	AGE	-5.82E-03	.002	-.115	-3.351	.001

a. Dependent Variable: PRLOG

Table 2 shows the impact of each independent variable on housing prices, keeping all other variables constant. As I predicted, Living area and Lot Area have a positive relationship to housing prices. Consistent with these predictions, the quadratic terms, Living Area Squared and Lot Area Squared, had a negative relationship to housing prices. This implies that prices increase with living and lot area but they increase at a decreasing rate.

Within the Ohlone Court Apartments Impact Area model I created dummy variables for the number of bedrooms and number of bathrooms within each home in order to capture more effectively their impact on housing price variation. Both of these variables had a negative relationship to housing prices. As noted in Table 2, if a home contained three or more bedrooms the price of the house was expected to be approximately 2.57% lower than a house with fewer than three bedrooms. The price of a house with three or more bathrooms was almost 4% lower than a house with fewer than three bathrooms. It is difficult to hypothesize why this is the case. One can assume that because this model is looking at the effect of each independent variable on housing prices, holding all else constant, that the use of space in houses of comparable size may be reflected in the home value. Perhaps the more space that is used for bedrooms and/or bathrooms results in a more cramped living environment or in a reduction in other amenities such as living rooms, dining rooms or other recreational areas.

In this model the presence of a swimming pool increased housing prices by 10.5% over those that did not. Surprisingly, the existence of a fireplace had a negative relationship to housing prices compared to those houses that did not contain a fireplace. However, because a house with fireplace is expected to be only .75% lower than a house without a fireplace, this difference is negligible and may be due to errors within the records.

As expected, the independent variable, Age, also had a negative relationship to housing prices. For each additional year of age, housing prices within this sample were expected to decrease by .58%.

The coefficients of the year variables represent the percentage change over the omitted base year. Therefore, as Table 2 reveals, housing prices in this sample increased every year except in the combined years 1995/1996. Subsequent to this period housing prices increased each year from 1997 to 2001 (14.9%, 29.7%, 42.3%, 62.5% and 72.7% respectively) over the base year of 1990-1992. These coefficients allow a price trend line to be developed for the average, quality controlled house in the Ohlone Court Apartments Impact Area.

Ohlone Court Apartments-Market Area

The "Market Area" for Ohlone Court Apartments is South San Jose. This area of San Jose is bounded to the West by Bascom Ave, Yerba Buena Rd to the East, Capitol Expressway to the North East, and Curtner Ave to the North West.

The price index for Ohlone Court Market Area was an extremely accurate model. The standard errors of the coefficients for the year variables are uniform in magnitude and all the other independent variables are statistically significant. Approximately 6,640 records were used in the Market Area hedonic model. Within the regression, 74.5% of the variation in sales prices could be explained by the independent variables. Within this sample the homes averaged 32.5 years old. The houses sold in Ohlone's Market Area, during the period between 1990 and 2001, had an average of 6.88 total rooms, 3.26 bedrooms and 2.23 bathrooms. The average lot size for these homes was 5,5811 square feet and the building area was approximately 1,634 square feet. The average sales price for the homes sold during this period was approximately $344,791. For further descriptive statistics please refer to Appendix III.

The results of the hedonic price model for Ohlone Court Apartments Market Area are shown in Tables 3 and 4 (definitions of the independent variables can be found in Appendix I):

Table 3

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.863[a]	.745	.744	.24105

a. Predictors: (Constant), YR01, AGE1630, LVAREASQ, FIRE1MOR, YR97, YR00, SWIM, YR98, AGE51PLU, YR9394, YR99, BR4MORE, LTAREASQ, YR9596, BA3MORE, AGE3150, LOT_AREA, BLDGAREA

Table 4

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	11.141	.029		382.971	.000
	LIVAREA	8.147E-04	.000	.948	25.160	.000
	LVAREASQ	-9.48E-08	.000	-.419	-12.073	.000
	BR4MORE	-8.11E-02	.008	-.083	-10.487	.000
	BA3MORE	4.566E-02	.009	.046	4.964	.000
	SWIM	1.154E-02	.010	.007	1.119	.263
	LTAREA	5.281E-05	.000	.329	13.769	.000
	LTAREASQ	-1.23E-09	.000	-.092	-4.332	.000
	FIRE1MOR	4.373E-02	.008	.044	5.564	.000
	AGE1630	-.126	.011	-.121	-11.885	.000
	AGE3150	-.115	.011	-.119	-10.051	.000
	AGE51PLU	-3.64E-02	.015	-.023	-2.483	.013
	YR9394	-1.69E-02	.011	-.012	-1.487	.137
	YR9596	2.944E-02	.011	.022	2.763	.006
	YR97	.182	.012	.112	14.884	.000
	YR98	.290	.011	.198	25.359	.000
	YR99	.415	.011	.296	37.352	.000
	YR00	.676	.011	.461	59.248	.000
	YR01	.760	.012	.478	63.094	.000

a. Dependent Variable: PRLOG

As Table 4 reveals, Living Area and Lot Area are positively correlated with housing prices. As living area and lot area increases, sales prices also increase. The negative relationship between the quadratic terms and home values reveal, as I predicted, a non linear relationship between living area and lot area and housing sales prices.

As was the case in the model for Ohlone's Impact Area, I created dummy variable categories for the number of bedrooms and bathrooms so as to help explain the variation in housing prices within this sample. In this case the categories were determined based on their importance in determining home values. For houses that contained more than four bedrooms, the sales prices within this sample were 8% lower than prices for houses that contained fewer than four bedrooms. Bathrooms, however, differed in this sample. In Ohlone Court Apartments Market Area houses that contained three or more bathrooms had a positive relationship to housing prices as compared to those houses with less than 3 bathrooms. Houses with three or more bathrooms, in fact, could expect to have sales prices approximately 4.6% higher than those that did not.

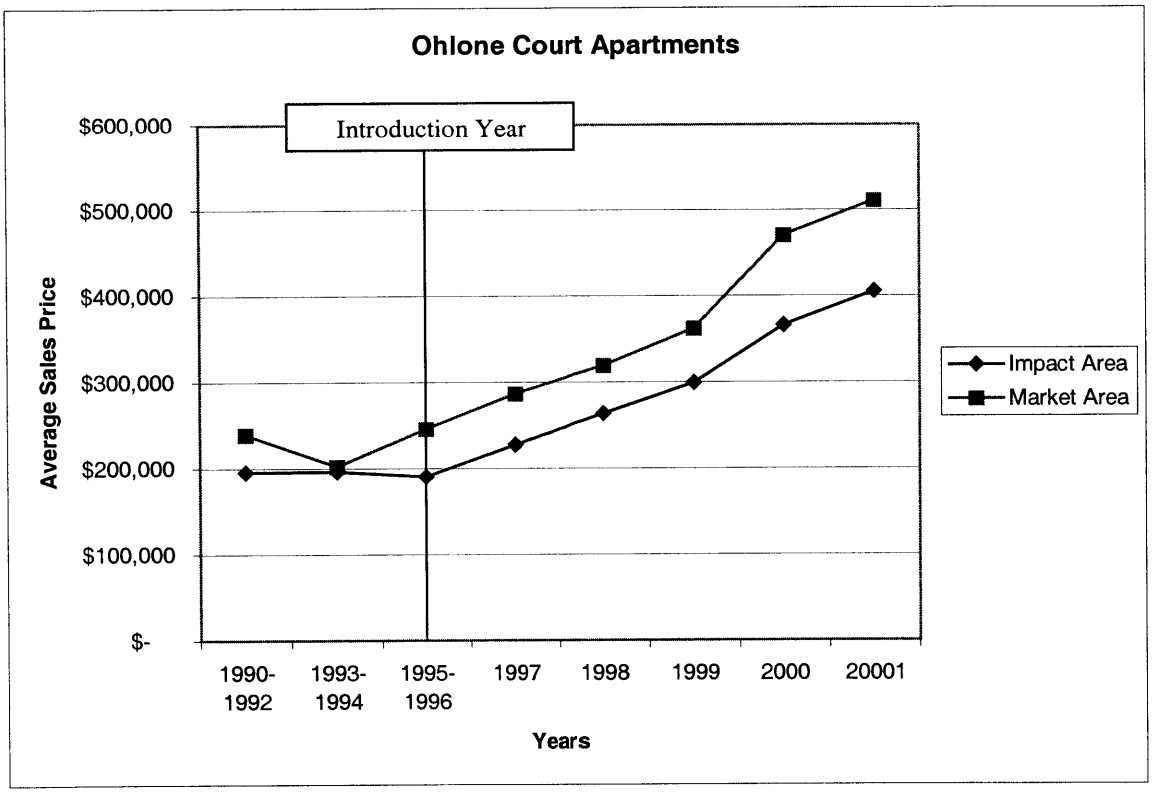
Both fire places and swimming pools had a positive relationship with housing sales prices (1.15% and 4.37% respectively). In this sample, I broke each house into an age dummy variable and compared each category to an omitted age category, houses between 0-15 years old. This helped explain price differentiation and increase the statistical significance of the variables. The age categories all had negative impacts on sales prices, revealing a decrease in home values for older homes as compared to more recently built houses. It is interesting to note that houses built over 51 years ago have a higher coefficient that those built between 16 and 50 years ago. This may be due to the fact that very old houses often contain a unique characteristic or old-fashioned charm that is captured in the home value.

The coefficients of the year variables allow for a price trend analysis. The coefficients represent the percent change in the average house as compared to the average house in the base year of 1990-1992. Every year from the base year through the year 2001, except the combined year of 1993/1994, showed a significant price increase.

Ohlone Court Apartments Model Results

Ohlone Court Apartments was completed in 1997. I have determined the introduction of the development into the neighborhood as the year 1995, when public meetings were held with surrounding neighbors. Though it would be best to show the change in average housing prices before and after the year 1995, due to sample size constraints in the impact area, 1995 and 1996 were combined within the regression.

Figure 14



As noted previously, if an affordable housing development were to have a negative effect on surrounding real estate values, it can be assumed that the "impact " area would trend differently during the period just subsequent to the introduction of affordable housing into the neighborhood. As Figure 14 reveals, following the introduction of Ohlone Court Apartments both the impact and market area had almost identical levels of appreciation. In fact, between 1995/1996 and 1999, the impact area's average housing sales price rose more

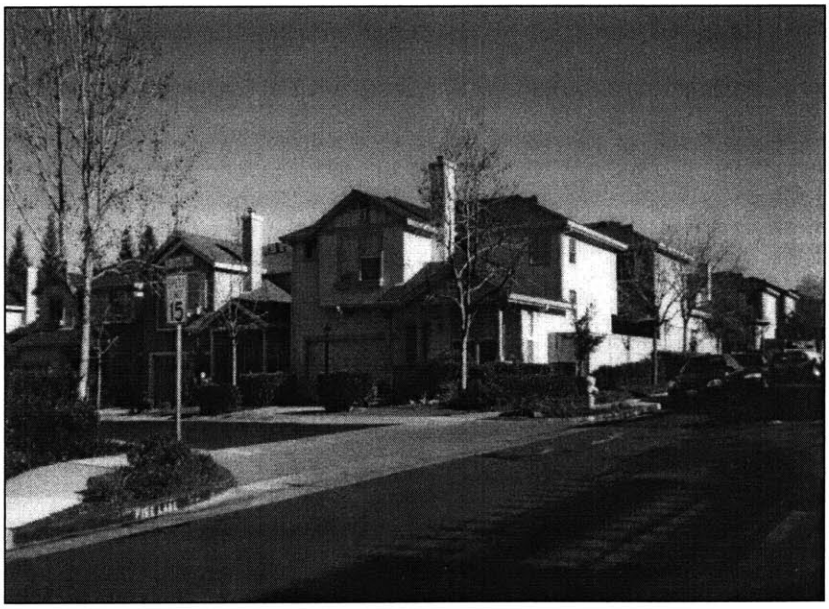
dramatically than the average sales prices in the market area. Between 1995/1996 and 1997, housing sales prices in the impact area rose by almost 19.3% as compared to the market area that rose by approximately 16.5%. The following year prices rose by 15.95% in the impact area and 11.4% in the market area. Between 1998 and 1999 both the impact area and the market area had identical growth, with housing sales prices rising by approximately 13%. The small differences between the price trends are not statistically significant, as they are less than two standard deviations away from one another, and as a result prices in the impact area and the market area can be interpreted as trending identically after the introduction of Ohlone Court Apartments.

Almaden Lake

The Almaden Lake development was a joint venture project in San Jose, Santa Clara County between BRIDGE Housing Corporation and a for profit developer. The project was built in 1993 as two separate, but jointly planned projects. The development includes the apartments at Almaden Lake (Figure 15), a 144-unit multi-family rental development developed by BRIDGE Housing Corporation as well as The Homes at Almaden Lake (Figure 16), a first-time homeownership project consisting of 84 single-family houses developed by the Martin Group. The apartments are nestled at the toe of the Santa Teresa Foothills along the southern side of the 11-acre property. The development is also within walking distance of the San Jose light rail system and is ideally located near major north/south and east/west freeways and recreational and retail shopping areas.

Figure 15: Almaden Lake Apartments

Figure 16: Single Family Homes at Almaden Lake



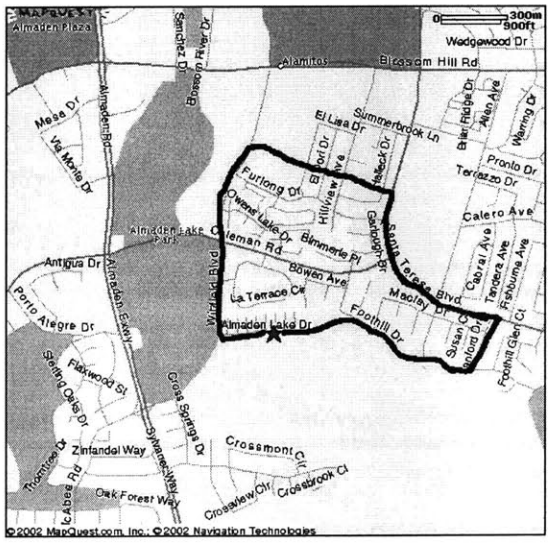
The Apartments at Almaden Lake are all affordable for very low-income families, earning approximately 50% of the Area Median Income. The units are built in six similar buildings and range from 1 bedroom to 3 bedrooms. Each building consists of a parking garage at grade, partially set into the slope, with three wood-frame stories above containing 24 units, 8 units per floor. A

generous common area has been established in the middle of the development. This "central square" provides residents with a large flat open space, a swimming pool, a structured children's play area, and a 3,200 square foot community building. The community facilities are shared with the Homes at Almaden Lake.

Apartments at Almaden Lake- Impact Area

Almaden Lake Apartments are located along the base of the Saint Teresa Foothills as well as Almaden Lake Park. To the West, about ¼ mile from the site, is Saint Theresa Boulevard, a major thoroughfare. As a result, the Impact Area did not include houses located on the Southern or Western side of the development, given that they are separated by large physical barriers. Also houses located on the other side of Saint Teresa Boulevard were not considered part of the Impact Area for the purposes of this study given that the Boulevard acts as a physical barrier between these neighborhoods. This resulted in an Impact Area (Figure 17) defined as those houses located within ½ miles from the site to the North, as well as the houses to the West of the development up to Saint Teresa Boulevard.

Figure 17: Almaden Lake Impact Area



The Almaden Lake Impact Area contains 886 sales records included in the hedonic price model. The exactness of the model can be seen by the uniform standard errors of the coefficients for the year dummy variables. The independent variables were almost all statistically significant and these variables were successful in explaining 84.3% of the variation in housing prices. Due to sample size the base year for the regression analysis is a combination of records from 1986-1987. The homes included within this sample averaged 17 years old. The houses sold in Almaden's Impact Area, during the period between 1987 and 2001, had an average of 5.71 total rooms, 2.38 bedrooms and 1.91 bathrooms. The average lot size for these homes was 2,320.5 square feet and the building area was approximately 1,255 square feet. The average sales price during this period was approximately $240,950. For further descriptive statistics please refer to Appendix IV.

The hedonic price model results for Almaden Lake Apartments Impact Area are shown in Tables 5 and 6 (definitions of the independent variables can be found in Appendix I):

Table 5

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.918[a]	.843	.839	.18528

a. Predictors: (Constant), AGE, YR97, YR91, YR90, YR92, BA3MORE, YR88, YR93, YR95, YR89, YR94, YR96, BR2MORE, YR01, SWIM, YR99, YR98, LOTSQ, LIVSQ, YR00, LTAREA, LIVAREA

Table 6

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.895	.061		177.599	.000
	LIVAREA	8.247E-04	.000	1.049	10.407	.000
	LTAREA	5.513E-05	.000	.357	6.192	.000
	SWIM	7.009E-02	.036	.030	1.934	.053
	YR88	.217	.044	.102	4.939	.000
	YR89	.433	.043	.228	10.128	.000
	YR90	.534	.049	.206	10.997	.000
	YR91	.429	.051	.151	8.417	.000
	YR92	.442	.045	.203	9.908	.000
	YR93	.415	.048	.158	8.620	.000
	YR94	.428	.042	.228	10.197	.000
	YR95	.456	.043	.233	10.675	.000
	YR96	.421	.043	.224	9.836	.000
	YR97	.536	.041	.301	13.001	.000
	YR98	.664	.039	.448	16.881	.000
	YR99	.822	.039	.549	21.057	.000
	YR00	1.093	.038	.849	28.866	.000
	YR01	1.141	.040	.693	28.314	.000
	BA3MORE	2.074E-02	.027	.019	.776	.438
	BR2MORE	6.078E-02	.025	.047	2.405	.016
	LVAREASQ	-1.26E-07	.000	-.562	-6.857	.000
	LTAREASQ	-2.04E-09	.000	-.135	-3.099	.002
	AGE	-1.22E-02	.001	-.210	-9.643	.000

a. Dependent Variable: PRLOG

As revealed in Table 6 my hypotheses regarding the relationships between the independent variables and housing prices were accurate. The square footage of both living area and lot area increases the value of a home yet this relationship is not linear as demonstrated by the negative coefficients of their quadratic terms. In this sample, the existence of a swimming pool added 7% to the average housing sales price as compared to houses that did not have a swimming pool. Age was not broken down into categories in this instance because as a linear variable, it was statistically significant in determining price variation. For every year of age, the average sales price of a house was reduced by 1.2%, holding all other characteristics constant.

For Almaden Lake Impact Area I again broke the bedroom and bathroom variables into categories. In this case, both dummy variables had a positive relationship to home values. Houses with two or more bedrooms were expected to sell 6.08% higher than houses that had fewer than two bedrooms, all else being equal. Houses with three or more bathrooms sold for 2.07% higher than houses with less than three bathrooms. However, it is important to note, that the bathroom variable was the only variable that was not statistically significant and therefore is not important in explaining price movements in this sample.

In this sample, all of the year coefficients showed percentage increases over the base year of 1986/1987. The coefficients are used to trace price movements over time. In general, the housing prices trended upwards in all of the years except in between the years 1990 to 1991, at which point there was almost a 10% decrease in housing prices. The trend line for Almaden Lake Impact Area will be further analyzed in the Model Results.

Apartments at Almaden Lake- Market Area

The Apartments at Almaden Lake "Market Area" is considered to be South San Jose (as defined for Ohlone Court Apartments). The Market Area includes all of the housing sales records in South San Jose except those that are considered part of the Almaden Impact Area.

The price index for Almaden Lake Apartments Market Area is a very tightly fitting model. This is particularly evident by the very small standard errors of the coefficients and the uniformity of the year variables. Within the regression, 57% of the variation in sales prices could be explained by the independent variables used within the model. Though this is lower than in other price models, it by no means indicates a less reliable price model. The unexplained variation in housing prices could be due to a number of outside characteristics that were not accounted for within the model. This does not, in this case, impact the accuracy

of the model as noted by the very low standard errors and the statistical significance of all the independent variables.

Approximately 8,555 records were used in the Market Area hedonic model. The homes included within this sample averaged 33 years old. The houses sold in Almaden's Market Area, during the period between 1987 and 2001, had an average of 6.89 total rooms, 3.25 bedrooms and 2.22 bathrooms. The average lot size for these homes was 6,191 square feet and the building area was 1,645 square feet. The average sales price during this period was approximately $315,762. For additional descriptive statistics please refer to Appendix V.

The results of the hedonic price model for Almaden Lake Apartments Market Area are shown in Tables 7 and 8 (definitions of the independent variables can be found in Appendix I):

Table 7

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.755[a]	.570	.569	.41087

a. Predictors: (Constant), AGE51PLU, YR91, FIRE2, YR90, YR88, YR89, YR92, YR93, SWIM, YR95, YR94, YR96, AGE1630, BR4MORE, YR97, YR01, FIRE1, LOTSQ, YR98, BA3MORE, YR00, YR99, LIVSQ, AGE3150, LOT_AREA, BLDGAREA

Table 8

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.585	.042		255.021	.000
	LIVAREA	9.150E-04	.000	.850	21.366	.000
	LVAREASQ	-1.18E-07	.000	-.432	-11.933	.000
	LTAREA	4.739E-05	.000	.275	12.349	.000
	LTAREASQ	-9.54E-10	.000	-.102	-5.434	.000
	SWIM	3.176E-02	.015	.015	2.068	.039
	FIRE1	4.267E-02	.012	.034	3.668	.000
	FIRE2	.137	.025	.043	5.470	.000
	YR88	.203	.026	.067	7.783	.000
	YR89	.405	.026	.134	15.514	.000
	YR90	.357	.029	.103	12.408	.000
	YR91	.386	.026	.131	15.006	.000
	YR92	.406	.025	.146	16.405	.000
	YR93	.356	.026	.121	13.905	.000
	YR94	.403	.024	.149	16.565	.000
	YR95	.395	.025	.144	16.108	.000
	YR96	.490	.023	.204	21.628	.000
	YR97	.618	.022	.264	27.722	.000
	YR98	.728	.021	.345	34.394	.000
	YR99	.848	.021	.422	41.100	.000
	YR00	1.101	.021	.522	52.138	.000
	YR01	1.173	.022	.513	53.190	.000
	BR4MORE	-8.26E-02	.012	-.064	-7.143	.000
	BA3MORE	5.047E-02	.014	.038	3.686	.000
	AGE1630	-.125	.016	-.092	-7.895	.000
	AGE3150	-.121	.017	-.096	-7.136	.000
	AGE51PLU	-6.83E-02	.022	-.033	-3.076	.002

a. Dependent Variable: PRLOG

Table 8 shows that my predictions regarding the coefficients of the independent variables are correct in this sample. As hypothesized Living area and Lot Area had a positive relationship to housing prices and their quadratic terms, Living Area Squared and Lot Area Squared, had a negative relationship to housing prices. This implies that prices increase with living and lot area but they increase at a decreasing rate.

In this model I created dummy variables for the number of bedrooms and number of bathrooms within each home in order to capture more effectively

their impact on housing price variation. In this model, the number of bedrooms had a negative relationship to housing prices while the number of bathrooms had a positive relationship. Table 8 reveals that within this sample, if a home contained four or more bedrooms the price of the house was expected to be approximately 8.26% lower than a house with fewer than four bedrooms. The price of a house with three or more bathrooms was approximately 5% higher than a house with fewer than three bathrooms. As mentioned above, one can only hypothesize about why bedrooms and bathrooms effect housing prices differently in different samples. I assume that because the hedonic price model considers the impact of each independent variable on housing prices, holding all else constant, that the various uses of space in houses of comparable size are reflected in home values differently in different areas. Perhaps the more space that is used for bedrooms and/or bathrooms is not an indication of the quality or type of house.

In this model the presence of a swimming pool increased housing prices by 3.176% over those that did not. For the presence of fireplaces, the variable was broken down into dummy variables. This helped increase the statistical significance of the variables. A house with one fireplace increased housing prices by 3.17% over those houses that did not contain a fireplace. For houses that had two or more fireplaces, the price of the home was expected to be 13.7% higher than a house that did not have a fireplace, holding all else constant.

Age, in this sample, was broken into four categories. The coefficients reveal a negative relationship between house prices and age however again, the oldest housing stock, over 51 years of age, was expected to have housing prices almost 6% higher than the other houses built between 16 and 50 years ago.

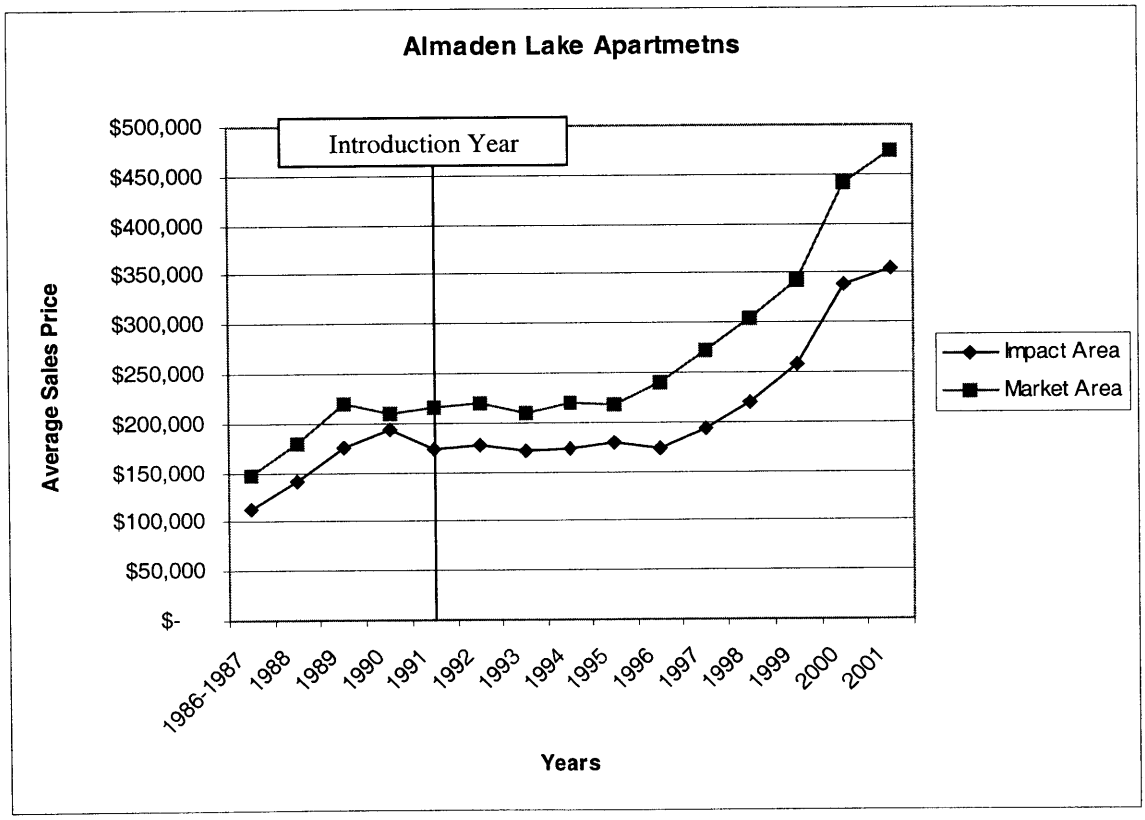
The coefficients of the year variables represent the percentage change over the omitted base year. These coefficients allow a price trend line to be developed for the average, quality controlled house. The coefficients reveal a

steady increase in prices over the base year of 1986/1987 with a small dip occurring between the years 1989 and 1990, at which point prices dropped by approximately 5%.

Apartments at Almaden Lake Model Results

Almaden Lake Apartments was completed in 1994. I have determined the introduction of the development into the neighborhood as the year 1991, when public meetings were held with surrounding neighbors, though the groundbreaking did not take place for another two years. Due to sample size constraints in the impact area, 1986 and 1987 were combined within the regression as the base year.

Figure 18



As the trend lines indicate in Figure 18 after the introduction of Almaden Lake Apartments, prices in both the impact and market areas remained relatively stable from 1991 through 1995. Any small differences between the two areas

were not statistically different. For example in between 1992 and1993 both the impact and market areas experienced a small decline in housing prices, -2.66% and –4.88% respectively. This difference is less than two standard deviations away from each other, given the sample size, and are therefore not considered to be statistically different in magnitude. The only year after the introduction of Almaden Lake Apartments that is statistically different between the impact and market area is the year between 1995 and 1996. Given that this is over four years after the introduction of the affordable housing development into the neighborhood, the two events do not appear to be correlated. This is further supported in later years, 1998 through to the year 2000, when housing prices in the impact area increase faster than the market area.

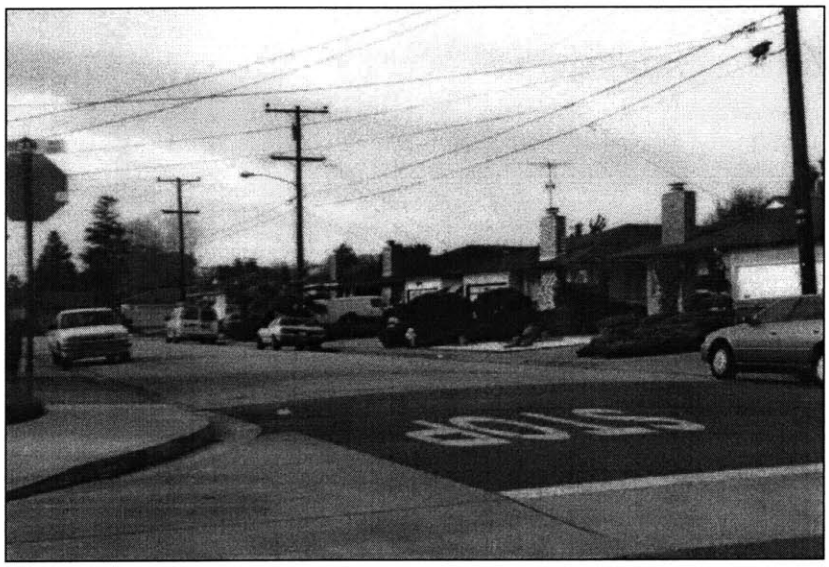
Strobridge Court

Strobridge Court (Figure 19) is a 96 unit affordable, rental inter-generational development, including both senior and family units. It is located in Castro Valley, an unincorporated area of Alameda County. The project was built in 1998 in response to a Request For Proposal issued by BART and a citizen's committee.

Figure 19: Strobrige Apartments, View from Wilbeam Avenue

The project site is adjacent to several market rate apartment complexes and is located at the entrance of the Castro Valley BART station which is surrounded predominantly by single-family homes (Figure 20). BRIDGE Housing Corporation worked with the Bay Area Rapid Transit District to build Strobridge Court, BART's first transit-oriented development. As part of BRIDGE's goal to build development around transit stations, BART and BRIDGE entered into a long-term lease for 2.33 acres of the northwest portion of the site.

Figure 20: Single Family Homes across from Strobridge Apartments



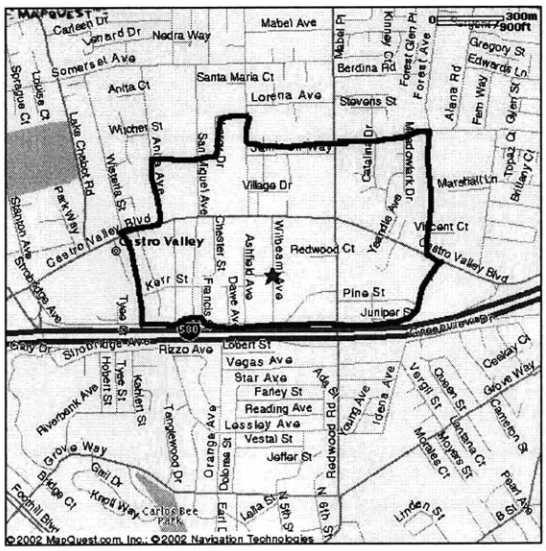
The project consists of 66 units designated for seniors and 30 units designated for families. The development combines a four-story apartment building for seniors with a series of low-rise structures containing larger units for families. 63 one and two bedroom senior units are located in three stories of wood frame construction on top of a concrete parking garage with a landscaped courtyard at podium level. The 30 three and four bedroom family units are situated in a series of three-story structures clustered around a central courtyard that features a children's play area. The project also includes the renovation and preservation of the historic Strobridge House. The Strobridge House was converted into three senior residential units. Additionally, the development contains indoor community spaces, and a ground-floor facility for the BART

Police, facing the BART station entrance. The units at Strobridge Court are affordable to very-low and low-income seniors and families.

Strobridge Court Apartments- Impact Area

Strobridge Apartments is located at the entrance of the Castro Valley BART parking lot on Wilbeam Avenue in Castro Valley. The development is surrounded on the East and to the south by the BART parking lot. Further to the South is Highway 580. Though Wilbeam Avenue has a few multi-family market rate developments, the remainder of the area to the East and the North of the apartments are single family. The impact area (Figure 21) used for this report are the single-family houses located within ½ mile radius from the site on all sides except to the South where the impact area is bounded by the highway.

Figure 21: Strobridge Court Impact Area



The Strobridge Court Impact Area contains 206 sales records included in the hedonic price model. The price model for this sample was more difficult to create due to the fact that many of the variables did not appear to be statistically significant in explaining price variation. However, through a careful process of variable selection an accurate model resulted, producing uniform errors of the coefficients for the year variables. The independent variables included within the

regression model successfully explained 67.4% of the variation in housing prices. The homes included within this sample averaged 41 years old. The houses sold in Strobridge's Impact Area, during the period between 1990 and 2001, had an average of 5.62 total rooms, 2.77 bedrooms and 1.86 bathrooms. The average lot size for these homes was 6,660 square feet and the building area was approximately 1,360 square feet. The average price for the homes sold during this period was approximately $215,325. For further descriptive statistics please refer to Appendix VI.

Due to sample size constraints sales records in years prior to 1997 have been combined together to ensure a more accurate analysis of the price trends. The results of the hedonic price model for Strobridge Apartments Impact Area are shown in Tables 9 and 10 (definitions of the independent variables can be found in Appendix I):

Table 9

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.821[a]	.674	.645	.14677

a. Predictors: (Constant), AGE56PLU, YR01, SWIM, BA2MORE, AGE1630, YR9495, FR1MORE, LIVSQ, YR98, YR99, YR00, BR3MORE, YR9293, AGE3145, YR9697, AGE4655, LIVAREA

Table 10

Coefficients [a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	11.630	.119		97.996	.000
	LIVAREA	4.515E-04	.000	.685	3.654	.000
	SWIM	8.175E-02	.070	.051	1.171	.243
	YR9293	-1.54E-02	.043	-.021	-.357	.721
	YR9495	-6.73E-02	.045	-.085	-1.486	.139
	YR9697	-9.49E-02	.040	-.151	-2.344	.020
	YR98	6.193E-02	.043	.089	1.450	.149
	YR99	.172	.048	.203	3.568	.000
	YR00	.378	.044	.494	8.569	.000
	YR01	.503	.046	.632	10.887	.000
	FR1MORE	-1.20E-03	.027	-.002	-.044	.965
	BR3MORE	1.410E-03	.026	.003	.055	.956
	BA2MORE	3.821E-02	.027	.075	1.433	.154
	LVAREASQ	-6.43E-08	.000	-.378	-2.115	.036
	AGE1630	-.117	.043	-.158	-2.743	.007
	AGE3145	6.900E-02	.039	.109	1.766	.079
	AGE4655	3.122E-02	.037	.064	.851	.396
	AGE56PLU	-5.47E-02	.055	-.050	-.998	.320

a. Dependent Variable: PRLOG

The results of the price index for Strobridge Apartment Impact Area are similar to the models for the other case studies. Living area and lot area are positively correlated with housing sales prices while there quadratic terms are negatively correlated, supporting the hypothesis that there is a non-linear relationship between the independent variables and home values.

In this sample the presence of a swimming pool added over 8% to the sales price, as compared to a house that does not contain a swimming pool. The existence of a fireplace appears to have a negative relationship to housing prices. However the .12% price differential between a house that has a fireplace and one that does not is not significant. Additionally, the variable is not a statistically significant variable within the price model.

Table 10 reveals that bedrooms in this model are not statistically significant. Though I tried various different bedroom categories, the results were the same. In this sample, the number of bedrooms within a house is not important in predicting price movements. Bathrooms, on the other hand, are

significant. Houses with two or more bathrooms had sales prices 3.82% higher than houses that had fewer than two bathrooms.

It is interesting to note that in this case, my hypothesis about the relationship between age and housing prices is not correct. In this sample age has a different impact on prices depending on the years that the house was built as compared to the modern houses, constructed within the last 15 years. In fact, for those houses built between 16 and 30 years ago housing prices were 11.7% lower than houses built within the last 15 years. However, houses built between 31 and 45 years ago increased the price of houses by 6.9% over the more modern houses. An explanation of this aberration could be that houses built between 31 and 55 years ago represent a style or a quality level that is capitalized into housing prices and that does not exist in houses built during other periods of time.

The coefficients for the dummy year variables vary tremendously over the time period. These coefficients are used to track price movements over time. The years prior to 1998 appear to have lower average prices than the base year of 1990/1991. Since 1998, prices have risen dramatically over the base year.

Strobridge Court Apartments- Market Area

The Strobridge Court Apartments is located in Castro Valley. The Market Area includes all of the housing sales records within the City of Castro Valley, except for those records considered to be a part of the Strobridge Court Apartment Impact Area.

Similar to the Strobridge Court Impact Area, the price index for Strobridge Court Apartments contains a few independent variables that are not statistically significant. However, the price index is still an extremely accurate model as shown by the standard errors of the coefficients for the year variables that are low and uniform in magnitude. Approximately 4038 records were used in the Market Area hedonic model. Within the regression, close to 70% of the

variation in sales prices can be explained by the independent variables used within the model. The homes included within this data set averaged 40.6 years old. The houses sold in Strobridge's Market Area, during the period between 1990 and 2001, had an average of 6.28 total rooms, 3.06 bedrooms and 2.08 bathrooms. The average lot size for these homes was 7,502 square feet and the building area was approximately 1,620 square feet. The average sales price for the homes sold during this period was approximately $270,320. For additional descriptive statistics please refer to Appendix VII.

The results of the hedonic price model for Strobridge Court Apartments Market Area are shown in Tables 11 and 12 (definitions of the independent variables can be found in Appendix I):

Table 11

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.835[a]	.698	.696	.19127

a. Predictors: (Constant), YR01, LOT_AREA, FIRE1MOR, AGE51PLU, YR98, SWIM, YR99, AGE1630, YR9495, YR9293, BR3MORE, YR00, LIVSQ, BA2MORE, AGE3150, YR9697, LOTSQ, BLDGAREA

Table 12

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	11.633	.030		389.712	.000
	LIVAREA	5.880E-04	.000	.987	18.852	.000
	LVAREASQ	-7.67E-08	.000	-.507	-10.479	.000
	SWIM	1.672E-02	.014	.011	1.192	.234
	LTAREA	4.002E-06	.000	.063	3.453	.001
	LTAREASQ	-7.38E-12	.000	-.007	-.372	.710
	FIRE1MOR	3.218E-02	.007	.044	4.938	.000
	BR3MORE	7.832E-02	.009	.093	8.716	.000
	BA2MORE	-3.37E-03	.010	-.004	-.324	.746
	AGE1630	-.168	.014	-.123	-11.952	.000
	AGE3150	-9.57E-02	.009	-.138	-10.566	.000
	AGE51PLU	-.141	.011	-.194	-13.189	.000
	YR9293	-5.10E-02	.013	-.050	-4.009	.000
	YR9495	-8.53E-02	.013	-.083	-6.699	.000
	YR9697	-8.91E-02	.012	-.097	-7.377	.000
	YR98	5.759E-02	.013	.052	4.317	.000
	YR99	.152	.013	.140	11.542	.000
	YR00	.369	.013	.370	29.348	.000
	YR01	.506	.014	.444	37.419	.000

a. Dependent Variable: PRLOG

Table 12 shows the relationships between the independent variables and housing prices. Increases to the square footage of living area and lot area increases housing prices at a decreasing rate. The existence of a swimming pool adds approximately 1.67% to the price of a house as compared to a house without a swimming pool. In this case a fireplace is statistically significant and adds 3.22% to a home's value. The number of bedrooms has a positive relationship to housing prices. In this sample houses with three or more bedrooms sold for 7.8% more than houses that had fewer than three bedrooms. The relationship between bathrooms and housing prices was negative however, as was the case for Strobridge Impact Area, the bathroom variable was not statistically significant.

Age, as a variable, was different than it was in the Strobridge Impact Area in that all of the age categories had a negative impact on housing values as

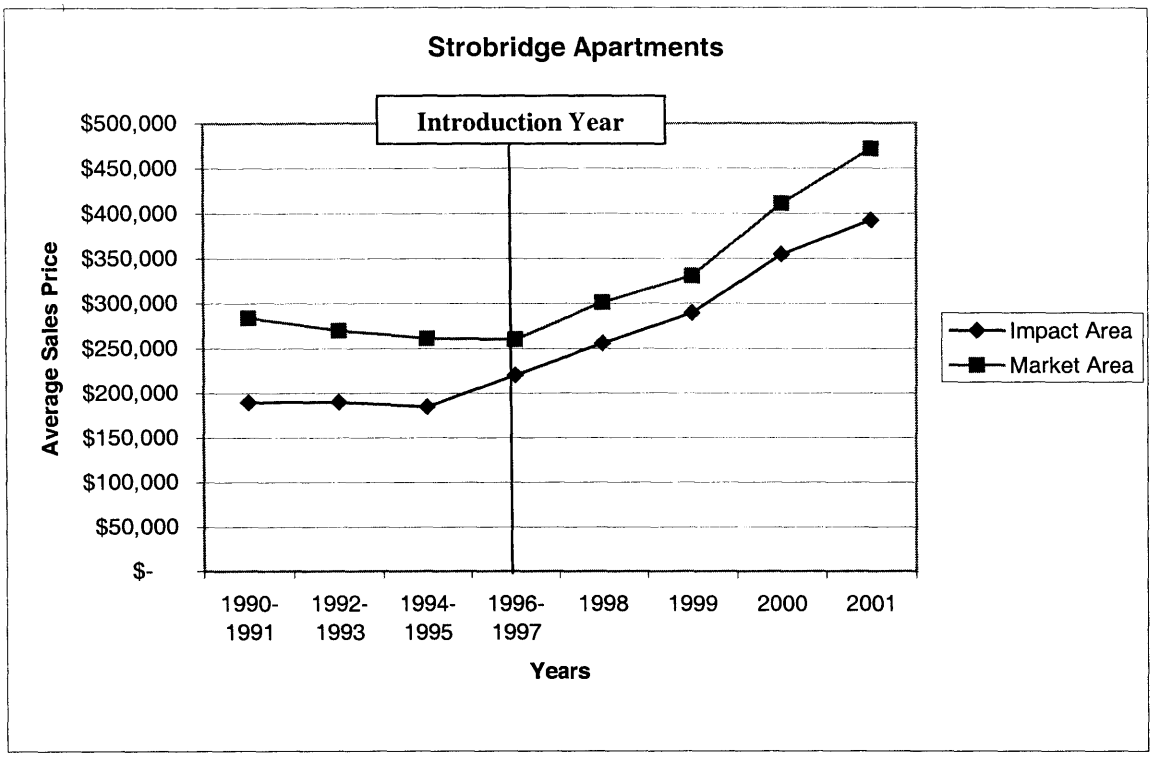
compared to the houses built within the last 15 years. A similarity, however, is that those houses built between 31 and 50 years ago sold for higher than houses built between 16 and 30 years ago. In all cases, age was an important variable in determining price variation within this sample.

The year coefficients show a significant recession in the market area between the base year, 1990/1991, and 1996. In 1998 prices began to rise significantly and continued to increase dramatically through to the present.

Strobridge Court Apartments Model Results

Strobridge Court Apartments was completed in 1998. Though Bridge Housing Corporation responded to the City of Castro Valley's Request For Proposal in 1993, the project did not break ground until 1996. Due to legal battles and the project's uncertainty during this period, I have determined the introduction of the development into the neighborhood as the year 1996. Due to sample size constraints in the impact area, 1990 and 1991 were combined within the regression as the base year.

Figure 22



Following the introduction of affordable housing into the impact area the housing sales price in the impact area rose almost identically to the housing sales prices in the market area. In the year 1998, prices in both the impact area and the market area increased by approximately 16%. In 1999 prices in the impact area rose by over 13.4% while the market area prices trended at a rate of 9.9%. This difference, however, is not statistically significant and the two areas, as can be seen in Figure 22, have essentially trended the same from the introduction of Strobridge Apartments into the impact area through to the present.

CONCLUSION

Extensive economic and population growth in the Bay Area over the last decade have resulted in dramatically increased housing prices and rents throughout the region. While the demand for housing has escalated, the production of housing has trailed behind. The shortage of housing in the San Francisco Bay Area is a real problem with significant implications for the future economic health of the region. The results of limited housing options are felt most acutely by low and moderate income families who play an important role in the Bay Area's economy. Many of these families can no longer afford housing in the Bay Area and are forced to move to other regions. High housing costs and constrained housing development limits the region's ability for economic growth and decreases the quality of life for its residents.

The housing problem in the Bay Area is regional and needs to be addressed on a regional scale. One effective method for stabilizing the economy is the provision of affordable housing throughout the Bay Area, both in the cities and the suburbs. In Myron Orflield's newly released document, *California Metropatterns*, the patterns of polarization associated with increased fiscal strain on suburbs and outlying towns is evident. As Orfield writes, "Most California regions are growing fast-and finding it hard to provide the schools, roads and water they need. Growth on the edge is encroaching on sensitive open space and productive farmland, Older communities in the core are struggling with growing social need and deteriorating infrastructure. Hamstrung by Proposition 13 and other state policies, thousand of cities are left to compete with each other for tax base, especially sales tax base, with little common social, political or economic strategy.[56]" As a result, residential developments, particularly multi-family are not permissible under many local zoning codes and the regional housing supply remains constrained. Low income families find themselves forced to move out of the region where the costs of living is lower or in areas of

[56]Myron Orfield, *California Metropatterns*.

pre-existing poverty. This leads to concentrated poverty in areas that are least equipped to deal with the fiscal needs of low income families. If affordable housing was provided throughout the region it would not only help reduce the concentration of poverty and racial segregation, it would also stem the polarization occurring between the region's communities, allowing workers to live closer to their jobs, reducing congestion on roadways, preserving valuable open space and natural amenities, and allow households to remain in their communities as their financial situations change.

Because the market supply is not responding adequately to rising prices, real estate developers, city planners and policy makers need to address the obstacles that are inhibiting the production of affordable housing. Even though there is a generally accepted need for affordable housing in the Bay Area, housing developers find it difficult to build low and moderate income housing they are capable of delivering. Some of the problems in the Bay Area are unavoidable, due to natural limits on land. However, a significant barrier to affordable housing development is the time and cost associated with responding to neighborhood opposition to new developments. Residents are often concerned that affordable housing will negatively impact surrounding real estate values. As a result developers are forced to spend time and resources addressing their concerns. This results in long permit approval time frames, higher development costs, and a delay in production of much needed affordable housing throughout the Bay Area.

Through a rigorous quantitative analysis, this report demonstrates that though neighbors often perceive affordable housing as having a negative impact on surrounding real estate values, this is not the case. In fact, the three case studies used in this analysis are not only 100% affordable but they are also located in areas of predominantly single-family owner occupied housing; neighborhoods that are often the most resistant to affordable housing developments. None of the three case studies used in this report shows a decline in housing prices due to the introduction of an affordable housing

development. *The true impact of affordable housing in these cases is not on surrounding real estate values, but instead is on the lives of the low income families that live in the developments and on the contribution that the housing developments make to the overall economic competitiveness of the region.*

To help reduce the time and costs associated with neighborhood opposition to affordable housing developments, BRIDGE, as well as other affordable housing developers, need an effective tool to educate neighbors on the real impacts of affordable housing on surrounding neighborhoods. This report separates the facts from the fiction behind affordable housing in the Bay Area. It has explored the claim that subsidized housing negatively impacts surrounding housing prices and has found that these perceptions are misplaced. The claim that affordable housing leads to property degradation and decreases housing prices is fictitious. Debunking this myth at a local level is a necessary step in finding a regional solution to the affordable housing crunch throughout the Bay Area.

APPENDIX I

Regression Model Definitions:

Variables	Definition
LIVAREA	Size of living area (sq. ft.)
LVAREASQ	Size of area squared (sq. ft.)
LTAREA	Size of lot (sq. ft.)
LTAREASQ	Size of lot squared (sq. ft.)
FIRE1MOR	Existence of one or more fireplaces
FIRE2MOR	Existence of two or more fireplaces
SWIM	Existence of a pool
BA2MORE	Existence of 2 or more bathrooms
BA3MORE	Existence of 3 or more bathrooms
BR2MORE	Existence of 2 or more bedrooms
BR4MORE	Existence of 4 or more bedrooms
AGE1125	The age of the house is between 11-25 years old
AGE2640	The age of the house is between 26-40 years old
AGE4160	The age of the house is between 41-60 years old
AGE61PLU	The age of the house is greater than 61 years old
AGE1630	The age of the house is between 16-30 years old
AGE3150	The age of the house is between 31-50 years old
AGE51PLU	The age of the house is greater than 51 years old
AGE3145	The age of the house is between 31-45 years old
AGE4655	The age of the house is between 46-55 years old
AGE56PLU	The age of the house is greater than 56 years old
YR8990	Sales recording date was in 1989 or 1990
YR9192	Sales recording date was in 1991 or 1992
YR9394	Sales recording date was in 1993 or 1994
YR9596	Sales recording date was in 1995 or 1996
YR9293	Sales recording date was in 1992 or 1993
YR9495	Sales recording date was in 1994 or 1995
YR9697	Sales recording date was in 1996 or 1997
YR87	Sales recording date was in 1987
YR88	Sales recording date was in 1988
YR89	Sales recording date was in 1989
YR90	Sales recording date was in 1990
YR91	Sales recording date was in 1991
YR92	Sales recording date was in 1992
YR93	Sales recording date was in 1993
YR94	Sales recording date was in 1994
YR95	Sales recording date was in 1995
YR96	Sales recording date was in 1996
YR97	Sales recording date was in 1997
YR98	Sales recording date was in 1998
YR99	Sales recording date was in 1999
YR00	Sales recording date was in 2000
YR01	Sales recording date was in 2001

APPENDIX II

Ohlone Court Apartments Impact Area Price Model

Descriptive Statistics

	N	Mean	Std. Deviation
LIVAREA	295	1566.21	298.074
BA3MORE	295	.5932	.49207
FIRE1	295	.4271	.49550
LTAREA	295	3494.41	2232.002
SWIM	295	.0678	.25182
BASE	295	.0949	.29360
YR9394	295	.0949	.29360
YR9596	295	.1458	.35347
YR97	295	.0915	.28884
YR98	295	.1254	.33176
YR99	295	.1763	.38170
YR00	295	.1661	.37280
YR01	295	.1051	.30718
LVAREASQ	295	2541561	988603.21426
LTAREASQ	295	1.7E+07	18988480.07
BR3MORE	295	.9492	.22006
AGE	295	26.8983	6.61295
Valid N (listwise)	295		

APPENDIX III

Ohlone Court Apartments Market Area Price Model

Descriptive Statistics

	N	Mean	Std. Deviation
LiVAREA	6639	1634.26	554.270
LVAREASQ	6639	2977974	2108576.719
BR4MORE	6639	.3874	.48719
BA3MORE	6639	.3466	.47592
SWIM	6639	.1002	.30024
LTAREA	6639	5810.64	2969.111
LTAREASQ	6639	4.3E+07	35391215.72
FIRE1MOR	6639	.6281	.48335
AGE1630	6639	.3044	.46019
AGE3150	6639	.4388	.49627
AGE51PLU	6639	.1008	.30104
BASE	6639	.1554	.36236
YR9394	6639	.1214	.32662
YR9596	6639	.1547	.36164
YR97	6639	.0955	.29392
YR98	6639	.1197	.32469
YR99	6639	.1332	.33977
YR00	6639	.1203	.32539
YR01	6639	.0997	.29964
Valid N (listwise)	6639		

APPENDIX IV

Almaden Lake Apartments Impact Area Price Model

Descriptive Statistics

	N	Mean	Std. Deviation
LIVAREA	886	1255.29	586.934
LTAREA	886	2320.536	2991.6219
SWIM	886	.0418	.20015
BASE	886	.0372	.18947
YR88	886	.0497	.21737
YR89	886	.0632	.24347
YR90	886	.0327	.17803
YR91	886	.0271	.16243
YR92	886	.0474	.21262
YR93	886	.0316	.17504
YR94	886	.0643	.24549
YR95	886	.0587	.23518
YR96	886	.0643	.24549
YR97	886	.0722	.25902
YR98	886	.1084	.31100
YR99	886	.1061	.30813
YR00	886	.1512	.35849
YR01	886	.0858	.28020
BA3MORE	886	.2223	.41606
BR2MORE	886	.8510	.35627
LVAREASQ	886	1919859	2066535.438
LTAREASQ	886	1.4E+07	30560334.64
AGE	886	17.0711	7.92967
Valid N (listwise)	886		

APPENDIX V

Almaden Lake Apartments Market Area Price Model

Descriptive Statistics

	N	Mean	Std. Deviation
LIVAREA	8555	1645.65	580.905
LVAREASQ	8555	3045564	2294203.593
LTAREA	8555	6191.44	3631.197
LTAREASQ	8555	5.2E+07	67045681.27
SWIM	8555	.1032	.30426
FIRE1	8555	.5936	.49120
FIRE2	8555	.0399	.19564
BASE	8555	.0824	.27500
YR88	8555	.0448	.20681
YR89	8555	.0448	.20681
YR90	8555	.0337	.18037
YR91	8555	.0470	.21163
YR92	8555	.0531	.22418
YR93	8555	.0478	.21337
YR94	8555	.0562	.23037
YR95	8555	.0549	.22787
YR96	8555	.0728	.25986
YR97	8555	.0777	.26777
YR98	8555	.0971	.29616
YR99	8555	.1087	.31129
YR00	8555	.0976	.29680
YR01	8555	.0814	.27340
BR4MORE	8555	.3906	.48792
BA3MORE	8555	.3434	.47488
AGE1630	8555	.3122	.46342
AGE3150	8555	.4402	.49644
AGE51PLU	8555	.0985	.29806
Valid N (listwise)	8555		

APPENDIX VI

Strobridge Court Apartments Impact Area Price Model

Descriptive Statistics

	N	Mean	Std. Deviation
LIVAREA	206	1360.17	373.750
SWIM	206	.0243	.15427
BASE	206	.1117	.31570
YR9293	206	.1311	.33830
YR9495	206	.1068	.30961
YR9697	206	.1893	.39272
YR98	206	.1456	.35360
YR99	206	.0922	.29006
YR00	206	.1165	.32161
YR01	206	.1068	.30961
FR1MORE	206	.2039	.40386
BR3MORE	206	.6408	.48094
BA2MORE	206	.6214	.48623
LVAREASQ	206	1989073	1446447.889
AGE1630	206	.1262	.33290
AGE3145	206	.1845	.38881
AGE4655	206	.5000	.50122
AGE56PLU	206	.0534	.22537
Valid N (listwise)	206		

APPENDIX VII

Strobridge Court Apartments Market Area Price Model

Descriptive Statistics

	N	Mean	Std. Deviation
LIVAREA	4038	1620.45	582.289
LVAREASQ	4038	2964839	2294396.894
SWIM	4038	.0518	.22157
LTAREA	4038	7502.23	5454.334
LTAREASQ	4038	8.6E+07	308155217.7
FIRE1MOR	4038	.3390	.47344
BR3MORE	4038	.7843	.41136
BA2MORE	4038	.7273	.44538
AGE1630	4038	.0696	.25448
AGE3150	4038	.4693	.49912
AGE51PLU	4038	.3462	.47582
BASE	4038	.0978	.29711
YR9293	4038	.1320	.33853
YR9495	4038	.1308	.33718
YR9697	4038	.1726	.37796
YR98	4038	.1080	.31039
YR99	4038	.1157	.31985
YR00	4038	.1402	.34720
YR01	4038	.1030	.30402
Valid N (listwise)	4038		

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