DIFFERENT STROKES

AN ANALYSIS OF GREEN BUILDING DEMAND

A Thesis

Presented to the faculty of the Department of Public Policy Administration

California State University, Sacramento

Submitted in partial satisfaction of
the requirements for the degree of

MASTER OF SCIENCE

in

Urban Land Development

by

Brandon Gene Anderson

FALL
2013

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Approved by:

____________________________________, Committee Chair
Robert Wassmer

____________________________________, Second Reader
Nuriddin Ikromov

____
Date

Student: Brandon Gene Anderson

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____________________________, Graduate Coordinator   ____________________
Robert Wassmer   Date

Department of Public Policy Administration

Abstract

of

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California adopted the CalGreen building code in 2011, which requires developers to incorporate *green* features in new commercial buildings to reduce greenhouse gas emissions. The code provides cities the opportunity to require additional features above the minimum standard. However, the literature on *green* buildings suggests that rent per square foot could differ between markets and submarkets depending on the demand for *green* buildings. Using the CoStar Professional Property(c) commercial property database, I perform a regression analysis using the log rent per square foot per year as the dependent variable and explanatory variables that control for quality, size, and location. I use LEED and Energy Star buildings to control for *green* buildings and multiply these variables with the submarket variables to measure the demand for *green* buildings within each submarket.

After controlling for size, quality, and location, I find that tenants are willing to pay a rental premium for Energy Star certified buildings in all submarkets across California, while the rental premium for LEED buildings is not statistically significant. However, I find that certain submarkets within California are willing to pay a rental premium for

LEED features, suggesting that there is a difference in demand for green buildings. I find that tenants in cities with residents with more education and higher incomes could be willing to pay more for the non-financial benefits of LEED buildings. In addition, tenants in locations that culturally favor the *green* features of LEED could be more willing to pay a rental premium. My findings first suggest that each city needs to assess the demand for green buildings before raising the developments standards. Second, cities that have insufficient demand could offer development incentives if the societal benefit of the green features outweigh the costs. Finally, California should align the building standard more closely with energy star, since tenants in California are more willing to pay for energy savings and it would further decrease the greenhouse gas emissions.

_______________________, Committee Chair
Robert Wassmer

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Date

ACKNOWLEDGEMENTS

"Many of life's failures are people who did not realize how close they were to success when they gave up."- Thomas A. Edison

Luckily, I have an entire support team that have guided, supported, and encouraged me through life's challenges. At the core of this support team, I would like to thank my family for instilling in me the importance of education, dedication, and coffee. I am truly lucky to have such a wonderful family. I am also internally grateful to my physiatrist and canine friend Mickey, you definitely kept me going. Love you buddy.

I would like to acknowledge my primary advisor Professor Rob Wassmer for providing me an opportunity to learn under his mentorship. Thank you for taking my late night calls, timely reviews, and your patience as I finished this thesis. Your expectations for excellence pushed me to learn and grow more academically and professionally than I would have ever imagined. I would also like to thank my second reader Professor Nuriddin Ikromov for obtaining the data I use for my thesis, his insights, and thorough review of my thesis. Your support through my undergraduate coursework helped me excel at the graduate level.

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Chapter 1

INTRODUCTION

The California Governor is attempting to develop strong and healthy cities through his commitment to a “green framework” and standardization of *green* buildings in California. However, is standardization the best approach considering the uniqueness of each city in California? With the passage of the CalGreen building codes, this is the direction governmental officials are heading in California, but could it affect future development considering feasibility is dictated by demand in a specific market? This master’s thesis explores the demand for *green* buildings in different markets in California to determine if certain markets experience a higher demand for *green* buildings.

The U.S Green Building Council (USGBC) touts that LEED buildings can be up to 30 percent more energy efficient and use less hazardous materials than conventional buildings. Although energy efficiency is desirable to reduce the greenhouse gases (GHGs) generated in heating and cooling a building, developers will only build financially feasible projects.

According to Kolbe and Greer (2006), rent per square foot is a major component of financial feasibility of any commercial development because it determines the investment’s ability to pay back the financer. If the expected rent earned per square foot is too low given the funds needed to finance the construction of the building, maintain, and heat/cool it, then the financer will not lend the money and the developer cannot build the project.

The demand, or willingness to pay, determines the rent for *green* buildings. The USGBC claims that *green* buildings could attract tenants willing to pay a rental premium for *green* building because tenants are willing to pay higher rent per square foot in return for more productive employees resulting from the green workspace environment, and/or the attraction of customers who value companies with green cultures. If these additional influences vary by market, either because the type of worker, customer, or company varies by market, then the *green* rental premium (over and above heating/cooling cost savings) will also vary by market. However, many developers and governmental officials do not completely comprehend how the differences in *green* building demand affect financial feasibility.

Although several researchers have explored the presence of rental premiums in office space buildings, the researchers heavily rely on major markets or case studies. Miller, Spivey, and Florance (2008) were one of the first studies to control for location and found that some cities do not have *green* rental premium for office buildings, suggesting that not all cities are the same. This thesis looks to add to this finding by closely looking at demand for *green* market differences in cities across California that could affect the financial feasibility of *green* buildings. Answering that question will add a layer of understanding to developers and policy makers on the feasibility of requiring the same *green* standards in all of California's commercial rental markets and expecting the same amount of *green* building to occur.

The next section of this chapter discusses the merit of studying the rental premium and market differences. I discuss the effect the built environment has on climate change in the Environment section. The Evolution of Environmental Policy section describes the existing policy aimed at curbing climate change and encouraging *green* development. The Green Building section describes how LEED, Energy Star, and CalGreen buildings benefit the environment and the tenants occupying the *green* buildings. In the Concerns for Green Standardization section of this chapter, I discuss the potential dangers of developing standards that do not match specific market needs. The sections in this chapter seek to identify the benefits and need for *green* development and potential dangers of developing policy that cannot account for differences in markets. Finally, I offer a brief description of each remaining chapter's content.

Environment

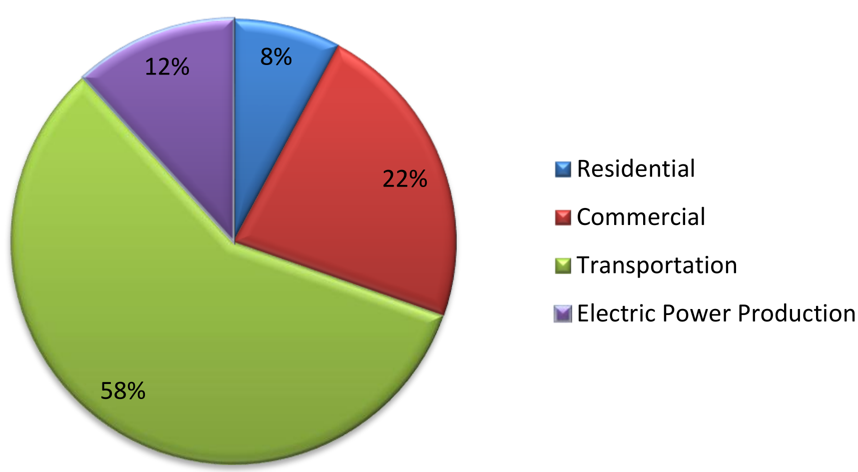
In the United States, the Environmental Protection Agency (EPA) has led the effort to recognize climate change and its leading cause, the emission of greenhouse gas (GHG). The EPA claims that human induced release of GHGs can change average temperature, rainfall, snow pack, and wind patterns over a period. By 2090, they estimate that temperatures in California and the Southwest Region of the United States could be approximately ten to twelve degrees hotter than current temperatures (Cal EPA, 2013). This expected rise in temperatures affects sea level, availability of fresh water, agriculture growth, and energy production. Rising temperatures will reduce the level of snow runoff by approximately ten to twenty percent, which historically serves as a reservoir for approximately 75% of California's freshwater (USGCRP 2009).

Luers and Mastradnrea (2007) report that scientists agree that humans are nearly 90 percent likely responsible for the accelerated increase in temperatures through the release of greenhouse gases. The largest quantity of greenhouse gases released through human activity is carbon dioxide (CO_2), which is largely due to the production, consumption, and lifestyle decisions that businesses, consumers, and individuals make. Younger *et al*. (2008) further argues that the built environment influences where people live, work, and shop. The growth in particular sectors, such as energy production, transportation, and buildings, have largely contributed to the increase in GHGs due to the intensive energy use related to its consumption.

According to the U.S. Energy Information Administration (2013), commercial buildings account for roughly 28 percent of the GHG released in California, where natural gas power plants account for roughly 30 percent of the energy production resulting in 20 percent of the GHGs released in the state. Transporting goods to businesses, heating, cooling, and lighting buildings consumes energy, which releases GHGs into the atmosphere. Environmental Leader (2008) argues that on average non-*green* buildings use 25 to 30 percent more energy than *green* buildings and release between 30 to 50 percent more greenhouse gases. The majority of the increased energy use is simply wasted energy. Many buildings have heating and cooling systems that are too large, poor insulation systems, and inefficient lighting systems.

Transportation is one of the leading causes of emission of GHG, which accounts for almost 60 percent of the GHG release in the state of California (see Figure 1.1 for a breakdown of energy consumption; U.S. Energy Information Administration, 2013). Land patterns and the choices residential and commercial uses make on location heavily dictate the emissions related to transportation. Over the past century, urban centers have decentralized creating new, less dense cities that may serve the central city. Glaeser and Kahn (2001) report that only sixteen percent of the employment within a metropolitan area is within walking distance, suggesting people are more dependent on cars, which emit more GHGs. As a result, the location and interaction of the built environment drives climate change just as much as the design of the buildings. The USGBC recognized the effect location has on development and incorporated credit for location that is closer to higher density residential uses, which I will discuss further in the LEED building section below.

Figure 1.1 - Greenhouse Gas Breakdown



Source: U.S. Energy Information Administration (2013)

Evolution of Environmental Policy

In response to some of these environmental concerns, California took steps to reduce emissions and climate change. Among these steps, the state incorporated the United States Environmental Protection agency (US EPA) Energy Star building label and the non-profit organization United States Green Building Council (USGBC) building rating system of Leadership Energy and Environment Development (LEED) building in policy to reduce GHG emissions in the State. The passage of AB 32 energized California's emphasis on lowering GHG emissions by mandating the reduction of GHG emissions to meet the mandated reduction standards. To satisfy the need to reduce emissions under AB 32, California recognized the benefits of raising the efficiency of the bottom tier buildings by requiring *green* building standards in the building code (CalGreen, 2010). The building rating programs the USGBC, United States EPA, and the CalGreen building code seeks to ensure development practices that incorporate energy efficiency and environmental protection the environmental policy discussed below look to promote. I will discuss the programs further in the G*reen* Building and Benefits Section below.

Assembly Bill 32

The early attempts at lowering emissions in California had some successes, but it was not until Assembly Bill 32 passed in 2006 that real movement toward lowering GHGs began. The Bill requires the reduction of GHG emissions to the 1990 level by 2020. The legislature charged the California Air Resource Board (ARB) with the task of developing and implementing a plan to reduce the GHG through the enforcement of the regulations and market forces. As of January 1, 2012, the ARB allocated businesses within the industrial, utility, and transportation fuels sectors a fixed amount of allowable GHG emissions. ARB decreases the allowable GHG release amount by two to three percent per year until 2020. Polluters can purchase excess allowances from cleaner businesses, which offers an incentive for innovation in cleaner technology.

Understanding that roughly 34 percent of the carbon-based emission comes from commercial buildings, in 2008 the Air Resource Board released an action plan that identified several recommended actions to reduce GHG emissions in California (Air Resource Board, 2008). One of the recommendations included the development of a building standard. As part of the target, the building standards would increase to zero energy buildings by 2030, which means the buildings do not require any energy from the public utility company developing.

Initial Environmental Building Efforts

One of the first efforts to change the built environment came under Executive Order S-20-04 in 2004, which requires state agencies and departments to reduce energy consumption by 20 percent by 2015. The Order also requires the State of California to obtain LEED Silver certification or higher on all new state-owned facilities, if the state funded the development. Any state agency must also lease, when over 5000 square feet and cost-effective, office space that is LEED certified. I discuss the details of LEED certification in the next section “Green Buildings.” Similarly, Executive Order 13514 requires all federal agencies or departments must lease buildings that are Energy Star Certified or Federally Energy Management Program classified.

Another early effort at changing the built environment came under AB 1103 in 2007, which requires the reporting of the energy consumption of commercial buildings over 50,000 square feet. Any potential buyer or tenant could request to see this information. The aim was to raise awareness of energy consumption and let individuals make conscious decisions about acquisition and leasing options. In essence, it attempted to place a market value on energy consumption in that less efficient buildings would rent and sell for less.

California Environmental Quality Act

In response to the Assembly Select Committee on Environmental Quality recommendation to prepare legislation to model the National Environmental Policy Act (NEPA), in 1970 California developed its own environmental policy law to require environmental review on projects that could affect the environment. The legislature intended CEQA to provide decision makers with sound analysis on the environmental effects of a proposed action. The act looked to discover ways to avoid or reduce environmental damage, increase transparency, and enhance public participation (Bass, Herson, and Bogdan, 2004).

Over time, several court rulings and amendments to CEQA enlarged the scope and impact of the act. Specifically, Friends of Mammoth v. Board of Supervisors (1972) 8 Cal. 3d 247 established that governmental approval under CEQA is required for private land decisions. Specifically, CEQA requires agencies to conduct a review of any proposed project to identify any environmental effects. The effects could range from wildlife, cultural, to environmental justice issues. California passed Senate Bill 97 in 2007, which requires lead agencies to analyze GHG emissions for all proposed projects and mitigate any significant effects (OPR, 2011). CEQA and SB 97 solidified

California's commitment to avoiding and/or minimizing the release of GHG emissions by ensuring every project receives a thorough analysis of its environmental effects.

However, many argue that CEQA lost its true intent of identifying and analyzing environmental affects through the series of court decisions and amendments, which has significant impact on timing and costs of development projects (Bass, Herson, and Bogdan, 2004). Gleaser (2011) argues that additional environmental review makes development in California more difficult, which could push projects to other states. Recently, controversial efforts led by United States Senator Rubio to streamline CEQA review had some traction in 2012, but efforts lost traction in early 2013 (Ewers, 2013).

Senate Bill 375

In conjunction with AB 32, Senate Bill 375 attempts to connect land use to the efforts at reducing GHG emissions in California. The ARB must develop targets that seek to reduce the number of miles vehicles travel. Each metropolitan planning organization (MPO) is responsible for developing a strategy that will meet the target the ARB establishes. The federal government will fund the MPOs that complete and implements the strategy. Local jurisdictions will adopt the strategy as part of the general plan. The plan housing allocation must match the strategy in the plan, which typically rewards dense development of mixed-uses close to transit hubs and mixed-use. Assuming the plan adequately identifies the housing need and location of development, a potential project may qualify for a categorical exemption under CEQA. The categorical exemption allows the permitting agency to expedite the environmental analysis, which reduces the holding costs for the developer.

Benefits of Green Buildings

According to the U.S EPA (2012), "green building is the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle." The *green* development movement we know today effectively began when the American Institute of Architects (AIA) developed the Committee of the Environment in 1989 that disseminated information on *green* building practices. A few years later, the U.S. EPA expanded their energy star label to include buildings. The following year, a group of architects formed a non-profit organization called the U.S Green Building Council (USGBC) that furthered the efforts of U.S EPA and AIA. The organization developed the first certification guidelines in 1999 called the Leadership in Energy and Environmental Design that attempted to guide comprehensively *green* development. California made a step to require some of the guidelines by incorporating them into the building code. Next, I discuss the requirements and benefits of energy star label, LEED certification, and the CalGreen building code.

LEED

According to LEED (2009), the building rating system is a market driven system that rates the buildings on several criteria that supports an overarching mission to tackle global warming, dependence on non-renewable sources of energy, and human health by focusing on the built environment. There are seven main goals including Sustainable Sites, Water Efficiency, Energy and Atmosphere, Material and Resources, Indoor Environmental Quality, Innovation of Design, and Regional priority. Each goal has design features and qualities that will earn the building points toward different levels of certification. For example, a building can earn points under the sustainable sites section for developing a half-mile near a commuter train or bus rapid transit. A building can also earn points for reusing existing building materials or using non-toxic building materials. For additional examples, see Table 1.1 below.

Table 1.1 - LEED Certification Definition and Examples

Goal	Definition	Development Example
Sustainable Sites	Develop sites that depend less on automotive transportation, use less land, and general reduce environmental impacts	Develop 60,000 sqft/acre building, or is near residential that is 10 units/Acre
Water Efficiency	Reduce reliance on potable water	50% reduction in potable water for irrigation
Energy and Atmosphere	Reduce energy use and systems that release harmful chemicals into the environment	Install HVAC system that is 30% more efficient than the baseline building
Material Resources	Recycle and reuse construction materials and rely more heavily on renewable materials	Use rapidly renewable materials, such as bamboo, in the construction of the buildings
Indoor Environmental Quality	Improve the indoor air quality, improve ventilation, thermal control and lighting	Install individual lighting for 90% of the building
Innovation in Design	Exhibit innovation and forward thinking that incorporates features never developed	Develop a new process that is not incorporated the current LEED standards
Regional Priority	Develop in regional priority areas	Construct building in the CBD of a major city, such as San Francisco, California

Source: Kubba (2012)

Certified inspectors will determine how well the building incorporates the design features and goals USGBC identifies and reward points accordingly. The LEED standards for certification tie the range of points to the seven goals identified above. The inspector will reward more points when the developer incorporates features into the building that are beyond the minimum LEED requirement. Buildings that accumulate enough points can earn one of four levels of LEED certification. The USGBC will award a building with the certified level if the building receives at least 40 points, silver with at least 50 points, gold with at least 60 points, or platinum with more than 80 points.

Several studies examine the potential economic and environment benefits of obtaining the LEED certifications. Specifically, LEED certified buildings produce 30 percent less GHG from energy consumption than conventional buildings (Malin, 2007). The study also shows that LEED certified buildings are typically more efficient than predicted. However, a small percentage of the buildings consumed more energy after the renovation, but increased occupancy and energy intensive uses might be driving the author's findings. USGBC (2012) reports that LEED certified building lowers the risk of respiratory diseases by nine to twenty percent. LEED certified building also lowers allergy and asthma risks by up to twenty-five percent. Employees are also 27 percent less likely to miss work due to headache related sick leave in LEED certified buildings, which increases productivity by $70 per employee annually. USGBC finds that the energy and productivity savings is enough to attract tenants from other buildings. Based on reports, USGBC claims that LEED certified buildings lease twenty percent faster and are four percent more occupied, which results in higher net income for the buildings' owners.

Energy Star Label

As mentioned above, the United States EPA developed the Energy Star label to signal to consumers that certain products are energy efficient. The Unites States EPA have separate processes for obtaining the label depending on if the developer is upgrading an existing building or constructing a new building. For the existing building, the Energy Star label uses benchmarking ratings to identify a building's performance against other similar types of buildings. The intent is to establish energy reduction goals to increase the efficiency. As the developer upgrades the building, the building's efficiency will increase, which also increases the building's benchmark score. Instead of monitoring the increase in energy performance, new construction projects will use modeling software to estimate the building benchmark rating based on the design specifications. Scores for both existing and new construction range from 1-100 based on the performance of the building against other buildings. For example, if a building obtains a score of 75 or higher, the building is more efficient than 75 percent of all other building in that particular class. The United States EPA requires buildings to achieve a score of 75 or higher to be rewarded the Energy Star label.

According to McGraw-Hill Construction Research & Analytics (2012), Energy Star buildings can decrease operating expenses by as much as eleven percent. Labeled building use 35 percent less energy, which decreases the amount of GHG emission by approximately 35 percent. As a result, Energy Star emphasis and major benefit focuses on energy reduction and operational saving costs, which we should observe in every market. Several utility companies in California have implemented a price premium for peak energy usage (York, Kushler, and Witte, 2007). The energy efficiency of labeled buildings are better positioned to absorb the additional expenses for peak use. Miller, Spivey, and Florance (2008) find that like LEED certified buildings, Energy Star labeled buildings can command $30.50 per square foot while conventional building command $28.10 per square foot, which amounts to an approximately $2.40 rental premium per square foot. The authors also find that energy star buildings have an occupancy rate approximately 4 percent higher than other similar buildings.

CalGreen Building Code

The California Legislature attempted to draft statutes that would require *green* buildings and develop standards (AB 35, AB 888, and AB 1035), however former Governor Schwarzenegger vetoed the series of bills stating these standards need to rely on industry to develop standards. The California Building Standards Commission (BSC) developed minimum *green* building standards for California in cooperation with the USGBC, which became part of the California Building Standards Code as part 11 in Title 24 of the California Code of Regulations. The building standards allow local areas to require more stringent development codes, but they must comply with these state standards at a minimum. Effective January 1, 2012, the building codes apply to all new residential and non-residential buildings, which incorporates many of the LEED building concepts. The Code includes two voluntary codes that could translate into becoming LEED certified. Tier one, on average, results in 15 percent energy saving while Tier two, on average, results in 30 percent energy savings (Graves, 2012). According the Lewis (2010), the major benefit of the CalGreen building code is that it forces the bottom tier buildings to become more efficient and reduce California's GHG emissions.

The CalGreen building code is broken down into sections that are very similar to the LEED standards. The non-commercial portion of the code includes a Planning and Design section that focuses on site selection, building features that promote reuse of materials, and alternative modes of transportation. The energy efficiency and water efficiency section focuses on reducing consumption, much like the Energy and Atmosphere and Water efficiency section on the LEED standards. The building code includes a Material Conservation section that promotes the use of recycled materials. Finally, the building code includes a section on environmental quality, which stresses the use of non-toxic materials. According to Lewis (2010), the CalGreen code roughly translates to 10 LEED certification points. The first voluntary standard translates to roughly 20 LEED points and the second voluntary standard translates to roughly 40 LEED points, which is equivalent to the USGBC's lowest level of certification.

The importance of developing *green* has evolved over time and California has taken the first steps in setting industry standards. The USGBC and US EPA have made very convincing arguments regarding the increased rental rates and lower vacancy rates for buildings that went *green*. The next section discusses the concerns about standardizing *green* development.

Concerns for Green Standardization

Given that feasibility is the interaction between development costs and market rents, the CalGreen building code raises reasons for concern. The code gives local jurisdictions the ability to raise the building standards beyond the established minimum at any point in time. For example, San Francisco developed *green* standards above the CalGreen requirements and incorporated them into the building code (Longinotti and Mathai-Jackson, 2011). Lewis (2008) explains that the goal of the USGBC is to raise gradually the LEED development standard over time in order to balance the construction costs with the environmental protection. Over time, construction technology will advance and more developers will find it feasible to develop at a platinum level in today's standards.

However, until feasibility catches up to the desired *green* development goals, artificially raising standards will only push development to locations where it is still feasible. Gleaser (2011) explains that the rising development costs in places like California or New York pushes development to other places that are cheaper and easier to develop. A rental premium for *green* development in San Francisco may not guarantee the same rental premiums in Sacramento because *green* building demand could differ in each city. The level of uncertainty regarding a market's ability to command the proper rental premium to make development feasibility increases the developer's risk and decreases the chance of development occurring in particular markets.

Lewis (2010) suggests that the next phase is incorporating existing buildings into the CalGreen Code to require proposed renovations to comply with *green* standards. The Sacramento region has approximately 90 million square feet of office space and nearly three quarters of that space is class B or below (Colliers, 2009). The aging building stock presents a major opportunity for redevelopment that could incorporate many *green* principals. However, increasing the *green* standard beyond what individual markets can stand might push development, as Gleaser (2011) describes, out to markets that are more feasible. Without redevelopment, the older building stock will release more GHG than necessary and slow California's progress in reaching the emission goals established in AB 32.

Conclusion

In this introductory chapter, I discussed the impacts the built environment has on the climate change and the evolution of *green* policies aimed at reducing its effects. The section also explores the three *green* building standards found in California and the benefits of each. Furthermore, this chapter discusses the potential cost of *green* development and its impact on feasibility and potential concern for developing a *green* standard that is too aggressive.

In the remaining part of this thesis, I will next discuss the existing literature on variables that affect rental values of all buildings, energy related rental effects, and non-energy related effects, and a hedonic model for rental prices. The primary purpose of this chapter is to research the theory and existing models that research rental values to inform my study.

Using the existing theory and research, in Chapter 3 I will discuss the methodology I use to determine if rental per square foot premiums exist in all markets for *green* buildings. I will explain the CoStar dataset and briefly summarize the data. Finally, I will discuss the model, including the functional form of each variable used in the regression analysis used to describe the quality, size, location, and interaction between variables.

In Chapter 4, I discuss the results of the regression analysis, specifically addressing the interaction variables that I use to describe differences in market demand. I also discuss some surprising findings.

In the last final Chapter, I interpret the findings of Chapter 4 and offer some policy implications of my findings. I investigate the interaction variables further and summarize the implications for the different submarkets markets based on the regression findings. I also offer recommendations for future studies and policy that addresses the future of g*reen* buildings and their standardization.

Chapter 2

LITERATURE REVIEW

Numerous researchers have developed models using regression analysis to explain why commercial buildings rent at different rates. The researchers use observable data on the buildings, markets, and users to develop statistical analyses that can explain the variation in rent. This literature review examines the existing analyses for rental rates and the effects of *green* development on rents. The review focuses on four central themes.

The first theme serves to examine the existing hedonic models to predict commercial building rental rates and models to predict the effect of *green* building on rentals. The second theme focuses on explaining key variables that affect rental rates for all buildings. The third theme discusses why energy related benefits of *green* buildings could produce a rental premium. The fourth theme focuses on the non-energy related effects of *green* buildings that could differentiate depending on demand. I will use the review of the existing models and discussion of the variables to develop my own regression model to determine the effects of *green* buildings.

Explanation of Key Rental Predictors

Quality

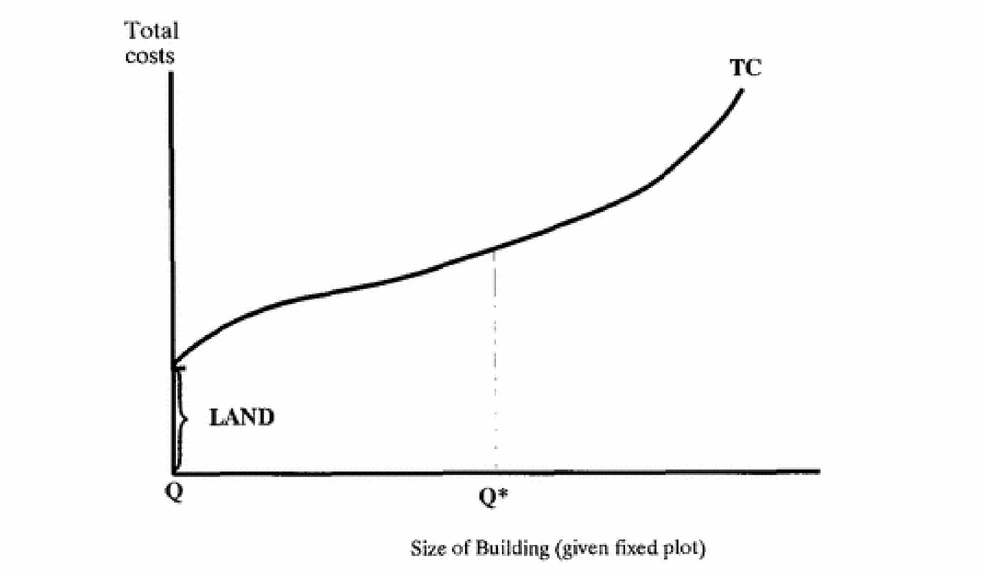
The age of the building decreases the ability of the building to increase rents. This is mainly due to what Baum (1989) describes as the physical deterioration of the construction material and the utility of the building over time. Weather detracts from the outside appearance and the effectiveness of the mechanical systems, such as the heating, ventilation, and air conditioning (HVAC) system. In addition to the aesthetics of the building, Wartzebach, Miles, and Cannon (1987) find that the functional obsolescence of a building also plays a role in the building's power to charge market rents. They find that changes in building standards and advancements in technology can make older existing building less functional. Baum's (1993) survey of building tenants finds that the internal functions of the building ranked as more important than the overall aesthetics of the exterior. He also finds that age alone accounts for almost 38 percent of the decline in value. Major rehabilitation of a building reverses the effects of age by updating technology and aesthetics. In certain markets, such as Manhattan where developers renovate buildings frequently, the effects of age are insignificant (Shilton and Zaccaria (1994).

Building Size

Shilton and Zaccaria (1994) look at buildings from different markets and find that taller buildings have a higher capacity to concentrate more tenants in one building. Clapp (1980) argues that tenants may pay a premium for buildings that can accommodate tenant clustering. Shilton and Zaccaria (1994) also find that larger buildings generally have larger floor plans, meaning that tenants are better able to design the layout of the office. As a result, larger buildings can accommodate more tenants' needs, so these building have higher demand.

However, Cowell, Munneke, and Trefzger (1998) find that as average floor areas and number of floors increase, rent will increase, but at a lower rate for each additional square foot of average floor area. Their finding suggests that rents will follow a concave slope as specified in point 0 to Q_* in figure 2.1 below. The findings suggest that the utility of increasing space is less valuable to tenants as the size increases. Although, Shilton and Zaccaria (1994) find that when a developer continues to add more floors, rental rates will increase more quickly as seen to the right of point Q_* in figure 2.1 below.

Figure 2.1 - Building Size and Rent



Source: Shilton and Zaccaria (1994)

Location

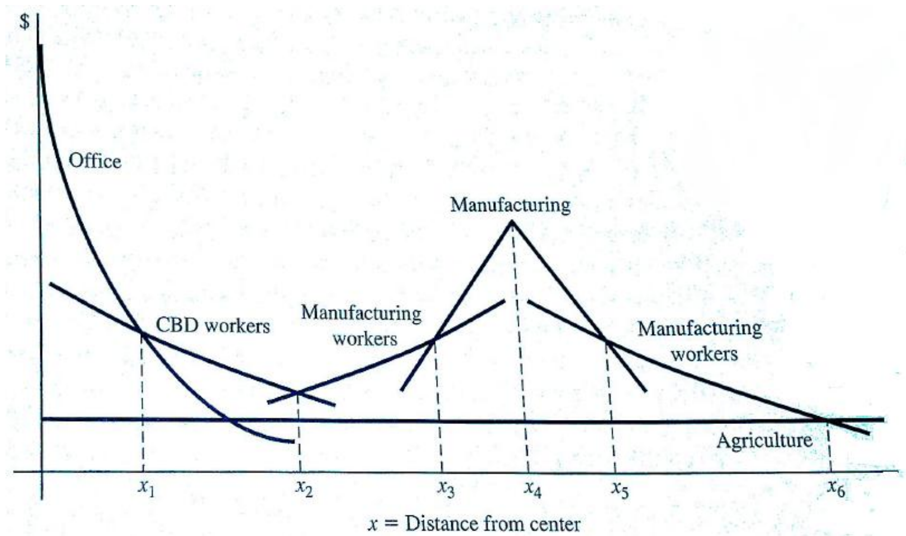
The physical location of a commercial building has a major effect on the rental rate of buildings. Dunse and Jones (1998) find when they divide Glasgow, Scotland into sections, each section had a different effect on the rent. The difference in effect shows that there are differences in submarket effects that drive the effect on rental.

Grissom and Diaz (1991) explain that we can divide the location driving forces into three categories: appearance of the surrounding area, the relationship to the surrounding area, and the interrelationship of the community. The first force mainly concerns the general appearance of a location. The relationship of the area considers the physical distance of amenities in the surrounding area, while the last force considers the interactions of businesses, such as office workers, restaurants, and shopping stores (Dunse, Leishman, and Watkins, 2000).

Businesses will choose to locate near places that have other businesses that closely relate in order to attract additional customers and profits (O'Sullivan, 2007). The potential for higher profits provides an incentive to pay higher rent for the space. Areas that have higher cluster densities tend to have higher rents, largely due to the value of the face-to-face contact with support companies (Clapp, 1980). O'Hara (1977) developed a theoretical model to identify where a firm will choose to locate and purports that as density increases, rents also tend to increase. The link between density and rents partially explains why central business districts, or downtowns, typically demands higher rents than commercial property in lower density suburban districts.

Von Thunen (1826) theorizes that land rent is a relationship between the yield of the land and the costs to ship the product. Companies that choose to locate closer to the city center value the centrality because it is more profitable. Alonso (1964) further describes this relationship between distance and land rent by characterizing land uses and their willingness to pay. As we move further away from the city center, the type of uses change depending on the company's willingness to pay higher rents to locate closer to the city center (see figure 2.2 below). O'Sullivan (2009) explains that central locations place businesses closer to their customers, which can increase the potential profits. The potential profits minus the cost of travel dictates where businesses choose to locate.

Figure 2.2 - Bid Rent Curve



Source: O'Sullivian (2009)

Lang (2003) argues that the majority of the office space is located in the downtown area, based on the 13 metropolitan areas she studied. Office buildings are typically located closest to the CBD because of the high value of face-to-face contact. On the other hand, manufacturing is less concerned with face-to-face contact and values locations that offer large spaces for the equipment. As a result, office space will out-bid manufacturing near the CBD because office uses are more profitable closer to the CBD than manufacturing (O'Sullivan, 2011). The presence of most of the office space in the downtown could have an effect on the amount of clustering and rental premium. Drennan (2002) examines land uses in the United States and found that the businesses that dominate the downtown areas are producer services, which include finance, insurance, and real estate. These firms gain the most from face-to-face transactions, so they are the most willing to pay higher rents for space in the downtown district (Storper and Venables, 2004). United States Census data (2000) shows us that many downtown cities are experiencing faster job growth than adjacent suburban cities, which means demand and rents for office space should increase.

Drennan and Kelly (2011) look at the effects of dispersion of development on office rental rates and discover that cities with a strong downtown had office rents that were approximately $12 per square foot higher than suburban office rents. The authors argue that in these markets there is a strong clustering of the service providers, which tend to have the largest demand for downtown space. However, the authors did find that weak and or secondary markets were inconclusive as to the effect on rents. The authors' findings suggest that the city size has an effect on the potential rental premium.

During time of declining rents, tenants will rent larger spaces (Clapp, 1993). Alternatively, tenants tend to cluster closer together when it is more expensive to rent spaces. For example, Slade (2000) explains that the rental rate per square foot in class "A" buildings tend to decrease at a lower rate while markets decline because tenants choose to relocate from lower to higher class buildings. Lower average rents allow tenants of inferior buildings the opportunity to upgrade to higher class buildings. Clapp (1993) also finds that as the number of class "A" buildings increase by ten percent the rental change between 2007 and 2009 decreased by 3.9 percent, which further verifies Slade (2000) findings that class A buildings rental decreases at a slower rate.

Energy Effects

One of the major benefits cited in the literature is the energy savings *green* buildings can generate through more efficient designs and equipment. Katz (2002) claims that *green* buildings can have as much as a 30 percent energy saving, which could translate into $60,000 over 20 years for a 100,000 square foot office building. In addition, *green* buildings are more likely to have on-site renewable energy sources that could also offset the costs of operation. Wiley, Benefield, and Johnson (2010) explain that many commercial leases include owner reimbursements clauses that places utility costs on the tenant. The energy savings for tenants in *green* buildings could allow the tenants to pay above the market rate for similar non-green buildings.

Turner and Frankel (2008) find that Energy Star buildings are six to ten percent more energy efficient than LEED certified buildings, but most LEED certified buildings are more energy efficient than expected. The author finds some instances where certain buildings consume more than the national average, which could be driving the findings of the other studies. We should see the energy related premium in every market, since the direct cost savings results in additional available funds available for rent. However, the other benefits of LEED or Energy Star certification can have different affects depending on the market. In the next section, I review the literature regarding the effects of *green* features that are demand driven.

Non-Energy Effect

Work Environment

The literature suggests that energy savings is a major component of the rental premium for both energy star and LEED certified buildings, but another major factor is the improvement of the working environment. Based on surveys of occupant satisfaction with LEED certified buildings, office furnishing, maintenance, air quality and lighting positively contributed to the overall satisfaction of the occupants. Many of the LEED and Energy Star building renovations include individualized lighting and thermal controls that allows the lighting and climate to suit the tenant's unique needs. Occupants in buildings that did not allow individualized control over temperature were far less satisfied and productive than occupants in buildings that individualized control (Lee and Guerin, 2009, Huizenga et. al 2006, Heerwagen and Zagreus, 2005, and Leaman and Bordass, 2005).

One of the more infamous case studies of the West Bend Mutual Insurance headquarters in West Bend, Wisconsin, found that the upgrade to the HVAC and lighting system allowed more individualized control over the temperature and lighting. The company saw an increase of sixteen percent in case processing after the renovation, which translates to almost $350,000 in labor dollars (Romm and Browning, 1998). Improved lighting, especially natural light, has shown to decrease the level of depression in employees, which could increase the productivity of employees by as much as 2 hours per employee per year (Singh et. al, 2011). However, Boyce, Hunter, and Howlett (2003) suggest that improvement in lighting will not guarantee improved productivity, but poor lighting conditions can strain the eyes and create glare that could inhibit productivity.

Ulrich (1984) compares hospitals with windows and without windows and found that window patients recovered almost one day sooner than patients without a window did. Designing a building that encourages natural lighting and outdoor views may decrease the number of sick days an employee takes. Most companies in the United States are responsible for covering health care costs and lost productivity losses. Fewer sick days means the employee is more productive in a given year, which could increase profits and decrease health expenses for companies. This has become even more apparent with the passage of the Affordable Care Act of 2010, which requires employers and employees to hold at least a minimum amount of health care insurance (Manchikanti and Hirsch, 2011).

Improved air quality is another well-documented benefit of *green* buildings that can contribute to additional cost savings. Singh et. al (2010) find that employees that moved from a non-LEED to a LEED certified building gained roughly 1.75 work hours per year in productivity from the improved air quality. Wargocki, Wyon, and Fanger (2000) isolates the effects of improving air quality and found typing speed and document accuracy increases by as much as 1.5 percent. The increase in speed and accuracy increases productivity and reduces risks for employer, since employees spend less on administrative tasks.

The effects of improved productivity, whether it stems from improved lighting, heating, or air quality, have shown to have an impact on overall profitability. The increase in potential profits could drive tenants to locate in *green* buildings and the potential cost savings in productivity could afford potential tenants the opportunity to pay a premium for rent.

Social Responsibility

Beyond profits stemming from improved productivity in the work place, the literature finds that businesses value qualities that meet certain social goals. According to the USGBC (2006), obtaining the platinum level LEED certification can decrease energy usage by 34 percent and diverts roughly 200 tons of waste from landfills. Businesses that rent *green* spaces can send a message to customers about the firm's culture/commitment to preserving the environment (Smith, 2007). A commitment to social responsibility can positively affect a company's reputation and give it a competitive advantage (Eberl and Schwaiger, 2005). Customers are also more satisfied with products, or services that they know come from a business he or she perceives as socially responsible (Fornell et al., 2006). Luo and Bhattacharya (2006) look at the effects of social responsibility and customer satisfaction on the market value and find that when a company was socially responsible and had a quality product customer satisfaction increases and lowers the firm's non-market risk by .205 percent. Increased customer satisfaction can increase customer loyalty and willingness to pay (Bolton and Drew, 1991). For example, Homburg, Koschate, and Hoyer (2005) conducts an experiment and found that 1 unit increase in customer satisfaction increase the customer's willingness to pay by 7.6 percent.

Increased profitability provides an incentive for businesses to invest in socially responsible products, such as Energy Star and LEED certified buildings. Eichholtz, Kok, and Quigley (2009) examine the tenants in LEED certified buildings to determine if specific industries are more likely to rent *green* building and found that tenants that choose to locate in a LEED certified building typically occupied much larger spaces. The authors suggest that this is due to the tenants' corporate social responsibility strategy. However, the literature falls short in making any conclusive determinations that tenants are cognitively choosing to locate in *green* building for social responsible reasons.

User

Differences in the preferences and expectations of the tenants' customers will drive the decision about the type of buildings the tenants will lease. Creyer and Ross (1997) study consumer purchasing behavior and find that customers' expectations about a product drives their decision-making. All things being equal, people will generally choose to have organic products or products that do not use child labor. However, Auger *et al* (2003) find that the level of importance of the feature dictates the consumer's willingness to pay or act. While developing the theoretical framework for why "companies go *green*," Bansel and Roth (2000) find that corporations tend to meet expected norms, meaning there could be dramatic differences in norms between the types of tenants, industries, and markets.

Heinkel, Kraus, and Zechner (2001) and Derwall (2007) find that environmentally friendly companies have lower capital costs and higher investment rates. The amount of capital available to socially responsible projects and companies is approaching $3.8 trillion in 2012 (SIF, 2012). However, not every local market has *green* funds available, so many of the companies have to resort to public capital and investors.

Dirk and Dreux (1990) and Pagano, Panetta, and Zingales (1998) argue that transactional costs, loss of control, and takeover risks prevent many small businesses from using the stock market to gain access to public funds. Pagano, Panetta, and Zingales (1998) further explain that the size of the firm is a major determinant of whether a company will proceed with an initial public offering (IPO), or when the company first sells ownership of the firm to the public. As a result, larger companies dominate the stock exchanges and are more likely to capture the *green* public capital to fund their financial needs. As a result, they have a higher potential return for incorporating a *green* culture.

Both small and large firms must meet public expectations, or risk governmental intervention, financial loss, and market penetration (Bardon, 2001 and Karpoff, Lott, and Rankine, 1999). Larger companies generally have a larger clientele that are more widely dispersed, which generally increases the degree of public scrutiny. Larger firms need a more comprehensive corporate socially responsibility plan to display its commitment to the stakeholders (Pagano, Panetta, and Zingales, 1998). However, large publically traded companies have the most exposure to this risk, since the public investment correlates directly to the firm's financial returns. Eichholtz, Kok, and Quigley (2010) argue that investing in *green* buildings, such as LEED or Energy Star certified building, will build the company's reputation, and lead to increased investment. McWilliams and Siegel (2001) suggest that large firms are more capable of investing in corporate responsibility because of the economies of scale that make it financially feasible.

Market

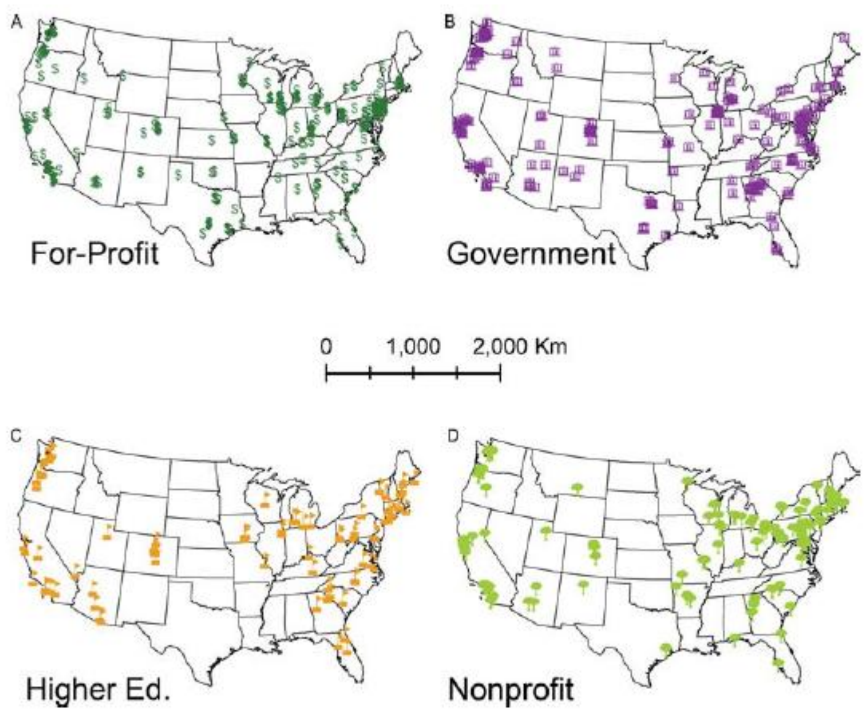
Whyte (1993) discusses the growing trend towards matching the building size to the size of the company. Naturally, large companies require larger spaces, while small firms require smaller spaces. Shelton and Stanley (1999) tells us that larger markets have a higher number and density of larger companies as tenants. Based on the literature regarding larger companies, we would find that markets with more large companies would also have a higher demand for *green* buildings. For example, Cindell (2009) finds that Fortune 500 companies are approximately 24 percent more likely to rent LEED certified buildings.

Cindell (2009) also finds that a 4.34 percent increase in income and 4.5 percent increase in education produce a ten percent increase in the likelihood of a *green* building development within a city. The author argues that more educated and affluent people are more aware of the benefits of green buildings and can afford to reward businesses for their corporate responsibility. The businesses in larger cities have a greater incentive to rent green building because of the rewards from the customers.

Nord (1980) looks at city population size and education level and finds that larger cities tends to have a higher concentration of more educated residents, suggesting that larger cities would have a higher demand for green buildings. Baum-Snow and Pavan (2012) look at the wage gap between large and small metropolitan statistical areas and find that households in larger cities typically have more disposable income. For example, figure 2.3 below shows the clustering of green buildings in markets, particularly larger and medium sized markets, such as San Francisco, Los Angeles, Sacramento, and Riverside, California. Although green buildings tend to cluster in larger cities, Eichholtz, Kok, and Quigley (2009) find that only government agencies are more likely to rent green buildings. The authors argue that several federal and state regulations requiring government agencies are producing the effect.

Miller, Spivey, and Florance (2008) look at differences in the cost of going green and find that it costs approximately two percent more to develop green buildings in Merced than it does in San Francisco, California, see table 2.1 below. Casually observing the differences between San Francisco and Merced, we can see that the market size of Merced is much smaller than San Francisco. San Francisco was fifth in the nation in terms of building space certified green as of 2007, suggesting that there is more demand for green construction firms and suppliers. The greater demands allows for greater economies of scales, which reduces the overall production costs (O'Sullivian, 2009). As a result, larger or specialized *green* markets are more capable of supporting green development.

Figure 2.3 - Green Building Clustering



Source: Cidell (2009)

Table 2.1 - Cost of Green Development

Market	Platinum	Gold	Silver
USGBC Ave.	7.8%	2.7%	1.0%
San Francisco	7.8%	2.7%	1.0%
Merced	10.3%	5.3%	3.7%
Denver	7.6%	2.8%	1.2%
Boston	8.8%	4.2%	2.6%
Houston	9.1%	6.3%	1.7%

Source: Miller, Spivey, and Florance (2008)

O'Sullivan (2009) explains that the clustering of likeminded individuals in cities drives the demand for buildings types and features. Kahn and Vaughn (2009) test this hypothesis with respect to the likelihood of building green buildings and find that as the environmental factor, measured in historical voting history for environmental proposition, increases by 10 percent the likelihood a green building is built increases by 5.87 percent. The author suggests that customer preferences for environmentally conscious buildings and businesses will differ depending on location.

Hedonic Model

Rental Model

According to Rosen (1974), a hedonic model allows us to predict the market's willingness to pay for individual attributes. Using information collected on the individual features of each building, we can determine the value each feature adds to the total rental. For example, Clapp (1980) looks at the rental values in the Los Angeles Metropolitan area and find three significant rental determinants: building quality, size, and location.

Hough and Kratz (1983) and Vandell and Lane (1989) further test the effects of "good architecture" as defined by the tenants and building owners and find that an increase from lowest quintile designed building to the highest quintile building increases rents from $27.58 per square foot to $30.81 per square foot for newer buildings. However, older buildings with "good architecture" did not experience a significant rental premium. The study suggests that obsolescence is a key rental determinant in terms of appearance and functionality of the building. Cannaday and Kang (1983) and Brennan *et al*. (1984), further confirm that size, quality, and location are major drivers of commercial rental rates in Illinois markets. The authors find that locating one mile closer to Madison Street and LaSalle Street in Chicago main business district, increases rent per square foot by .72 percent. After controlling for the variables in the table, the authors' model was able to explain approximately 89 percent of the rental variation using a log-linear form of the variables. The log-linear equation looks at the expected increase in rentals for a one-unit increase in the observed variable.

Dunse and Jones (1998) add to the theory by including physical accommodation variables, such as air conditioning, carpeting, lighting, presence of recreation area, and other internal services, in the model that predicts commercial office buildings rental in Glasgow, Scotland. The authors find that only some of the physical accommodation variables are significant, including air condition adding $18.85 per square foot, carpet adding $8.03 per square foot, and raised floors adding $13.96 per square foot to the total rent per square foot. Ho *et al.* (2005) also looks at the importance of property specific features and find that functionality, measured by floor size and efficiency, services, measured by work environment and climate, and access, measured by amount of parking, accounted for approximately 75 percent of tenant's assessment of building quality. The studies show some significance for the inclusion of specific physical accommodations, but the studies only includes one market. Furthermore, the conclusion of the survey data only measures the tenant's perception of the utility from each feature, but it does not measure the true willingness to pay.

Several researchers have used appraiser and real estate agents' assessment of building class as a proxy for interior features and building quality "(Gascock *et al*., 1990, Wiley, Benefield, and Johnson, 2010). Fuerst and McAllister (2011) find that rental per square foot increases by .12 percent when the quality of a building increases from "B" to" A. The building class rates building on a scale from "A" (best quality) to "F" (lowest quality) on the building's quality, features, and functionality. The rating also incorporates depreciation and obsolescence of the building over time. Given that the rating represents numerous factors, including it in a hedonic model will bundle the effects of the separate building features and age, but it will control for the quality of the buildings.

The literature on the hedonic model for commercial rental suggests that rental is a function of the building age, size, location, and proximity to amenities. In the next section, I review the model that explains rental variation for green buildings.

Green Building Model

Eichholtz, Kok, and Quigley (2010b), Fuerst and McAllister (2011), Miller, Spivey, and Florance (2008) develop and expand the existing hedonic model for commercial buildings to explain the rental premium for LEED and Energy Star certified commercial buildings. The model considered controls for age, building size, site area, and submarkets, but the authors include a variable for LEED or Energy Star certification. After including the certification information, Fuerst and McAllister (2011) find that LEED and Energy Star buildings are statically significant and lead to an approximately five percent and four percent rental premium , respectively, compared to non-LEED or Energy Star buildings. The other authors find similar results, but the magnitudes differed slightly. Partly due to differences in the time and markets they used.

Eicholtz, Kok, and Quigley (2009) find that tenants in energy star buildings are willing to pay approximately three percent above market rental rates. The authors also find that LEED buildings did not produce a significant rent premium. Fuerst and McAllister (2011) find similar results in that LEED certified buildings had a negative effect on vacancy rates, whereas Energy Star buildings had a positive effect. One explanation for the difference between LEED and energy star buildings could be that tenants value energy efficiency more than the sustainable qualities USGBC requires for LEED certified buildings. However, the limited data and great diversity in submarkets and building selection could also be driving the results. In subsequent studies, LEED buildings had significant and positive rent premium (Wiley, Benefield, Johnson, 2008).

Most of the authors control for location by comparing similar buildings that are adjacent to the LEED or Energy Star building. For example, Eichholtz, Kok, and Quigley (2009) first used a geographic information system to map the location of the green buildings and selected similar non-green buildings in terms of quality and size that are within a quarter mile of the green building. The three major issues with this practice is that first, a quarter mile may not represent the true submarket for a region, second, it does not identify the effect different submarkets have on the rental premium for green buildings, and third, heterogeneity in building features makes selecting similar buildings extremely difficult. Fuerst and McAllister (2011) use actual submarkets within cities, but the study did not analyze the interaction between location and green buildings. Variation in location and submarkets may affect the presence rental premium, suggesting some areas might not experience significant rental benefits from green buildings.

One of the largest criticisms of using the LEED or Energy Star efficiency rating variables in the model is that it bundles the effects of specific green features and reports the effect of the system as a whole, much like the building class. The inclusion of the LEED and Energy Star variable also reports the perceived value of the certification itself. However, including the certification does capture the effect of the green system as a whole, which several researchers find the certification satisfactory for comparative purposes (Eichholtz, Kok, and Quigley, 2010, Fuerst and McAllister, 2011, and Miller, Spivey, and Florance, 2008).

Understanding the limitation in the data, Eichholtz, Kok, and Quigely (2010b) study the rental premiums and controlled for the measured and unmeasured characteristics of the certified and uncertified commercial buildings by using a propensity variable that captures the likelihood of a given building to be certified. The authors find that LEED and Energy Star buildings add approximately 5.8 and 2.12 percent to the rental rate charged, respectively, to the rental while also controlling for size, age, location, and proximity to amenities. This method assumes that the observed variables are enough to assess the likelihood of a building incorporating green features. Given that the specific features are not available in any widely available dataset, it is unlikely that the propensity variable will actually identify the differences in certified and non-certified buildings.

Although somewhat limited, several authors have attempted to isolate the effects of certain green features. Carter and Keeler (2008) study buildings that added vegetation and storm-water collection systems to rooftops, known as green roofs, and find the value of the building increased by approximately 10 to 14 percent, but the upfront costs are around 20 percent more than conventional roofs. Abbott and Lewis (2013) and Ichihara and Cohen (2010) use data from CoStar and control for buildings with green roofs in New York and Washington D.C and find that green roofs add approximately 16 percent to rents per square foot.

The largest gap in the hedonic model literature for green building is the lack of information on specific building attributes. According to Kubba (2012), there are huge differences between the type and efficiency of the "*green* features" a developer can incorporate into the building. Due to the variety of green features and needs of specific systems, it is difficult to differentiate and track the value of specific features. For instance, some buildings may need extensive upgrades to the HVAC system, while other buildings may only need minor adjustments due to variation in location. Although additional research needs to focus on identifying and controlling for specific green features in the hedonic model, the inclusion of the LEED and Energy Star variable does identify the effects of green development holistically. Appendix A summarizes the rental hedonic models for commercial buildings and the effect of *green* buildings on rent.

Conclusion

The literature on the model for rental values suggests that we can predict commercial rental rate by including variables that discuss age and quality, size, and location. We find that there is very limited information on the individual features of the commercial buildings, but we can control for the general quality by using the building class information. In lieu of specific building features variables, researchers have used information on LEED and Energy Star certification to proxy for green buildings. Generally, energy savings, work environment improvement, social responsibility, and variation in markets are the main reasons a tenant would pay a premium for green buildings. We expect all tenants to demand energy savings similarly, but the other reasons should affect tenants in various cities and markets differently. Chapter 3 will discuss the model and variables I will use to further investigate the variation in tenant's demand for green buildings in cities across California.

CHAPTER 3

METHODOLOGY

The literature in the previous chapter looked at the predictors of commercial office rental per square foot and theory of *green* rental premiums. These key predictors affecting rental include quality, size, and location. The magnitude of the effect could differ depending on market demand, especially the *green* building effects. I hypothesize that certain markets lack sufficient demand for *green* buildings resulting in lower rental premium or do not significantly affect rent. To test this theory, I use regression analysis to identify the interaction of *green* buildings and different submarkets across California. Regression analysis uses statistics to isolate the effects of the causal variables on the dependent variable (average rent per square foot), while controlling for other variables that affect the dependent variable (Studenmund, 2011). The technique allows me to isolate the demand driven effects of *green* buildings in markets, while controlling for other factors previous studies find to impact rent, such as quality, size, and location.

This chapter discusses the model and data I use to explain the variance in commercial rents using regression. I first describe the model and functional form of the dependent and independent variables. Next, I provide a justification of the dependent variable (log rent per square foot per year) and the independent variables I use in the model of this thesis, which includes a discussion of the predicted effect on rent. I also describe how I code each variable in the regression analysis. I further describe the origin and methodology of the CoStar commercial real estate dataset.

Model and Functional Form

The regression analysis I run attempts to establish a cause and effect relationship between the dependent variable, log rent per year per square foot, and the independent variables I use to explain the variation in the rent in office buildings. The literature in the previous chapter identified three main predictors of rent: a building's quality, size, and location. The literature suggests that LEED and Energy Star certifications describe the *green* building quality and fit into the quality section of the model. However, the literature also suggests that there is an interaction between building features and the location based on differences in demand for specific features. The interaction variables in the model explore the demand-driven effects for *green* building features. I must include all of the independent variables to avoid omitted variable bias (Studenmund, 2011).

I represent the model as an equation below:

Log rent per square foot per year= *ƒ [Building Quality, Building Size and Type, Location, Key Interaction variables]*

The four functions below further specify the variables that explain the variance in rent. Table 3.1 in the Data section of this chapter further describes the variables and their anticipated effects on log rent per square foot per year.

Quality = *ƒ [Building Class, Year built/renovated, On-site parking, Parking Ratio, Superior amenities, Superior building features, Superior aesthetics, LEED Certification, Energy Star Certification, LEED X Energy Star, Near public transportation]*

Size= *ƒ [Building rentable square foot, Number of stories, Typical space square footage]*

Location= *ƒ [Submarket]*

Key Interaction Variables= *ƒ [LEED*Submarket area, Energy Star*Submarket area]*

Functional Form

The model equations can have a series of potential forms that represent the relationship between the independent variables and the dependent variable, but Studenmund (2011) recommends that theory support the functional form instead of variance minimization. The literature suggests that the relationship between rent and key explanatory variables is nonlinear. As Rosen (1974) suggests, I will use the log form of the dependent variable (rent per square foot per year), which I interpret as an increase in the independent variable produces a percent change in the rent per square foot per year.

Dependent and Independent Variable Justification

According to Studenmund (2011), the variables included in a regression analysis must have theoretical support. The following section provides justification for the variables used to describe quality, size and type, location, and key interaction variables.

Dependent Variable

This thesis uses the CoStar Property Professional© commercial property database's reported rent per square foot per year to measure tenant's willingness to pay for commercial spaces. Using per square foot per year rental allows me to compare buildings of different sizes, since larger buildings naturally collect more total rent than smaller buildings. This thesis focuses on the average per square foot per year rent to compare buildings holistically by eliminating the effects of location within the building.

The CoStar database does not report the rents in some buildings, so I dropped those buildings from the study. Although I risk introducing a bias into the regression results, including buildings that withhold rents would incorrectly report the rent for the building. For example, the buildings that do not report rents might be withholding the information because the rent is very low or high. Dropping these buildings could alter the explanatory variables' effects, since the model does not measure the effects on very high or low rent buildings. To address this issue, I have to recognize the potential bias when I interpret the regression results.

Quality Independent Variables

The quality function measures the appearance, construction quality, and interior functionality. Research shows that age is a major predictor of the physical deterioration of the construction material and functional obsolescence of the building, which means age has a negative effect on rent per square foot (Baum, 1989 and Wartzebach and Miles, 1991). Furthermore, tenants are willing to pay more for certain building amenities, such as onsite restaurants, day care, or adjacent hotels. Tenants are also more willing to pay for onsite parking or superior features such as 24-hour access, security systems, or conference rooms (Lee and Guerin, 2009, Huizenga et. al 2006, Heerwagen, 2002, and Leaman and Bordass, 2000). Office buildings that receive a higher building class rating generally are higher quality buildings, which increases rents(Gascock *et al.*, 1990, Wiley, Benefield, and Johnson, 2010). There are no class C LEED and Energy Star buildings, so I exclude class C buildings in the dataset. LEED and Energy Star buildings offer higher quality construction and energy savings, which I expect to increase rent (Eichholtz, Kok, and Quigley, 2010b, Fuerst and McAllister, 2011, Miller, Spivey, and Florance, 2008).

Size Independent Variables

Larger buildings allow a greater mix of tenants, especially tenants that require large spaces. As the building square feet increases, I expect the rental per square foot to increase, so I place a positive sign next to the rental square foot variable. I place a positive sign next to number of floors variable, since taller buildings allow tenants to cluster closer together. The clustering allows greater agglomeration and increases tenants' willingness to pay (Shilton and Zaccaria, 1994).

Location Independent Variables

The literature suggests that location is the single most important predictor of rent (Drennan and Kelly, 2011, O'Hara, 1977, and Clapp, 1980). The market area variable delineates a core area where uses interact and compete within the boundary. The market area is broken into competitive submarkets, where uses within one submarket compete with uses in another submarket all within the same market area. The literature does not identify the effect of specific submarkets, so I placed a question mark next to the market area and submarket area variables. However, the literature suggests that urban cores have more clustering, so I expect tenants are willing to pay more for spaces located in urban cores than space in suburban areas (Lang, 2003, O'Sullivan, 2011, and Drennan, 2002). The submarket variable controls for the difference between urban and suburban areas.

Key Interaction Variables

The literature suggests that some locations do not significantly contribute to the per square foot rental premium (Fuerst and McAllister, 2011). Although Eichholtz, Kok, and Quigley (2010b), Fuerst and McAllister (2011), Miller, Spivey, and Florance (2008) find that LEED and Energy Star significantly increase market rents, I did not find any literature on the interaction between specific submarkets and *green* buildings. Therefore, I place a question mark next to the submarket interaction variables.

Predicted Effect

Table 3.1 shows the variables used in the study, provides a description of the measurement, and the predicted effects on the average rent per square foot per year. I use + to represent a positive relationship, - to represent a negative relationship, and ? to represent an unknown relationship.

Table 3.1- Variable Name, Measurement, Predicted Effect

Dependent Variable	Measurement	Predicted Effect on the Independent Variable
Log average rent per square foot per year	Continuous variable that measures the average rent collected minus the vacancy rate.	
Independent Variable		
Size		
Number of stories	Discrete variable that measures the total number of floors within the building	+
Building rentable space	Discrete variable that measures the amount of rentable space within the building	+
Typical space square footage	Discrete variable that measures the square footage of the typical space within the building	+

Quality		
Year built/renovated	Discrete variable that measures when the building was constructed or had a major renovation.	-
Building class A	Dummy variable where 1 is Class A building, and 0=Class B	+
On-site parking	Dummy variable where 1=Building has onsite parking	+
Superior amenities	Dummy variable where 1=Building has adjacent banking, restaurant, day care, or hotel services	+
Superior building aesthetics	Dummy variable where 1=Building has atrium, balcony, courtyard, pond, waterfront, or sky lighting	+
Superior building features	Dummy variable where 1=Building has 24 hour access, card key access, security system, or conference room	+
Near public transit	Dummy variable where 1 means the building is within a 10 minute walk of bus or commuter rail line	+
LEED Certification	Dummy variable where 1=Building has LEED certification	+
Energy Star Certification	Dummy Variable where 1=Building has Energy Star certification	+
Energy Star X LEED Certification	Dummy variable where 1= Building has both Energy Star and LEED certification	?
Location		
Submarket area	Dummy variable where 1= submarket area and 0=not submarket area. See appendix B for a list of 296 submarket areas Downtown Sacramento submarket left out	?
Interaction		
Interaction-Submarket area and LEED	Dummy variable where 1= interaction between the submarket area variable and LEED building certification variable. Downtown Sacramento interaction left out	?
Interaction-Submarket area and Energy Star	Dummy variable where 1= interaction between the market area variable and Energy Star building certification variable. Downtown Sacramento interaction left out	?

Data

CoStar Group Inc. collects and updates data on commercial properties in one of the most comprehensive databases available in the United States. Established in 1987, CoStar employs roughly 1000 researchers to compile property features including building size, age, class, address, submarkets, sales price, and rental values per square foot per year. The researchers verify and update nearly 5.1 million data points per day by contacting brokers, developers, and owners. A researcher verifies the data before making each data point available in the database. The database contains both tenant and building level data points. As I identified in the Literature Review Chapter, no database collects specific *green* features on commercial properties, but CoStar began identifying buildings with LEED and Energy Star certification in 2005.

The dataset analyzed in this study includes approximately 4,600 observations, which spans across California in ten markets identified by CoStar. The Northern California markets include East Bay, South Bay, San Francisco, Marin, and Sacramento. Fresno is the only Central California Market. In Southern California, I include Inland Empire, Los Angeles, Orange County, and San Diego See figure 3.1 below for an overview map of the market areas and Appendix C for maps of the submarkets within each market. Appendix D summarizes the statistics for each variable, including the sample size (excluding missing observations), mean, standard deviation, minimum value, and maximum value. Several market areas have zero LEED Platinum, LEED Gold, LEED Silver, or LEED Certified, which could cause issues with the regression results. To address this issue, I combine all of the LEED buildings into one dummy variable. I assign a value of one if the building has LEED Certified, Silver, Gold, or Platinum certification.

Figure 3.1 – Market Overview Map

Source: CoStar (2013)

I provide a matrix of the correlation coefficients for each pair of independent variables and their statistical significance in Table 3.2 below. The correlation matrix identifies the degree to which one variable changes in relation to another. Variables with correlation coefficients between zero and positive one increase together, while variables with correlation coefficients between zero and negative one move in opposite directions. As the correlation coefficient approaches either negative or positive one, the relationship between the variables also increases. Statically significant correlation coefficients suggest the correlation is not random. I identify the statistical significance at the 90 percent confidence level or higher by placing an asterisk next to a correlation coefficient, which means there is only a 10 percent chance the results is random chance. I place two or three asterisks next to the correlation coefficient if the statistical significance is 95 or 99 percent, respectively, or higher.

Table 3.2 - Correlation Coefficient Matrix

	Log Rent	Energy Star	All LEED	Occupancy	Number of Stories
Log Rent	1				
Energy Star	0.2678***	1			
All LEED	0.2006***	0.442***	1		
Occupancy	0.2133***	0.1518***	0.1146***	1	
Number of Stories	0.3018***	0.4395***	0.4432***	0.1446***	1
Total Rentable Space	0.2677***	0.4886***	0.4796*	0.1291***	0.9024***
Typical Square Foot	0.0526***	0.2492	0.1323***	0.0475***	0.0362***
Age of Building	-0.0151	-0.0004	-0.051***	0.1145***	0.0297***
Parking Ratio	-0.1891***	-0.0807***	-0.1026***	-0.1049***	-0.3458***
On Site Parking	0.0573***	0.0113***	-0.0088***	0.0415***	0.0499***
Superior Amenities	0.0612***	0.0422***	0.0264	0.0311***	0.0351***
Superior Aesthetics	0.0211*	0.0606***	0.0394***	0.0517***	0.0503***
Superior Building Features	0.0709***	0.012	0.0042	0.0272**	0.0058
Class A Building	0.3406***	0.4986***	0.3184***	0.1349***	0.4734***
Near Public Transit	0.0701***	-0.0264**	-0.0304	0.0355***	0.0356

	Rentable Space	Typical Square Foot	Age of Building	Parking Ratio	On Site Parking
Total Rentable Space	1				
Typical Square Foot	0.3023***	1			
Age of Building	-0.0258*	-0.0936***	1		
Parking Ratio	-0.272***	0.064***	-0.0882***	1	
On Site Parking	0.0319**	-0.0309***	0.0201	-0.0386***	1
Superior Amenities	0.0289***	0.0085	0.0196	-0.0425	0.1956***
Superior Aesthetics	0.045***	0.0222*	0.0033	-0.0144	0.0721***
Superior Building Features	0.005	0.0118	0.0197	-0.038***	0.1812***
Class A Building	0.5112***	0.22***	-0.0835***	-0.0748***	0.0222
Near Public Transit	0.0262*	-0.0002	0.0637***	-0.079**	0.0695***

	Superior Amenities	Superior Aesthetics	Superior Features	Class A Building	Near Public Transit
Superior Amenities	1				
Superior Aesthetics	0.193***	1			
Superior Features	0.3981***	0.1534***	1		
Class A Building	0.0461***	0.0604***	0.0457***	1	
Near Public Transit	0.0666***	0.0491***	0.194***	0.0214	1

*Statistically significant at 90% confidence level;
** Statistically significant at 95% confidence level
*** Statistically significant at 99% confidence level

The correlation matrix helps identify explanatory variables that react too similarly to the dependent variable, known as multicollinearity. When variables are highly correlated and not significant, they can create a bias in the standard error of the regression coefficient. According to Studenmund (2011), correlation coefficients higher than 0.8 or lower than -0.8 indicate issues with multicollinearity

Conclusion

I explained the model, functional form of the variables, and provided a theoretical support for the independent variables that explain the effective rent per square foot per year. I also discussed the specific variables I use in my model and provided the predicted effect on rent per square foot per year. The literature focuses primarily on the existence on a rental premium, but ignores the effect of location and the interaction with other variables. This study focuses on these interactions to discover the potential interaction between *green* buildings and location variables. In the next chapter, I review the results from the regression analysis using the model discussed in this chapter. I summarize the directions and magnitudes of the regression coefficients.

Chapter 4

REGRESSION RESULTS

The previous chapter defined the model and variables I use in the regression analysis to test my hypothesis that only certain markets will experience a rent premium per square foot, per year, for green buildings (after controlling for size, quality, and location). In this chapter, I discuss my ordinary least squares regression analyses and results for five log-linear model, specifically highlighting the location interaction variables. I also discuss the tests and techniques I use to correct for multicollinearity and heteroskedasticity that affect the variable coefficients and standard errors.

Studenmund (2011) explains that ordinary least squares (OLS) is a regression technique that explains movement in one variable, caused by another variable, after holding the influence of other included causal variables constant. OLS reports regression coefficients. A positive coefficient means that an increase in the explanatory variable will cause an increase in the dependent variable, while a negative coefficient means that an increase in the explanatory variable will decrease the dependent variable. As the absolute value of the variable's coefficient increases, the change in the dependent variable increases. In addition, the reported standard error describes the relative precision of the coefficient. Studenmund (2011) explains that the standard error is simply the square root of the variable's variance, which means that increasing the number of observations will increase precision.

The regression results report coefficients and standard errors for each explanatory variable; however, the relative certainty the coefficients are producing an effect is explained in the p-value and the confidence interval. The confidence interval represents the variables' range of true values a specified percentage of the time, generally 90 percent (Studenmund, 2011). Used in conjunction with the confidence interval, the p-value tells us the lowest level of significance we could be confident in saying the coefficient is producing an effect greater than zero. For example, a p-value of .05 suggests that we can be 95 percent confident that the coefficient affects the dependent variable in a non-zero manner.

Rosen (1974) suggests that log-linear is the best functional form to predict commercial rental rates. The log-linear model means that I take the log of the dependent variable, rent per square foot per year, and I do not use logs for any of the explanatory variables. I run five models, which progressively add variables to explain the effects of LEED and Energy Star. I will use R squared and number of significant variables to choose which model is the best fit. The R squared reports the model's ability to explain variation in the dependent variable. For example, an R-Squared value of .60 means that the given model is able to explain 60 percent of the variation from the mean rent per square foot per year. A larger R squared means the model is able to explain more of the variation in the dependent variable better.

Multicollinearity

When two variables increase or decrease too similarly, the variables have a potential of creating an issue called multicollinearity. Multicollinearity will inflate the reported standard errors, which artificially creates insignificant variables. To test for its existence, I preliminarily look at the correlation coefficients, which report the degree in which variables move together. A correlation coefficient of one, or negative one, means the variables change perfectly together, or in opposite directions. Table 4.1 below reports the highly correlated variables and the variable dropped from the regression models. After removing the perfectly correlated variables, I further look for collinearity issues by running the variance inflation factor (VIF) test. The VIF test estimates the amount of variance added to the regression coefficients caused by multicollinearity.

Table 4.1- Highly Correlated Variables

Submarket Variable 1	Submarket Variable 2	Correlation Coefficient
East Palo Alto_Menlo Park East/EPA (Dropped)	East Palo Alto_Menlo Park East/EPA X LEED and Energy Star	1
San Jose_N. San Jose Brokaw X LEED	San Jose_N. San Jose Brokaw	0.8943
San Jose_N. San Jose Brokaw X Energy Star	San Jose_N. San Jose Brokaw (Dropped)	1
Pleasant Hill_Pleasant Hill X Energy Star	Pleasant Hill_Pleasant Hill Dropped	1
Ladera Ranch_San Juan Cap/S Clemente/D X Energy Star	Ladera Ranch_San Juan Cap/S Clemente/D (Dropped)	1
San Francisco_Potrero West of 101 Fwy (Dropped)	San Francisco_Potrero West of 101 Fwy X Energy Star	1
San Francisco_Rincon/South Beach (Dropped)	San Francisco_Rincon/South Beach X Energy Star	1
San Mateo_San Mateo Corridor/Hwy 92 Dropped	San Mateo_San Mateo Corridor/Hwy 92 X Energy Star	1
San Mateo_San Mateo Downtown South (Dropped)	San Mateo_San Mateo Downtown South X Energy Star	1
San Mateo_San Mateo Downtown North	San Mateo_San Mateo Downtown North X Emergy Star	0.8164
San Mateo_San Mateo Downtown South (Dropped)	San Mateo_San Mateo Downtown South X Energy Star	1
Los Angeles_Santa Monica Mountains (Dropped)	Los Angeles_Santa Monica Mountains X Energy Star	1
San Francisco_South Financial District	San Francisco_South Financial District X Energy Star	0.8316

San Francisco_South Financial District	San Francisco_South Financial District X Energy Star	0.9606
Santa Ana_South Santa Ana (Dropped)	Santa Ana_South Santa Ana X Energy Star	1
Orange_The City Area	Orange_The City Area X Energy Star	0.8449
San Francisco_Union Square Dropped	San Francisco_Union Square X Energy Star	1
San Ramon_Bishop Ranch X LEED	San Ramon_Bishop Ranch X Energy Star	0.9391
Los Angeles_Century City X LEED	Los Angeles_Century City X Energy Star	0.8861
East Palo Alto_Menlo Park East/EPA X LEED	East Palo Alto_Menlo Park East/EPA X Energy Star (Dropped)	1
Santa Clara_Mission College Area X LEED	Santa Clara_Mission College Area X Energy Star	0.8164
San Jose_N. San Jose Brokaw X LEED	San Jose_N. San Jose Brokaw X Energy Star	0.8943
San Diego_Old Twn/S Arena/Pt Loma X LEED	San Diego_Old Twn/S Arena/Pt Loma X Energy Star (Dropped)	1
Santa Ana_Parkcenter Area X LEED	Santa Ana_Parkcenter Area X Energy Star	0.8164
Pleasanton_Pleasanton North	Pleasanton_Pleasanton North X Energy Star (Dropped)	1
Pleasanton_Pleasanton South X LEED	Pleasanton_Pleasanton South X Energy Star (Dropped)	1
San Mateo_San Mateo Downtown South X LEED	San Mateo_San Mateo Downtown South X Energy Star (Dropped)	1
San Francisco_South Financial District X LEED	San Francisco_South Financial District X Energy Star	0.8657
Alhambra_Western SGV X LEED	Alhambra_Western SGV X Energy Star	0.8941

Generally I find that the LEED dummy variable and the LEED interaction variables are somewhat correlated, which adds additional variance to the regression coefficients. To resolve multicollinearity, Studenmund (2011) suggests 1) increasing the number of observations to decrease the variance and multicollinearity; 2) dropping duplicative variables, which reduces the amount of variance; 3) doing nothing because the effects of omitted variables is worse than multicollinearity. I am unable to increase the number of observations because California has a fixed number of LEED and Energy Star Buildings until new construction adds more units to the dataset. I was able to drop the rentable square foot, since its measurement mimics the number of stories variable. I investigated the collinear variables further by dropping each in turn, but found that the collinear variable did not change. Therefore, I choose not to make any further multicollinearity adjustments to avoid the omitted variable bias. Appendix E summarizes the VIF scores for Model 5 that includes the LEED, Energy Star, and submarket interaction variables.

Heteroskedasticity

Next, I have to test for the existence of heteroskedasticity in the results, which occurs when the variance of the error term differs across observations. For example, consumer's willingness to pay for organic products in cities with relatively low incomes is presumably low because few low-income consumers can afford organic products. However, cities with relatively high incomes might have residents willing to pay more for organic products, but many high-income consumers may still not be willing to pay a premium for organic products. As a result, the variance in the error term is larger in high-income cities than low-income cities. The existence of heteroskedasticity can lead to false significance testing, incorrect interpretations, and inaccurate regression coefficients.

To test for its existence, I first use the Breusch/Pagan test, which analyzes the hypothesis that all of the error terms are constant for every observation. The test reports a chi squared of 77.33 and a probability of 0.0000, which means the sum of the error terms is approximately 77.33 and there is a 99.99 percent chance my observations are experiencing heteroskedasticity. To validate the finding from the Breusch/Pagan test, I run the Szroeter's test for homoskedasticity, which reports the probability that each variable is homoskedastic. Excluding the submarket variables, I find that only age, on-site parking, superior aesthetics, superior features, and buildings located near public transportation do not suffer from heteroskedasticity. I correct for heteroskedasticity by running the regression with robust standard errors (Studenmund, 2011). I report the corrected regression in Appendix F.

Model Results

Model 1: Energy Star, LEED, and No interaction

The first model controls for size, quality, and location of the buildings, but does not include any of the submarket interaction variables with Energy Star or LEED. Excluding the submarket interaction variables forces every location to affect the rent per square foot per year for *green* buildings equally. Assuming all locations are equal, Energy Star increases rent per square foot per year by 5.7 percent, while LEED increases rent by 9.4 percent in all markets. If a building has both Energy Star and LEED certification, then rent per square foot per year only increases by 1.55 percent in all markets. Appendix F summarizes the findings.

Model 2: Separate LEED Levels

Model 2 includes all of the same control variables for size, quality, and location, but separates LEED Certified and Silver certification from LEED Gold and Platinum Certification. Assuming every market affects green buildings equally, Energy Star increases rent per square foot by 8.0 percent, LEED Certified and Silver increases rent by 12.31 percent, LEED Gold and Platinum increases rent by 11.01 percent. If a building has both Energy Star and the LEED Certified or Silver certification, the rent per square foot per year only increases rent by 6.4 percent, while a building with Energy Star and LEED Gold or Platinum increases rent by 5.5 percent. The difference in the rent per square foot per year between the levels of LEED is only 1.3 percent, suggesting the level of LEED does not make large difference in rent per square foot per year premium.

Model 3: LEED Interaction Only

Model 3 changes the assumption that all markets are equal and looks at the interaction between LEED certified buildings and submarkets in California. While controlling for size, quality, location, and difference in demand for LEED buildings, Energy Star increases rent per square foot per year 7.5 percent in all markets. Surprisingly, LEED certification does not significantly affect rent per square foot per year in all markets after including the interaction between LEED and Submarkets.

After dropping the Downtown Sacramento submarket to use as a reference, there are approximately 24 submarkets in Model 3 where LEED buildings have a significant effect on rent per square foot per year. LEED buildings in Foster City located in the San Francisco Market and Brentwood located in the Los Angeles market, have rents per square foot per year 100 and 79 percent, respectively, more than a similar LEED building in the Downtown Sacramento submarket. This suggests that tenants in these markets have a greater demand for LEED certified buildings. I also find that LEED buildings in Pleasanton South, Greater Downtown Los Angeles, El Segundo, Navato, Lake Forest, or South San Francisco East Highway 101 submarkets have lower rents per square foot per year than Downtown Sacramento submarket, suggesting these markets have a lower demand for LEED certified buildings.

Model 4: Energy Star Interaction Only

When I replace the interaction between LEED certified and submarket variable with the interaction between Energy Star and submarkets in Model 4, I find that Energy Star and LEED certified buildings do not significantly affect rent per square foot per year. Much like model 3, specific submarkets have a significant effect on rent per square foot. Approximately half of the 35 significant submarkets decrease rent per square foot per year. Energy Star Buildings located in the Waterfront submarket of San Francisco and the Beverly Hills submarket in Los Angeles receive approximately 36 and 45 percent, respectively, more rent than an Energy Star building in the Downtown Sacramento Submarket.

Model 5: LEED and Energy Star Interaction

Models 3 and 4 do not capture location differences in demand for both Energy Star and LEED, so I run one more model that includes the Interaction between Energy Star and LEED interaction. I find that Energy Star significantly increases rent by approximately 9.4 percent across all markets, but LEED does not significantly affect rent per square foot per year at the 90 percent confidence interval. Conventionally, I would consider any variable below 90 percent insignificant, suggesting the variable does not affect rent. However, if we ignore the confidence criteria, I find there is an 88 percent chance LEED is decreasing rent per square foot per year by 6.2 percent. The negative effect of LEED suggests that tenants are unwilling to pay for the non-financial benefits of LEED, after controlling for the effects of Energy Star.

In addition to my finding for *green* buildings, I find that tenants are willing to pay 2.3 percent more for buildings that have one more parking space per 1000 square feet. This supports my initial hypothesis that tenants are willing to pay more for buildings that provide additional parking for employees. Furthermore, tenants are willing to pay .44 percent more per buildings story and 16 percent more for class A than class B buildings, which shows that rents for taller and higher quality buildings are higher. I also find that a one-year increase in age decreases rents by .23 percent. As Baum (1989) suggests, older buildings suffer from deterioration, which detracts from the utility of the buildings.

There are 19 submarkets that experience a significant affect when interacted with LEED buildings and 28 submarkets that significantly affect rent per square foot per year when interacted with Energy Star. Roughly, 11 of the submarkets have higher rents when I multiply them with LEED or Energy Star variable. The majority of the significant and positive submarkets are located in the Los Angeles market area. I find that model 5 is my preferred model, since it best accounts for most of the potential variables that could create an effect.

Model Fit and Preferred Model

The R squared reports how well the model is able to explain the movement of the dependent variable. I report the R squared for each of the six models in Appendix F of this thesis. The LEED and Energy Star Interaction variables in model 5 accounts for most of the variables that could affect rent per square foot per year established in the previous chapter. In addition, model 5 has the highest adjusted R squared .5813, which means the independent variables can explain approximately 58.13 percent of the variation in the dependent variable around its average value after considering the number of variables in the model. Therefore, Model 5 is the preferred model for this thesis. Table 4.2 compares the observed effect in model 5 with my predicted effect in the previous chapter. Table 4.3 summarizes the significant interaction variables of in Models 3 through 5.

Table 4.2 - Comparison of Observed and Predicted Effect

Variable	Model 5 Observed Effect	Explanation of Effect	Predicted Effect
Size			
Number of stories	+	As a building adds one more story, the rent increases by .44%	+
Building rentable space	Dropped for multicollinearity	-	+
Typical space square footage	NS	-	+
Quality			
Age	-	A one year increase in the age of the building decreases rent by .23%	-
Building class A	+	An A class building increases rent by 16%	+
On-site parking	NS		+
Parking Ratio	+	As a building increases the ratio of parking spaces to number of tenants by 1 it increases rent by 2.8%	+
Superior amenities	NS	-	+
Superior building aesthetics	NS	-	+
Superior building features	NS	-	+
Near public transit	NS	-	+
LEED Certification	NS	-	+
Energy Star Certification	+	An energy star certified building increases rent by 9.4%	+
Energy Star and LEED Certification	NS		?
Location			
Submarket area	See Discussion below		?
Interaction			
Interaction-Submarket area and LEED	See discussion below		?
Interaction-Submarket area and Energy Star	See discussion below		?

Table 4.3 - Significant Interaction Variables

Market	Interaction Variable (City_Submarket)	Statistically Significant Rental Premium		
		Model 3 (LEED Only)	Model 4 (Energy Star Only)	Model 5 (Both)
East Bay	Pleasanton_Pleasanton South X LEED	-39.99%		
	Oakland_Oakland Downtown X LEED	19.07%		14.84%
	Emeryville_Emeryville X LEED	18.50%		21.36%
	Oakland_Oakland Downtown X Energy Star		17.65%	
	San Ramon_Bishop Ranch X Energy Star		-8.00%	
Inland Empire	San Bernardino_East San Bernardino X LEED	11.27%		
	Corona_South Riverside X Energy Star		-17.56%	-10.03%
	Ontario_Airport Area X Energy Star		-21.48%	
	Ontario_Airport Area X LEED			-10.42%
	San Bernardino_East San Bernardino X Energy Star		-20.87%	
Los Angeles	Artesia_Mid Cities X LEED	27.74%		-1.00%
	Long Beach_Long Beach: Downtown X LEED	24.17%		3.14%
	Los Angeles_Greater Downtown X LEED	-22.70%		
	Canoga Park_Woodland Hills/Warner Ctr X LEED	13.45%		31.80%
	Los Angeles_Brentwood X LEED	73.78%		
	Northridge_Eastern SFV X LEED	17.65%		12.90%
	Carlsbad_Carlsbad X LEED	27.20%		12.23%
	Irvine_Irvine Spectrum X LEED	17.10%		
	Agoura Hills_Calabasas/Westlake Vill X LEED	9.60%		
	El Segundo_El Segundo X LEED	-14.21%		
	Agoura Hills_Calabasas/Westlake Vill X Energy Star		12.21%	
	Alhambra_Western SGV X Energy Star			-17.02%
	Aliso Viejo_Laguna Hills/Aliso Viejo X Energy Star		-3.57%	
	Anaheim_Anaheim Hills X Energy Star		1.55%	
	Artesia_Mid Cities X Energy Star		-0.87%	
	Beverly Hills_Beverly Hills X Energy Star		45.76%	44.09%
	Beverly Hills_West Los Angeles X Energy Star		3.68%	4.95%
	Buena Park_Buena Park/La Palma X Energy Star		-8.46%	
	Burbank_Burbank X Energy Star		20.39%	
	Camarillo_Camarillo/Point Mugu X Energy Star		-4.87%	20.60%
	Canoga Park_Woodland Hills/Warner Ctr X Energy Star			-12.17%
	Culver City_Culver City X Energy Star			-4.87%

Los Angeles	Culver City_Marina Del Rey/Venice X Energy Star			16.95%
	El Segundo_El Segundo X Energy Star		2.62%	6.77%
	Encino_Encino X Energy Star			-15.49%
	Hollywood_Hollywood/Silver Lake X Energy Star			21.92%
	Irvine_Irvine Spectrum X Energy Star		-5.63%	
	Los Angeles_Brentwood X Energy Star		20.48%	22.57%
	Los Angeles_Greater Downtown X Energy Star		-16.25%	-18.68%
	Los Angeles_Miracle Mile X Energy Star			2.89%
	Los Angeles_Miracle Mile X LEED			61.06%
	Los Angeles_Southeast Los Angeles X Energy Star		-13.10%	13.22%
	Oxnard_Oxnard/Port Hueneme X Energy Star		-3.16%	-1.02%
	Santa Monica_Santa Monica X Energy Star		49.92%	53.06%
	Ventura_Ventura X Energy Star		0.20%	2.32%
Marin	Novato_Novato/Ignacio/N Marin X LEED	-30.50%		
	San Rafael_San Rafael/Larkspur X Energy Star		25.40%	
	Santa Rosa_Santa Rosa X Energy Star			-27.72%
Orange	Foothill Ranch_Lake Forest/Foothill Ranc X LEED	-33.15%		-49.89%
	Costa Mesa_Costa Mesa X LEED	19.49%		-6.90%
	Huntington Beach_Huntington Beach X Energy Star		-16.43%	-16.29%
	Laguna Niguel_Laguna Niguel/Laguna Beach X Energy Star			-18.56%
	Newport Beach_Newport Beach X Energy Star			-8.14%
	Newport Beach_Newport Beach X LEED			28.14%
	Orange_The City Area X Energy Star			-11.33%
Sacramento	Rocklin_Roseville/Rocklin X LEED	37.21%		-14.22%
	El Dorado_El Dorado X Energy Star			-41.30%
	Rocklin_Roseville/Rocklin X Energy Star		-13.62%	-13.28%
San Diego	San Diego_Kearny Mesa X LEED	16.37%		
	San Diego_Sorrento Mesa X LEED	19.64%		
	San Diego_Scripps Ranch X LEED	27.15%		33.84%
	San Diego_Mission Valley X LEED	16.99%		0.47%
	Gardena_190th Street Corridor X Energy Star		-8.97%	
	Ladera Ranch_Mission Viejo X Energy Star		-3.09%	
	San Diego_Del Mar Hts/Carmel Valley X Energy Star		25.55%	27.76%
	San Diego_Governor Park X Energy Star			-5.23%
	San Diego_Kearny Mesa X Energy Star		-8.42%	
	San Diego_Mission Valley X Energy Star		-0.01%	
	San Diego_Scripps Ranch X Energy Star		8.06%	10.21%
	San Diego_Sorrento Mesa X Energy Star		16.50%	

San Francisco	South San Francisco_South SF East of 101 Fwy X LEED	-44.81%		-18.74%
	Foster City_Foster City/Redwood Shrs X LEED	110.48%		57.27%
	San Francisco_Financial District X LEED			-23.03%
	San Francisco_Waterfront/North Beach X Energy Star		36.63%	
South Bay	San Jose_Downtown San Jose East X LEED	26.10%		
	Cupertino_Cupertino X Energy Star		54.99%	
	San Jose_Downtown San Jose East X Energy Star		18.89%	
Blank cell - not significant or no observations				

Conclusion

In this chapter, I discussed the OLS regression process I use to answer the question: does location affect the rental premium for green buildings? I corrected for some of the multicollinearity by dropping the redundant variable total rentable square feet. I also found nearly half of my variables suffered from Heterskdasicity, so I ran robust coefficients to correct the issue. I found the preferred model (Model 5) includes the interaction variables, logs rent per square per foot, and leaves the independent variables in a linear form. Model 5 has an R square value of .5813, which means it is able to explain roughly 58.13 percent of the change in rent per square foot per year around the average value observed in this sample.

The results show that the rent per square foot per year premium for LEED buildings does depend on location, since I find that LEED buildings are not significant after controlling for location and the interaction with Energy Star and LEED certified buildings. The results also confirm my hypothesis that Energy Star buildings provide a rental premium in any market, given there are energy savings. The findings in the interaction between submarkets and LEED and Energy Star buildings could give clues as to which markets are likely to have rental premiums for green buildings. In the next chapter, I will further explore the interaction variable to develop potential reasons why certain markets affect rent per square foot differently, discuss the policy implication of my findings, and the limitations of this study.

Chapter 5

CONCLUSION

In Chapter One of this thesis, I discussed the need for improving the quality and development standards for office buildings in California to reduce greenhouse gas emissions. However, I questioned the demand for "green" office buildings in all urban areas. If there are differences in demand, requiring the same development standard under the CalGreen building code could increase development costs beyond what the market can absorb and thus stifle new office development in such markets. In Chapter Two, I investigated the causes of differences in demand for office rental properties across markets and in particular, the demand for green buildings, finding that size, quality, and location are the main components of rental premiums. Other authors find that LEED certification and Energy Star certification creates a rental per square foot premium for office buildings. However, several authors also find significant differences in the value of the premium for green buildings across market areas.

In Chapter Three, I developed a regression model that could explain differences in rent per square foot, using the suggested controls for quality, size, and location. The model also includes interaction variables that would measure the demand for LEED and Energy Star buildings. After running the regression analysis in Chapter Four with the submarket interaction variables, I find that LEED buildings do not significantly affect rent per square foot, but Energy Star buildings remains significant and positive. The findings confirm my initial hypothesis that demand for *green* buildings differs between markets and that Energy Star is more likely to have a positive effect on rent per square foot.

In this concluding chapter of my thesis on market demand for green buildings, I first investigate the submarkets that experience a significant rent effect for LEED or Energy Star to assess the potential explanation for the demand differences. The next section identifies policy implications affecting the CalGreen building code, based on the findings in Chapter Four. Finally, I identify the limitations of this thesis and suggest future studies to inform policy makers and local jurisdictions.

Exploration of Interaction Variables

The preferred model that includes the interaction variables between the submarket, LEED, and Energy Star discussed in the previous chapter finds that LEED buildings do not significantly affect rent per square foot in all markets, but certain submarkets do have a significant effect. Summarized in Table 4.5 of Chapter 4, I find 46 submarket interaction variables statistically significant, which have rental premiums above or below the Downtown Sacramento Submarket. Although I was able to identify the submarkets that affect rent, the regression results do not prove a causal relationship with the interaction variable. This section will explore the market areas to identify possible reasons submarkets are experiencing different demand for *green* buildings.

California: Energy Savings

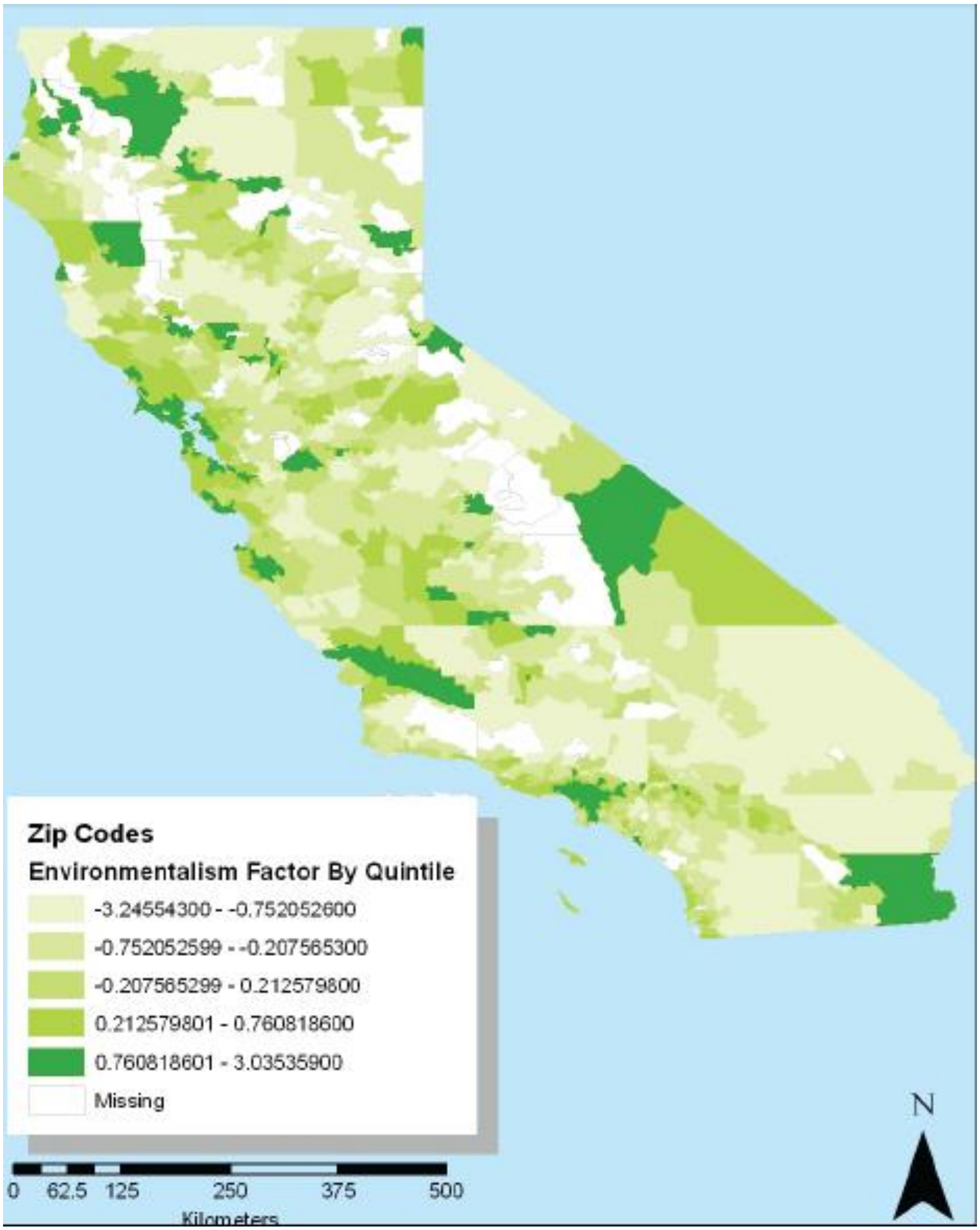
After controlling for all other variables, the results in Chapter 4 suggest that tenants in California are willing to pay a rental premium for a building that has Energy Star Certification in all submarkets. Given Energy Star focuses on conserving energy, the energy cost savings could increase tenants' wiliness to pay for energy star buildings. According to US EPA (2006) Energy Star buildings, on average, reduce tenants energy related costs by 35 percent. However, the willingness to pay for the energy savings differed across submarkets. For example, tenants in the Downtown Sacramento submarket are willing to pay approximately 9 percent more for Energy Star buildings, while tenants in Beverly Hills values Energy Star buildings 4.95 more than the Downtown Sacramento Submarket. Many of the utility companies offer users incentives for reducing energy consumption, which could increase demand for Energy Star buildings. For example, the City of Sacramento and the Sacramento Municipal Utility District collaborated to increase awareness of energy conservation and offered rebates for consumers that decreased energy consumption by 20 percent. The focus on energy conservation could be driving the results in Sacramento and other submarket.

On the other hand, tenants in California might be willing to pay less for LEED in all markets, suggesting that tenants are unwilling to pay for the non-energy related LEED features. However, the LEED certification variable is not significant in my preferred model. Once I controlled for the energy related effects from Energy Star, the value of the other green features disappear, but in some submarkets, the effects are positive. For example, tenants in the Downtown Sacramento Submarket are willing to pay 6.5 percent less, while tenants in the Woodland Hills Submarket are willing to pay 31.8 percent more than in Sacramento. The drastic difference in demand for green buildings features could be driving the difference in submarkets. According to LEED (2009), LEED buildings include energy related features, but the certification spans to several other areas, including water and material conservation. Many of these features do not monetarily compensate society or the developer, so the willingness of customers to reward businesses that invest in the other features primarily determines the rental premium. The results presented in Chapter Four suggest that customer's willingness pay drastically changes between markets.

San Francisco/East Bay Market Area: Education Pays

Tenants of Oakland and Emeryville are willing to pay approximately 14 and 21 percent more for LEED certified buildings. Foster City in the San Francisco submarket also experiences a 57 percent rental premium for LEED certified buildings. Interestingly, UC Berkeley and Stanford University are both relatively close to these submarkets, which could be influencing the education levels. Condell (2009) argues that higher educated people have a greater demand for LEED buildings. We can see that Emeryville and Oakland have a high concentration of highly educated people within their city boundaries. Approximately 72 percent of the Emeryville's population has at least an undergraduate degree, with 36 percent of the population having a graduate degree (US Census Bureau, 2010). Even more surprising, the median income for Oakland is about the same as Sacramento, however, undergraduate education levels are approximately ten percent higher and graduate education is six percent higher in Oakland. This provides further support to the hypothesis that education is increasing tenants' willingness to pay for LEED certified buildings. Foster City does have approximately 63 percent of its population with undergraduate degrees, but it also has median income that is nearly twice the state's median income, suggesting income could also play a role in the willingness of tenants to pay more for LEED buildings. Furthermore, Kahn and Vaughn (2009) rate locations based on political affiliation and historical environmental voting patterns by zip code and find that the Oakland submarket has one of the highest environmental scores in California, while Sacramento is close to the bottom quintile. This suggests that the customer base in Oakland is more environmentally conscious than Sacramento, therefore may reward businesses that rent green buildings. The dark green in Figure 5.1 below identifies the most environmentally conscious areas of California.

Figure 5.1 – Environmentally Conscious Locations

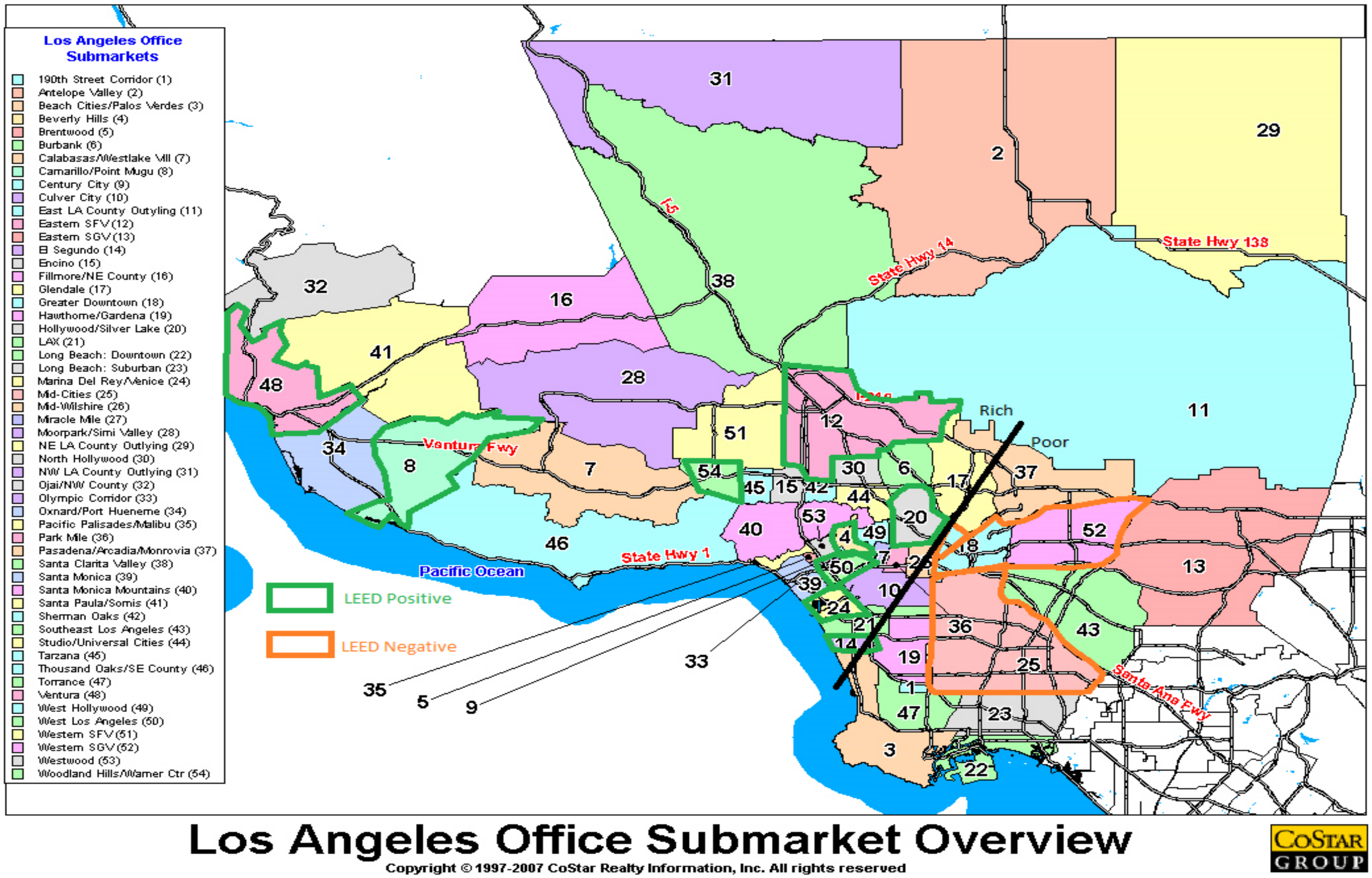


Source: Kahn and Vaughn (2009)

Los Angeles and Orange County Market Area: A Case for Income

The Los Angeles market area has a very diverse mix of education and income levels, which appears to affect the rental premium of LEED buildings. Figure 5.2 below identifies the significant submarkets for LEED within the Los Angeles market area. We can see a dividing line between the rich and poor areas of Los Angeles. Tenants in the more affluent submarkets (e.g. Beverly Hills, Malibu and Hollywood) are willing to pay a premium for LEED certified buildings. For example, tenants are willing to pay 61 percent more for LEED certified buildings in the Miracle Mile submarket, which has a high concentration of high-end retailers and very affluent residents in adjacent Beverly Hills and Hollywood neighborhoods. Conversely, the only three submarkets where tenants are willing to pay less than Downtown Sacramento submarket are in the less affluent areas of Los Angeles, including the Mid-Cities submarket. The Mid-Cities submarket includes the Watts and Compton neighborhoods, which are some of the poorest areas within Los Angeles and have historically had issues with crime and gang activity.

Figure 5.2 – Los Angeles LEED Submarkets



Source: Costar (2013)

The Newport Beach submarket in the Orange County market area further supports the theory that income drives the willingness to pay for the non-energy related feature of LEED. For example, Newport Beach's median household income is approximately 106,000 in 2010 (US Census Bureau, 2010). In addition, I find that tenants are willing to pay approximately 28.14 percent more for LEED certified buildings and 8.14 percent less for Energy Star buildings than Downtown Sacramento submarket. As Condell (2009) argues, more disposable income translates into a higher capacity to reward environmentally conscious businesses. As a result, tenants are willing to pay more for building space that further shows to the business' customers that the business supports the environment. However, the average low temperature is between 50 to 65 degrees, and the average high is between 63 and 72 degrees, suggesting there is a low payoff for energy conservation. As a result, businesses are not saving much money from locating in an energy star building, since energy costs are already low.

Policy Implications

California has a very diverse landscape and demographic that makes up the urban markets, which has created demand differences for products, including Green buildings. The results from this thesis highlight the demand differences in submarkets that drive rental premiums. Recognizing the differences is a key in developing appropriate policies that will balance the benefits from developing green buildings, while encouraging development.

Diverse Policy

The existing CalGreen building code has minimum development standards, but allows local governments to increase the standard to the two voluntary levels or any higher standard. Increasing the standard beyond the market demand for Green buildings can slow development and push growth to other markets that experience rental premiums. If cities increase the development standards beyond the demand, Table 5.1summarizes the likely harmed submarkets. Generally, the rental premium for green buildings in these submarkets is negative or barely positive, suggesting rents might be unable to compensate developers for the additional costs of building green.

Table 5.1 – Likely Affected Submarkets

Market	Submarket	Rental Premium: Model 5
Orange	Foothill Ranch Lake Forest/Foothill Ranch X LEED	-49.89%
Sacramento	El Dorado_El Dorado X Energy Star	-41.30%
Marin	Santa Rosa_Santa Rosa X Energy Star	-27.72%
San Francisco	San Francisco_Financial District X LEED	-23.03%
San Francisco	South San Francisco_South SF East of 101 Fwy X LEED	-18.74%
Los Angeles	Los Angeles_Greater Downtown X Energy Star	-18.68%
Orange	Laguna Niguel_Laguna Niguel/Laguna Beach X Energy Star	-18.56%
Los Angeles	Alhambra_Western SGV X Energy Star	-17.02%
Orange	Huntington Beach_Huntington Beach X Energy Star	-16.29%
Los Angeles	Encino_Encino X Energy Star	-15.49%
Sacramento	Rocklin_Roseville/Rocklin X LEED	-14.22%
Sacramento	Rocklin_Roseville/Rocklin X Energy Star	-13.28%
Los Angeles	Canoga Park_Woodland Hills/Warner Ctr X Energy Star	-12.17%
Orange	Orange_The City Area X Energy Star	-11.33%
Inland Empire	Ontario_Airport Area X LEED	-10.42%
Inland Empire	Corona_South Riverside X Energy Star	-10.03%
Orange	Newport Beach_Newport Beach X Energy Star	-8.14%
Orange	Costa Mesa_Costa Mesa X LEED	-6.90%

San Diego	San Diego_Governor Park X Energy Star	-5.23%
Los Angeles	Culver City_Culver City X Energy Star	-4.87%
Los Angeles	Oxnard_Oxnard/Port Hueneme X Energy Star	-1.02%
Los Angeles	Artesia_Mid Cities X LEED	-1.00%
San Diego	San Diego_Mission Valley X LEED	0.47%

Glaeser (2011) argues the development of the Southern states in the Sun Belt rose because states such as California and New York were too expensive and difficult to develop. The additional building requirements increase the costs to developers, thereby pushing development to cheaper and more profitable locations.

For example, I find that rent per square foot for LEED buildings in Ontario, CA is 10.41 percent less than Downtown Sacramento submarket. Tenants in Ontario are unwilling to pay a rental premium for LEED buildings, suggesting an increase in the development standards could increase construction costs. An increase in development obstacles could drive developers to adjacent markets that experience rental premiums, such as the Miracle Mile submarket in the Los Angeles Market area. However, not every submarket in Los Angeles experiences rental premiums. If Figure 5.2 accurately depicts the interaction between income and the demand for green buildings, then the less affluent submarkets of Los Angeles could also see development decline if officials raise development standards. It is important for officials to assess the demand for green buildings before increasing the standards to avoid disrupting the balance in the market.

Externality Pricing

Demand for *green* buildings may not exist in every market, but the societal benefits of developing *green* may exceed the added costs to developers. According to

Malvin (2008), *green* buildings can decrease greenhouse gas emissions and water consumption, which provides a benefit to everyone in the submarket and California. Economists call the added societal benefit from developing Green buildings a positive externality. However, I find that in some markets, tenants do not fully compensate developers for supplying this benefit. O'Sullivan (2011) argues that without compensation, developers will supply too few green buildings than the socially efficient quantity. Therefore, the developer needs to receive additional profits to close the gap in supply.

If a local jurisdiction wants to increase the minimum green development standard, the developer may need public concessions to entice development within the jurisdiction. In areas where the value of increasing the amount of developable space outweighs the costs of the additional green requirements in the building code could make green development feasible for developers. For example, LEED buildings in the Santa Rosa submarket rent for 27.72 percent less than LEED buildings in Downtown Sacramento submarket area. However, officials in the city of Santa Rosa and Marin County have historically limited the amount of development within their market area. As a result, allowing taller buildings allows developers to offset more of the initial development costs with added rental space (Levinson, 1997). The additional rental space could offset the added costs of developing to a higher green standard. Although this approach will not work in every market, local jurisdictions must recognize that if demand does not support the additional green requirement they must develop creative ways of closing the profit gap.

Align Development Requirement with Environmental Goals

The main goal of AB 32 is to reduce the amount of GHG emissions released in California. According to McGraw-Hill Construction Research & Analytics (2012), LEED requirements do decrease GHG emission; however, Energy Star focuses more on reducing energy consumption, which decreases GHG emissions to a greater degree. I find that Energy Star certification is significant and positive in more submarkets than LEED buildings, suggesting there is a greater demand for Energy Star. For example, I find that rents for Energy Star buildings in the Southwest Los Angeles submarket are approximately 13.22 percent more than the Downtown Sacramento submarket, which is the only positive rental premium submarket I found in the less affluent area of Los Angeles market area. Local jurisdictions could increase additional energy requirements, without sacrificing as much development. This would decrease the level of needed subsidization from the local governments, since the building owner would receive more rent from tenants. As a result, the total level of GHG emission would decrease because more markets could increase the development standard without the need for subsidies.

Limitations and Future Studies

Although I have identified the submarkets that have different demand for LEED and Energy Star buildings, this study stops short of explaining the differences. I theorize that income and education are key variables that explain the demand differences, but I cannot draw conclusion about it causality without further research. As a result, we need future studies to explore the potential effects of income and education on demand for Green buildings. Specifically, the Los Angeles market area provides a great opportunity to develop a case study between the more affluent submarkets, such as Beverly Hills, and the less affluent submarkets, such as Mid-Cities.

The findings and conclusions of this thesis are also limited to office buildings, since I only considered office buildings. Retail and other commercial tenants could demand *green* buildings much differently than office tenants, which could affect the submarkets that experience a rental premium for green buildings. The model for office space is likely different from retail or other commercial uses as well, so we need additional research that identifies these differences. Furthermore, the number of LEED and Energy Star observations available limits the conclusions a researcher can draw, since the variance in the observations is too large. Increasing the number of observations would decrease the variance and increase the number of significant submarkets. Adding significant submarkets to the analysis would enable the researcher to understand demand differences for Green buildings better.

Finally, this thesis used LEED and Energy Star buildings to proxy for the demand for green feature. However, the CalGreen building code is different from both of the certification processes, meaning the rental premiums might be different for different submarkets. Although I controlled for buildings constructed after California incorporated the Green building standards, I did not have enough buildings in my dataset to study the effects of the building code on rental premiums. Development activity in California is finally beginning to increase after a long hiatus, which means the new buildings must comply with the CalGreen building code. Once developers add enough buildings, additional research should focus on studying the rental premium and demand for CalGeen buildings. This will assist policy makers in determining the need for development subsidies in certain markets and determine how fast they can increase the building standards.

Conclusion

The findings from this thesis demonstrate the demand differences in submarkets for *green* buildings, which education, income levels, and preference could explain the differences. As a result, local jurisdictions that do not have significant demand need to realize that increasing the Green development standard above the minimum will only serve to push development to submarkets that are more profitable or out of California. To offset the lack of demand for green buildings, local jurisdictions could implement policy that would increase the profitability of developing Green buildings. Finally, the findings of this thesis suggest that tenants in California prefer the Energy Star certified buildings and are willing to pay a premium in all markets throughout California. Therefore, increases in the building standards should focus on energy related features, since the higher rents could keep more developers within the submarket.

Development of *green* buildings has gained tremendous traction across the nation and especially in California. The potential reduction in greenhouse gas emissions and water consumption is truly remarkable, but it comes at a cost. If the tenants renting the space are not willing to pay for the non-financial benefits, then developers find it difficult to justify adding those green features. Therefore, each city must recognize its own uniqueness when it comes to developing *green* and understand more is not always better.

APPENDIX A: Summary of Variables in Hedonic Models

Author (year)	Data Source	Dependent Variable	Independent Variable (Magnitude of Influence)
Dunse and Jones (1998)	University of Paisley's property monitoring initiative in Scotland	Rent per square foot, Linear	Quality • Built 1980-1989 (-25.8) • Built 1950-1979 (-40.76) • Refurbished 1950-1979 (-24.80) • Built pre war (-48.70) • Refurbished pre war (-31.02) • Double Glazing Window (-31.89) • Parking (-10.92) • Peripheral Business parks (-19.36) • Distance from St Vincent Street (-5.20) • Air Conditioning (18.85) • Acoustic tile (-7.79) • Carpet (8.03) • Cellular layout (-7.18) • Raised floor (13.96) • Tea Preparation area (5.51) Size • Office area (.01) Location • Core Market Area (-12.15) All variables in linear form
Mills (1992)	Asking rents collected by undisclosed company	Effective Rent per square foot, Log (Rent per square foot * Vacancy Rate)	Quality • Year (-.305) • Year Squared (.744) • Parking onsite (-.334) • Shopping onsite (.268) • Restaurant onsite (.964) • Banks onsite (.768) • Daycare onsite (.171) Size • Size of space (.334) • Size of space squared (-.592) Location • West Loop (-.973) • East Loop (-.113) • North Michigan (-.701) • Evanston (-.136) • Northbrook (.128) • O'Hare (-.126) • Schaumburg (-.247) • Oakbrook (-.154) • Napterville (-.209) All variables in log form

Vandell and Lane (1989)	Spaulding and Slye Office Reports	Rent per square foot, Log	Quality • Age (-.0092) Size • Total building square footage(.0000001105) • Number of floors (.088) • Building design (.0459) • Onsite parking(-.1032) Location • Distance to CBD (-.00000602) • Distance to transit (.0000537)
Brennan et al. (1989)	Survey data from broker transactions in Chicago	Rent per square foot, Log	Quality • Vertical location in building (0.00197) • Vacancy rate(-0.00968) • Total building transaction (0.00007) Size • Square foot of transaction (-.00147) Location • Distance to La Salled Street (.06083) • Distance to Madison Street (0.01664) Lease Agreement Control • Lease escalation (0.1457) • Consumer Price Index escalation (0.17202) All variables in Log form
Clapp (1980)	Los Angeles County tax rolls; Coldwell Banker; Los Angeles Air Pollution Control District; Building Owners and Managers Association; and Survey questionnaires	Rent per square foot, Log	Quality • Age (.1456) • Internal amenity dummy (.01873) • Parking Dummy (.07670) Size • Building total Square foot (.007384) • Number of floors (.05814) Location • Net rentable square foot within two blocks (.007384) • Number of floors (.08570) • Beverly Hills dummy (.1189) • Distance to freeway (.06430) • Average commute time (- .1158) • Employees commute by bus (.002922) All variables in Log form

Green Building Literature			
Furest and McAllister (2011)	CoStar	Rent per square foot, Log	Green Variables • LEED (.25) • Energy Star (.26) Quality • 3-6 years old log (.15) • 7-10 years old log (.51) • 11-19 years old log (.45) • 20-23 years old log (.40) • 23-26 years old log (.38) • 27-31 years old log (.38) • 32-42 years old log (.28) • 43-62 years old log (.27) • 62+ years old log (.29) • Building Class A (.45) • Building Class B (.06) Size • Number of Floors log (.16) • Size of building log (-.23) • Site area log(.09) Location • Longitude of building (-.01) • Latitude of building (.82) • Submarket controls (NR) Time Series Controls • Moderately Strong Market (-.08) • Moderately Weak Market (-.10)
Eichholtz, Kok, and Quigley (2010b)	Costar	Rent per square foot, Log	Green Variables • Green Rating (.028) • Energy Star (.033)* • LEED (.052) Quality • Occupancy (.020) • Building Class A (.012) • Building Class B (.101) • Amenities Dummy (.047) Age: • <10 years (.131) • 10-20 years (.085) • 20-30 years (.049) • 30-40 years (.044) Size • Building size square foot (.102) • Intermediate number of floors (.009)* • High number of floors (-.029) Location • CoStar Submarket (NR) • Employment Growth (.608) Lease Agreement • Triple Net Lease (-.047)

Miller, Spivey, and Florance (2008)	CoStar	Rent per square foot, Linear	Green Variables • Energy Star (13.99) • LEED (24.14) Quality • Age (-4.66) • Certified in 2003 (-6.92) • Certified in 2004 (20.97) • Certified in 2005 (51.73) • Certified in 2006 (75.82) • Certified in 2007 (103.04) Size • Size (0)* Location • Located in CBD 64.05 • Boston Dummy (161.26) • Los Angeles Dummy (95.17 • Washington DC Dummy (160.39) • San Francisco dummy (121.51)
Wiley, Benefield, and Johnson (2008)	CoStar	Rent per square foot, Log	Green Variables • LEED (.1516) • Energy Star (.0734) Quality • Age log (-.0706) • Occupancy (.0012) Size • Maximum contiguous space in square feet Log (0.0196) Location • 46 Submarket controls Lease agreements • Lease agreement with double Net log (-.1658)* • Lease agreement gross (-.0436) • Lease agreement negotiable (-.0109) • Lease agreement net (-.2174) • Lease agreement all utilities (-.0018) • Lease agreement plus cleaning (-.2079) • Lease agreement electric and cleaning (-.1119) • Lease agreement all electric (.0171)* • Lease agreement tenant pays electric (.0354) • Lease agreement Triple Net (-.2173) • Lease agreement with utilities (-.1184)
			*Variable not significant

APPENDIX B – Market and Submarket Area Summary

Market	Submarket
East Bay	Alameda
	Albany/Kensington
	Antioch/Pittsburg/Brentwood
	Berkeley
	Bishop Ranch
	Brentwood
	Concord
	Danville/Alamo
	Dublin
	E Hayward/Castro Valley
	El Cerrito
	Emeryville
	Fremont East of 880
	Fremont West of 880
	Hacienda Business Park
	Lafayette/Moraga/Orinda
	Livermore
	Martinez/Pacheco
	N Hayward/Castro Valley
	Napa County
	Newark
	Oakland-Airport
	Oakland-Downtown
	Oakland-North
	Oakland-Port/Jack London
	Oakland-South
	Oakland-West
	Pinole/Hercules/El Sobrante
	Pleasant Hill
	Pleasanton-North
	Pleasanton-South
	Richmond/San Pablo
	San Leandro East of 880
	San Leandro West of 880
	San Ramon-Other
	Union City
	W Hayward/Castro Valley
	Walnut Creek-BART/DT
	Walnut Creek-Shadelands
Fresno	Fresno County
	Madera County
	Merced County
Inland Empire	Airport Area
	Coachella Valley
	Corona
	East San Bernardino

Inland Empire	North San Bernardino
	Riverside
	Riverside Outlying
	San Bernardino Outlying
	South Riverside
	West San Bernardino
Los Angeles	190th Street Corridor
	Antelope Valley
	Beach Cities/Palos Verdes
	Beverly Hills
	Brentwood
	Burbank
	Calabasas/Westlake Village
	Camarillo/Point Mugu
	Century City
	Culver City
	East LA County Outlying
	Eastern SFV
	Eastern SGV
	El Segundo
	Encino
	Fillmore/NE County
	Glendale
	Greater Downtown
	Hawthorne/Gardena
	Hollywood/Silver Lake
	LAX
	Long Beach: Downtown
	Long Beach: Suburban
	Marina Del Rey/Venice
	Mid-Cities
	Mid-Wilshire
	Miracle Mile
	Moorpark/Simi Valley
	NE LA County Outlying
	North Hollywood
	NW LA County Outlying
	Ojai/NW County
	Olympic Corridor
	Oxnard/Port Hueneme
	Pacific Palisades/Malibu
	Park Mile
	Pasadena/Arcadia/Monrovia
	Santa Clarita Valley
	Santa Monica
	Santa Monica Mountains
	Santa Paula/Somis
	Sherman Oaks
	Southeast Los Angeles
	Studio/Universal Cities

Los Angeles	Tarzana
	Thousand Oaks/SE County
	Torrance
	Ventura
	West Hollywood
	West Los Angeles
	Western SFV
	Western SGV
	Westwood
	Woodland Hills/Warner Ctr
Marin	Corte Madera/Mill Valley
	Healdsburg/Cloverdale/N
	Novato/Ignacio/N Marin
	Petaluma/Cotati/Rohnert
	San Rafael/Larkspur
	Santa Rosa
	Sebastopol/Bedogo/West
	Sonoma/Wine Country
Orange	Brea/La Habra
	Buena Park/La Palma
	Civic Center Area
	Costa Mesa
	Cypress
	East Orange
	Fountain Valley
	Fullerton
	Garden Grove
	Huntington Beach
	Irvine
	Irvine Spectrum
	Laguna Hills/Aliso Viejo
	Laguna Niguel/Laguna Beach
	Lake Forest/Foothill Ranch/RSM
	Los Alamitos/Stanton
	Main Place Area
	Mission Viejo
	Newport Beach
	North/East Anaheim
	Outlying Orange County
	Parkcenter Area
	Placentia/Yorba Linda
	S J Capistrano/S Clemente/Dana Pt
	Santa Ana
	Seal Beach
	South Santa Ana
	Stadium Area
	The City Area
	Tustin (South of I-5)
	Westminster

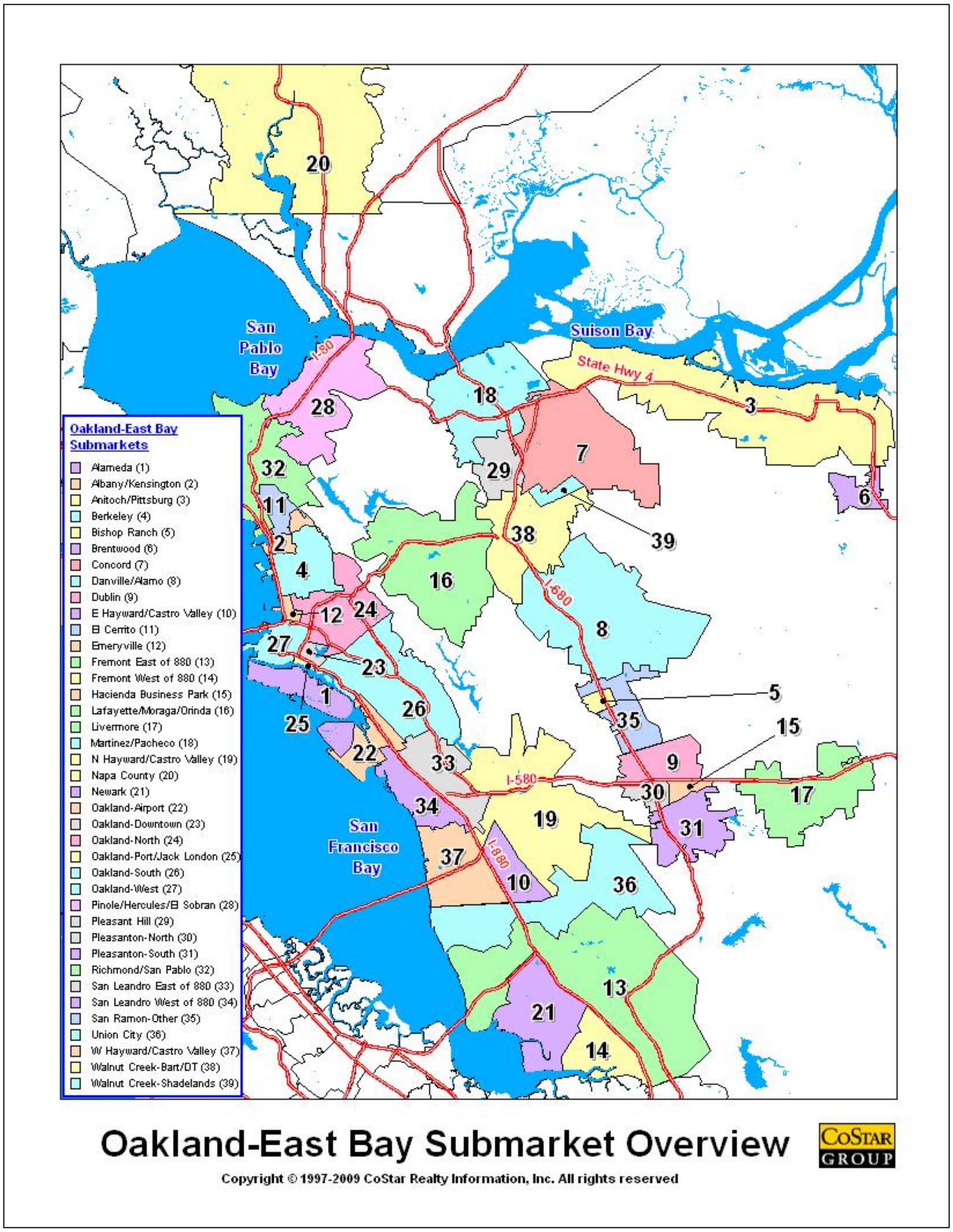
Sacramento	Auburn/Lincoln
	Benicia/Vallejo
	Campus Commons
	Carmichael/Fair Oaks
	Citrus Heights/Orangevale
	Davis/Woodland
	Downtown
	East Sacramento
	El Dorado
	Fairfield/Suisun City
	Folsom
	Highway 50 Corridor
	Howe Ave/Fulton Ave
	Midtown
	Natomas/Northgate
	Outer El Dorado County
	Outer Placer County
	Outer Sacramento County
	Outer Solano County
	Outer Yolo County
	Point West
	Rio Linda/N Highlands
	Roseville/Rocklin
	South Sacramento
	Submarket
	Submarket Overview
	Sutter County
	Vacaville/Dixon
	Watt Ave
	West Sacramento
	Yuba County
South Bay	Campbell
	Central Sunnyvale
	Cupertino
	Da La Cruz
	Downtown Mountain View
	Downtown Palo Alto
	Downtown San Jose East
	Downtown San Jose West
	East Arques Ave Corridor
	Embarcadero/101
	Gilroy
	Los Altos
	Los Gatos
	Milpitas
	Mission College Area
	Moffett Park
	Morgan Hill
	N. San Jose-Brokaw
	N.E. Santa Clara

South Bay	Oak Creek
	Oakmead Park
	Palo Alto South
	Peery Park
	Plumeria Drive
	San Jose Airport
	San Jose Central
	San Jose East
	San Jose, IBP East
	San Jose, IBP West
	San Jose, Winchester
	Santa Clara
	Saratoga
	Scott Blvd Corridor
	Shoreline Corridor North
	Shoreline Corridor South
	South Moffett Triangle
	South San Jose
	South Sunnyvale
	Sunnyvale Triangle
	West Mountain View
San Diego	Camp Pendleton
	Carlsbad
	Chula Vista
	College Area
	Coronado
	Del Mar Hts/Carmel Valley
	Downtown
	East County
	Escondido
	Governor Park
	Kearny Mesa
	La Jolla
	MCAS Miramar
	Mira Mesa/Miramar
	Mission Gorge
	Mission Valley
	National City
	North Beach Cities
	North Central County
	Oceanside
	Old Town/S Arena/Pt Loma
	Otay Mesa
	Outlying SD County N
	Outlying SD County S
	Park East
	PB/Rose Canyon/Morena
	Poway
	Rancho Bernardo
	San Marcos

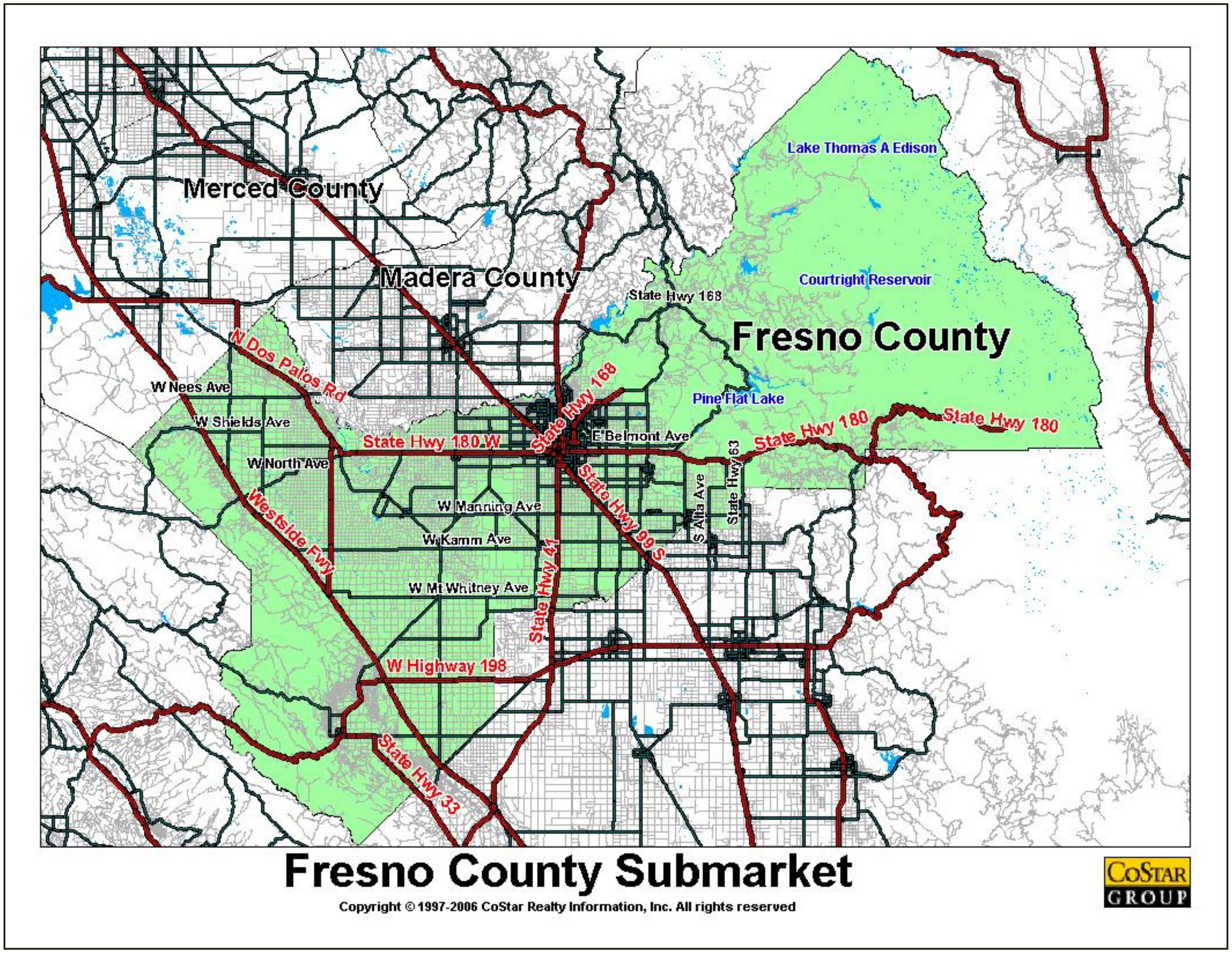
San Diego	San Ysidro/Imperial Beach
	Scripps Ranch
	Sorrento Mesa
	Sorrento Valley
	Southeast San Diego
	Torrey Pines
	Uptown East
	Uptown West/Park West
	UTC
	Vista
San Francisco	Bayview/Hunters Point
	Belmont
	Brisbane/Daly City
	Burlingame-Airport Blvd
	Burlingame-Old Bayshore
	Burlingame-West of 101
	Chinatown/Nob Hill
	Civic Center
	Financial District
	Foster City/Redwood Shores
	India Basin
	Jackson Square
	Lower South of Market
	Menlo Park-Atherton
	Menlo Park-East/EPA
	Menlo Park-Sand Hill
	Mission Bay/China Basin
	Pacifica
	Potrero East of 101 Fwy
	Potrero West of 101 Fwy
	Redwood City-N of 84 Fwy
	Redwood City-Port
	Redwood City-S of 84 Fwy
	Rincon/South Beach
	San Bruno/Millbrae
	San Carlos
	San Mateo-Corridor/Hwy 92
	San Mateo-Downtown North
	San Mateo-Downtown South
	Showplace Square
	South Financial District
	South of Market
	South SF East of 101 Fwy
	South SF West of 101 Fwy
	Southern City
	Union Square
	Van Ness Corridor
	Waterfront/North Beach
	West of Van Ness
	Yerba Buena

APPENDIX C- Market and Submarket Maps

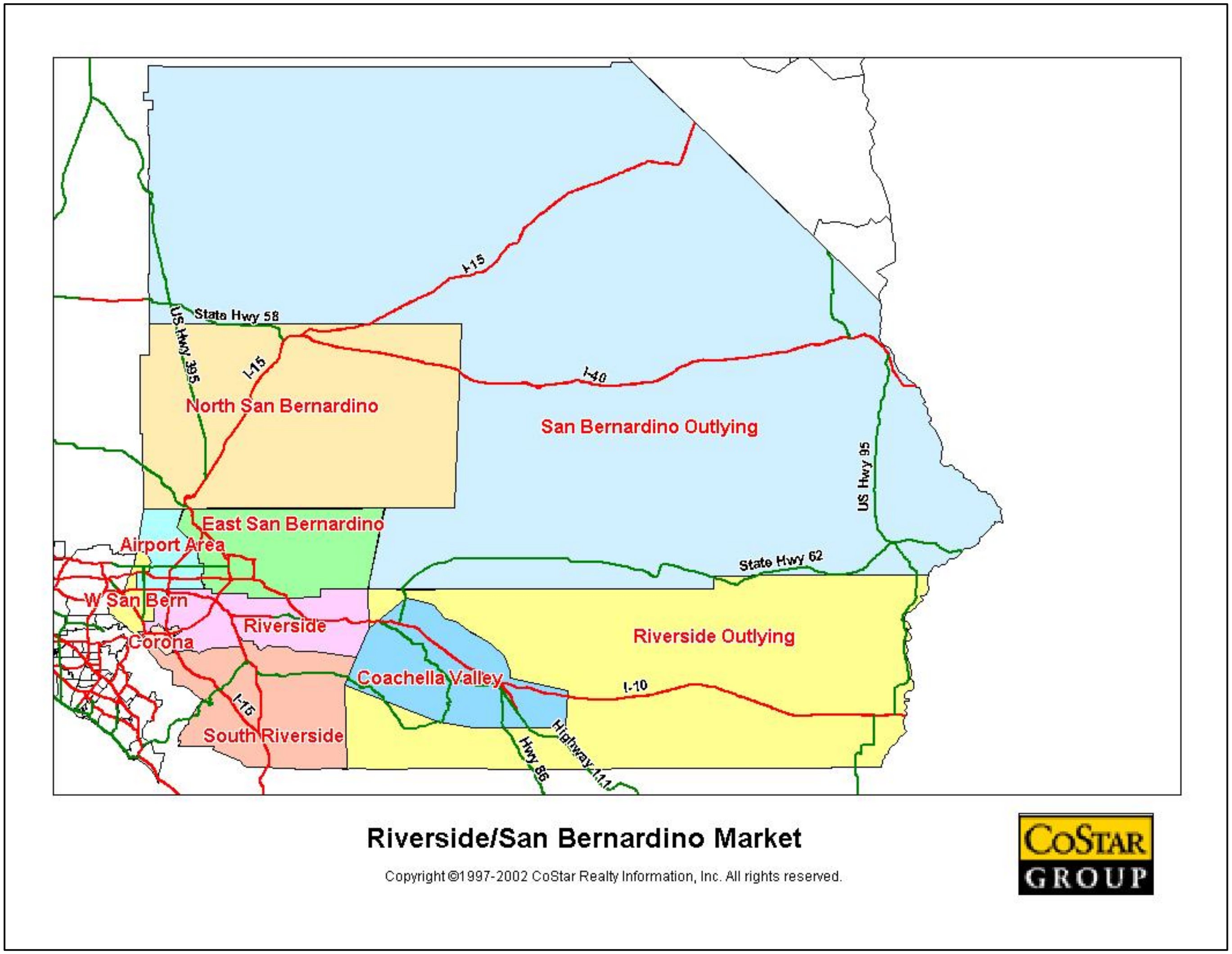
Map 1 - East Bay Market Area



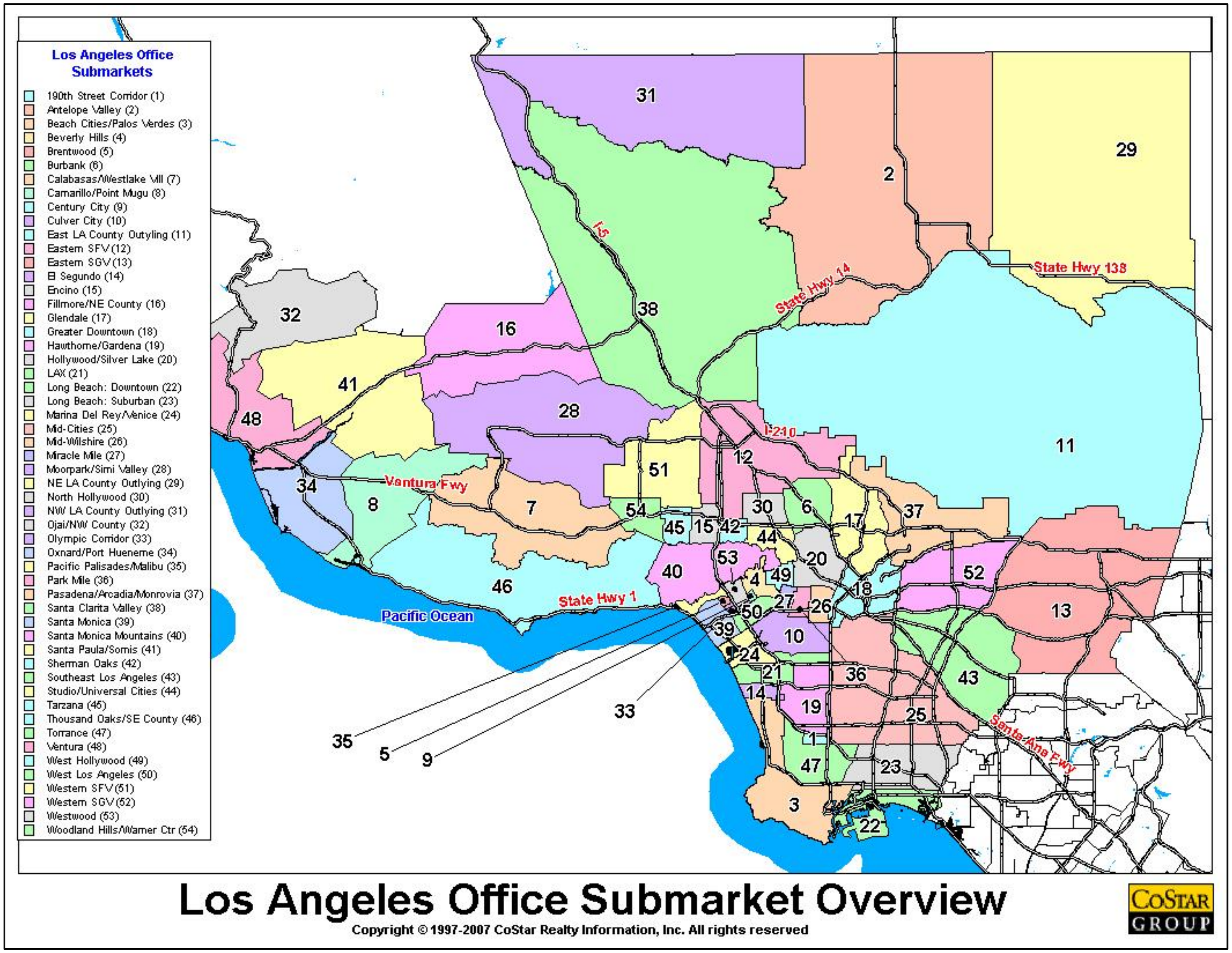
Map 2 - Fresno Market Area



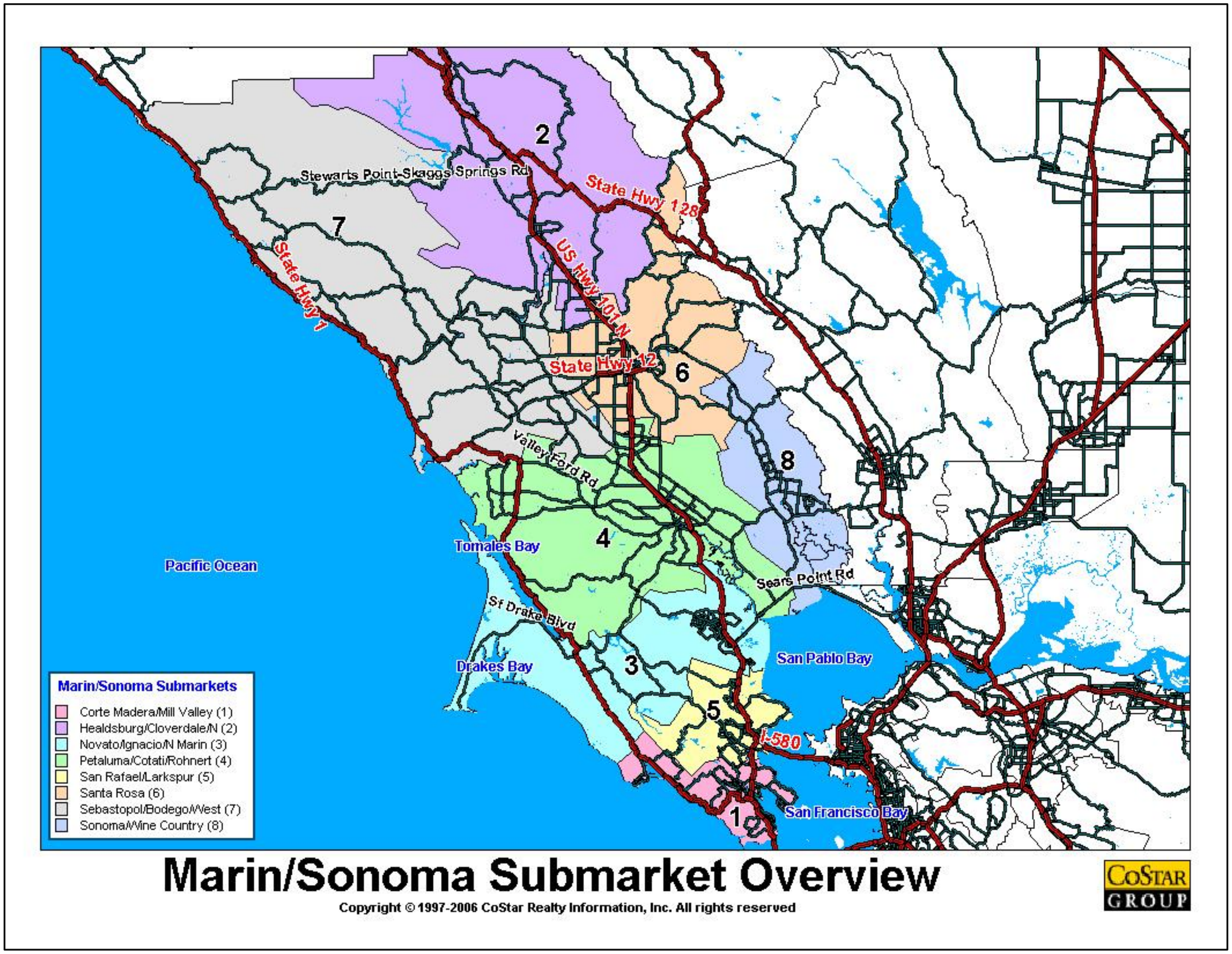
Map 3 - Inland Empire Market Area



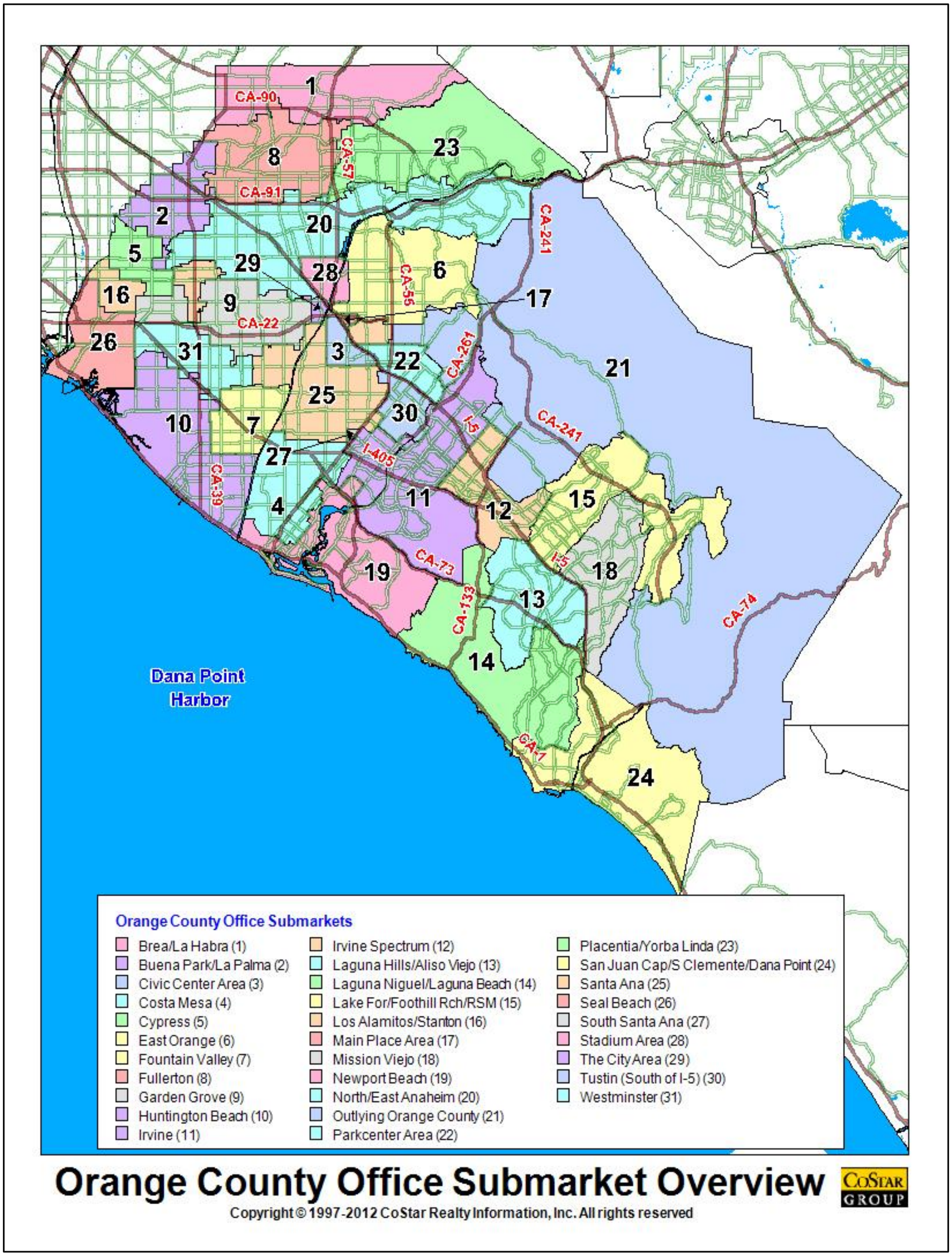
Map 4 - Los Angeles Market Area



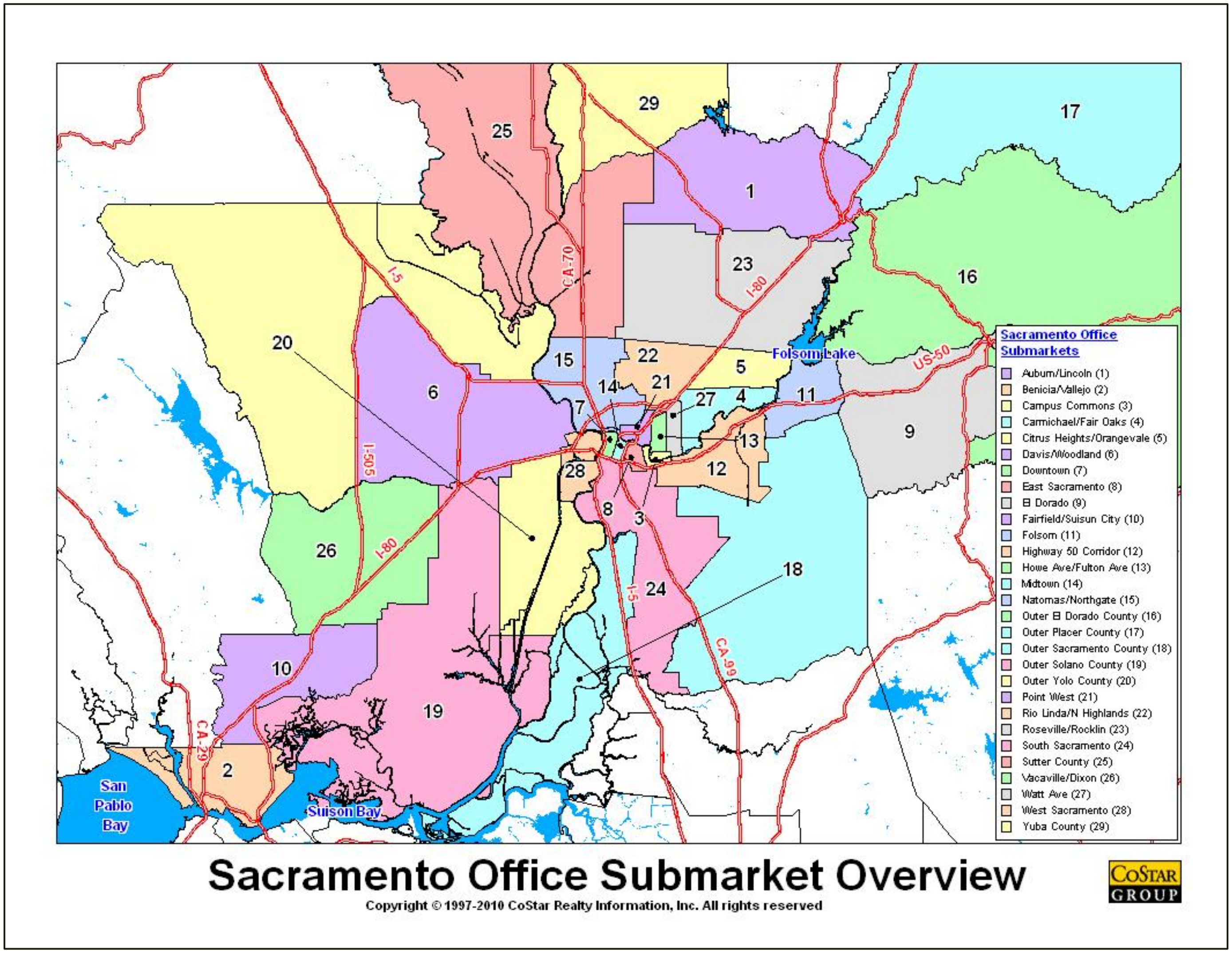
Map 5 - Marin Market Area



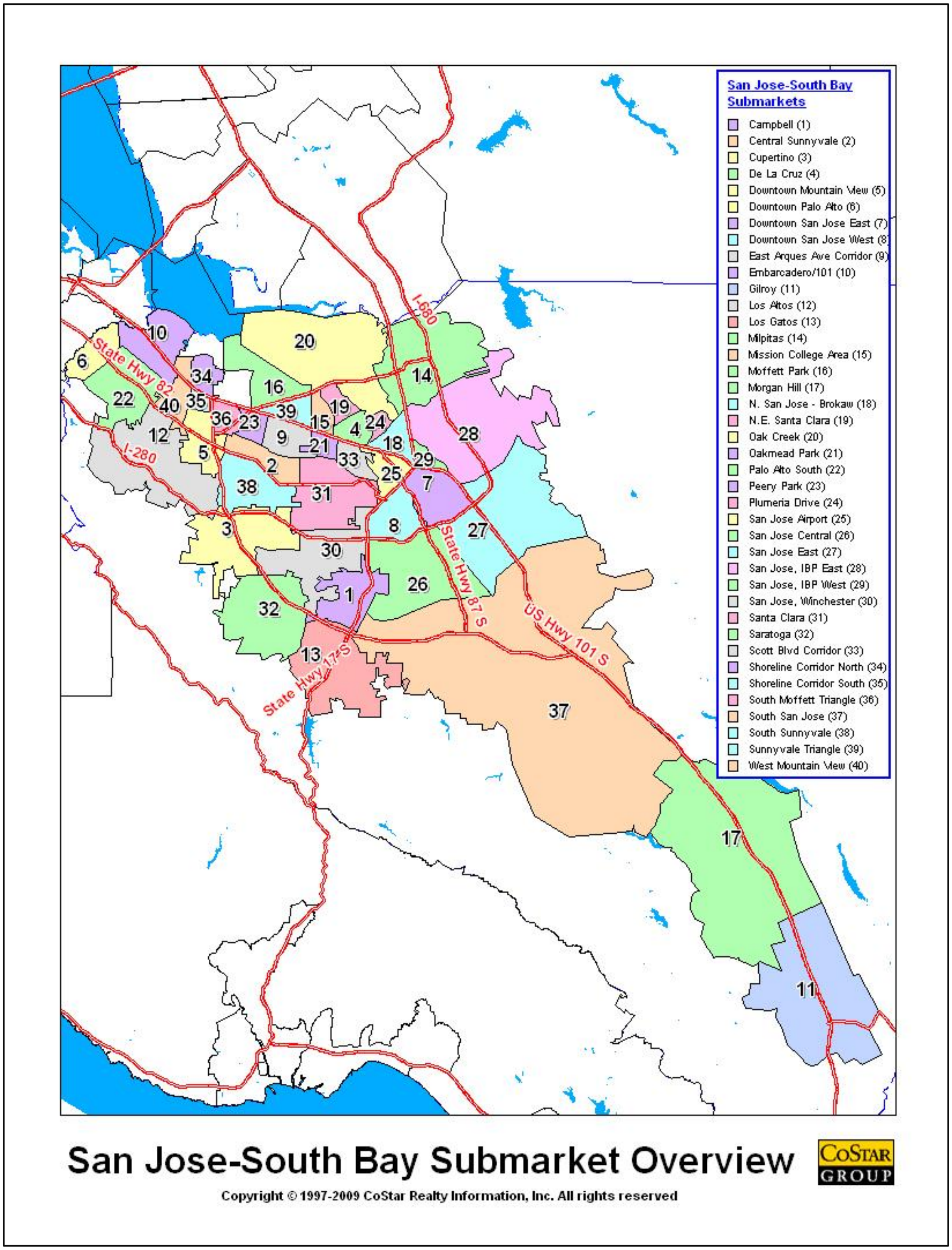
Map 6 - Orange County Market Area



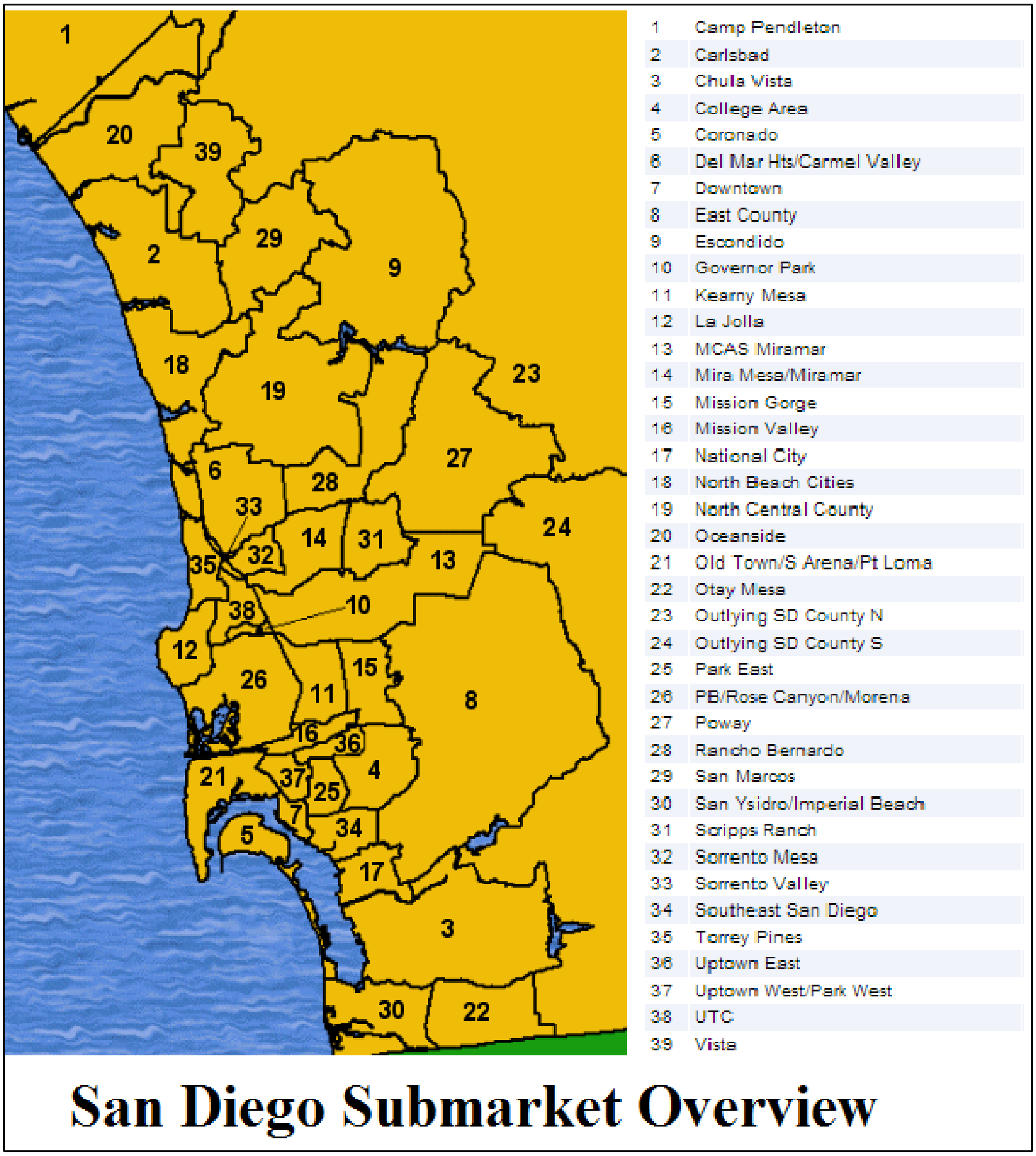
Map 7 - Sacramento Market Area



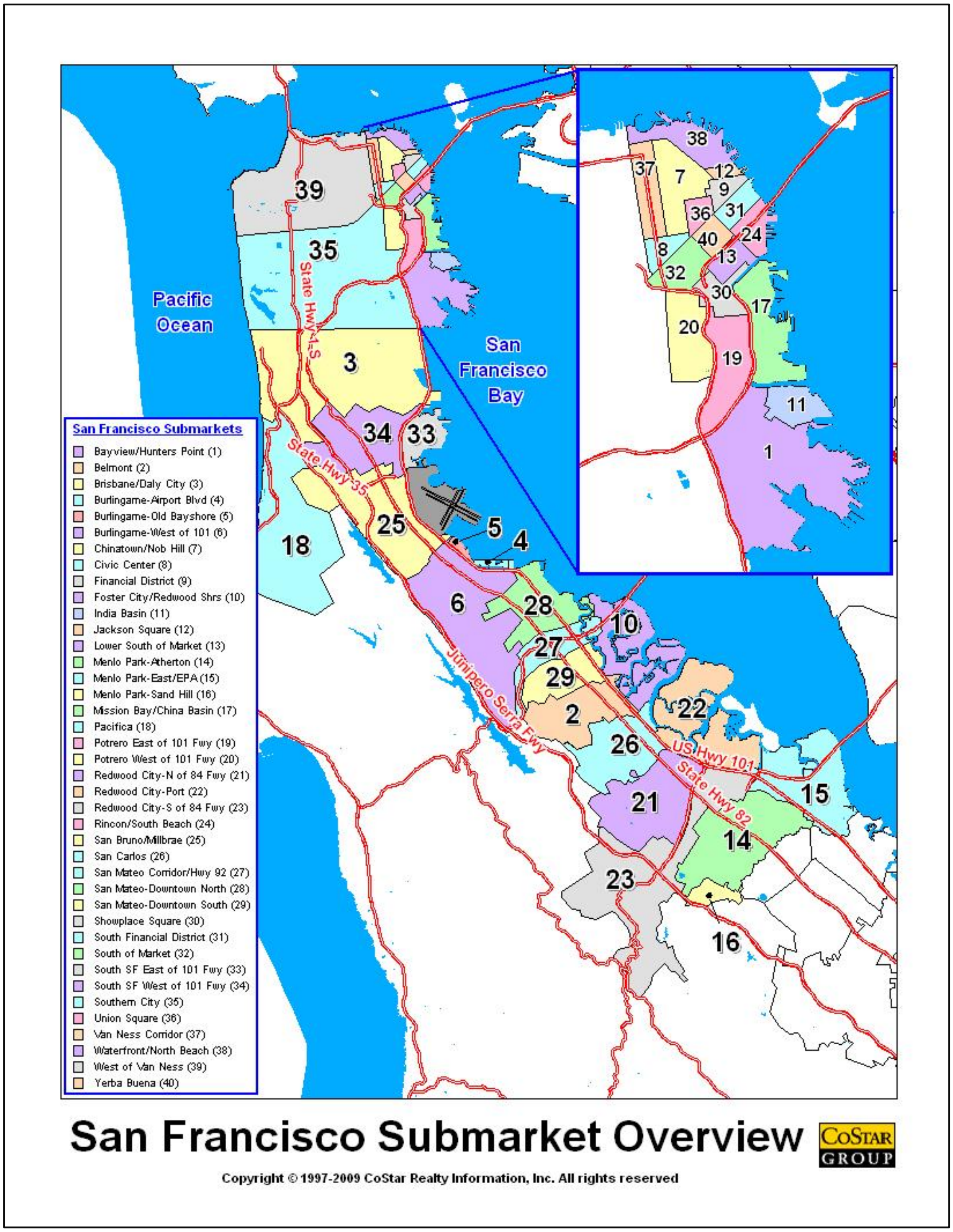
Map 8 - South Bay Market Area



Map 9 - San Diego Market Area



Map 10 - San Francisco Market Area



Source: CoStar Group (2013)

APPENDIX D - Descriptive Statistics

Dependent Variable	Obs.	Mean	Std. Dev.	Min	Max
Log Rent	4606	3.171089	0.369596	1.0986	5.0106
Independent Variable	Obs.	Mean	Std. Dev.	Min	Max
Size					
Occupancy	4606	0.76128	0.258152	0	1
Number of Stories	4606	4.43921	5.756448	1	62
TypFlrSF	4602	17904.9	14665.27	714	225962
Quality					
Energy Star Certification	4606	0.205601	0.404184	0	1
All Leed Certification	4598	0.068073	0.251899	0	1
Leed X Energy Star	4598	0.059156	0.235942	0	1
Age of Building	4606	21.67412	13.35435	0	143
Parking Ratio	4062	3.533296	1.135556	0.01	10
Onsite Parking	4606	0.232957	0.422761	0	1
Superior amenities	4606	0.289188	0.453435	0	1
Superior building aesthetics	4606	0.21624	0.411724	0	1
Superior building features	4606	0.221016	0.414976	0	1
Building Class A	4537	0.253912	0.435296	0	1
Near Public Transit	4606	0.200608	0.400499	0	1
Location (City_Submarket)					
Gardena_190th Street Corridor	4606	0.004776	0.068954	0	1
Ontario_Airport Area	4606	0.024316	0.154045	0	1
Alameda_Alameda	4606	0.004125	0.064101	0	1
Anaheim_Anaheim Hills	4606	0.001086	0.032933	0	1
San Francisco_Bayview/Hunters Point	4606	0.000651	0.025516	0	1
Manhattan Beach_Beach Cities/Palos Verdes	4606	0.000434	0.020836	0	1
Beverly Hills_Beverly Hills	4606	0.014546	0.11974	0	1
San Ramon_Bishop Ranch	4606	0.003908	0.062398	0	1
Brea_Brea/La Habra	4606	0.006513	0.08045	0	1
Los Angeles_Brentwood	4606	0.004342	0.065759	0	1
Brisbane_Brisbane/Daly City	4606	0.003257	0.05698	0	1
Buena Park_Buena Park/La Palma	4606	0.003908	0.062398	0	1
Burbank_Burbank	4606	0.008901	0.093937	0	1
Agoura Hills_Calabasas/Westlake Vill	4606	0.009553	0.097281	0	1
Camarillo_Camarillo/Point Mugu	4606	0.003257	0.05698	0	1
Campbell_Campbell	4606	0.004776	0.068954	0	1
Sacramento_Campus Commons	4606	0.00304	0.055054	0	1
Carlsbad_Carlsbad	4606	0.016717	0.128224	0	1
Sunnyvale_Central Sunnyvale	4606	0.000651	0.025516	0	1
Los Angeles_Century City	4606	0.004342	0.065759	0	1
Chatsworth_Chatsworth Ind	4606	0.000217	0.014735	0	1
Folsom_Citrus Heights/Orangevale	4606	0.000217	0.014735	0	1
Santa Ana_Civic Center Area	4606	0.003691	0.060647	0	1
La Quinta_Coachella Valley	4606	0.011507	0.106662	0	1
Concord_Concord	4606	0.005862	0.076347	0	1
Corona_Corona	4606	0.000868	0.02946	0	1
Mill Valley_Corte Madera/Mill Valley	4606	0.003474	0.058842	0	1
Costa Mesa_Costa Mesa	4606	0.009553	0.097281	0	1

Culver City_Culver City	4606	0.004559	0.067376	0	1
Cupertino_Cupertino	4606	0.003474	0.058842	0	1
Cypress_Cypress	4606	0.002605	0.050981	0	1
Davis_Davis/Woodland	4606	0.000868	0.02946	0	1
Santa Clara_De La Cruz	4606	0.001303	0.036073	0	1
San Diego_Del Mar Hts/Carmel Valley	4606	0.005428	0.073481	0	1
Sacramento_Downtown Sacramento	4606	0.01802	0.133038	0	1
Mountain View_Downtown Mountain View	4606	0.000434	0.020836	0	1
Palo Alto_Downtown Palo Alto	4606	0.001303	0.036073	0	1
San Jose_Downtown San Jose East	4606	0.008467	0.091637	0	1
San Jose_Downtown San Jose West	4606	0.001303	0.036073	0	1
Dublin_Dublin	4606	0.003908	0.062398	0	1
Sunnyvale_East Arques Ave Corridor	4606	0.000434	0.020836	0	1
Orange_East Orange	4606	0.002605	0.050981	0	1
San Bernardino_East San Bernardino	4606	0.006513	0.08045	0	1
Northridge_Eastern SFV	4606	0.00304	0.055054	0	1
Baldwin Park_Eastern SGV	4606	0.016066	0.125743	0	1
El Dorado_El Dorado	4606	0.00825	0.090465	0	1
El Segundo_El Segundo	4606	0.008033	0.089276	0	1
Palo Alto_Embarcadero/101	4606	0.001954	0.044165	0	1
Emeryville_Emeryville	4606	0.003257	0.05698	0	1
Encino_Encino	4606	0.005862	0.076347	0	1
Fairfield_Fairfield/Suisun City	4606	0.001737	0.041644	0	1
San Francisco_Financial District	4606	0.011073	0.104653	0	1
Folsom_Folsom	4606	0.010638	0.102603	0	1
Foster City_Foster City/Redwood Shrs	4606	0.007165	0.084349	0	1
Fountain Valley_Fountain Valley	4606	0.003257	0.05698	0	1
Fresno_Fresno County	4606	0.00152	0.038959	0	1
Glendale_Glendale	4606	0.010638	0.102603	0	1
San Diego_Governor Park	4606	0.002605	0.050981	0	1
Los Angeles_Greater Downtown	4606	0.027139	0.162505	0	1
Pleasanton_Hacienda Business Park	4606	0.005862	0.076347	0	1
Gardena_Hawthorne/Gardena	4606	0.000651	0.025516	0	1
Gold River_Highway 50 Corridor	4606	0.020191	0.140669	0	1
Hollywood_Hollywood/Silver Lake	4606	0.005645	0.074928	0	1
Sacramento_Howe Ave/Fulton Ave	4606	0.002388	0.048816	0	1
Huntington Beach_Huntington Beach	4606	0.001303	0.036073	0	1
Irvine_Irvine	4606	0.031915	0.175793	0	1
Irvine_Irvine Spectrum	4606	0.020625	0.142142	0	1
San Francisco_Jackson Square	4606	0.002822	0.053057	0	1
San Diego_Kearny Mesa	4606	0.014112	0.117966	0	1
Los Angeles_LAX	4606	0.003474	0.058842	0	1
La Jolla_La Jolla	4606	0.004559	0.067376	0	1
Aliso Viejo_Laguna Hills/Aliso Viejo	4606	0.014763	0.120617	0	1
Laguna Niguel_Laguna Niguel/Laguna Beac	4606	0.002388	0.048816	0	1
Foothill Ranch_Lake Forest/Foothill Ranch	4606	0.009119	0.095065	0	1
Long Beach_Long Beach: Downtown	4606	0.00673	0.081771	0	1
Long Beach_Long Beach: Suburban	4606	0.006296	0.079107	0	1
San Francisco_Lower South of Market	4606	0.001303	0.036073	0	1
Orange_Main Place Area	4606	0.003691	0.060647	0	1

Culver City_Marina Del Rey/Venice	4606	0.004559	0.067376	0	1
East Palo Alto_Menlo Park East/EPA	4606	0.000651	0.025516	0	1
Artesia_Mid Cities	4606	0.004776	0.068954	0	1
Los Angeles_Mid Wilshire	4606	0.000651	0.025516	0	1
Artesia_Mid-Cities	4606	0.000868	0.02946	0	1
Los Angeles_Mid-Wilshire	4606	0.001303	0.036073	0	1
Sacramento_Midtown	4606	0.001086	0.032933	0	1
Milpitas_Milpitas	4606	0.005645	0.074928	0	1
San Diego_Mira Mesa/Miramar	4606	0.001086	0.032933	0	1
Los Angeles_Miracle Mile	4606	0.005428	0.073481	0	1
San Francisco_Mission Bay/China Basin	4606	0.000651	0.025516	0	1
Santa Clara_Mission College Area	4606	0.004342	0.065759	0	1
San Diego_Mission Gorge	4606	0.000434	0.020836	0	1
San Diego_Mission Valley	4606	0.013027	0.1134	0	1
Ladera Ranch_Mission Viejo	4606	0.007382	0.085608	0	1
Sunnyvale_Moffett Park	4606	0.001303	0.036073	0	1
Monterey_Monterey	4606	0.00304	0.055054	0	1
Simi Valley_Moorpark/Simi Valley	4606	0.003474	0.058842	0	1
Morgan Hill_Morgan Hill	4606	0.002171	0.046549	0	1
Castro Valley_N Hayward/Castro Valley	4606	0.002822	0.053057	0	1
San Jose_N. San Jose Brokaw	4606	0.001086	0.032933	0	1
San Jose_N. San Jose - Brokaw	4606	0.002605	0.050981	0	1
Santa Clara_N.E. Santa Clara	4606	0.000217	0.014735	0	1
American Canyon_Napa County	4606	0.005211	0.072004	0	1
Sacramento_Natomas/Northgate	4606	0.017369	0.130655	0	1
Newport Beach_Newport Beach	4606	0.019974	0.139926	0	1
Encinitas_North Beach Cities	4606	0.00825	0.090465	0	1
North Hollywood_North Hollywood	4606	0.001086	0.032933	0	1
Monterey_North Monterey County	4606	0.00304	0.055054	0	1
Anaheim_North/East Anaheim	4606	0.002822	0.053057	0	1
Novato_Novato/Ignacio/N Marin	4606	0.004342	0.065759	0	1
San Jose_Oak Creek	4606	0.001954	0.044165	0	1
Oakland_Oakland Downtown	4606	0.011724	0.107652	0	1
Oakland_Oakland Port/Jack London	4606	0.000434	0.020836	0	1
Santa Clara_Oakmead Park	4606	0.00152	0.038959	0	1
San Diego_Old Twn/S Arena/Pt Loma	4606	0.000868	0.02946	0	1
Los Angeles_Olympic Corridor	4606	0.004994	0.070496	0	1
Oxnard_Oxnard/Port Hueneme	4606	0.006296	0.079107	0	1
San Diego_PB/Rose Canyon/Morena	4606	0.000434	0.020836	0	1
Pacifica_Pacifica	4606	0.000868	0.02946	0	1
Santa Ana_Parkcenter Area	4606	0.008684	0.092794	0	1
Los Angeles_Pasadena/Arcadia/Monrovia	4606	0.022362	0.147874	0	1
Sunnyvale_Peery Park	4606	0.000217	0.014735	0	1
Placentia_Placentia/Yorba Linda	4606	0.002388	0.048816	0	1
Pleasant Hill_Pleasant Hill	4606	0.000434	0.020836	0	1
Pleasanton_Pleasanton North	4606	0.00304	0.055054	0	1
Pleasanton_Pleasanton South	4606	0.003474	0.058842	0	1
San Jose_Plumeria Drive	4606	0.002388	0.048816	0	1
Sacramento_Point West	4606	0.005862	0.076347	0	1
San Francisco_Potrero West of 101 Fwy	4606	0.000217	0.014735	0	1

San Diego_Rancho Bernardo	4606	0.006948	0.08307	0	1
Point Richmond_Richmond/San Pablo	4606	0.002605	0.050981	0	1
San Francisco_Rincon/South Beach	4606	0.001954	0.044165	0	1
Beaumont_Riverside	4606	0.013244	0.114329	0	1
Rocklin_Roseville/Rocklin	4606	0.015849	0.124904	0	1
San Jose_San Jose Airport	4606	0.004994	0.070496	0	1
Campbell_San Jose Central	4606	0.001303	0.036073	0	1
San Jose_San Jose, IBP East	4606	0.001086	0.032933	0	1
San Jose_San Jose, Winchester	4606	0.00152	0.038959	0	1
Ladera Ranch_San Juan Cap/S Clemente/D	4606	0.000651	0.025516	0	1
San Marcos_San Marcos	4606	0.001954	0.044165	0	1
San Mateo_San Mateo Corridor/Hwy 92	4606	0.001954	0.044165	0	1
San Mateo_San Mateo Downtown North	4606	0.000651	0.025516	0	1
San Mateo_San Mateo Downtown South	4606	0.000434	0.020836	0	1
San Mateo_San Mateo-Corridor/Hwy 92	4606	0.007165	0.084349	0	1
San Mateo_San Mateo-Downtown North	4606	0.000868	0.02946	0	1
San Rafael_San Rafael/Larkspur	4606	0.002605	0.050981	0	1
Santa Ana_Santa Ana	4606	0.006513	0.08045	0	1
Newhall_Santa Clarita Valley	4606	0.006948	0.08307	0	1
Santa Monica_Santa Monica	4606	0.019757	0.139179	0	1
Los Angeles_Santa Monica Mountains	4606	0.000868	0.02946	0	1
Santa Rosa_Santa Rosa	4606	0.006296	0.079107	0	1
San Diego_Scripps Ranch	4606	0.004559	0.067376	0	1
Seal Beach_Seal Beach	4606	0.000868	0.02946	0	1
Sherman Oaks_Sherman Oaks	4606	0.00673	0.081771	0	1
Mountain View_Shoreline Corridor South	4606	0.000217	0.014735	0	1
San Francisco_Showplace Square	4606	0.001086	0.032933	0	1
San Diego_Sorrento Mesa	4606	0.008684	0.092794	0	1
San Diego_Sorrento Valley	4606	0.001737	0.041644	0	1
San Francisco_South Financial District	4606	0.005428	0.073481	0	1
Mountain View_South Moffett Triangle	4606	0.001737	0.041644	0	1
Corona_South Riverside	4606	0.005862	0.076347	0	1
South San Francisco_South SF East of 101 Fwy	4606	0.001737	0.041644	0	1
South San Francisco_South SF West of 101 Fwy	4606	0.000651	0.025516	0	1
Sacramento_South Sacramento	4606	0.000217	0.014735	0	1
Santa Ana_South Santa Ana	4606	0.002388	0.048816	0	1
San Francisco_South of Market	4606	0.001303	0.036073	0	1
Los Angeles_Southeast Los Angeles	4606	0.005862	0.076347	0	1
Anaheim_Stadium Area	4606	0.006296	0.079107	0	1
Stockton_Stockton	4606	0.002388	0.048816	0	1
Studio City_Studio/Universal Cities	4606	0.001737	0.041644	0	1
Woodland Hills_Tarzana	4606	0.000651	0.025516	0	1
Orange_The City Area	4606	0.00152	0.038959	0	1
Newbury Park_Thousand Oaks/SE County	4606	0.015415	0.123209	0	1
Torrance_Torrance	4606	0.006296	0.079107	0	1
La Jolla_Torrey Pines	4606	0.001086	0.032933	0	1
Tustin_Tustin (South of I-5)	4606	0.002605	0.050981	0	1
La Jolla_UTC	4606	0.007165	0.084349	0	1
San Francisco_Union Square	4606	0.004776	0.068954	0	1

San Diego_Uptown West/Park West	4606	0.000217	0.014735	0	1
San Francisco_Van Ness Corridor	4606	0.000217	0.014735	0	1
Ventura_Ventura	4606	0.006948	0.08307	0	1
Vista_Vista	4606	0.00304	0.055054	0	1
Pleasant Hill_Walnut Creek BART/DT	4606	0.013027	0.1134	0	1
Walnut Creek_Walnut Creek Shadelands	4606	0.004559	0.067376	0	1
San Francisco_Waterfront/North Beach	4606	0.00152	0.038959	0	1
Los Angeles_West Hollywood	4606	0.007816	0.088071	0	1
Beverly Hills_West Los Angeles	4606	0.005211	0.072004	0	1
West Sacramento_West Sacramento	4606	0.000868	0.02946	0	1
Chino_West San Bernardino	4606	0.002822	0.053057	0	1
Canoga Park_Western SFV	4606	0.009119	0.095065	0	1
Alhambra_Western SGV	4606	0.00673	0.081771	0	1
Westminster_Westminster	4606	0.001737	0.041644	0	1
Los Angeles_Westwood	4606	0.008901	0.093937	0	1
Canoga Park_Woodland Hills/Warner Ctr	4606	0.012158	0.109603	0	1
San Francisco_Yerba Buena	4606	0.001303	0.036073	0	1
Interaction Variables					
Ontario_Airport Area X LEED	4606	0.000217	0.014735	0	1
Beverly Hills_Beverly Hills X LEED	4606	0.000217	0.014735	0	1
San Ramon_Bishop Ranch X LEED	4606	0.003691	0.060647	0	1
Los Angeles_Brentwood X LEED	4606	0.000434	0.020836	0	1
Brisbane_Brisbane/Daly City X LEED	4606	0.000217	0.014735	0	1
Carlsbad_Carlsbad X LEED	4606	0.000651	0.025516	0	1
Agoura Hills_Calabasas/Westlake Vill X LEED	4606	0.000434	0.020836	0	1
Sacramento_Campus Commons X LEED	4606	0.000217	0.014735	0	1
Carlsbad_Carlsbad X LEED	4606	0.000434	0.020836	0	1
Sunnyvale_Central Sunnyvale X LEED	4606	0.000217	0.014735	0	1
Los Angeles_Century City X LEED	4606	0.002388	0.048816	0	1
Costa Mesa_Costa Mesa X LEED	4606	0.000434	0.020836	0	1
Sacramento_Downtown Sacramento X LEED	4604	4606	.0034737	0	1
San Jose_Downtown San Jose East X LEED	4606	0.000217	0.014735	0	1
San Jose_Downtown San Jose West X LEED	4606	0.000217	0.014735	0	1
San Bernardino_East San Bernardino X LEED	4606	0.000217	0.014735	0	1
Northridge_Eastern SFV X LEED	4606	0.000217	0.014735	0	1
Baldwin Park_Eastern SGV X LEED	4606	0.000434	0.020836	0	1
El Segundo_El Segundo X LEED	4606	0.000868	0.02946	0	1
Emeryville_Emeryville X LEED	4606	0.000651	0.025516	0	1
San Francisco_Financial District X LEED	4606	0.003691	0.060647	0	1
Folsom_Folsom X LEED	4606	0.000217	0.014735	0	1
Foster City_Foster City/Redwood Shrs X LEED	4606	0.001086	0.032933	0	1
Fresno_Fresno County X LEED	4606	0.000434	0.020836	0	1
Glendale_Glendale X LEED	4606	0.002171	0.046549	0	1
Los Angeles_Greater Downtown X LEED	4606	0.003691	0.060647	0	1
Gold River_Highway 50 Corridor X LEED	4606	0.001086	0.032933	0	1
Irvine_Irvine X LEED	4606	0.004776	0.068954	0	1
Irvine_Irvine Spectrum X LEED	4606	0.000868	0.02946	0	1

San Diego_Kearny Mesa X LEED	4606	0.000217	0.014735	0	1
Foothill Ranch_Lake Forest/Foothill Ranc X LEED	4606	0.000651	0.025516	0	1
Long Beach_Long Beach: Downtown X LEED	4606	0.000434	0.020836	0	1
Long Beach_Long Beach: Suburban X LEED	4606	0.000217	0.014735	0	1
Culver City_Marina Del Rey/Venice X LEED	4606	0.000651	0.025516	0	1
East Palo Alto_Menlo Park East/EPA X LEED	4606	0.000651	0.025516	0	1
Artesia_Mid Cities X LEED	4606	0.000651	0.025516	0	1
Los Angeles_Miracle Mile X LEED	4606	0.000868	0.02946	0	1
Santa Clara_Mission College Area X LEED	4606	0.000434	0.020836	0	1
San Diego_Mission Valley X LEED	4606	0.000868	0.02946	0	1
Sunnyvale_Moffett Park X LEED	4606	0.000217	0.014735	0	1
Castro Valley_N Hayward/Castro Valley X LEED	4606	0.000217	0.014735	0	1
San Jose_N. San Jose Brokaw X LEED	4606	0.000868	0.02946	0	1
Sacramento_Natomas/Northgate X LEED	4606	0.00152	0.038959	0	1
Newport Beach_Newport Beach X LEED	4606	0.001303	0.036073	0	1
North Hollywood_North Hollywood X LEED	4606	0.000217	0.014735	0	1
Novato_Novato/Ignacio/N Marin X LEED	4606	0.000217	0.014735	0	1
San Jose_Oak Creek X LEED	4606	0.000434	0.020836	0	1
Oakland_Oakland Downtown X LEED	4606	0.00152	0.038959	0	1
Santa Clara_Oakmead Park X LEED	4606	0.000217	0.014735	0	1
San Diego_Old Twn/S Arena/Pt Loma X LEED	4606	0.000217	0.014735	0	1
Santa Ana_Parkcenter Area X LEED	4606	0.000434	0.020836	0	1
Los Angeles_Pasadena/Arcadia/Monrovia X LEED	4606	0.001086	0.032933	0	1
Pleasanton_Pleasanton North X LEED	4606	0.001086	0.032933	0	1
Pleasanton_Pleasanton South X LEED	4606	0.000217	0.014735	0	1
San Francisco_Rincon/South Beach X LEED	4606	0.000217	0.014735	0	1
Rocklin_Roseville/Rocklin X LEED	4606	0.000434	0.020836	0	1
Ladera Ranch_San Juan Cap/S Clemente/D X LEED	4606	0.000651	0.025516	0	1
San Mateo_San Mateo Corridor/Hwy 92 X LEED	4606	0.000434	0.020836	0	1
San Mateo_San Mateo Downtown South X LEED	4606	0.000434	0.020836	0	1
Newhall_Santa Clarita Valley X LEED	4606	0.000651	0.025516	0	1
Santa Monica_Santa Monica X LEED	4606	0.000651	0.025516	0	1
San Diego_Scripps Ranch X LEED	4606	0.000434	0.020836	0	1
San Diego_Sorrento Mesa X LEED	4606	0.000217	0.014735	0	1
San Francisco_South Financial District X LEED	4606	0.00304	0.055054	0	1
Mountain View_South Moffett Triangle X LEED	4606	0.000217	0.014735	0	1

Corona_South Riverside X LEED	4606	0.000217	0.014735	0	1
South San Francisco_South SF East of 101 Fwy X LEED	4606	0.000434	0.020836	0	1
Santa Ana_South Santa Ana X LEED	4606	0.000217	0.014735	0	1
Anaheim_Stadium Area X LEED	4606	0.000434	0.020836	0	1
Studio City_Studio/Universal Cities X LEED	4606	0.000217	0.014735	0	1
Torrance_Torrance X LEED	4606	0.000217	0.014735	0	1
La Jolla_UTC X LEED	4606	0.002605	0.050981	0	1
Pleasant Hill_Walnut Creek BART/DT X LEED	4606	0.000868	0.02946	0	1
Canoga Park_Western SFV X LEED	4606	0.000217	0.014735	0	1
Alhambra_Western SGV X LEED	4606	0.002605	0.050981	0	1
Los Angeles_Westwood X LEED	4606	0.001086	0.032933	0	1
Canoga Park_Woodland Hills/Warner Ctr X LEED	4606	0.000868	0.02946	0	1
Gardena_190th Street Corridor X Energy Star	4606	0.00152	0.038959	0	1
Ontario_Airport Area X Energy Star	4606	0.001737	0.041644	0	1
Alameda_Alameda X Energy Star	4606	0.000868	0.02946	0	1
Anaheim_Anaheim Hills X Energy Star	4606	0.000434	0.020836	0	1
San Francisco_Bayview/Hunters Point X Energy Star	4606	0.000434	0.020836	0	1
Beverly Hills_Beverly Hills X Energy Star	4606	0.001737	0.041644	0	1
San Ramon_Bishop Ranch X Energy Star	4606	0.003257	0.05698	0	1
Brea_Brea/La Habra X Energy Star	4606	0.00152	0.038959	0	1
Los Angeles_Brentwood X Energy Star	4606	0.001303	0.036073	0	1
Brisbane_Brisbane/Daly City X Energy Star	4606	0.000434	0.020836	0	1
Buena Park_Buena Park/La Palma X Energy Star	4606	0.001954	0.044165	0	1
Burbank_Burbank X Energy Star	4606	0.001737	0.041644	0	1
Agoura Hills_Calabasas/Westlake Vill X Energy Star	4606	0.002388	0.048816	0	1
Camarillo_Camarillo/Point Mugu X Energy Star	4606	0.000651	0.025516	0	1
Campbell_Campbell X Energy Star	4606	0.000651	0.025516	0	1
Carlsbad_Carlsbad X Energy Star	4606	0.001737	0.041644	0	1
Los Angeles_Century City X Energy Star	4606	0.00304	0.055054	0	1
Santa Ana_Civic Center Area X Energy Star	4606	0.000434	0.020836	0	1
La Quinta_Coachella Valley X Energy Star	4606	0.000434	0.020836	0	1
Concord_Concord X Energy Star	4606	0.00152	0.038959	0	1
Corona_Corona X Energy Star	4606	0.000217	0.014735	0	1
Mill Valley_Corte Madera/Mill Valley X Energy Star	4606	0.000868	0.02946	0	1
Costa Mesa_Costa Mesa X Energy Star	4606	0.000868	0.02946	0	1
Culver City_Culver City X Energy Star	4606	0.001954	0.044165	0	1
Cupertino_Cupertino X Energy Star	4606	0.000434	0.020836	0	1
Cypress_Cypress X Energy Star	4606	0.000217	0.014735	0	1
San Diego_Del Mar Hts/Carmel Valley X Energy Star	4606	0.00152	0.038959	0	1
Sacramento_Downtown Sacramento X Energy Star	4606	.0073817	.0856083	0	1

Mountain View_Downtown Mountain View X Energy Star	4606	0.000217	0.014735	0	1
Palo Alto_Downtown Palo Alto X Energy Star	4606	0.000434	0.020836	0	1
San Jose_Downtown San Jose East X Energy Star	4606	0.002388	0.048816	0	1
San Jose_Downtown San Jose West X Energy Star	4606	0.000217	0.014735	0	1
Dublin_Dublin X Energy Star	4606	0.000434	0.020836	0	1
Orange_East Orange X Energy Star	4606	0.000217	0.014735	0	1
San Bernardino_East San Bernardino X Energy Star	4606	0.00304	0.055054	0	1
Northridge_Eastern SFV X Energy Star	4606	0.000651	0.025516	0	1
Baldwin Park_Eastern SGV X Energy Star	4606	0.001954	0.044165	0	1
El Dorado_El Dorado X Energy Star	4606	0.000651	0.025516	0	1
El Segundo_El Segundo X Energy Star	4606	0.002388	0.048816	0	1
Palo Alto_Embarcadero/101 X Energy Star	4606	0.000217	0.014735	0	1
Emeryville_Emeryville X Energy Star	4606	0.000868	0.02946	0	1
Encino_Encino X Energy Star	4606	0.001086	0.032933	0	1
San Francisco_Financial District X Energy Star	4606	0.007599	0.086849	0	1
Folsom_Folsom X Energy Star	4606	0.000868	0.02946	0	1
Foster City_Foster City/Redwood Shrs X Energy Star	4606	0.001303	0.036073	0	1
Fountain Valley_Fountain Valley X Energy Star	4606	0.000217	0.014735	0	1
Fresno_Fresno County X Energy Star	4606	0.000217	0.014735	0	1
Glendale_Glendale X Energy Star	4606	0.003257	0.05698	0	1
San Diego_Governor Park X Energy Star	4606	0.000868	0.02946	0	1
Los Angeles_Greater Downtown X Energy Star	4606	0.006948	0.08307	0	1
Pleasanton_Hacienda Business Park X Energy Star	4606	0.000651	0.025516	0	1
Gold River_Highway 50 Corridor X Energy Star	4606	0.004342	0.065759	0	1
Hollywood_Hollywood/Silver Lake X Energy Star	4606	0.000868	0.02946	0	1
Sacramento_Howe Ave/Fulton Ave X Energy Star	4606	0.000217	0.014735	0	1
Huntington Beach_Huntington Beach X Energy Star	4606	0.000434	0.020836	0	1
Irvine_Irvine X Energy Star	4606	0.012158	0.109603	0	1
Irvine_Irvine Spectrum X Energy Star	4606	0.002171	0.046549	0	1
San Diego_Kearny Mesa X Energy Star	4606	0.002605	0.050981	0	1
Los Angeles_LAX X Energy Star	4606	0.000651	0.025516	0	1
Aliso Viejo_Laguna Hills/Aliso Viejo X Energy Star	4606	0.001954	0.044165	0	1
Laguna Niguel_Laguna Niguel/Laguna Beac X Energy Star	4606	0.000434	0.020836	0	1
Foothill Ranch_Lake Forest/Foothill Ranc X Energy Star	4606	0.001737	0.041644	0	1

Long Beach_Long Beach: Downtown X Energy Star	4606	0.002388	0.048816	0	1
Long Beach_Long Beach: Suburban X Energy Star	4606	0.001737	0.041644	0	1
Orange_Main Place Area X Energy Star	4606	0.000868	0.02946	0	1
Culver City_Marina Del Rey/Venice X Energy Star	4606	0.002171	0.046549	0	1
Artesia_Mid Cities X Energy Star	4606	0.001086	0.032933	0	1
Los Angeles_Mid Wilshire X Energy Star	4606	0.000217	0.014735	0	1
Milpitas_Milpitas X Energy Star	4606	0.000434	0.020836	0	1
Los Angeles_Miracle Mile X Energy Star	4606	0.00152	0.038959	0	1
Santa Clara_Mission College Area X Energy Star	4606	0.000651	0.025516	0	1
San Diego_Mission Valley X Energy Star	4606	0.003691	0.060647	0	1
Ladera Ranch_Mission Viejo X Energy Star	4606	0.000434	0.020836	0	1
Simi Valley_Moorpark/Simi Valley X Energy Star	4606	0.000217	0.014735	0	1
San Jose_N. San Jose Brokaw X Energy Star	4606	0.001086	0.032933	0	1
Sacramento_Natomas/Northgate X Energy Star	4606	0.003908	0.062398	0	1
Newport Beach_Newport Beach X Energy Star	4606	0.003691	0.060647	0	1
Encinitas_North Beach Cities X Energy Star	4606	0.000651	0.025516	0	1
North Hollywood_North Hollywood X Energy Star	4606	0.000434	0.020836	0	1
Monterey_North Monterey County X Energy Star	4606	0.000651	0.025516	0	1
Anaheim_North/East Anaheim X Energy Star	4606	0.000217	0.014735	0	1
Novato_Novato/Ignacio/N Marin X Energy Star	4606	0.000434	0.020836	0	1
Oakland_Oakland Downtown X Energy Star	4606	0.002388	0.048816	0	1
Los Angeles_Olympic Corridor X Energy Star	4606	0.001303	0.036073	0	1
Oxnard_Oxnard/Port Hueneme X Energy Star	4606	0.000434	0.020836	0	1
Santa Ana_Parkcenter Area X Energy Star	4606	0.000651	0.025516	0	1
Los Angeles_Pasadena/Arcadia/Monrovia X Energy Star	4606	0.004994	0.070496	0	1
Placentia_Placentia/Yorba Linda X Energy Star	4606	0.000434	0.020836	0	1
Pleasant Hill_Pleasant Hill X Energy Star	4606	0.000434	0.020836	0	1
San Jose_Plumeria Drive X Energy Star	4606	0.000217	0.014735	0	1
Sacramento_Point West X Energy Star	4606	0.00152	0.038959	0	1
San Francisco_Potrero West of 101 Fwy X Energy Star	4606	0.000217	0.014735	0	1
San Diego_Rancho Bernardo X Energy Star	4606	0.000651	0.025516	0	1
San Francisco_Rincon/South Beach X Energy Star	4606	0.001086	0.032933	0	1
Beaumont_Riverside X Energy Star	4606	0.000434	0.020836	0	1

Rocklin_Roseville/Rocklin X Energy Star	4606	0.004559	0.067376	0	1
San Jose_San Jose Airport X Energy Star	4606	0.000868	0.02946	0	1
San Jose_San Jose, Winchester X Energy Star	4606	0.000217	0.014735	0	1
San Marcos_San Marcos X Energy Star	4606	0.000217	0.014735	0	1
San Mateo_San Mateo Corridor/Hwy 92 X Energy Star	4606	0.001737	0.041644	0	1
San Mateo_San Mateo Downtown North X Energy Star	4606	0.000434	0.020836	0	1
San Rafael_San Rafael/Larkspur X Energy Star	4606	0.000434	0.020836	0	1
Santa Ana_Santa Ana X Energy Star	4606	0.000651	0.025516	0	1
Newhall_Santa Clarita Valley X Energy Star	4606	0.001954	0.044165	0	1
Santa Monica_Santa Monica X Energy Star	4606	0.00304	0.055054	0	1
Los Angeles_Santa Monica Mountains X Energy Star	4606	0.000434	0.020836	0	1
Santa Rosa_Santa Rosa X Energy Star	4606	0.000651	0.025516	0	1
San Diego_Scripps Ranch X Energy Star	4606	0.000434	0.020836	0	1
Seal Beach_Seal Beach X Energy Star	4606	0.000434	0.020836	0	1
Sherman Oaks_Sherman Oaks X Energy Star	4606	0.000651	0.025516	0	1
San Francisco_Showplace Square X Energy Star	4606	0.000217	0.014735	0	1
San Diego_Sorrento Mesa X Energy Star	4606	0.002171	0.046549	0	1
San Francisco_South Financial District X Energy Star	4606	0.004342	0.065759	0	1
Mountain View_South Moffett Triangle X Energy Star	4606	0.000217	0.014735	0	1
Corona_South Riverside X Energy Star	4606	0.000434	0.020836	0	1
South San Francisco_South SF East of 101 Fwy X Energy Star	4606	0.001086	0.032933	0	1
Santa Ana_South Santa Ana X Energy Star	4606	0.002388	0.048816	0	1
Los Angeles_Southeast Los Angeles X Energy Star	4606	0.001954	0.044165	0	1
Anaheim_Stadium Area X Energy Star	4606	0.001086	0.032933	0	1
Stockton_Stockton X Energy Star	4606	0.000217	0.014735	0	1
Studio City_Studio/Universal Cities X Energy Star	4606	0.000434	0.020836	0	1
Orange_The City Area X Energy Star	4606	0.001086	0.032933	0	1
Newbury Park_Thousand Oaks/SE County X Energy Star	4606	0.001086	0.032933	0	1
Torrance_Torrance X Energy Star	4606	0.001303	0.036073	0	1
La Jolla_Torrey Pines X Energy Star	4606	0.000217	0.014735	0	1
La Jolla_UTC X Energy Star	4606	0.004125	0.064101	0	1
Ventura_Ventura X Energy Star	4606	0.001086	0.032933	0	1
Pleasant Hill_Walnut Creek BART/DT X Energy Star	4606	0.002605	0.050981	0	1
Walnut Creek_Walnut Creek Shadelands X Energy Star	4606	0.000217	0.014735	0	1
San Francisco_Waterfront/North Beach X Energy Star	4606	0.000217	0.014735	0	1

Beverly Hills_West Los Angeles X Energy Star	4606	0.000868	0.02946	0	1
West Sacramento_West Sacramento X Energy Star	4606	0.000217	0.014735	0	1
Canoga Park_Western SFV X Energy Star	4606	0.001303	0.036073	0	1
Alhambra_Western SGV X Energy Star	4606	0.003257	0.05698	0	1
Westminster_Westminster X Energy Star	4606	0.000434	0.020836	0	1
Los Angeles_Westwood X Energy Star	4606	0.002388	0.048816	0	1
Canoga Park_Woodland Hills/Warner Ctr X Energy Star	4606	0.00304	0.055054	0	1

APPENDIX E - Variance Inflation Factor (VIF) Model 5

Variable	VIF
All Leed	56.59
Energy Star	34.98
San Ramon_Bishop Ranch X LEED	27.35
San Ramon_Bishop Ranch	18.52
San Francisco_South Financial District X Energy Star	17.04
San Francisco_Financial District X Energy Star	14.8
San Francisco_South Financial District	13.4
San Francisco_Financial District	12.15
San Ramon_Bishop Ranch X Energy Star	11.63
Los Angeles_Century City X Energy Star	9.28
Alhambra_Western SGV X Energy Star	7.74
Irvine_Irvine X Energy Star	6.56
Alhambra_Western SGV X LEED	6.43
Irvine_Irvine	5.98
Los Angeles_Century City X LEED	5.9
La Jolla_UTC X Energy Star	5.71
Los Angeles_Greater Downtown X Energy Star	5.49
San Jose_N. San Jose Brokaw X LEED	5.47
San Jose_N. San Jose Brokaw X Energy Star	5.28
San Francisco_South Financial District X LEED	5.06
Los Angeles_Century City	5.03
Number of Stories	4.58
Ontario_Airport Area	4.53
Santa Ana_Parkcenter Area	4.23
Los Angeles_Greater Downtown	4.22
Los Angeles_Greater Downtown X LEED	4.21
Irvine_Irvine Spectrum	4.11
San Francisco_Financial District X LEED	4.1
La Jolla_UTC X LEED	4.06
Irvine_Irvine X LEED	3.98
Gold River_Highway 50 Corridor	3.92
Orange_The City Area X Energy Star	3.91
Sacramento_Natomas/Northgate	3.87
Glendale_Glendale X Energy Star	3.81
American Canyon_Napa County	3.78
South San Francisco_South SF East of 101 Fwy X Energy Star	3.76
Orange_The City Area	3.73
Rocklin_Roseville/Rocklin	3.6
Santa Monica_Santa Monica	3.49
La Jolla_UTC	3.47
Carlsbad_Carlsbad	3.45
Los Angeles_Pasadena/Arcadia/Monrovia X Energy Star	3.44
Santa Clara_Mission College Area X Energy Star	3.43
Glendale_Glendale X LEED	3.34
Santa Ana_Parkcenter Area X Energy Star	3.34
Aliso Viejo_Laguna Hills/Aliso Viejo	3.3
Rocklin_Roseville/Rocklin X Energy Star	3.29

Alhambra_Western SGV	3.28
Culver City_Marina Del Rey/Venice X Energy Star	3.27
San Diego_Mission Valley	3.25
Santa Ana_Parkcenter Area X LEED	3.23
Santa Clara_Mission College Area X LEED	3.23
Artesia_Mid Cities X Energy Star	3.23
San Mateo_San Mateo Downtown North X Energy Star	3.18
San Diego_Kearny Mesa	3.18
Los Angeles_Westwood X LEED	3.17
San Francisco_Bayview/Hunters Point X Energy Star	3.17
El Segundo_El Segundo X Energy Star	3.15
Oakland_Oakland Downtown X Energy Star	3.14
Sacramento_Natomas/Northgate X Energy Star	3.13
Baldwin Park_Eastern SGV	3.13
Culver City_Marina Del Rey/Venice	3.11
San Mateo_San Mateo Downtown North	3.1
Newbury Park_Thousand Oaks/SE County	3.1
San Francisco_Bayview/Hunters Point	3.1
Gold River_Highway 50 Corridor X Energy Star	3.09
San Bernardino_East San Bernardino X Energy Star	3.08
San Diego_Mission Valley X Energy Star	3.08
Newport Beach_Newport Beach X Energy Star	3.07
Canoga Park_Woodland Hills/Warner Ctr	3.01
Pleasant Hill_Walnut Creek BART/DT	3
Fresno_Fresno County X LEED	2.98
South San Francisco_South SF East of 101 Fwy	2.95
Canoga Park_Woodland Hills/Warner Ctr X LEED	2.88
Artesia_Mid Cities X LEED	2.85
Glendale_Glendale	2.83
San Bernardino_East San Bernardino	2.82
Buena Park_Buena Park/La Palma X Energy Star	2.74
Long Beach_Long Beach: Downtown X Energy Star	2.74
Beaumont_Riverside	2.69
Santa Monica_Santa Monica X Energy Star	2.66
Encinitas_North Beach Cities	2.66
Agoura Hills_Calabasas/Westlake Vill	2.64
Newhall_Santa Clarita Valley X Energy Star	2.63
Irvine_Irvine Spectrum X Energy Star	2.59
Oxnard_Oxnard/Port Hueneme	2.59
San Diego_Sorrento Mesa	2.57
San Jose_Downtown San Jose East X Energy Star	2.56
Foothill Ranch_Lake Forest/Foothill Ranc	2.56
El Segundo_El Segundo	2.55
Los Angeles_Westwood	2.53
Studio City_Studio/Universal Cities X Energy Star	2.51
Agoura Hills_Calabasas/Westlake Vill X Energy Star	2.51
Los Angeles_Brentwood X Energy Star	2.5
Culver City_Culver City X Energy Star	2.49
Foothill Ranch_Lake Forest/Foothill Ranc X Energy Star	2.49
Long Beach_Long Beach: Downtown	2.48

San Jose_Downtown San Jose East	2.47
Beverly Hills_Beverly Hills	2.46
Foster City_Foster City/Redwood Shrs	2.44
Costa Mesa_Costa Mesa X LEED	2.43
Costa Mesa_Costa Mesa	2.43
Newport Beach_Newport Beach X LEED	2.42
Pleasant Hill_Walnut Creek BART/DT X Energy Star	2.42
Newhall_Santa Clarita Valley	2.42
Canoga Park_Western SFV	2.42
Los Angeles_Westwood X LEED	2.41
Los Angeles_Miracle Mile X Energy Star	2.4
Burbank_Burbank	2.39
Los Angeles_Southeast Los Angeles	2.39
Culver City_Culver City	2.39
Building Class A	2.37
Folsom_Folsom	2.36
Brisbane_Brisbane/Daly City X Energy Star	2.35
Novato_Novato/Ignacio/N Marin X Energy Star	2.34
San Jose_Oak Creek	2.32
San Diego_Kearny Mesa X Energy Star	2.31
Oakland_Oakland Downtown X LEED	2.29
Anaheim_Stadium Area X Energy Star	2.28
Long Beach_Long Beach: Suburban	2.28
San Diego_Sorrento Mesa X LEED	2.27
Corona_South Riverside X Energy Star	2.26
Brea_Brea/La Habra	2.25
Long Beach_Long Beach: Suburban X Energy Star	2.24
Costa Mesa_Costa Mesa X LEED	2.23
Los Angeles_Southeast Los Angeles X Energy Star	2.23
Sacramento_Natomas/Northgate X LEED	2.22
Fresno_Fresno County X Energy Star	2.21
Sacramento_Point West	2.2
Pacifica_Pacifica	2.19
Concord_Concord	2.19
San Diego_Del Mar Hts/Carmel Valley	2.19
Los Angeles_Miracle Mile	2.18
North Hollywood_North Hollywood X Energy Star	2.17
Seal Beach_Seal Beach X Energy Star	2.17
Gardena_190th Street Corridor	2.17
Pleasanton_Pleasanton North X LEED	2.15
Anaheim_Stadium Area	2.15
Ventura_Ventura	2.15
Studio City_Studio/Universal Cities X LEED	2.13
Foster City_Foster City/Redwood Shrs X LEED	2.13
San Diego_Rancho Bernardo	2.13
Seal Beach_Seal Beach	2.13
San Jose_Downtown San Jose West	2.13
Novato_Novato/Ignacio/N Marin X LEED	2.12
Brisbane_Brisbane/Daly City X LEED	2.12
Irvine_Irvine Spectrum X LEED	2.12

Corona_South Riverside X LEED	2.11
Carlsbad_Carlsbad X Energy Star	2.11
Torrance_Torrance	2.11
Ladera Ranch_Mission Viejo	2.1
Mountain View_Downtown Mountain View X Energy Star	2.09
Emeryville_Emeryville	2.09
Palo Alto_Downtown Palo Alto X Energy Star	2.08
Beverly Hills_Beverly Hills X Energy Star	2.07
Mountain View_Downtown Mountain View	2.07
Encino_Encino	2.07
Palo Alto_Downtown Palo Alto	2.06
Northridge_Eastern SFV X Energy Star	2.05
San Diego_Old Twn/S Arena/Pt Loma	2.05
Gardena_190th Street Corridor X Energy Star	2.04
Los Angeles_Brentwood	2.04
Pleasanton_Pleasanton North	2.04
La Quinta_Coachella Valley	2.04
Los Angeles_Miracle Mile X LEED	2.03
Sherman Oaks_Sherman Oaks	2.03
El Segundo_El Segundo X LEED	2.02
Newport Beach_Newport Beach	2.02
Santa Ana_Santa Ana	2.02
Torrance_Torrance X Energy Star	2.01
San Diego_Del Mar Hts/Carmel Valley X Energy Star	1.97
El Dorado_El Dorado	1.97
Artesia_Mid Cities	1.97
Pleasanton_Hacienda Business Park	1.96
Foothill Ranch_Lake Forest/Foothill Ranc X LEED	1.95
Baldwin Park_Eastern SGV X Energy Star	1.95
Sacramento_Point West X Energy Star	1.94
Concord_Concord X Energy Star	1.94
San Jose_San Jose Airport	1.94
Los Angeles_Olympic Corridor X Energy Star	1.92
South San Francisco_South SF East of 101 Fwy X LEED	1.91
Anaheim_Stadium Area X LEED	1.91
San Diego_Scripps Ranch	1.9
Canoga Park_Woodland Hills/Warner Ctr X LEED	1.89
Aliso Viejo_Laguna Hills/Aliso Viejo X Energy Star	1.89
Los Angeles_Olympic Corridor	1.89
Brea_Brea/La Habra X Energy Star	1.88
San Diego_Governor Park	1.88
Beverly Hills_West Los Angeles	1.86
Milpitas_Milpitas	1.86
San Diego_Old Twn/S Arena/Pt Loma X LEED	1.85
Newhall_Santa Clarita Valley X LEED	1.85
Corona_South Riverside	1.85
Orange_Main Place Area	1.85
Alameda_Alameda	1.84
Hollywood_Hollywood/Silver Lake	1.84
Burbank_Burbank X Energy Star	1.83

San Diego_Governor Park X Energy Star	1.83
Anaheim_Anaheim Hills X Energy Star	1.83
Campbell_Campbell	1.83
Anaheim_Anaheim Hills	1.83
Canoga Park_Western SFV X LEED	1.81
Ladera Ranch_San Juan Cap/S Clemente/D X LEED	1.8
Santa Clara_Mission College Area	1.8
San Mateo_San Mateo Corridor/Hwy 92 X Energy Star	1.79
Parking Ratio	1.79
Gold River_Highway 50 Corridor X LEED	1.78
Folsom_Folsom X Energy Star	1.78
Camarillo_Camarillo/Point Mugu	1.78
San Jose_Oak Creek X LEED	1.77
Emeryville_Emeryville X LEED	1.77
San Mateo_San Mateo-Corridor/Hwy 92	1.77
Santa Rosa_Santa Rosa	1.77
San Diego_Mission Valley X LEED	1.76
Emeryville_Emeryville X Energy Star	1.75
North Hollywood_North Hollywood X LEED	1.74
Sunnyvale_Central Sunnyvale X LEED	1.74
San Jose_Downtown San Jose West X LEED	1.74
Ontario_Airport Area X Energy Star	1.74
Pleasant Hill_Walnut Creek BART/DT X LEED	1.73
Los Angeles_Brentwood X LEED	1.73
Mill Valley_Corte Madera/Mill Valley	1.73
Foster City_Foster City/Redwood Shrs X Energy Star	1.72
Santa Ana_South Santa Ana X Energy Star	1.71
Los Angeles_LAX	1.71
Dublin_Dublin	1.7
Northridge_Eastern SFV	1.7
Fresno_Fresno County	1.7
Walnut Creek_Walnut Creek Shadelands	1.69
Huntington Beach_Huntington Beach	1.69
Huntington Beach_Huntington Beach X Energy Star	1.67
Ventura_Ventura X Energy Star	1.66
Orange_Main Place Area X Energy Star	1.66
La Jolla_La Jolla	1.65
Encino_Encino X Energy Star	1.64
Northridge_Eastern SFV X LEED	1.63
Alameda_Alameda X Energy Star	1.63
Santa Monica_Santa Monica X LEED	1.62
Mill Valley_Corte Madera/Mill Valley X Energy Star	1.62
Santa Ana_Civic Center Area	1.62
Carlsbad_Carlsbad X LEED	1.61
Anaheim_North/East Anaheim	1.61
Los Angeles_West Hollywood	1.61
San Diego_Scripps Ranch X LEED	1.6
Monterey_North Monterey County	1.6
San Francisco_Showplace Square	1.6
Mountain View_South Moffett Triangle	1.6

Culver City_Marina Del Rey/Venice X LEED	1.59
San Francisco_Showplace Square X Energy Star	1.59
San Jose_Downtown San Jose West X Energy Star	1.59
Hollywood_Hollywood/Silver Lake X Energy Star	1.59
Los Angeles_Mid Wilshire X Energy Star	1.59
Studio City_Studio/Universal Cities	1.59
Sunnyvale_Central Sunnyvale	1.59
Laguna Niguel_Laguna Niguel/Laguna Beac	1.59
Los Angeles_Mid Wilshire	1.59
Beverly Hills_West Los Angeles X Energy Star	1.58
Novato_Novato/Ignacio/N Marin	1.58
Westminster_Westminster	1.58
Carlsbad_Carlsbad X LEED	1.57
San Mateo_San Mateo Corridor/Hwy 92 X LEED	1.57
North Hollywood_North Hollywood	1.57
Sunnyvale_Peery Park	1.57
San Rafael_San Rafael/Larkspur	1.56
San Francisco_Rincon/South Beach X Energy Star	1.55
Fountain Valley_Fountain Valley	1.55
San Jose_San Jose Airport X Energy Star	1.54
Sacramento_Campus Commons	1.53
Brisbane_Brisbane/Daly City	1.52
Pleasanton_Pleasanton South	1.51
Simi Valley_Moorpark/Simi Valley	1.51
Superior Features	1.51
Sunnyvale_Moffett Park X LEED	1.5
Amenities	1.5
Westminster_Westminster X Energy Star	1.5
Camarillo_Camarillo/Point Mugu X Energy Star	1.5
Los Angeles_LAX X Energy Star	1.5
Santa Clara_N.E. Santa Clara	1.5
Newbury Park_Thousand Oaks/SE County X Energy Star	1.49
Cupertino_Cupertino	1.49
Castro Valley_N Hayward/Castro Valley	1.47
Santa Clara_Oakmead Park	1.47
San Jose_Plumeria Drive	1.47
San Francisco_Waterfront/North Beach	1.47
La Jolla_Torrey Pines	1.46
West Sacramento_West Sacramento	1.46
Corona_Corona	1.46
Cypress_Cypress	1.46
Orange_East Orange	1.46
Folsom_Folsom X LEED	1.45
San Francisco_Rincon/South Beach X LEED	1.45
Agoura Hills_Calabasas/Westlake Vill X LEED	1.45
Long Beach_Long Beach: Downtown X LEED	1.45
Monterey_North Monterey County X Energy Star	1.45
Santa Rosa_Santa Rosa X Energy Star	1.45
Sacramento_Howe Ave/Fulton Ave	1.45
San Diego_Old Twn/S Arena/Pt Loma X LEED	1.44

Vista_Vista	1.44
La Jolla_Torrey Pines X Energy Star	1.42
San Francisco_Waterfront/North Beach X Energy Star	1.42
West Sacramento_West Sacramento X Energy Star	1.42
Corona_Corona X Energy Star	1.42
Laguna Niguel_Laguna Niguel/Laguna Beac X Energy Star	1.42
Sunnyvale_Moffett Park	1.42
Santa Clara_Oakmead Park X LEED	1.41
Mountain View_South Moffett Triangle X LEED	1.41
Placentia_Placentia/Yorba Linda X Energy Star	1.41
San Rafael_San Rafael/Larkspur X Energy Star	1.41
Campbell_Campbell X Energy Star	1.41
San Marcos_San Marcos	1.41
Stockton_Stockton	1.41
Palo Alto_Embarcadero/101	1.41
Oakland_Oakland Port/Jack London	1.4
Age of building	1.39
San Jose_San Jose, Winchester	1.39
El Dorado_El Dorado X Energy Star	1.38
Pleasanton_Hacienda Business Park X Energy Star	1.38
San Jose_N. San Jose Brokaw	1.38
Typical Space Square Foot	1.38
Canoga Park_Western SFV X LEED	1.37
Santa Ana_Santa Ana X Energy Star	1.37
Baldwin Park_Eastern SGV X LEED	1.36
Encinitas_North Beach Cities X Energy Star	1.36
San Diego_Rancho Bernardo X Energy Star	1.35
Sherman Oaks_Sherman Oaks X Energy Star	1.35
Point Richmond_Richmond/San Pablo	1.35
Tustin_Tustin (South of I-5)	1.35
Castro Valley_N Hayward/Castro Valley X LEED	1.34
Rocklin_Roseville/Rocklin X LEED	1.34
Near Public Transit	1.34
Chino_West San Bernardino	1.33
Torrance_Torrance X LEED	1.32
Sacramento_Campus Commons X LEED	1.32
Santa Ana_Civic Center Area X Energy Star	1.32
Dublin_Dublin X Energy Star	1.29
San Jose_San Jose, Winchester X Energy Star	1.28
San Diego_Scripps Ranch X Energy Star	1.28
Long Beach_Long Beach: Suburban X LEED	1.27
Oxnard_Oxnard/Port Hueneme X Energy Star	1.27
Beverly Hills_Beverly Hills X LEED	1.26
Mountain View_South Moffett Triangle X Energy Star	1.26
Milpitas_Milpitas X Energy Star	1.26
Ontario_Airport Area X LEED	1.25
Onsite parking	1.25
San Diego_Sorrento Valley	1.25
Monterey_Monterey	1.25
Morgan Hill_Morgan Hill	1.25

Occupancy	1.24
San Diego_Sorrento Mesa X LEED	1.23
East Palo Alto_Menlo Park East/EPA X LEED	1.23
San Marcos_San Marcos X Energy Star	1.23
Ladera Ranch_Mission Viejo X Energy Star	1.23
Fairfield_Fairfield/Suisun City	1.23
Superior Aestics	1.23
Santa Ana_South Santa Ana X LEED	1.22
San Jose_Downtown San Jose East X LEED	1.22
San Diego_Kearny Mesa X LEED	1.21
Beaumont_Riverside X Energy Star	1.21
Stockton_Stockton X Energy Star	1.21
Palo Alto_Embarcadero/101 X Energy Star	1.21
San Bernardino_East San Bernardino X LEED	1.2
Cypress_Cypress X Energy Star	1.19
Campbell_San Jose Central	1.19
Santa Clara_De La Cruz	1.19
Pleasanton_Pleasanton South X LEED	1.18
San Jose_Plumeria Drive X Energy Star	1.18
Orange_East Orange X Energy Star	1.18
Sacramento_Howe Ave/Fulton Ave X Energy Star	1.18
Simi Valley_Moorpark/Simi Valley X Energy Star	1.18
Anaheim_North/East Anaheim X Energy Star	1.17
Cupertino_Cupertino X Energy Star	1.17
San Jose_San Jose, IBP East	1.17
San Mateo_San Mateo Downtown South X LEED	1.16
Fountain Valley_Fountain Valley X Energy Star	1.15
Los Angeles_Mid-Wilshire	1.15
Sacramento_Midtown	1.15
Walnut Creek_Walnut Creek Shadelands X Energy Star	1.14
San Diego_Mira Mesa/Miramar	1.13
Pleasant Hill_Pleasant Hill X Energy Star	1.12
La Quinta_Coachella Valley X Energy Star	1.12
Oakland_Oakland Downtown	1.12
Los Angeles_Santa Monica Mountains X Energy Star	1.11
Gardena_Hawthorne/Gardena	1.1
San Mateo_San Mateo-Downtown North	1.09
South San Francisco_South SF West of 101 Fwy	1.09
San Francisco_Lower South of Market	1.09
Artesia_Mid-Cities	1.09
San Diego_Mission Gorge	1.08
San Francisco_Potrero West of 101 Fwy X Energy Star	1.06
San Francisco_Yerba Buena	1.06
Davis_Davis/Woodland	1.06
San Francisco_Jackson Square	1.06
Mountain View_Shoreline Corridor South	1.04
Folsom_Citrus Heights/Orangevale	1.04
San Francisco_Mission Bay/China Basin	1.04
San Jose_N. San Jose - Brokaw	1.03
Buena Park_Buena Park/La Palma	1.03

San Diego_PB/Rose Canyon/Morena	1.03
Los Angeles_Pasadena/Arcadia/Monrovia	1.03
Sacramento_South Sacramento	1.03
San Francisco_South of Market	1.03
Woodland Hills_Tarzana	1.03
San Diego_Uptown West/Park West	1.03
San Francisco_Van Ness Corridor	1.03
Chatsworth_Chatsworth Ind	1.03
Sunnyvale_East Arques Ave Corridor	1.03
Manhattan Beach_Beach Cities/Palos Verdes	1.03

APPENDIX F - Regression Coefficients

Log rent per square foot per year (Dependent Variable)	Model 1: Energy Star, LEED, and No interaction	Model 2: Levels of LEED	Model 3:All LEED, Energy Star, and LEED interaction	Model 4: All LEED, Energy Star, and Energy Star interaction	Model 5: All LEED, Energy Star, LEED interaction and Energy Star Interaction
EnergyStar	0.0572*** (0.0105)	0.0801*** (0.0106)	0.0754*** (0.0106)	0.0320 (0.0395)	0.0944** (0.0406)
All_Leed	0.0946*** (0.0342)	-	-0.0283 (0.0386)	0.0085 (0.0158)	-0.0615 (0.0395)
LEED Certified and Silver	-	0.1231*** (0.048)	-	-	-
LEED Gold and Platnium	-	0.1101*** (0.0438)	-	-	-
LeedX Energy Star	-0.1363*** (0.0374)	-	-	-	-
LEED Certified and Silver X Energy Star	-	-0.1396** (0.055)	-	-	-
LEED Gold and Platinum X Energy Star	-	-0.1346*** (0.0474)	-	-	-
Occupancy	0.0741*** (0.018)	0.087*** (0.0182)	0.086*** (0.0184)	0.0807*** (0.0186)	0.0804*** (0.0188)
Stories	0.0829*** (0.009)	0.0016** (0.001)	0.0031*** (0.0012)	0.0035*** (0.0013)	0.0045*** (0.0014)
Typical Square Foot (Measured in 10,000 square feet)	.00004 (.00251)	0.00176 (0.0026)	0.00064 (0.00262)	0.00047 (0.00268)	.0003 (.0072)
Age	-0.0026*** (0.0004)	-0.0024*** (0.0004)	-0.0024*** (0.0004)	-0.0024*** (0.0004)	-0.0023*** (0.0005)
ParkRatio	0.0279*** (0.0048)	0.0269*** (0.0049)	0.0272*** (0.0049)	0.0273*** (0.005)	0.028*** (0.0051)
Onsiteparking	-0.0119 (0.0091)	-0.0113** (0.0092)	-0.0117 (0.0094)	-0.008 (0.0094)	-0.0088 (0.0095)
Amenities	0.0139 (0.009)	0.0141** (0.009)	0.014 (0.0092)	0.0122 (0.0094)	0.0116 (0.0095)
SuperiorAes	-0.0119 (0.0094)	-0.0124** (0.0095)	-0.0138 (0.0095)	-0.0126 (0.0098)	-0.0142 (0.0099)
SuperiorFeatures	-0.0146* (0.01)	-0.0151** (0.0101)	-0.0141* (0.0102)	-0.0167* (0.0105)	-0.0154* (0.0106)
Building_Class1	0.1084*** (0.0109)	0.1579*** (0.01)	0.1509*** (0.0104)	0.1635*** (0.0105)	0.1617*** (0.0108)
Near_commuterline	0.0201** (0.01)	0.0233** (0.01)	0.0225** (0.0102)	0.0137* (0.0104)	0.0125* (0.0106)
Gardena_190th Street Corridor	-0.2053*** (0.0461)	-0.2233*** (0.0517)	0.3006 (0.532)	-0.3012*** (0.0642)	-0.2793*** (0.0645)

Ontario_Airport Area	-0.2746*** (0.0349)	-0.3128*** (0.0416)	0.2104 (0.531)	-0.3528*** (0.0442)	-0.3323*** (0.045)
Alameda_Alameda	-0.1234 (0.0958)	-0.1469** (0.1025)	0.3756 (0.5391)	-0.1684* (0.1128)	-0.1463* (0.1131)
Anaheim_Anaheim Hills	-0.0953* (0.0708)	-0.1193** (0.068)	0.4063 (0.5339)	-0.2166** (0.0951)	-0.1941** (0.0962)
San Francisco_Bayview/Hunters Point	-0.1798*** (0.0556)	-0.2087*** (0.0416)	0.319 (0.5314)	-0.2907 (0.2005)	-0.2695 (0.1555)
Manhattan Beach_Beach Cities/Palos Verdes	0.0081* (0.0295)	0.0089** (0.0355)	0.5324* (0.7566)	-0.0189* (0.0631)	0.003* (0.0401)
Beverly Hills_Beverly Hills	0.6929*** (0.0654)	0.6999*** (0.0682)	1.2225** (0.5341)	0.7375*** (0.0763)	0.7594*** (0.0768)
San Ramon_Bishop Ranch	-0.0889** (0.0438)	-0.1237** (0.0552)	0.2898 (0.5373)	-0.2576*** (0.0461)	-0.2461 (0.2217)
Brea_Brea/La Habra	-0.0705* (0.0441)	-0.0956** (0.0478)	0.4289* (0.5315)	-0.1141** (0.0576)	-0.092* (0.0581)
Los Angeles_Brentwood	0.461*** (0.0859)	0.4749*** (0.0908)	1.0276 (0.5386)	0.5757*** (0.112)	0.5959*** (0.1123)
Brisbane_Brisbane/Daly City	-0.0448* (0.0965)	-0.0559** (0.1002)	0.5463 (0.5328)	-0.0214* (0.0665)	-0.0004* (0.0664)
Buena Park_Buena Park/La Palma	-0.1415*** (0.0436)	-0.1841*** (0.0518)	0.342 (0.5319)	-0.2819*** (0.0849)	-0.2596*** (0.0852)
Burbank_Burbank	0.0691 (0.0382)	0.0564 (0.0462)	0.564 (0.5316)	-0.005* (0.0504)	0.0023 (0.0502)
Agoura Hills_Calabasas/Westlake	-0.0251* (0.046)	-0.0649** (0.0498)	0.4559 (0.5319)	-0.1195* (0.0612)	-0.097* (0.0616)
Camarillo_Camarillo/Point Mugu	-0.2001*** (0.0632)	-0.2712*** (0.0662)	0.2583 (0.5335)	-0.3525*** (0.0746)	-0.3286*** (0.075)
Campbell_Campbell	0.1115 (0.0571)	0.0946 (0.0622)	0.6168 (0.5329)	0.0551 (0.0646)	0.0758 (0.0647)
Sacramento_Campus Commons	0.0103* (0.0623)	-0.0267** (0.065)	0.4946 (0.5339)	-0.0536* (0.0662)	-0.0416* (0.0701)
Carlsbad_Carlsbad	-0.0897** (0.0411)	-0.129*** (0.0455)	0.3909* (0.5314)	-0.1742*** (0.0496)	-0.1518*** (0.0502)
Sunnyvale_Central Sunnyvale	0.5806*** (0.1848)	0.5745*** (0.1902)	1.1764 (0.6117)	0.5794*** (0.1633)	0.6405** (0.3037)
Los Angeles_Century City	0.3092*** (0.0536)	0.3546*** (0.061)	0.8242 (0.5364)	0.3573*** (0.0862)	0.3763*** (0.0862)
Chatsworth_Chatsworth Ind	-0.4124 (0.4175)	-0.4474** (0.4437)	0.0767 (0.5403)	-0.4801 (0.4929)	-0.4578 (0.452)
Folsom_Citrus Heights/Orangevale	-0.4923* (0.4699)	-0.5225** (0.4877)	0.092 (0.5356)	-0.5563* (0.5297)	-0.5369* (0.4919)
Santa Ana_Civic Center Area	-0.4328*** (0.0824)	-0.4294*** (0.0805)	0.1644 (0.5324)	-0.4861*** (0.0912)	-0.4666*** (0.0916)
La Quinta_Coachella Valley	-0.3103*** (0.0523)	-0.3605*** (0.056)	0.2218 (0.5311)	-0.3907*** (0.0578)	-0.3676*** (0.0584)
Concord_Concord	-0.2852*** (0.0371)	-0.3009*** (0.0431)	0.2008* (0.5308)	-0.3412*** (0.0508)	-0.3188*** (0.0513)
Corona_Corona	-0.2853*** (0.0304)	-0.3248*** (0.0393)	1.0148 (0.5317)	-0.34*** (0.036)	-0.3169*** (0.0368)

Mill Valley_Corte Madera/Mill Valley	0.5114*** (0.0453)	0.4903*** (0.0499)	0.2503 (0.5317)	0.4211*** (0.0496)	0.4419*** (0.0502)
Costa Mesa_Costa Mesa	-0.2264*** (0.0445)	-0.2651*** (0.0487)	0.5163* (0.5311)	-0.3073*** (0.0521)	-0.2848*** (0.0526)
Culver City_Culver City	0.0151* (0.0362)	-0.0089** (0.0422)	0.891 (0.5328)	0.0056* (0.0496)	0.0275* (0.0502)
Cupertino_Cupertino	0.4038*** (0.0552)	0.3662*** (0.059)	0.2425 (0.5352)	0.3223*** (0.0618)	0.3447*** (0.0622)
Cypress_Cypress	-0.2579*** (0.0705)	-0.2798*** (0.0786)	0.5862 (0.5861)	-0.3194*** (0.0872)	-0.2975*** (0.0876)
Davis_Davis/Woodland	0.1142* (0.2097)	0.0616* (0.2518)	0.2951 (0.5304)	0.0273* (0.2488)	0.0509* (0.249)
Santa Clara_De La Cruz	-0.2039*** (0.0299)	-0.2283*** (0.0344)	0.8704 (0.5308)	-0.2642*** (0.0356)	-0.2429*** (0.0364)
San Diego_Del Mar Hts/Carmel Valley	0.3682*** (0.0317)	0.3444*** (0.0392)	0.5529* (0.5312)	0.3545*** (0.0397)	0.3763*** (0.0403)
Mountain View_Downtown Mountain View	0.9083*** (0.1182)	0.0382** (0.0385)	1.4589*** (0.5346)	0.9337* (0.6163)	0.9546 (5.0001)
Palo Alto_Downtown Palo Alto	1.1176*** (0.0315)	0.9395*** (0.0661)	1.6398*** (0.5312)	1.0997*** (0.2525)	1.1224 (5.0001)
San Jose_Downtown San Jose East	-0.0339 (0.0436)	1.115*** (0.043)	0.5104 (0.5319)	-0.083 (0.0613)	-0.0642 (0.0616)
San Jose_Downtown San Jose West	0.0562* (0.141)	0.0017** (0.0498)	0.6218 (0.5449)	0.0402* (0.1439)	0.1265* (0.2338)
Dublin_Dublin	-0.1913*** (0.0508)	0.0458** (0.1112)	0.3099 (0.5323)	-0.2592*** (0.0596)	-0.2367*** (0.0601)
Sunnyvale_East Arques Ave Corridor	0.4653** (0.187)	-0.2134*** (0.0558)	0.9547 (0.8896)	0.3974*** (0.1043)	0.4189** (0.2099)
Orange_East Orange	0.1669* (0.1117)	0.4301 (0.2247)	0.6658 (0.5409)	0.1631* (0.1052)	0.1847* (0.1054)
San Bernardino_East San Bernardino	-0.2793*** (0.0456)	0.142* (0.1125)	0.205 (0.5319)	-0.4073*** (0.0687)	-0.3843*** (0.0692)
Northridge_Eastern SFV	-0.0763** (0.0355)	-0.3172*** (0.05)	0.4185 (0.5308)	-0.1361*** (0.0405)	-0.1145*** (0.0413)
Baldwin Park_Eastern SGV	-0.1099*** (0.037)	-0.0924** (0.0394)	0.3845 (0.5311)	-0.1668*** (0.047)	-0.1476*** (0.0478)
El Dorado_El Dorado	-0.2709*** (0.0679)	-0.1361*** (0.0426)	0.1887 (0.5343)	-0.3519*** (0.0802)	-0.3294*** (0.0806)
El Segundo_El Segundo	0.1333*** (0.0432)	-0.3358*** (0.0725)	0.667* (0.5318)	0.1618*** (0.0558)	0.183*** (0.0563)
Palo Alto_Embarcadero/101	0.6127*** (0.0764)	0.1245*** (0.0467)	1.1004** (0.5352)	0.5123*** (0.0806)	0.5339*** (0.081)
Emeryville_Emeryville	0.0546 (0.0595)	0.5766*** (0.078)	0.5598 (0.5348)	0.044 (0.0849)	0.0367 (0.0949)
Encino_Encino	0.0608 (0.04)	0.0585* (0.0634)	0.5945 (0.5314)	0.0555 (0.0486)	0.075 (0.0492)
Fairfield_Fairfield/Suisun City	-0.0675* (0.1114)	0.0729 (0.044)	0.4173* (0.5417)	-0.1452 (0.1145)	-0.1221 (0.1143)
San Francisco_Financial District	0.4147*** (0.0723)	-0.1076** (0.1147)	1.074** (0.5413)	0.2798* (0.6296)	0.2974* (0.6304)
Folsom_Folsom	-0.0743**	0.4775***	0.3947*	-0.1653***	-0.1424***

	(0.0345)	(0.0775)	(0.5308)	(0.042)	(0.0426)
Foster City_Foster City/Redwood Shrs	0.4221*** (0.0411)	-0.1327*** (0.039)	0.9031 (0.5321)	0.3529*** (0.0549)	0.3528*** (0.0586)
Fountain Valley_Fountain Valley	-0.1384 (0.095)	0.391*** (0.0496)	0.3663 (0.5381)	-0.1974 (0.1033)	-0.1763 (0.1037)
Fresno_Fresno County	-0.0717 (0.0977)	-0.1578** (0.0969)	0.5176 (0.5438)	-0.0885 (0.1032)	-0.0305 (0.1236)
Glendale_Glendale	0.0145 (0.0338)	-0.1043** (0.1033)	0.5338 (0.5318)	-0.0241 (0.0524)	-0.0015 (0.0532)
San Diego_Governor Park	0.0604* (0.0378)	0.0132** (0.0426)	0.5453 (0.5312)	0.0279 (0.0417)	0.0504 (0.0423)
Los Angeles_Greater Downtown	-0.0606 (0.0309)	0.0195** (0.0447)	0.539 (0.5314)	-0.0001* (0.0424)	0.0176 (0.0432)
Pleasanton_Hacienda Business Park	-0.0291* (0.0377)	-0.0084** (0.0416)	0.4709 (0.5313)	-0.0896* (0.0487)	-0.068* (0.0491)
Gardena_Hawthorne/Gardena	-0.3502*** (0.0591)	-0.0512** (0.0453)	0.1447 (0.5328)	-0.4102*** (0.0583)	-0.3887*** (0.0586)
Gold River_Highway 50 Corridor	-0.2396*** (0.0318)	-0.3782*** (0.0599)	0.2378* (0.5307)	-0.3143*** (0.0421)	-0.292*** (0.0428)
Hollywood_Hollywood/Silver Lake	0.3388*** (0.0457)	-0.2887*** (0.0377)	0.878 (0.5323)	0.3622*** (0.0514)	0.3825*** (0.0519)
Sacramento_Howe Ave/Fulton Ave	-0.131* (0.0808)	0.3573*** (0.0534)	0.3605 (0.5356)	-0.1867** (0.0888)	-0.1653 (0.0894)
Huntington Beach_Huntington Beach	-0.1294* (0.072)	-0.1626** (0.0814)	0.3624 (0.5353)	-0.1163* (0.0836)	-0.0945* (0.0843)
Irvine_Irvine	-0.1078*** (0.0302)	-0.1631** (0.0802)	0.3959 (0.5308)	-0.1793*** (0.0455)	-0.1575*** (0.0461)
Irvine_Irvine Spectrum	-0.17*** (0.0367)	-0.1253*** (0.038)	0.3173* (0.5311)	-0.2482*** (0.0454)	-0.2258*** (0.046)
San Francisco_Jackson Square	0.3748** (0.1734)	-0.1988*** (0.0425)	0.9477 (0.5595)	0.3935** (0.1848)	0.4111** (0.186)
San Diego_Kearny Mesa	-0.1773*** (0.035)	0.4306 (0.1813)	0.3232 (0.531)	-0.2529*** (0.0456)	-0.2313*** (0.0462)
Los Angeles_LAX	-0.3162*** (0.0623)	-0.1986*** (0.0409)	0.2393 (0.5333)	-0.3439*** (0.0772)	-0.3265*** (0.0785)
La Jolla_La Jolla	0.2981*** (0.0638)	-0.2781*** (0.0624)	0.8146 (0.5336)	0.2572*** (0.0663)	0.2793*** (0.0668)
Aliso Viejo_Laguna Hills/Aliso Viejo	-0.1043** (0.0461)	0.2913*** (0.0656)	0.3913 (0.5317)	-0.1788*** (0.0564)	-0.1574*** (0.0569)
Laguna Niguel_Laguna Niguel/Laguna Beac	0.0249* (0.0691)	-0.133*** (0.0503)	0.5129 (0.5344)	-0.0135* (0.0874)	0.0082* (0.0874)
Foothill Ranch_Lake Forest/Foothill Ranc	-0.2214*** (0.0461)	-0.0095** (0.0732)	0.2861 (0.5317)	-0.2666*** (0.0551)	-0.2442*** (0.0556)
Long Beach_Long Beach: Downtown	-0.2055*** (0.0401)	-0.2631*** (0.0504)	0.3352 (0.5315)	-0.2321*** (0.054)	-0.2141*** (0.0547)
Long Beach_Long Beach: Suburban	-0.1037** (0.0443)	-0.1659*** (0.0459)	0.4065* (0.5317)	-0.1662*** (0.0609)	-0.1449** (0.0614)
San Francisco_Lower South of Market	0.692*** (0.0569)	-0.1225** (0.0488)	1.2429** (0.5332)	0.6849*** (0.0637)	0.7077*** (0.0633)
Orange_Main Place Area	-0.2228*** (0.0455)	0.7217*** (0.0608)	0.2892 (0.5319)	-0.2777*** (0.0651)	-0.257*** (0.0653)

Culver City_Marina Del Rey/Venice	0.1778*** (0.0428)	-0.2331*** (0.0521)	0.7004* (0.5323)	0.2136*** (0.0721)	0.2377*** (0.0763)
East Palo Alto_Menlo Park East/EPA	0.8329*** (0.0514)	0.1729*** (0.0492)	1.3324** (0.5337)	0.7686*** (0.0561)	0.7972*** (0.0614)
Artesia_Mid Cities	-0.153*** (0.0446)	0.8008*** (0.0578)	0.3069 (0.5316)	-0.2589*** (0.0527)	-0.2366*** (0.0532)
Los Angeles_Mid Wilshire	-0.2564* (0.1679)	-0.1793*** (0.0494)	0.2696 (0.5536)	-0.1954 (0.2101)	-0.1767* (0.2132)
Artesia_Mid-Cities	0.213** (0.0942)	-0.2539** (0.1633)	0.7059 (0.5382)	0.1473* (0.0959)	0.1699* (0.0965)
Los Angeles_Mid-Wilshire	-0.186 (0.1224)	0.1814 (0.0966)	0.3522 (0.5406)	-0.2089 (0.108)	-0.1881 (0.1087)
Sacramento_Midtown	0.1066* (0.0729)	-0.1692** (0.107)	0.6122 (0.5353)	0.0509* (0.0762)	0.0727* (0.0762)
Milpitas_Milpitas	-0.4254*** (0.0897)	0.0884* (0.0782)	0.0597 (0.5372)	-0.4884*** (0.0973)	-0.4656*** (0.0975)
San Diego_Mira Mesa/Miramar	-0.6682*** (0.103)	-0.4636*** (0.0925)	-0.1534 (0.5392)	-0.7125*** (0.1032)	-0.6915*** (0.1035)
Los Angeles_Miracle Mile	0.2153*** (0.0684)	-0.6748*** (0.1035)	0.7634 (0.5362)	0.286*** (0.0876)	0.2842*** (0.0888)
San Francisco_Mission Bay/China Basin	0.3142 (0.358)	0.267*** (0.0722)	0.8101 (1.0277)	0.2564 (0.2927)	0.2833 (0.335)
Santa Clara_Mission College Area	0.0102 (0.0564)	0.2845 (0.3388)	0.5195 (0.5334)	-0.0412 (0.068)	-0.0206 (0.0682)
San Diego_Mission Gorge	-0.2452* (0.5105)	-0.0018** (0.0623)	0.2465 (0.6818)	-0.3146* (0.4296)	-0.2948* (0.4315)
San Diego_Mission Valley	-0.0939*** (0.0288)	-0.2762** (0.4253)	0.4211 (0.5306)	-0.1508*** (0.0394)	-0.1306*** (0.0401)
Ladera Ranch_Mission Viejo	-0.1182** (0.0504)	-0.0905** (0.0364)	0.3827 (0.5321)	-0.1825*** (0.0593)	-0.1612*** (0.0596)
Sunnyvale_Moffett Park	0.1679 (0.1632)	-0.1415** (0.0556)	0.6521 (0.5696)	0.1243 (0.1643)	0.1137 (0.2124)
Monterey_Monterey	0.0638 (0.1021)	0.1427 (0.1615)	0.5564 (0.54)	-0.0004 (0.1064)	0.0228 (0.1071)
Simi Valley_Moorpark/Simi Valley	-0.0192* (0.1017)	0.0318** (0.1053)	0.4436 (0.5387)	-0.067* (0.0857)	-0.0427* (0.0862)
Morgan Hill_Morgan Hill	-0.2875*** (0.0708)	-0.086** (0.0988)	0.1986 (0.5355)	-0.3592*** (0.0813)	-0.3371*** (0.0818)
Castro Valley_N Hayward/Castro Valley	-0.1015* (0.0721)	-0.3256*** (0.0809)	0.3764 (0.5352)	-0.147* (0.0814)	-0.1627** (0.078)
San Jose_N. San Jose Brokaw	0.1051*** (0.0293)	-0.1179** (0.078)	0.6124 (0.9589)	0.0866*** (0.0311)	0.0554* (0.6519)
San Jose_N. San Jose - Brokaw	-0.0686 (0.0427)	0.0962 (0.0412)	0.4177 (0.5319)	-0.1408*** (0.0519)	-0.1185** (0.0524)
Santa Clara_N.E. Santa Clara	-1.2695* (1.1886)	-0.106** (0.0514)	-0.7785 (0.8496)	-1.3267 (1.2549)	-1.3054 (1.2005)
American Canyon_Napa County	0.1403** (0.0576)	-1.3009** (1.215)	0.6228 (0.5329)	0.0639* (0.0622)	0.087* (0.0625)
Sacramento_Natomas/North gate	-0.1766*** (0.036)	0.0985* (0.0616)	0.2855 (0.531)	-0.2814*** (0.0472)	-0.2591*** (0.0478)
Newport Beach_Newport	0.0712*	-0.2355***	0.5622	0.0184*	0.04*

Beach	(0.0381)	(0.0407)	(0.5311)	(0.0469)	(0.0474)
Encinitas_North Beach Cities	0.2647*** (0.041)	0.0472** (0.0435)	0.7477 (0.5315)	0.1867*** (0.0506)	0.2095*** (0.0511)
North Hollywood_North Hollywood	0.1322* (0.105)	0.2227*** (0.0472)	0.6409 (0.5451)	0.0702* (0.1909)	0.0862* (0.3759)
Monterey_North Monterey County	-0.1426* (0.0741)	0.0981* (0.1029)	0.3482 (0.5351)	-0.1909* (0.0977)	-0.1683* (0.098)
Anaheim_North/East Anaheim	-0.4296*** (0.0742)	-0.1762** (0.0782)	0.0725 (0.535)	-0.5004*** (0.0862)	-0.479*** (0.0863)
Novato_Novato/Ignacio/N Marin	0.0396 (0.0464)	-0.4507*** (0.08)	0.5648 (0.5321)	0.011 (0.0569)	0.0324 (0.0573)
San Jose_Oak Creek	-0.0022 (0.0701)	0.0195** (0.0563)	0.5163 (0.5375)	-0.0097 (0.0764)	-0.0166 (0.0919)
Oakland_Oakland Downtown	0.0409 (0.0353)	0.0041** (0.0763)	0.5589 (0.5315)	-0.0312* (0.0439)	-0.0115* (0.0445)
Oakland_Oakland Port/Jack London	0.0986* (0.0906)	0.0738 (0.043)	0.6872 (0.5308)	0.1337** (0.0589)	0.1583*** (0.0584)
Santa Clara_Oakmead Park	0.195* (0.1033)	0.0895 (0.1175)	0.6842 (0.5468)	0.1489* (0.1185)	0.1398* (0.1341)
San Diego_Old Twn/S Arena/Pt Loma	0.2586*** (0.0718)	0.1769* (0.117)	0.7726 (0.5352)	0.1624* (0.0884)	0.2385*** (0.0869)
Los Angeles_Olympic Corridor	0.2656*** (0.0598)	0.1916 (0.0868)	0.7758 (0.5329)	0.2134*** (0.0597)	0.2362*** (0.0604)
Oxnard_Oxnard/Port Hueneme	-0.137*** (0.0497)	0.252*** (0.0597)	0.3297 (0.5323)	-0.2476*** (0.0598)	-0.2247*** (0.06)
San Diego_PB/Rose Canyon/Morena	-0.1385 (0.1776)	-0.1986*** (0.0553)	0.3532 (0.6337)	-0.2031 (0.2404)	-0.1811 (0.1983)
Pacifica_Pacifica	-0.1708* (0.1668)	-0.1705** (0.1942)	0.2702 (0.5911)	-0.2886* (0.3307)	-0.2643* (0.2934)
Santa Ana_Parkcenter Area	-0.1422*** (0.0544)	-0.2565** (0.2829)	0.3579 (0.533)	-0.1991*** (0.0627)	-0.1781*** (0.0631)
Los Angeles_Pasadena/Arcadia/ Monrovia	0.1275*** (0.0289)	-0.1624*** (0.0588)	0.6383 (0.5308)	0.0823** (0.0399)	0.1038 (0.0405)
Sunnyvale_Peery Park	0.7084* (0.5475)	0.1118*** (0.0367)	1.1959 (1.1975)	0.6352* (0.4597)	0.6551* (0.523)
Placentia_Placentia/Yorba Linda	-0.2026*** (0.0498)	0.6721* (0.5187)	0.2848 (0.5321)	-0.2634*** (0.0646)	-0.2412*** (0.0648)
Pleasant Hill_Pleasant Hill	0.0302 (0.105)	-0.2401*** (0.0544)	0.5376 (0.5401)	-	-0.0184 (0.1085)
Pleasanton_Pleasanton North	-0.0086 (0.0492)	0.0133** (0.1078)	0.5159 (0.5346)	-0.0598 (0.0502)	-0.023 (0.0749)
Pleasanton_Pleasanton South	0.0758 (0.058)	-0.0262** (0.0547)	0.5915 (0.5323)	0.0076 (0.0631)	0.0588 (0.0564)
San Jose_Plumeria Drive	0.0235* (0.0653)	0.0393** (0.0601)	0.5224 (0.5335)	-0.0462* (0.0708)	-0.0238* (0.0711)
Sacramento_Point West	-0.2361*** (0.0368)	0.0005** (0.0666)	0.2586* (0.5311)	-0.3085*** (0.0508)	-0.2876*** (0.0513)
San Francisco_Potrero West of 101 Fwy	0.8489*** (0.1029)	-0.2655*** (0.0432)	1.4389** (0.7295)	0.9286*** (0.0263)	0.8803*** (0.0285)

San Diego_Rancho Bernardo	-0.0002 (0.0355)	0.9257*** (0.2138)	0.498 (0.5309)	-0.0712* (0.043)	-0.0496* (0.0436)
Point Richmond_Richmond/San Pablo	-0.18* (0.1191)	-0.0257** (0.0411)	0.3142* (0.5445)	-0.2447* (0.127)	-0.2237* (0.1274)
San Francisco_Rincon/South Beach	0.631*** (0.0827)	-0.2091** (0.1275)	1.2098** (0.5437)	0.6475*** (0.0978)	0.6472*** (0.1226)
Beaumont_Riverside	-0.2355*** (0.04)	0.6578*** (0.0939)	0.2455 (0.5313)	-0.3196*** (0.0479)	-0.297*** (0.0484)
Rocklin_Roseville/Rocklin	-0.2615*** (0.0462)	-0.2785*** (0.0458)	0.1906 (0.5319)	-0.4339*** (0.064)	-0.4114*** (0.0645)
San Jose_San Jose Airport	-0.0081 (0.0371)	-0.3236*** (0.051)	0.5229 (0.5313)	-0.0387 (0.0495)	-0.0179 (0.0501)
Campbell_San Jose Central	0.0187* (0.0987)	-0.0078** (0.0985)	0.5157 (0.5385)	-0.043* (0.1005)	-0.0207* (0.101)
San Jose_San Jose, IBP East	-0.3993*** (0.0962)	-0.4295*** (0.0986)	0.0939 (0.5385)	-0.4584*** (0.0968)	-0.4355*** (0.097)
San Jose_San Jose, Winchester	0.1735 (0.1377)	0.1592 (0.1491)	0.6809 (0.55)	0.116 (0.185)	0.1382 (0.1854)
Ladera Ranch_San Juan Cap/S Clemente/D	-0.0807 (0.1131)	-0.1267** (0.1161)	0.5382 (0.5419)	-0.0556* (0.1125)	0.0361* (0.118)
San Marcos_San Marcos	-0.1667* (0.114)	-0.2079** (0.1212)	0.3187* (0.5433)	-0.2742** (0.1325)	-0.2517* (0.1328)
San Mateo_San Mateo Corridor/Hwy 92	0.4228*** (0.0706)	0.3894*** (0.0763)	0.9403* (0.5318)	0.3918*** (0.0773)	0.3846*** (0.0515)
San Mateo_San Mateo Downtown North	0.4935*** (0.1514)	0.5382*** (0.1794)	1.0569* (0.5576)	0.4129*** (0.069)	0.4275*** (0.1215)
San Mateo_San Mateo Downtown South	0.5909** (0.284)	0.576 (0.2829)	1.1052* (0.6019)	0.5511* (0.2839)	0.5823** (0.2854)
San Mateo_San Mateo-Corridor/Hwy 92	0.4264*** (0.0527)	0.4369*** (0.0564)	0.9581 (0.5325)	0.3958*** (0.0567)	0.4154*** (0.0573)
San Mateo_San Mateo-Downtown North	0.2469* (0.1372)	0.2739 (0.1593)	0.7937 (0.5525)	0.237 (0.157)	0.2576 (0.1556)
San Rafael_San Rafael/Larkspur	0.1557* (0.0931)	0.1441* (0.0974)	0.6666 (0.5382)	0.0719* (0.1184)	0.0925* (0.1188)
Santa Ana_Santa Ana	-0.2371*** (0.0512)	-0.2835*** (0.0568)	0.2403 (0.5323)	-0.2855*** (0.0552)	-0.2639*** (0.0556)
Newhall_Santa Clarita Valley	0.0626* (0.0409)	0.0216** (0.047)	0.5385* (0.5316)	-0.0231* (0.0578)	-0.0007* (0.0581)
Santa Monica_Santa Monica	0.6496*** (0.0337)	0.6318*** (0.0402)	1.1629** (0.531)	0.6372*** (0.0425)	0.659*** (0.0431)
Los Angeles_Santa Monica Mountains	0.3835*** (0.0624)	0.3844*** (0.0529)	0.9091 (0.5323)	0.4248* (0.3775)	0.4502* (0.3398)
Santa Rosa_Santa Rosa	-0.1974*** (0.0449)	-0.2454*** (0.0494)	0.2799 (0.5317)	-0.2652*** (0.0554)	-0.2434*** (0.0559)
San Diego_Scripps Ranch	-0.1215* (0.0719)	-0.1541** (0.0752)	0.3581 (0.5355)	-0.2009** (0.0823)	-0.2068** (0.088)
Seal Beach_Seal Beach	0.2217*** (0.0708)	0.1812 (0.0734)	0.7088 (0.5346)	0.1344 (0.1977)	0.1556* (0.1976)
Sherman Oaks_Sherman Oaks	0.1148*** (0.0379)	0.1119*** (0.0423)	0.6343 (0.5312)	0.0701 (0.0432)	0.0913** (0.044)

Mountain View_Shoreline Corridor South	0.4421 (0.4385)	0.3713 (0.3500)	0.8948 (1.0436)	0.3336 (0.304)	0.3583* (0.3463)
San Francisco_Showplace Square	0.2059 (0.1481)	0.2018 (0.1254)	0.7224 (0.5449)	0.2431* (0.1518)	0.2666* (0.1503)
San Diego_Sorrento Mesa	-0.0383 (0.043)	-0.0556** (0.0481)	0.4634 (0.5316)	-0.1242** (0.0564)	-0.1027 (0.0569)
San Diego_Sorrento Valley	-0.0076* (0.077)	-0.0271** (0.0788)	0.4961* (0.5352)	-0.0617* (0.0803)	-0.0397* (0.0812)
San Francisco_South Financial District	0.494*** (0.0939)	0.5403*** (0.0957)	1.0307 (0.5554)	0.754*** (0.2543)	0.774** (0.3322)
Mountain View_South Moffett Triangle	0.3587*** (0.0583)	0.3007*** (0.0678)	0.8291 (0.5348)	0.2751*** (0.0768)	0.2879*** (0.0883)
Corona_South Riverside	-0.3571*** (0.0654)	-0.3965*** (0.0701)	0.1212 (0.5345)	-0.4469*** (0.0742)	-0.4232*** (0.0745)
South San Francisco_South SF East of 101 Fwy	0.0889 (0.0794)	0.0849 (0.0921)	0.7195 (0.5321)	0.1824** (0.0815)	0.2022** (0.0806)
South San Francisco_South SF West of 101 Fwy	-0.2785 (0.3522)	-0.2804** (0.3897)	0.2405 (0.6544)	-0.324 (0.3787)	-0.3037 (0.3756)
Sacramento_South Sacramento	-0.1835* (0.2244)	-0.213** (0.2409)	0.3092 (0.6078)	-0.2451* (0.2886)	-0.2246* (0.249)
Santa Ana_South Santa Ana	-0.2843*** (0.0416)	-0.268*** (0.0506)	0.2499 (0.5321)	-0.2791*** (0.0463)	-0.3271*** (0.0501)
San Francisco_South of Market	0.5872** (0.2927)	0.5819 (0.2335)	1.1052 (0.9533)	0.5435** (0.2576)	0.5668** (0.2767)
Los Angeles_Southeast Los Angeles	-0.2378*** (0.0478)	-0.275*** (0.054)	0.2501 (0.5321)	-0.3581*** (0.0696)	-0.336*** (0.0699)
Anaheim_Stadium Area	-0.212*** (0.0365)	-0.2258*** (0.0439)	0.3079 (0.5311)	-0.2505*** (0.0481)	-0.2293*** (0.0486)
Stockton_Stockton	-0.468*** (0.0927)	-0.4632*** (0.0973)	0.059 (0.5386)	-0.5113*** (0.1085)	-0.4914*** (0.1087)
Studio City_Studio/Universal Cities	0.2982*** (0.0505)	0.2815*** (0.0627)	0.7913 (0.5338)	0.2463*** (0.0746)	0.2682*** (0.075)
Woodland Hills_Tarzana	0.0252* (0.0292)	-0.0096** (0.0459)	0.5161 (0.7337)	-0.0455* (0.0883)	-0.0212* (0.0539)
Orange_The City Area	-0.1488*** (0.0463)	-0.1305** (0.052)	0.3897 (0.5319)	-0.089** (0.0389)	-0.0693 (0.0395)
Newbury Park_Thousand Oaks/SE County	0.0397 (0.0412)	0.0023** (0.0462)	0.526 (0.5313)	-0.0239 (0.0472)	-0.0016 (0.0477)
Torrance_Torrance	0.0079* (0.0485)	-0.0182** (0.0551)	0.5069 (0.5324)	-0.0226 (0.0649)	-0.0015 (0.0652)
La Jolla_Torrey Pines	0.3576 (0.1997)	0.3217* (0.1989)	0.8484 (0.5663)	0.235* (0.2812)	0.2577* (0.2815)
Tustin_Tustin (South of I-5)	-0.2171* (0.1372)	-0.2464** (0.1447)	0.2768 (0.5487)	-0.2829 (0.1449)	-0.2611 (0.145)
La Jolla_UTC	0.16*** (0.0362)	0.1457*** (0.0433)	0.6572 (0.5317)	0.0572 (0.0607)	0.0787* (0.061)
San Francisco_Union Square	0.2776 (0.1515)	0.3369 (0.1962)	0.8538 (0.8948)	0.341 (0.224)	0.294 (0.1636)
San Diego_Uptown West/Park West	-0.286 (0.1852)	-0.2555** (0.2025)	0.2655 (0.634)	-0.2937 (0.2536)	-0.2738 (0.2194)
San Francisco_Van Ness	0.5023*	0.5417*	1.0623	0.5027*	0.5249*

Corridor	(0.4556)	(0.4719)	(1.1134)	(0.4246)	(0.5012)
Ventura_Ventura	-0.2066*** (0.0458)	-0.2863*** (0.0509)	0.244 (0.532)	-0.3773*** (0.0526)	-0.3532*** (0.053)
Vista_Vista	-0.063* (0.0595)	-0.1092** (0.0587)	0.4145 (0.5325)	-0.1432** (0.0604)	-0.121** (0.061)
Pleasant Hill_Walnut Creek BART/DT	0.1073*** (0.034)	0.095 (0.0414)	0.6219 (0.5312)	0.0488* (0.0434)	0.0733* (0.0441)
Walnut Creek_Walnut Creek Shadelands	-0.0992* (0.0619)	-0.136** (0.064)	0.3872 (0.5332)	-0.1627** (0.067)	-0.14** (0.0674)
San Francisco_Waterfront/North Beach	0.2727** (0.1355)	0.2721* (0.1493)	0.7956* (0.5502)	0.163* (0.1799)	0.1855* (0.1791)
Los Angeles_West Hollywood	0.5274*** (0.0677)	0.5412*** (0.0705)	1.0628** (0.5342)	0.5027*** (0.0709)	0.5234*** (0.0713)
Beverly Hills_West Los Angeles	0.1581*** (0.0546)	0.1665*** (0.0592)	0.6883 (0.5329)	0.1684** (0.067)	0.1906*** (0.0673)
West Sacramento_West Sacramento	-0.2085* (0.1196)	-0.2678** (0.1264)	0.2565 (0.5442)	-0.222* (0.1212)	-0.1988* (0.1205)
Chino_West San Bernardino	-0.1203* (0.0668)	-0.1736** (0.0728)	0.3512 (0.5342)	-0.2074*** (0.0735)	-0.1843** (0.0738)
Canoga Park_Western SFV	-0.1573*** (0.0475)	-0.1899*** (0.0517)	0.3338 (0.532)	-0.2082*** (0.055)	-0.1851*** (0.0553)
Alhambra_Western SGV	0.0105 (0.0469)	-0.0143** (0.053)	0.5375 (0.5345)	0.0134 (0.0921)	0.0352 (0.0925)
Westminster_Westminster	-0.1783* (0.1118)	-0.1927** (0.1126)	0.3322 (0.5412)	-0.2448* (0.1512)	-0.2221* (0.1514)
Los Angeles_Westwood	0.2706*** (0.0417)	0.276*** (0.0486)	0.7853 (0.5321)	0.2205*** (0.056)	0.2409*** (0.0566)
Canoga Park_Woodland Hills/Warner Ctr	-0.0302* (0.0337)	-0.0528** (0.0386)	0.4616 (0.531)	-0.0625* (0.0405)	-0.0399* (0.041)
San Francisco_Yerba Buena	0.4172 (0.1613)	0.4596 (0.2033)	0.9796 (0.9413)	0.4628* (0.2397)	0.4153*** (0.1315)
Ontario_Airport Area X LEED	-	-	0.1933 (0.2762)	-	0.2281*** (0.0833)
Beverly Hills_Beverly Hills X LEED	-	-	0.0214 (14.0002)	-	0.3562 (1.6026)
San Ramon_Bishop Ranch X LEED	-	-	0.1412* (0.1015)	-	0.0849 (0.2297)
Los Angeles_Brentwood X LEED	-	-	-0.2897*** (0.1048)	-	0.0525 (0.0656)
Brisbane_Brisbane/Daly City X LEED	-	-	-1.0113* (0.9889)	-	-1.0084* (1.3455)
Carlsbad_Carlsbad X LEED	-	-	0.272** (0.1146)	-	0.2741 (0.156)
Agoura Hills_Calabasas/Westlake Vill X LEED	-	-	0.096 (0.0564)	-	0.0606 (0.0571)
Sacramento_Campus Commons X LEED	-	-	0.1739 (0.5864)	-	0.1989 (0.1966)
Carlsbad_Carlsbad X LEED	-	-	0.1911 (0.1775)	-	0.1815 (0.176)

Sunnyvale_Central Sunnyvale X LEED	-	-	-0.0894 (0.5645)	-	-0.0491 (0.3851)
Los Angeles_Century City X LEED	-	-	0.059* (0.1123)	-	0.1849* (0.1799)
Costa Mesa_Costa Mesa X LEED	-	-	0.1949*** (0.0694)	-	0.2158*** (0.0624)
San Jose_Downtown San Jose East X LEED	-	-	0.261*** (0.0542)	-	0.2037 (0.3491)
San Jose_Downtown San Jose West X LEED	-	-	-0.0949* (0.3106)	-	-0.1314 (0.2744)
San Bernardino_East San Bernardino X LEED	-	-	0.1127* (0.0668)	-	0.0643* (0.4114)
Northridge_Eastern SFV X LEED	-	-	0.1765** (0.0741)	-	0.2435*** (0.0734)
Baldwin Park_Eastern SGV X LEED	-	-	0.1605* (0.133)	-	0.1945 (0.1344)
El Segundo_El Segundo X LEED	-	-	-0.1421* (0.0837)	-	0.0018* (0.0928)
Emeryville_Emeryville X LEED	-	-	0.185 (0.0966)	-	0.2136** (0.0862)
San Francisco_Financial District X LEED	-	-	-0.1735 (0.1458)	-	-0.2303 (0.1318)
Folsom_Folsom X LEED	-	-	-0.1067* (0.3513)	-	-0.082* (0.1017)
Foster City_Foster City/Redwood Shrs X LEED	-	-	0.2017*** (0.0707)	-	0.22*** (0.0697)
Fresno_Fresno County X LEED	-	-	-0.2131 (0.1632)	-	-0.1065 (0.2841)
Glendale_Glendale X LEED	-	-	0.0229* (0.0568)	-	0.0514 (0.0619)
Los Angeles_Greater Downtown X LEED	-	-	-0.227*** (0.0615)	-	-0.0989 (0.081)
Gold River_Highway 50 Corridor X LEED	-	-	-0.0045 (0.0643)	-	0.0447 (0.0609)
Irvine_Irvine X LEED	-	-	0.014* (0.0534)	-	-0.0108 (0.0561)
Irvine_Irvine Spectrum X LEED	-	-	0.171** (0.0777)	-	0.0869 (0.1228)
San Diego_Kearny Mesa X LEED	-	-	0.1637*** (0.056)	-	0.1181* (0.3413)
Foothill Ranch_Lake Forest/Foothill Ranc X LEED	-	-	-0.3315*** (0.0724)	-	-0.2547** (0.1107)
Long Beach_Long Beach: Downtown X LEED	-	-	0.2417*** (0.0522)	-	0.2455*** (0.0682)
Long Beach_Long Beach: Suburban X LEED	-	-	-0.1063 (0.2765)	-	-0.1097 (0.1462)
Culver City_Marina Del Rey/Venice X LEED	-	-	0.0242* (0.0751)	-	0.0623* (0.116)
East Palo Alto_Menlo Park East/EPA X LEED	-	-	-	-	-

Artesia_Mid Cities X LEED	-	-	0.2774*** (0.0632)	-	0.2265* (0.1188)
Los Angeles_Miracle Mile X LEED	-	-	0.1251 (0.1565)	-	0.3265** (0.1405)
Santa Clara_Mission College Area X LEED	-	-	0.002* (0.3319)	-	0.0109* (0.3797)
San Diego_Mission Valley X LEED	-	-	0.1699** (0.0753)	-	0.1352 (0.0745)
Sunnyvale_Moffett Park X LEED	-	-	0.2035 (0.5562)	-	0.2302 (0.3008)
Castro Valley_N Hayward/Castro Valley X LEED	-	-	0.4816 (0.8958)	-	0.5157 (0.3648)
San Jose_N. San Jose Brokaw X LEED	-	-	0.0204 (0.7998)	-	0.0542 (0.6525)
Sacramento_Natomas/North gate X LEED	-	-	0.0788 (0.0625)	-	0.0882* (0.059)
Newport Beach_Newport Beach X LEED	-	-	0.128 (0.1449)	-	0.2814 (0.1564)
North Hollywood_North Hollywood X LEED	-	-	0.0519* (0.4543)	-	0.0881 (0.4241)
Novato_Novato/Ignacio/N Marin X LEED	-	-	-0.305 (0.1565)	-	-0.194 (0.2698)
San Jose_Oak Creek X LEED	-	-	0.1715* (0.1581)	-	0.1951* (0.1579)
Oakland_Oakland Downtown X LEED	-	-	0.1907*** (0.0548)	-	0.1484** (0.0654)
Santa Clara_Oakmead Park X LEED	-	-	0.2433 (0.5639)	-	0.2905 (0.3605)
San Diego_Old Twn/S Arena/Pt Loma X LEED	-	-	-0.2085 (0.5553)	-	-0.1997 (0.3827)
Santa Ana_Parkcenter Area X LEED	-	-	0.0437 (0.2155)	-	0.15 (0.2227)
Los Angeles_Pasadena/Arcadia/ Monrovia X LEED	-	-	-0.0543 (0.0721)	-	-0.0258 (0.0772)
Pleasanton_Pleasanton North X LEED	-	-	-0.0407* (0.0936)	-	-0.0336 (0.0965)
Pleasanton_Pleasanton South X LEED	-	-	-0.3999*** (0.0602)	-	-0.3915 (0.4763)
San Francisco_Rincon/South Beach X LEED	-	-	-0.123* (1.051)	-	-0.104* (0.6786)
Rocklin_Roseville/Rocklin X LEED	-	-	0.3721*** (0.0581)	-	0.2693*** (0.0513)
Ladera Ranch_San Juan Cap/S Clemente/D X LEED	-	-	-	-	-
San Mateo_San Mateo Corridor/Hwy 92 X LEED	-	-	-0.092* (0.4391)	-	-0.0662* (0.4305)
San Mateo_San Mateo Downtown South X LEED	-	-	-	-	-
Newhall_Santa Clarita	-	-	0.1028	-	0.1295

Valley X LEED			(0.1062)		(0.1057)
Santa Monica_Santa Monica X LEED	-	-	-0.1738* (0.1214)	-	0.0175* (0.1306)
San Diego_Scripps Ranch X LEED	-	-	0.2715** (0.1187)	-	0.3384*** (0.1232)
San Diego_Sorrento Mesa X LEED	-	-	0.1964*** (0.0687)	-	0.1394 (0.1283)
San Francisco_South Financial District X LEED	-	-	0.0193 (0.2079)	-	0.1402 (0.2226)
Mountain View_South Moffett Triangle X LEED	-	-	0.0913 (0.7782)	-	0.1329 (0.2624)
Corona_South Riverside X LEED	-	-	0.1841* (0.1721)	-	-0.0387* (0.0836)
South San Francisco_South SF East of 101 Fwy X LEED	-	-	-0.4481*** (0.0626)	-	-0.3896*** (0.078)
Santa Ana_South Santa Ana X LEED	-	-	0.0482 (0.0658)	-	0.0824 (0.0643)
Anaheim_Stadium Area X LEED	-	-	-0.1394 (0.1654)	-	-0.0774 (0.1629)
Studio City_Studio/Universal Cities X LEED	-	-	0.1023 (0.6825)	-	0.2049 (0.4477)
Torrance_Torrance X LEED	-	-	0.0066 (0.4603)	-	0.1229 (0.2229)
La Jolla_UTC X LEED	-	-	0.0385 (0.0714)	-	-0.0155 (0.0768)
Pleasant Hill_Walnut Creek BART/DT X LEED	-	-	-0.0025 (0.0702)	-	-0.0178 (0.0825)
Canoga Park_Western SFV X LEED	-	-	0.0664 (0.2591)	-	0.2253 (0.2247)
Alhambra_Western SGV X LEED	-	-	-0.0513 (0.0902)	-	0.0985 (0.0621)
Los Angeles_Westwood X LEED	-	-	0.085* (0.0602)	-	0.1105* (0.1352)
Canoga Park_Woodland Hills/Warner Ctr X LEED	-	-	0.1345*** (0.0477)	-	0.318*** (0.0774)
Gardena_190th Street Corridor X Energy Star	-	-	-	0.1795** (0.0741)	0.1156 (0.0742)
Ontario_Airport Area X Energy Star	-	-	-	0.106 (0.063)	0.0435 (0.0634)
Alameda_Alameda X Energy Star	-	-	-	-0.0231* (0.3038)	-0.0862 (0.3034)
Anaheim_Anaheim Hills X Energy Star	-	-	-	0.2002** (0.0978)	0.1369 (0.0991)
San Francisco_Bayview/Hunters Point X Energy Star	-	-	-	0.1061* (0.2024)	0.0453* (0.1582)
Beverly Hills_Beverly Hills X Energy Star	-	-	-	-0.3119*** (0.1148)	-0.4129*** (0.1164)
San Ramon_Bishop Ranch X Energy Star	-	-	-	0.1457** (0.0632)	0.0772 (0.0808)

Brea_Brea/La Habra X Energy Star	-	-	-	-0.0359* (0.0639)	-0.0994* (0.0647)
Los Angeles_Brentwood X Energy Star	-	-	-	-0.4028*** (0.1162)	-0.4646*** (0.119)
Brisbane_Brisbane/Daly City X Energy Star	-	-	-	-0.4714* (0.7677)	0.0023 (0.98)
Buena Park_Buena Park/La Palma X Energy Star	-	-	-	0.1654* (0.0884)	0.1017 (0.0889)
Burbank_Burbank X Energy Star	-	-	-	0.177** (0.0794)	0.0954 (0.0916)
Agoura Hills_Calabasas/Westlake Vill X Energy Star	-	-	-	0.1221* (0.0726)	0.0612* (0.0775)
Camarillo_Camarillo/Point Mugu X Energy Star	-	-	-	0.2718 (0.1061)	0.206 (0.1062)
Campbell_Campbell X Energy Star	-	-	-	0.0626 (0.245)	-0.0016 (0.2467)
Carlsbad_Carlsbad X Energy Star	-	-	-	0.1161 (0.074)	0.0261 (0.0795)
Los Angeles_Century City X Energy Star	-	-	-	-0.0784 (0.1076)	-0.2491 (0.1842)
Santa Ana_Civic Center Area X Energy Star	-	-	-	0.1621 (0.1026)	0.0993 (0.1045)
La Quinta_Coachella Valley X Energy Star	-	-	-	0.0157 (0.1617)	-0.0489 (0.2511)
Concord_Concord X Energy Star	-	-	-	0.0461 (0.0668)	-0.0217 (0.0678)
Corona_Corona X Energy Star	-	-	-	-0.0278 (0.0569)	-0.0923 (0.0832)
Mill Valley_Corte Madera/Mill Valley X Energy Star	-	-	-	0.1682 (0.1173)	0.1047 (0.1179)
Costa Mesa_Costa Mesa X Energy Star	-	-	-	0.111 (0.0765)	-0.0281* (0.0574)
Culver City_Culver City X Energy Star	-	-	-	-0.0786* (0.0637)	-0.1431** (0.0643)
Cupertino_Cupertino X Energy Star	-	-	-	0.1956*** (0.0678)	0.136 (0.1376)
Cypress_Cypress X Energy Star	-	-	-	0.0654* (0.0945)	0.0017* (0.1096)
San Diego_Del Mar Hts/Carmel Valley X Energy Star	-	-	-	-0.1309** (0.0554)	-0.1931*** (0.0563)
Mountain View_Downtown Mountain View X Energy Star	-	-	-	-0.0399 (2.093)	-0.1116 (5.7308)
Palo Alto_Downtown Palo Alto X Energy Star	-	-	-	0.0082* (2.016)	-0.0555 (5.2859)
San Jose_Downtown San Jose East X Energy Star	-	-	-	0.157** (0.0796)	0.0775 (0.0823)
San Jose_Downtown San	-	-	-	-0.0319	-0.1694

Jose West X Energy Star				(0.1464)	(0.2959)
Dublin_Dublin X Energy Star	-	-	-	0.1269 (0.1888)	0.0637 (0.189)
Orange_East Orange X Energy Star	-	-	-	-0.5931* (0.6193)	-0.6586 (0.7015)
San Bernardino_East San Bernardino X Energy Star	-	-	-	0.1667** (0.0819)	0.1036 (0.0843)
Northridge_Eastern SFV X Energy Star	-	-	-	0.0665 (0.0865)	-0.0547 (0.0502)
Baldwin Park_Eastern SGV X Energy Star	-	-	-	0.039 (0.0638)	-0.0346* (0.0676)
El Dorado_El Dorado X Energy Star	-	-	-	-0.1167* (0.1032)	-0.178* (0.1048)
El Segundo_El Segundo X Energy Star	-	-	-	-0.1675** (0.069)	-0.2097*** (0.0781)
Palo Alto_Embarcadero/101 X Energy Star	-	-	-	0.3108 (0.3436)	0.2476 (0.3268)
Emeryville_Emeryville X Energy Star	-	-	-	-0.0217 (0.0923)	-0.0996* (0.0863)
Encino_Encino X Energy Star	-	-	-	-0.0897 (0.0782)	-0.1549 (0.0797)
San Francisco_Financial District X Energy Star	-	-	-	0.1544 (0.6338)	0.26 (0.6355)
Folsom_Folsom X Energy Star	-	-	-	0.0056 (0.0783)	-0.0191 (0.0831)
Foster City_Foster City/Redwood Shrs X Energy Star	-	-	-	0.0969 (0.1033)	0.0281 (0.0983)
Fountain Valley_Fountain Valley X Energy Star	-	-	-	0.0796 (0.1455)	0.0169 (0.1061)
Fresno_Fresno County X Energy Star	-	-	-	-0.2471 (0.2232)	-0.1703 (0.3132)
Glendale_Glendale X Energy Star	-	-	-	0.0188 (0.0611)	-0.0416* (0.0701)
San Diego_Governor Park X Energy Star	-	-	-	-0.0837* (0.0831)	-0.1467* (0.0834)
Los Angeles_Greater Downtown X Energy Star	-	-	-	-0.1944*** (0.0661)	-0.1868** (0.083)
Pleasanton_Hacienda Business Park X Energy Star	-	-	-	0.0487 (0.0957)	-0.0154 (0.0952)
Gold River_Highway 50 Corridor X Energy Star	-	-	-	0.0003 (0.0504)	-0.058* (0.052)
Hollywood_Hollywood/Silver Lake X Energy Star	-	-	-	-0.1905 (0.1227)	-0.2577** (0.1207)
Sacramento_Howe Ave/Fulton Ave X Energy Star	-	-	-	-0.0945* (0.1451)	-0.1599* (0.2271)
Huntington Beach_Huntington Beach X Energy Star	-	-	-	-0.1962** (0.0941)	-0.2573*** (0.0947)
Irvine_Irvine X Energy Star	-	-	-	0.0676*	0.0314

				(0.053)	(0.0574)
Irvine_Irvine Spectrum X Energy Star	-	-	-	0.1599** (0.0771)	0.0862 (0.1129)
San Diego_Kearny Mesa X Energy Star	-	-	-	0.1366** (0.0546)	0.0709 (0.0566)
Los Angeles_LAX X Energy Star	-	-	-	0.1241* (0.0812)	0.06 (0.0826)
Aliso Viejo_Laguna Hills/Aliso Viejo X Energy Star	-	-	-	0.1111 (0.0607)	0.0504* (0.0617)

Laguna Niguel_Laguna Niguel/Laguna Beac X Energy Star	-	-	-	-0.1221 (0.0903)	-0.1856** (0.0907)
Foothill Ranch_Lake Forest/Foothill Ranc X Energy Star	-	-	-	-0.1257 (0.1016)	-0.0664 (0.1082)
Long Beach_Long Beach: Downtown X Energy Star	-	-	-	0.0849 (0.0773)	-0.0146 (0.0808)
Long Beach_Long Beach: Suburban X Energy Star	-	-	-	0.0614 (0.0813)	0.0208 (0.0822)
Orange_Main Place Area X Energy Star	-	-	-	0.0597 (0.0714)	-0.0077* (0.0715)
Culver City_Marina Del Rey/Venice X Energy Star	-	-	-	-0.0946* (0.0841)	-0.1625 (0.0908)
Artesia_Mid Cities X Energy Star	-	-	-	0.2182*** (0.0786)	0.0597 (0.1201)
Los Angeles_Mid Wilshire X Energy Star	-	-	-	-0.2561 (0.478)	-0.3163 (0.546)
Milpitas_Milpitas X Energy Star	-	-	-	-0.0758 (0.5431)	-0.1414* (0.5428)
Los Angeles_Miracle Mile X Energy Star	-	-	-	-0.1886 (0.1415)	-0.3496** (0.1557)
Santa Clara_Mission College Area X Energy Star	-	-	-	0.0159* (0.1789)	-0.0096 (0.2033)
San Diego_Mission Valley X Energy Star	-	-	-	0.1187** (0.0492)	0.0397 (0.051)
Ladera Ranch_Mission Viejo X Energy Star	-	-	-	0.1196 (0.0668)	0.0575 (0.0683)
Simi Valley_Moorpark/Simi Valley X Energy Star	-	-	-	-0.6374* (0.651)	-0.7027* (0.7253)
San Jose_N. San Jose Brokaw X Energy Star	-	-	-	-	-
Sacramento_Natomas/North gate X Energy Star	-	-	-	0.077 (0.0534)	0.0083* (0.0525)
Newport Beach_Newport Beach X Energy Star	-	-	-	-0.0186 (0.0867)	-0.1758** (0.0844)
Encinitas_North Beach Cities X Energy Star	-	-	-	0.061 (0.0847)	-0.0024 (0.0837)
North Hollywood_North Hollywood X Energy Star	-	-	-	0.0636 (0.1993)	0.007 (0.3805)
Monterey_North Monterey County X Energy Star	-	-	-	-0.0518 (0.1003)	-0.1142 (0.1008)
Anaheim_North/East Anaheim X Energy Star	-	-	-	0.203 (0.3008)	0.1359 (0.2029)
Novato_Novato/Ignacio/N Marin X Energy Star	-	-	-	-0.1841* (0.1971)	-0.1148 (0.1939)
Oakland_Oakland Downtown X Energy Star	-	-	-	0.1765*** (0.0542)	0.0713 (0.0614)
Los Angeles_Olympic Corridor X Energy Star	-	-	-	0.0515* (0.1595)	-0.0134* (0.1612)
Oxnard_Oxnard/Port	-	-	-	0.1841***	0.1201

Hueneme X Energy Star				(0.0709)	(0.0716)
Santa Ana_Parkcenter Area X Energy Star	-	-	-	0.0165 (0.1277)	-0.104 (0.0757)
Los Angeles_Pasadena/Arcadia/ Monrovia X Energy Star	-	-	-	0.0066 (0.0531)	-0.0383 (0.0566)
Placentia_Placentia/Yorba Linda X Energy Star	-	-	-	-0.0027 (0.0684)	-0.0641* (0.0693)
Pleasant Hill_Pleasant Hill X Energy Star	-	-	-	0.0232 (0.1079)	-
San Jose_Plumeria Drive X Energy Star	-	-	-	0.2289 (0.2308)	0.1648 (0.123)
Sacramento_Point West X Energy Star	-	-	-	0.0606* (0.0668)	-0.0015* (0.0674)
San Francisco_Potrero West of 101 Fwy X Energy Star	-	-	-	-	-
San Diego_Rancho Bernardo X Energy Star	-	-	-	0.1264* (0.1275)	0.0638* (0.1273)
San Francisco_Rincon/South Beach X Energy Star	-	-	-	-	-
Beaumont_Riverside X Energy Star	-	-	-	0.2414* (0.1539)	0.1776* (0.1537)
Rocklin_Roseville/Rocklin X Energy Star	-	-	-	0.2658*** (0.0727)	0.1842** (0.0732)
San Jose_San Jose Airport X Energy Star	-	-	-	0.0243 (0.0707)	-0.0402 (0.0703)
San Jose_San Jose, Winchester X Energy Star	-	-	-	0.0851 (0.1955)	0.0147 (0.2549)
San Marcos_San Marcos X Energy Star	-	-	-	0.2737* (0.5361)	0.2109* (0.4595)
San Mateo_San Mateo Corridor/Hwy 92 X Energy Star	-	-	-	-	-
San Mateo_San Mateo Downtown North X Energy Star	-	-	-	0.165* (0.3371)	0.1051 (0.3447)
San Rafael_San Rafael/Larkspur X Energy Star	-	-	-	0.222 (0.1199)	0.1588 (0.1205)
Santa Ana_Santa Ana X Energy Star	-	-	-	-0.2547 (0.2493)	-0.3166 (0.2495)
Newhall_Santa Clarita Valley X Energy Star	-	-	-	0.06* (0.0691)	-0.0217* (0.0692)
Santa Monica_Santa Monica X Energy Star	-	-	-	-0.17*** (0.0654)	-0.2229*** (0.0723)
Los Angeles_Santa Monica Mountains X Energy Star	-	-	-	-0.0815 (0.3788)	-0.1516* (0.3412)
Santa Rosa_Santa Rosa X Energy Star	-	-	-	-0.0668* (0.0601)	-0.1282** (0.0609)
San Diego_Scripps Ranch X Energy Star	-	-	-	0.2495*** (0.0914)	0.2145** (0.0968)

Seal Beach_Seal Beach X Energy Star	-	-	-	0.0612 (0.1996)	0 (0.1995)
Sherman Oaks_Sherman Oaks X Energy Star	-	-	-	0.0744 (0.2032)	0.0047 (0.2046)
San Francisco_Showplace Square X Energy Star	-	-	-	-0.2022* (0.1831)	-0.2689 (0.2287)
San Diego_Sorrento Mesa X Energy Star	-	-	-	0.165** (0.0715)	0.0948 (0.0746)
San Francisco_South Financial District X Energy Star	-	-	-	-0.2944 (0.2725)	-0.4277 (0.3759)
Mountain View_South Moffett Triangle X Energy Star	-	-	-	0.0515* (0.434)	-0.0008* (0.4344)
Corona_South Riverside X Energy Star	-	-	-	0.2393** (0.1082)	0.2285*** (0.0809)
South San Francisco_South SF East of 101 Fwy X Energy Star	-	-	-	-0.1985* (0.1555)	-0.0781* (0.1025)
Santa Ana_South Santa Ana X Energy Star	-	-	-	-	-
Los Angeles_Southeast Los Angeles X Energy Star	-	-	-	0.1951** (0.0819)	0.1322 (0.0826)
Anaheim_Stadium Area X Energy Star	-	-	-	-0.0471 (0.0807)	-0.0545 (0.0781)
Stockton_Stockton X Energy Star	-	-	-	0.092 (0.1216)	0.0292 (0.1736)
Studio City_Studio/Universal Cities X Energy Star	-	-	-	0 (0.1412)	-0.1438* (0.4334)
Orange_The City Area X Energy Star	-	-	-	-0.0731 (0.0686)	-0.1385** (0.0692)
Newbury Park_Thousand Oaks/SE County X Energy Star	-	-	-	-0.047 (0.2033)	-0.1097 (0.2034)
Torrance_Torrance X Energy Star	-	-	-	-0.0808 (0.0864)	-0.1513 (0.0942)
La Jolla_Torrey Pines X Energy Star	-	-	-	0.2359 (0.3649)	0.1754 (0.5746)
La Jolla_UTC X Energy Star	-	-	-	0.1034* (0.0724)	0.0913* (0.0795)
Ventura_Ventura X Energy Star	-	-	-	0.3473*** (0.06)	0.282*** (0.0606)
Pleasant Hill_Walnut Creek BART/DT X Energy Star	-	-	-	0.0893 (0.0802)	0.0423 (0.093)
Walnut Creek_Walnut Creek Shadelands X Energy Star	-	-	-	-0.1376* (0.205)	-0.2035 (0.2797)
San Francisco_Waterfront/North Beach X Energy Star	-	-	-	0.3344* (0.1822)	0.2677* (0.186)
Beverly Hills_West Los	-	-	-	-0.1636**	-0.2356***

Angeles X Energy Star				(0.0721)	(0.0731)
West Sacramento_West Sacramento X Energy Star	-	-	-	-0.2755 (0.2405)	-0.3404 (0.3321)
Canoga Park_Western SFV X Energy Star	-	-	-	-0.0805 (0.1491)	-0.1743* (0.1868)
Alhambra_Western SGV X Energy Star	-	-	-	-0.0845 (0.1013)	-0.1702 (0.0956)
Westminster_Westminster X Energy Star	-	-	-	0.116 (0.2009)	0.0524 (0.2014)
Los Angeles_Westwood X Energy Star	-	-	-	0.0618 (0.0885)	-0.0256* (0.1419)
Canoga Park_Woodland Hills/Warner Ctr X Energy Star	-	-	-	-0.0775* (0.0701)	-0.2161*** (0.0787)
_cons	2.9459*** (0.0314)	3.0602*** (0.02996)	2.4942*** (0.5315)	3.0545*** (0.039)	3.0269*** (0.0397)
	Adjusted R^2 0.5605	Adjusted R^2 0.5603	Adjusted R^2 .5683	Adjusted R^2 .5767	Adjusted R^2 .5813
*90 percent confidence interval **95 percent confidence interval ***99 percent confidence interval					

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