Voices on the Future

The New California Dream

How Demographic and Economic Trends May Shape the Housing Market

A Land Use Scenario for 2020 and 2035

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- Advancing land use policies and design practices that respect the uniqueness of both built and natural environments;
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Voices on the Future

ULI's Voices on the Future series seeks to explore perspectives on how changing markets and emerging public policy frameworks might result in new land use paradigms, market scenarios, and professional practices.

Preface

ULI and the ULI Foundation are pleased to publish Dr. Arthur C. Nelson's white paper titled *The New California Dream: How Demographic and Economic Trends May Shape the Housing Market* in the context of ULI's The City in 2050 dialogue. This paper represents a provocative scenario for land use in California. Around the world, communities are recognizing the strategic and crucial role that land use and real estate investments will play in shaping the underlying sustainability of their local economies. California's diverse metropolitan areas are at the center of this dialogue and in a position to set new standards for land use practice.

I would like to thank the Rockefeller Foundation for its financial support of this work, which enabled a highly collaborative process and brought this essay to fruition. The issues of smart growth and the strategic role of land use planning are vitally important in all communities around the world, but in California, the dialogue takes on a special significance for many reasons. Diverse stakeholders were engaged in the drafting of this paper, including public sector officials, private land use professionals, and independent thought leaders. Although the authorship of this paper resides with Dr. Nelson, ULI is proud to have encouraged a thoughtful review by many engaged leaders.

As Yogi Berra so wisely remarked, "Making predictions is never easy; especially about the future." And so it is with California. With dynamic demographic trends, ambitious energy and carbon reduction goals, and an economy that represents a globally concentrated source of creative entrepreneurism, the sustainability of California's long-term future is being shaped through a vibrant community-based land use dialogue. This endeavor is both a necessity and uniquely challenging.

The scenario presented in this paper does not purport to be an unbiased and complete analysis of long-term housing markets in California. Dr. Nelson presents a particular scenario for growth in California underpinned by many assumptions. Indeed, the scenario assumes significant ongoing investments in metropolitan transportation infrastructure and substantial reform of present-day land use regulations.

I hope that Dr. Nelson's scenario provokes reflection upon current land use and real estate trends and offers insight into how all land use professionals—public and private alike—can continue the vigorous dialogue on California's future. Stakeholders across the California land use community—and beyond—stand to benefit.

Patrick L. Phillips
President and CEO, ULI Worldwide

Foreword

Manuel Pastor, *Professor of Geography and American Studies & Ethnicity, University of Southern California*

In 2008, California passed Senate Bill (SB) 375, an effort to reduce greenhouse gas emissions (GHGs) by redesigning the state's urban growth patterns. The legislation specifically directs the state's metropolitan planning organizations (MPOs) to devise strategies to reduce vehicle miles traveled—and hence GHGs—by better matching future housing development with public transit opportunities. As part of the process, the MPOs are required to devise targets for GHG reduction as well as to develop "sustainable communities strategies" that better coordinate land use and transportation decisions.

For a state more used to sprawling apart than growing together, it seems a tall order: how do we reverse years of a pattern in which more land is consumed, average commutes lengthen, and environmental damage rises? In this compelling new report, one of our country's leading land use planners, Arthur C. Nelson, offers an important bit of news for those who worry that ambitious targets are unrealistic: the demographics are on our side.

While most of the national focus on our demographic future is on the rising diversity of our population—a fact well known here in California—Nelson points to two equally important changes: the aging of the population and the reduction in the share of households with children. Both mean that as California's population grows over the next 40 years, it will see a rise in housing demand for smaller lots, multifamily units, and other land use configurations consistent with transit-oriented compact development.

The challenge is how we get there from here. Nelson tries to connect the dots by illustrating the shift in the composition of real estate demand and pointing to the opportunity of "recycling" nonresidential land, particularly those lands adjacent to transit systems. Although the specific projections that Nelson offers may be subject to debate, the overall vision is certainly not. We can grow smarter and grow greener, meeting the mandates of SB 375 by planning for the future rather than the past.

Of course, one response to this underlying shift might be inaction. With housing preferences shifting, why not simply let the markets take care of adjusting the mix of housing types? The problem—as any reasonable observer will conclude in the wake of the current housing crisis—is that real estate markets are not always perfect, particularly since the purchase of a home involves a mix of emotion, investment, and lifestyle. Moreover, markets are shaped by what land use regulations will allow, and MPOs can use the process of drafting sustainable communities strategies to give investors the confidence that their investments in new housing formats will indeed pencil out.

By passing SB 375 and its predecessor, the *Global Warming Solutions Act of 2006*, California has stepped up to show real leadership on the environmental challenges facing this country. With the imperatives of climate change pulling us forward and the realities of demographic change pushing us along, it is time to reshape our metro areas in a way that will provide a more socially and environmental sustainable path for the Golden State.

Contents

Acknowledgments

Although the findings of this paper are my own, I never could have completed this work without the involvement of many dedicated professionals. Foremost are the professionals from California's regional planning agencies who provided invaluable coordination in the drafting of the findings. From the Sacramento Area Council of Governments, this includes Mike McKeever, Kacey Lizon, Gordon Garry, and Elena Fogg. From the Association of Bay Area Governments, this includes Jason Munkres, Ezra Rapport, Hing Wong, and Paul Fassinger. From the Southern California Association of Governments, this includes Hasan Ikhrata, Huasha Liu, Douglas Williford, Steve Fox, and Javier Minjares. From the San Diego Association of Governments, this includes Rob Rundle and Beth Jarosz.

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Last, I acknowledge Gail Meakins and Susie Petheram of the Metropolitan Research Center at the University of Utah. Many others have helped me who are not listed here: my thanks to all of you.

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Executive Summary

This report offers a scenario for how the use of land in California's four largest metropolitan areas may be reshaped between 2010 and 2035. Taken together, these four metropolitan areas house 80 percent of the state's population. The scenarios for 2020 and 2035 are based on current understanding of demographic, economic, and financial trends; on emerging market preferences revealed through surveys; and on an assessment of redevelopment opportunities in currently developed urban and suburban areas.

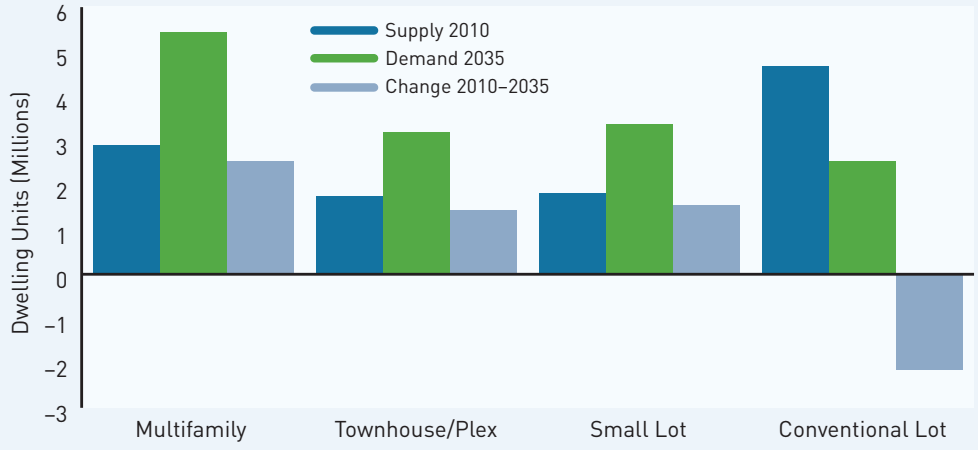
The report makes five principal findings:

First, the existing supply of conventional-lot (over one-eighth acre), single-family detached homes exceeds the projected demand for these homes in 2035. This finding does not mean there is no market for new conventional-lot homes in niche markets. It does mean that overall the expansion of the supply of conventional-lot, single-family detached homes would be in excess of current and projected demand (see figure 1).

Second, housing and neighborhood preference surveys indicate that Californians consider transit options to be far more important in choosing a location in which to live than the rest of the nation: 71 percent in California, compared with 47 percent nationally. The demand in 2035 for residences located within one-half mile of public transit stations—called transit-station areas, or TSAs—will exceed the aggregate amount of current supply plus all new residential units built in these metropolitan areas between 2010 and 2035 (see figure 2 and table 1).

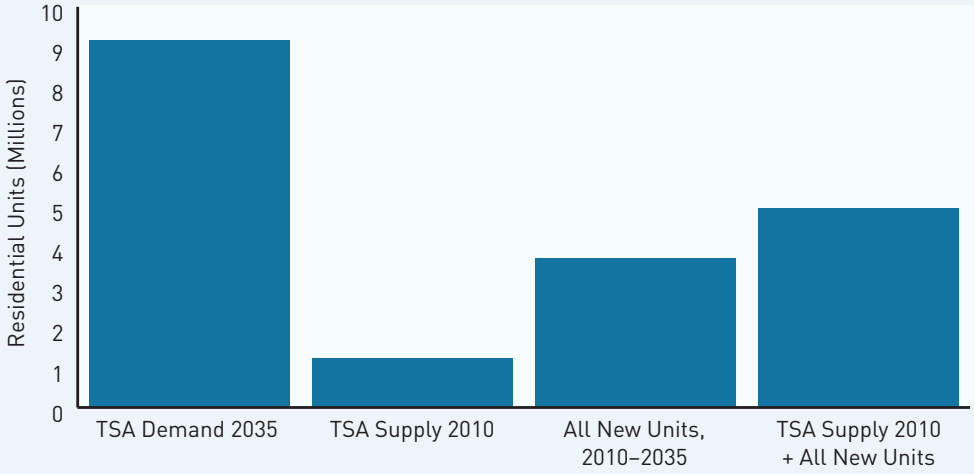
Third, through modest redevelopment that will happen anyway, existing developed land with nonresidential uses could be sufficient to accommodate all new jobs created over this period. In particular, existing and potential TSA development may have sufficient capacity to accommodate 7 million jobs, or more than enough to absorb all new jobs between 2010 and 2035 (see table 1).

FIGURE 1 **Demand in 2035 for Residential Units in the Largest Four Metropolitan Areas by Major Category, Compared to Supply in 2010**



Source: Author.

FIGURE 2 **Transit-Station Area Housing Demand Relative to Supply, 2010–2035**



Source: Author.

Fourth, changing demographics in combination with changes in home mortgage finance will reduce the rate of homeownership in California by up to 5 percent from 2010 levels and perhaps by as much as 10 percent over the long term. A 5 percent reduction represents a market condition where three-quarters of the demand for new housing in the state's largest metropolitan planning organization (MPO) areas will be for rental housing. This demand should lead to an increase in existing residential units being used to house multiple or intergenerational households as well as to a variety of hybrid or new housing formats, such as accessory dwelling units or new nontraditional multifamily housing options.

Fifth, these long-term market trends represent a directional alignment between the real estate preferences expressed by consumers and the greenhouse gas reduction objectives expressed by the state of California in the form of Senate Bill (SB) 375.[1]

Although this report presents one of several conceivable scenarios that can be envisioned for these four California MPOs between 2010 and 2035, it is based on best available evidence with respect to demographic, economic, and financial trends and consumer preferences. Nonetheless, as additional census and other data become available, and as economic, regulatory, and financial conditions continue to evolve, this scenario will need to be revisited.

TABLE 1 Conservative Development Capacity of TSAs

Measure	Amount
Net existing and potential TSA land area @ 20% of total land within half mile of transit stations	76,605 acres
Floor/area ratio, average	2.50
Residential	
Residential unit demand for TSAs, 2035	9.2 million units
Capacity @ 1,500 square feet/unit applied to two-thirds of net land area	3.7 million units
Residential units in TSAs, 2010	1.2 million units
All new units, 2010–2035	3.7 million units
Total new residential unit demand, 2010–2035	2.5 million units
Employment	
Capacity @ 400 square feet/worker applied to one-third of net land area	7.0 million jobs
Total employment in TSAs, 2010	3.0 million jobs
Total employment growth, 2010–2030	3.5 million jobs

Source: Author.

The bottom line is that as many as 9 million households would like the option to live in locations served by public transit, but today only about 1.2 million California households can claim to have it. Even if all new homes built between 2010 and 2035 were built in TSAs, several million households would be left without the TSA option they want (see figure 1 and table 1). In addition, existing and planned TSAs appear to have the capacity to absorb all new jobs that would typically be attracted to TSAs and about two-thirds of all new housing units between 2010 and 2035 (see table 1).

The question this report does not address is whether and how the land use regulations in the state's largest metropolitan areas can be restructured to facilitate planning and development processes that would allow absorption of this market demand in TSAs. Additional challenges must be overcome beyond facilitating the strong market demand for transit-accessible land uses. First, land use regulations must be proactively altered to "receive" this market demand. Second, although the public sector may be wary of investing the resources necessary to upgrade the infrastructure needed to meet current and growing demand, ways must be found to do so. Only through new public/private partnerships can these two challenges be surmounted.[2]

This report does affirm a consequential observation that by meeting emerging market demands, California's largest metropolitan areas will be shaping their markets in a manner that conceivably allows them to comply with SB 375. Although this report outlines a market-driven development scenario for 2020 and 2035 that may be loosely consistent with the objectives of SB 375, it does not prescribe how California's major metropolitan areas can or should meet those performance objectives. Local governments working with MPOs must find the most practicable ways in which to do so. Nonetheless, market forces seem to be heading in the direction of helping—rather than hindering—actions that achieve accord with SB 375.

CHAPTER 1

Introduction

With a population of more than 35 million, making it the nation's most populous state, California is poised to add 4 million residents between 2010 and 2020 and more than 12 million residents by 2035. Like the rest of the nation, its demographic composition is changing, and with that, its housing needs. In addition, most of California's nonresidential building stock will be rebuilt between 2010 and 2035. Given the nationwide recession and continuing underperformance of markets, now is a good time to anticipate future development needs for a changing society.

Moreover, California's environmental legislation of the last several years presents another consideration. In 2008, California enacted a law that would reduce greenhouse gas (GHG) emissions called the *Sustainable Communities and Climate Protection Act*. Part of that act aims to reduce GHG emissions by reducing passenger vehicle-miles traveled (VMT) through efficient and more compact land use development.

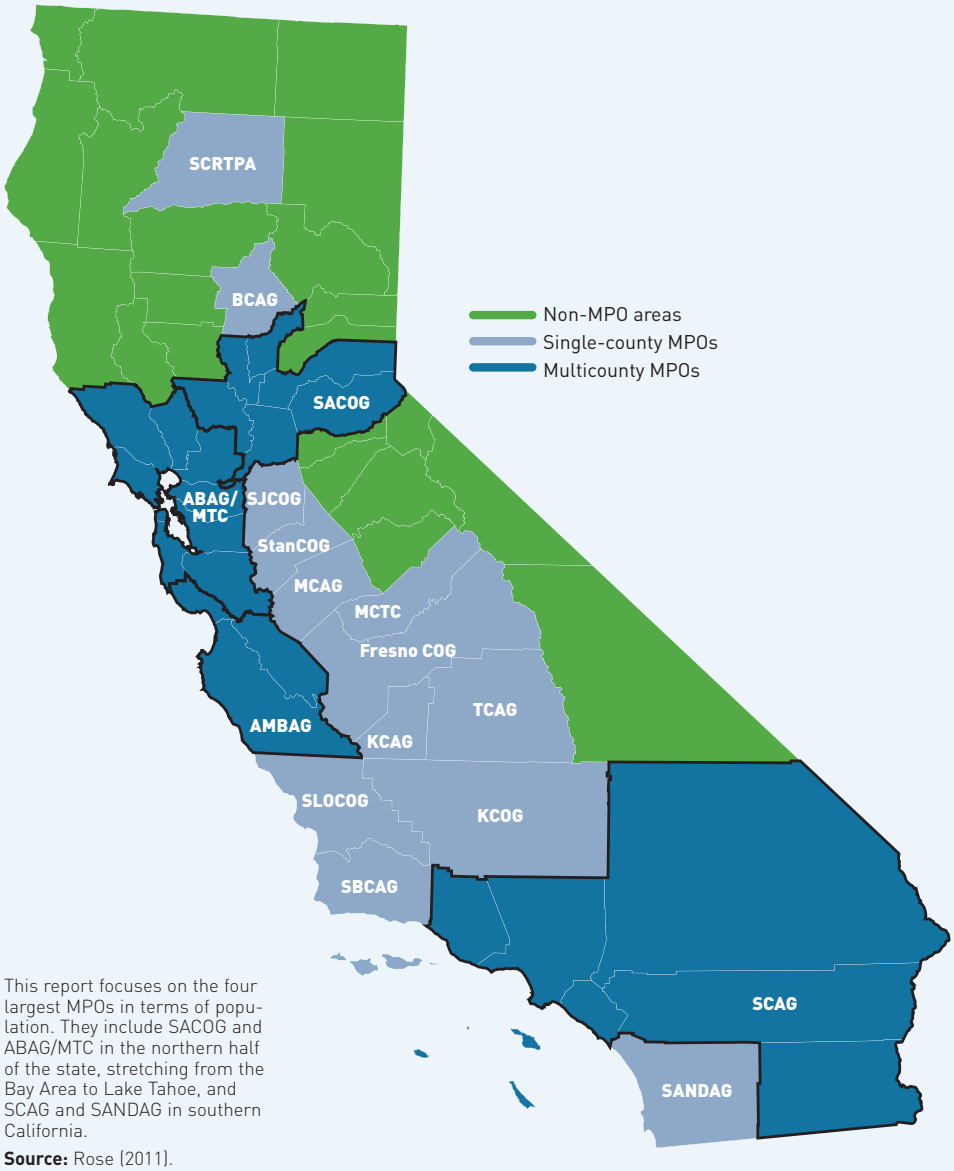
Every MPO in California must prepare a "sustainable communities strategy" (SCS) that shows how its region will meet GHG reduction targets set by the state's Air Resources Board through integrated land use and transportation planning. Once adopted by the MPO, the SCS will be incorporated into that region's federally enforceable regional transportation plan. The Air Resources Board will also review each final SCS to determine whether its implementation would achieve GHG emission reduction targets for the region; if not, the MPO needs to prepare a separate "alternative planning strategy" to meet the target.[3]

Fortunately, emerging market trends for real estate can be leveraged to help MPOs comply with SB 375. This report helps inform that process by identifying emerging market demands and showing how they may reshape California's metropolitan areas to 2035 and beyond. The particular audience of this report is California's four most populous MPOs, including their elected officials, public servants, and constituents. In the order of their presentation in chapter 4, those MPOs are

- Sacramento Area Council of Governments (SACOG);
- Metropolitan Transportation Commission (MTC), which serves the jurisdictions of the Association of Bay Area Governments (ABAG);
- Southern California Association of Governments (SCAG); and
- San Diego Association of Governments (SANDAG).

Figure 1.1 illustrates the location of these MPOs in relation to others in the state. The analysis of trends and their implications for these MPOs are applicable throughout the state—if not the nation.

FIGURE 1.1 California's Metropolitan Planning Organizations



This report focuses on the four largest MPOs in terms of population. They include SACOG and ABAG/MTC in the northern half of the state, stretching from the Bay Area to Lake Tahoe, and SCAG and SANDAG in southern California.

Source: Rose (2011).

Several underlying assumptions are used throughout the report. First, *transit* is used to mean accessible public transportation not only in its current form of fixed-rail and bus networks but also as the extensive future networks that are slated to be implemented over the course of the study period, including bus rapid transit. Second, *transit-station areas* include areas of urban land that are easily accessible to a transit station, usually within one-half mile. That is, this definition is not limited to TSA "projects" but is in fact a broader definition of land use potential within a half-mile radius of transit presently planned or planned in the future. Third, the market will support many other kinds of development that are not within one-half mile of a transit station that nonetheless have the densities, walkability, mixed uses, and other attributes that make sense for accommodating more growth. Finally, because many of California's metropolitan areas

are already among the nation's most densely settled—topped by Los Angeles—the findings of this analysis should be seen within a longer-term evolution of the marketplace and history of urban development in California.

This report consists of seven chapters. Chapter 2, next, anticipates future housing needs based on major demographic and housing tenure trends. Chapter 3 explores housing preferences from national and California-specific preference surveys. Chapter 4 shows that the current supply of homes on larger lots already exceeds the current (2010) as well as the future (2035) demand. This chapter also shows that the demand for (a) rental housing, (b) attached housing and small-lot homes, and (c) transit-accessible housing will dominate housing markets to 2035 and beyond, making the case that to meet current and emerging market demands, new housing will need to be in TSAs.

Chapter 5 estimates the extent to which nonresidential land uses may be redeveloped with a more compact mixture of land uses. It shows that about 70 percent of all new nonresidential construction will be simply to replace existing nonresidential structures, thus creating an opportunity to facilitate mixed-use redevelopment of existing nonresidential sites over the long term.

Chapter 6 demonstrates that new development in California's four largest metropolitan areas can be accommodated in the existing and planned TSAs—with sufficient remaining land capacity to accommodate future development throughout much of the 21st century.

Chapter 7 concludes the report with a review of key trends and opportunities facing California's four largest MPOs.

CHAPTER 2

Housing Demand Drivers

This report's premise is that future housing demand will be shaped chiefly by changes in demographic characteristics of the population and economic conditions that will reduce homeownership rates and increase the demand for rental options. The reasons are explored in this chapter. Changing housing and neighborhood preferences that drive the emerging demand for different residential choices are discussed in chapter 3.

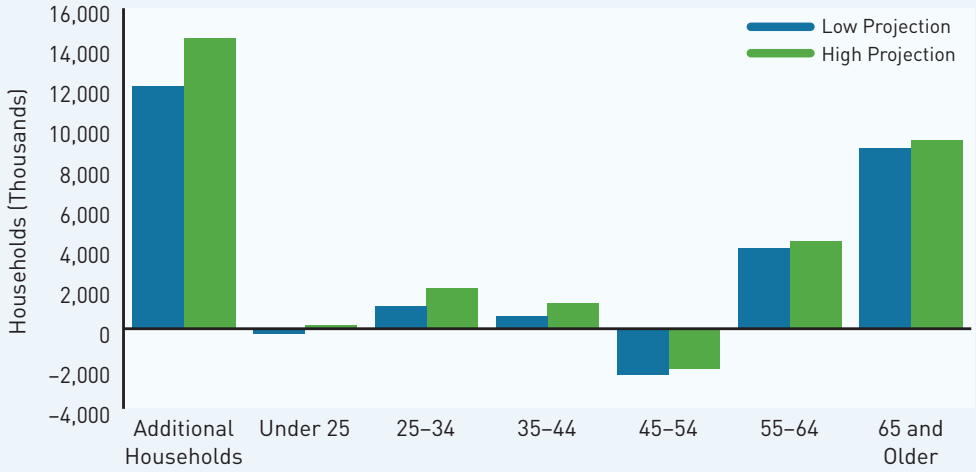
Broad Demographic Shifts

During the baby boom era of the late 1940s through the early 1960s, about half of all American households had children. Now less than one-third of households have children, and by 2030 the share of households with children could be as low as a quarter (Nelson 2006). Whereas households of the 1950s and 1960s demanded single-family detached homes on conventional subdivision lots (of more than 5,000 square feet) in a homogeneous suburb where parents could raise their children, the situation is different today. Between 2010 and 2020, more than 80 percent of the demand for new housing will be generated by households without children, as illustrated in figure 2.1. Many millions of these households may prefer something other than the conventional-lot and large-home option.

Housing Supply Lags Demand

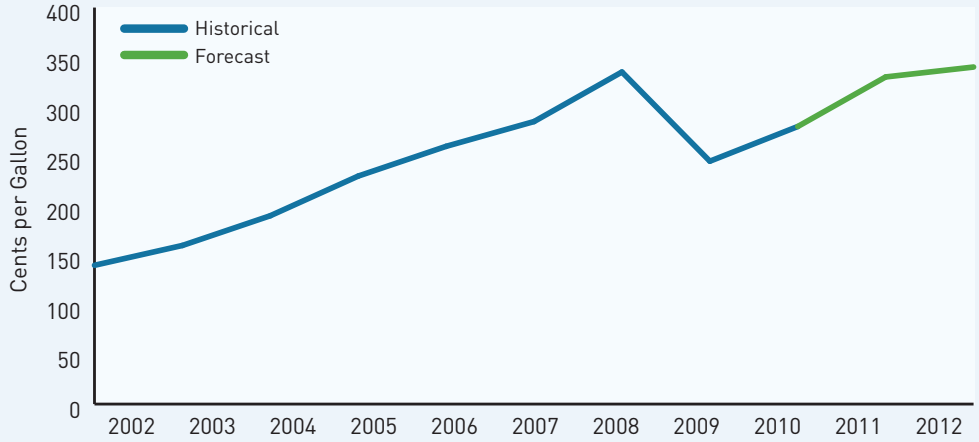
Unfortunately, housing supply lags demand. Leinberger (2007) notes that even at peak production the nation's supply of housing increases by just 1 to 2 percent annually. At that rate, a generation or more is needed for the housing market to catch up to current preferences.

FIGURE 2.1 Distribution of New Housing Demand, 2010–2020



Source: McIlwain (2009).

FIGURE 2.2 Price per Gallon of Gas, Averaged across All Grades, 2002–2012



Source: EIA (2011).
Note: Figures are not adjusted for inflation; 2012 figures are estimates. Price includes taxes.

Confounding Effects: Energy Costs, Lagging Employment and Income, and Shifting Wealth

Three other factors are reshaping housing demand: (a) rising energy costs; (b) lagging employment; and (c) shifting wealth.

RISING ENERGY COSTS

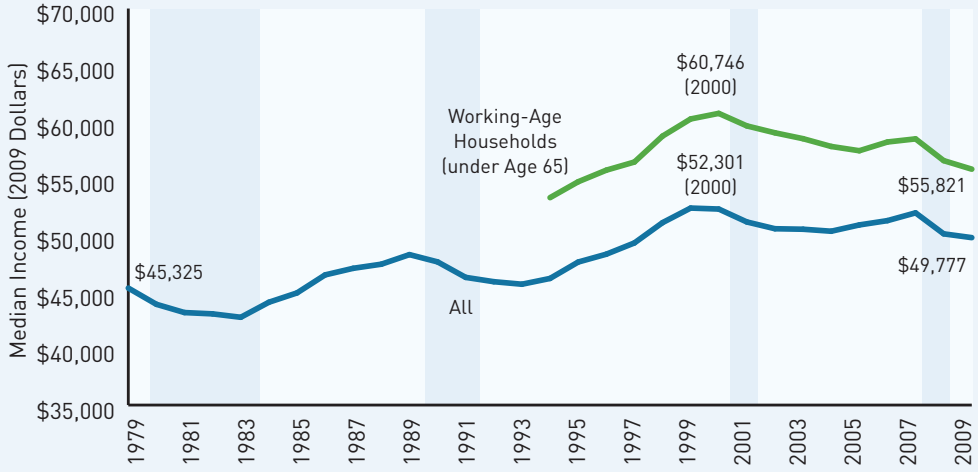
Energy prices are rising steadily, which will make supporting a home more expensive as home energy bills increase. It will also make locations far away from places of employment, shopping, and other daily destinations more expensive in terms of vehicle fuel costs. For instance, figure 2.2 shows the U.S. Department of Energy's trends and projections for gasoline prices from 2002 projected to 2012. (The dip during 2008–2009 was the recent recession.) Over the decade, gasoline prices are projected to have risen by about 9.7 percent, compounded annually,[4] or three times faster than inflation. If these rates continue, gasoline prices will exceed $8.00 per gallon by 2020.

LAGGING EMPLOYMENT AND INCOME

In addition, incomes are falling in real terms. According to the Harvard Joint Center for Housing, median household incomes for all age groups in each income category are probably lower now than in 2000. These confounding effects will further alter housing demand in the decade and generation to come (see SACOG 2011). As seen in figure 2.3, real median household incomes have fallen steadily since the late 1990s.

California's unemployment rate typically is higher than the nation's, and since the "Great Recession" the spread has increased, as illustrated in figure 2.4. Between 2008 and 2011, the gap between state and national unemployment rates has increased from 1.5 points to nearly 3.0 points. The national and state economies are projected to recover, but how long it will take and what the "new normal" unemployment rate will be are anyone's guess.

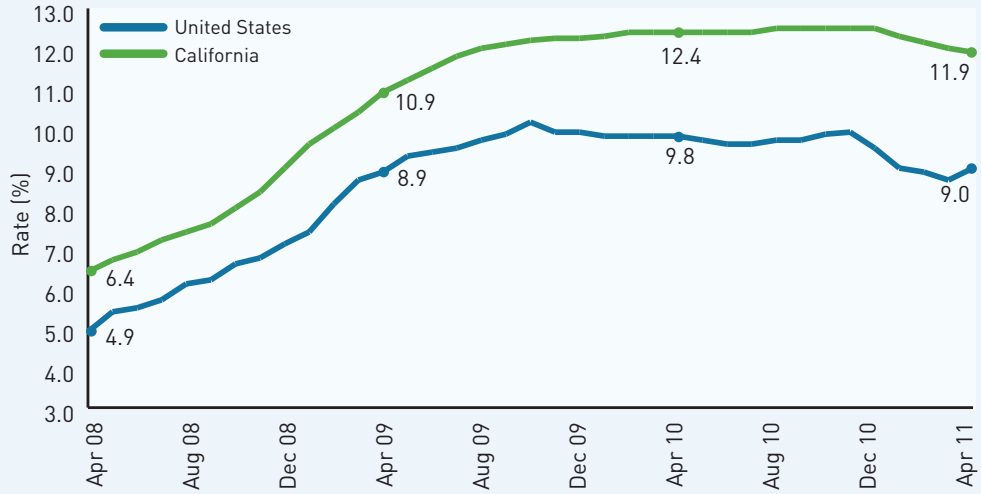
FIGURE 2.3 **Real U.S. Household Median Income (Adjusted for Inflation), 1979–2009**



Source: Economic Policy Institute analysis of U.S. Census Bureau data, http://www.stateofworkingamerica.org/files/images/orig/9-Income_median-income-79-09_not-in-SWA_3.png.

Note: Shaded areas denote recessions. Median income for workers under age 65 starts in 1994.

FIGURE 2.4 **Unemployment Trends, California and the United States, 2008–2011**



Source: California Employment Development Department, accessed June 4, 2011, http://www.labormarketinfo.edd.ca.gov/.

Note: April 2011; seasonally adjusted data.

If one looks at income with respect to both wages per job and personal per capita income projections provided by the California Employment Development Department, as summarized in table 2.1, wages in 2018 will be just about what they were in 2008. This estimate does not mean purchasing power in 2018 will be comparable to that in 2008, however. As noted previously, energy prices are likely to rise and thus reduce effective income. The cost of other goods and services, such as food and health care, also seem primed to rise more quickly than inflation. In effect, the

real purchasing power of most Californians in 2018 is likely to be less than that in 2008. Table 2.1 shows that projected per capita wage income will actually fall by about 5.3 percent.

SHIFTING WEALTH

At the same time, the wealth of the nation has been shifting steadily to more affluent households. In the 1980s, about 80 percent of the nation's wealth was held by 20 percent of its wealthiest households. By 2009, nearly 99 percent of America's wealth was held by the wealthiest fifth of its households (see figure 2.5). The recent recession could be blamed for reducing much of the wealth of the middle and lower classes. Historically, a large share of the wealth of American households has been the equity in their homes. Much of this value was removed by the recent recession, however, as seen in figure 2.6. Between 2006 and 2009, homeowners lost a third of their equity. Indeed, homeowner equity has fallen steadily since 1945, from about 85 percent to about 40 percent. The reason is the advent of highly leveraged home purchase opportunities that became widely available during the past generation. This situation seems to have changed, however, as is seen in the next section.

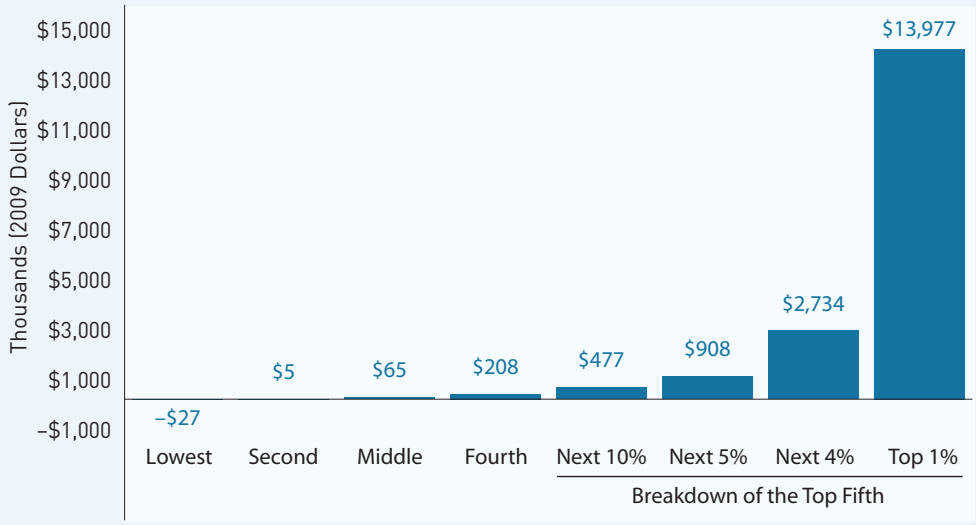
TABLE 2.1 Wages per Job and Wages per Capita, 2008–2018

Comparison	2008	2018	Change
Wages per Job	$46,113	$46,320	0.45%
Wages per Capita	$21,554	$20,409	–5.32%

Sources: Wages estimated from California Employment Development Department, accessed June 4, 2011, http://www.labormarketinfo.edd.ca.gov/?pageid=145; employment used to estimate wages per capita for 2008 from U.S. Census and for 2018 interpolated from the 2020 estimate from California Department of Finance, accessed June 4, 2011, http://www.dof.ca.gov/research/demographic/reports/projections/p-1/ ().

Note: Figures are in 2008 dollars.

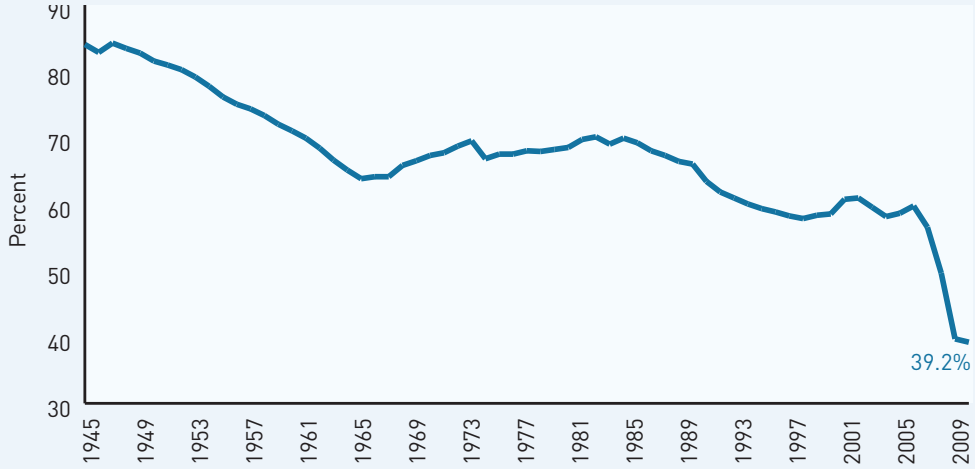
FIGURE 2.5 Share of U.S. Wealth Owned by Wealthiest 20 Percent of Households, 2009



Source: Economic Policy Institute; Federal Reserve Board, Survey of Consumer Finances and Flow of Funds, http://www.stateofworkingamerica.org/files/images/orig/11-Wealth_quintile_and_top_quintile_2.png.

Note: Wealth is determined by net worth, which is assets less liabilities. 2009 data are from Survey of Consumer Finances in 2007 with asset prices adjusted to reflect changes from 2007 to 2009 in Flow of Funds data.

FIGURE 2.6 **Homeowner Equity as Share of Home Value, 1945–2009**



Source: Economic Policy Institute analysis of Federal Reserve Board, Flow of Funds data, http://www.stateofworkingamerica.org/files/images/Figure-0_Homeequirty_inhouse_2.png.

The overall effects of shifting wealth and loss of home equity include the following:

- Fewer people are able to buy homes.
- Having fewer homebuyers may further drive down demand and thus prices, which may further erode equity.
- Those who own homes may not be able to refinance them to advance a variety of household objectives, from buying a second home to supporting their children's education, to simply reducing payments when rates fall.

Change in Institutional Support for Homeownership

The "Great Recession" of 2008–2009 was caused in part by the bursting of the "housing bubble" of the middle 2000s. Banks and other financial institutions were closed, home equity took its biggest decline since the start of the Great Depression, and millions of homes were foreclosed on or "sold short" to avoid foreclosure. In the wake of this financial disaster have come numerous changes. Initially, lending institutions increased their underwriting requirements, which reduced the number of people who could qualify to a buy a home. But two other changes appear imminent that could further reduce the number of people who may qualify for home loans: (a) pending Federal Deposit Insurance Corporation (FDIC) regulations and (b) the demise of Fannie Mae and Freddie Mac.

Early in 2011, the Office of the Comptroller of the Currency, the Federal Reserve, the FDIC, the Securities and Exchange Commission, the Federal Housing Finance Agency, and the Department of Housing and Urban Development proposed new rules defining what constitutes a qualified residential mortgage (QRM). The five core criteria that constitute the proposed definition of a QRM are as follows:[5]

1. Lenders who wish to sell mortgages may need to retain 5 percent of the overall value in their portfolios to retain the assumption of some risk—having some "skin" in the lending game.

2 Unless financial assistance is granted by the Federal Housing Administration (FHA), borrowers may be required to produce a downpayment of 20 percent of the home's appraised value, of which no more than half can be a gift from a relative or third party.

3 Mortgage refinancing may require the new loan to be no more than 75 percent of the value of the property (or 70 percent if the borrower takes cash out of the loan).

4 Minimum income-to-mortgage standards would be tightened.

5 No borrower who has fallen two months behind on any mortgage within the previous two years may qualify for a QRM.

The National Association of Home Builders (NAHB) assessed the criteria as follows:

> Requiring a high down payment would disproportionately harm first-time home buyers, who have limited wealth and on average account for 40 percent of home-buying activity. It would take an average family 12 years to scrape together a *20 percent down payment*. Borrowers who can't afford to put 20 percent down on a home and who are unable to obtain FHA financing will be expected to pay *a premium of two percentage points* for a loan in the private market *to offset the increased risk to lenders*, according to NAHB economists. This would *disqualify about 5 million potential home buyers*,[6] resulting in 250,000 fewer home sales and 50,000 fewer new homes being built per year.[7]

Table 2.2 illustrates the prospective impact the 20 percent downpayment may have. It shows the share of all owner-occupied homes by downpayment range. Requiring a 20 percent downpayment could disqualify over two-thirds of current homeowners from obtaining a QRM under the proposed rules.

The new rules would not preclude the FHA from insuring loans that have a less than 20 percent downpayment, but neither is the FHA expected to absorb much of the shift in market demand. For one thing, FHA mortgage insurance premiums would continue to be required for those putting less than 20 percent down, which would be on top of principal, interest, taxes, and insurance.

In addition, Fannie Mae and Freddie Mac are expected to substantially transform their operations over the coming decade. Fannie Mae (created in 1938) essentially invented the secondary mortgage market in the 1930s when it offered to buy mortgage "paper" that banks received from borrowers buying qualified homes. Before Fannie Mae, a bank could run out of money to lend for

TABLE 2.2 Share of Homes Purchased by Downpayment Range

Percent of Purchase Price	Share (%)	Cumulative (%)
No downpayment	14	14
Less than 3 percent	8	22
3–5 percent	12	34
6–10 percent	16	50
11–15 percent	6	56
16–20 percent	13	69
21–40 percent	13	82
41–99 percent	7	90
Bought outright	10	100

Source: Author adaptation from U.S. Census Bureau (2010).

Note: Highlighted range shows households with about 20 percent downpayment.

mortgages and thus stifle homebuilding. For its part, Fannie Mae created pools of investors who gave it money to buy the paper, with investment returns guaranteed by the full faith and credit of the United States. In the 1960s, Congress made Fannie Mae a quasi-private institution and created the Federal Home Loan Mortgage Corporation—FHLMC, or Freddie Mac—to compete with Fannie Mae and avoid having it monopolize the secondary mortgage market. The Government National Mortgage Association—Ginnie Mae—complements these two entities.[8] Together these are called government-sponsored enterprises, or GSEs.

Since 1990, GSEs have, on combined average, accounted for up to 90 percent of the residential mortgage-backed securities market, with the exception of the years between 2004 and 2007, when private unsecured mortgage lending soared. Since 2008, GSEs have accounted for nearly all of the residential mortgage-backed securities market, with virtually no private residential lending being securitized in the secondary residential markets.

The Obama Administration has publicly proposed three alternatives to phase out Fannie Mae and Freddie Mac. The first would reduce the government's role in insuring and guaranteeing mortgages, restricting it to assisting FHA and other programs whose missions are to facilitate lower- and moderate-income borrowers with good credit. Private lenders would take over the secondary mortgage market functions of Fannie Mae and Freddie Mac. The second alternative would be similar to the first, creating additional safeguards to ensure continued access to credit during a potential future housing crisis. The third, also a variation of the first, creates a reinsurance program to back private insurance programs that facilitate a targeted range of mortgages, such as those for low- and moderate-income households.[9]

Clearly, under any option, the financing of homes in the United States is going to change. Dr. Susan Wachter of the Wharton School at the University of Pennsylvania estimates that the price of 30-year fixed mortgages may rise by about three points—a 5 percent loan now would become an 8 percent loan after all the changes. Although some think this rate is too high, the loss of Fannie Mae and Freddie Mac will certainly result in more expensive mortgages—as will implementing the QRM policies. The NAHB has stated that the QRM policies may raise rates an additional two points, leading to a potential total five-point increase associated with the future institutional changes.[10]

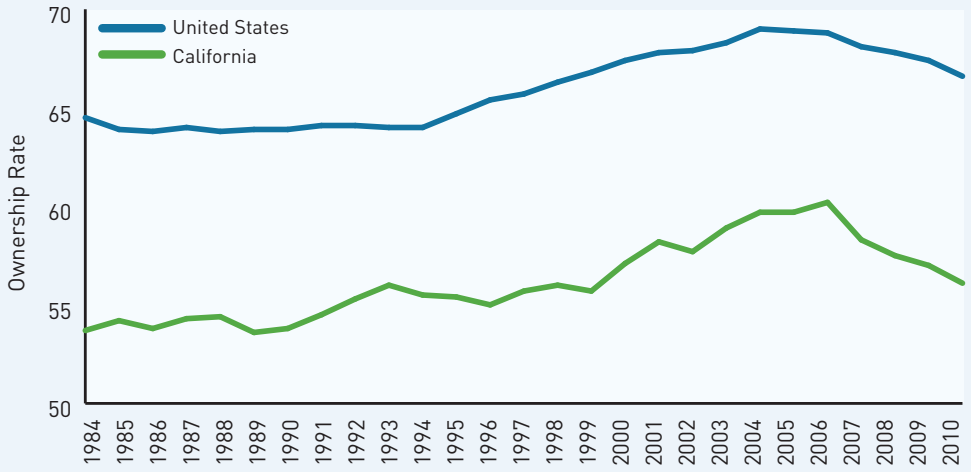
Declining Homeownership Rates—a Market Trend Scenario

Since the end of World War II, California's rate of homeownership has lagged behind that of the nation as a whole (see figure 2.7). A chief reason is the high cost of housing in California relative to the nation as a whole, which itself is caused by the state's large population base, rapid rate of growth, and limited supply of land suitable and available for development. Since 1984, California's homeownership has averaged about 15 percent lower (about 10 percentage points) than that of the nation as a whole.

Attitudes about homebuying nationally, and by extension in California, seem to be changing. For instance, Gail Cunningham (2009, 1) of the National Foundation for Credit Counseling, summarized results of a 2009 survey it commissioned as follows:

> The lack of confidence in consumers' ability to buy a home, improve their current housing situation, or trust homeownership to provide a significant portion of their wealth sends a strong message about the impact of the housing crisis. It appears that whether a person was directly affected or not, Americans' attitudes toward homeownership have shifted.

FIGURE 2.7 **U.S. and California Homeownership Rates, 1984–2009**



Source: U.S. Census.

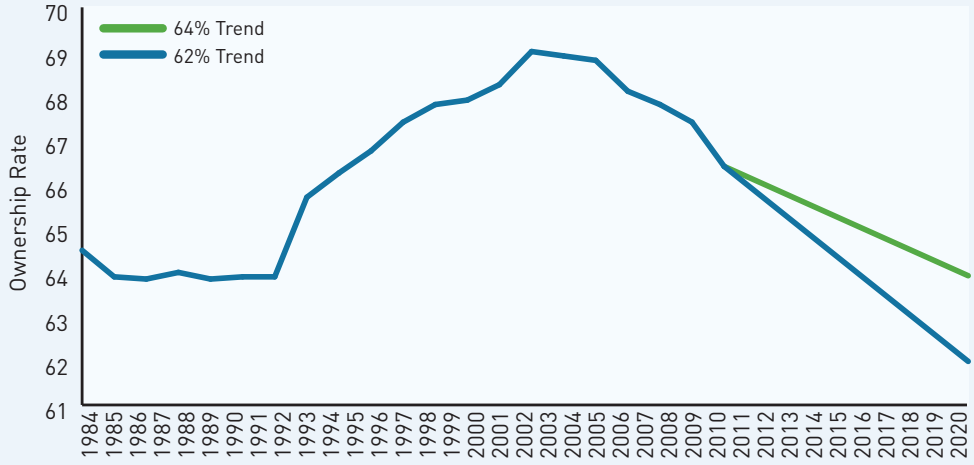
The survey also found that

- Almost one-third of those surveyed do not think they will ever be able to afford to buy a home;
- Forty-two percent of those who once purchased a home, but no longer own it, do not think they will ever be able to afford to buy another one;
- Of those who still own a home, 31 percent do not think they'll ever be able to buy another home (upgrade existing home, buy a vacation home, etc.); and
- Seventy-four percent of those who have never purchased a home felt they could benefit from first-time homebuyer education from a professional.

U.S. and California homeownership peaked in the middle 2000s. Both have declined since and are expected to continue to fall with the only question being how far. For instance, John McIlwain (2009) of the Urban Land Institute projected that the homeownership rate in 2020 would range between about 62 percent and 64 percent nationally (see figure 2.8 and table 2.3). This estimate was made before the proposed QRM rules and phasing out of Fannie Mae and Freddie Mac. Consider the list of factors that will tend to push down homeownership rates:

- The implementation of the proposed QRM policies and the demise of Fannie Mae and Freddie Mac could reduce the national homeownership rate by up to 10 percent, from about 66 percent in 2010 to about 60 percent in 2020, absent any change in the structural demand for housing. Even if a compromise version of those changes were implemented, homeownership rates would still fall, perhaps to about 63 percent.
- Changing attitudes about homeownership will continue to drive down homebuying rates, at least until markets and economic conditions stabilize and values can be realized.
- The inability to close the education gap between whites and other major ethnic groups will mean higher average unemployment rates and lower wages for growing portions of the population. This may lead to stagnant or declining real income, which will reduce the ability of households to purchase homes.

FIGURE 2.8 **U.S. Homeownership Rate, Actual 1984–2010 and Projected to 2020**



Source: McIlwain (2009).

Some have suggested a nuance that could moderate declining homeownership rates. Orbinsky (2011) observes that because (a) senior households own homes at the highest rates among all households—more than 80 percent of households of seniors between 65 and 74 years of age in the United States own their homes (see table 2.4), and (b) they will dominate the American housing market as baby boomers turn 65 between 2011 and 2029 (see figure 2.1), the overall homeownership rate probably will not change much.

This may not happen, at least in California, for several reasons. First, by the time the youngest baby boomers turn 65, the oldest ones will be in their 80s, and their homeownership rate will have fallen to levels of 35- to 44-year-olds. Second, the "Proposition 13" effect in California undermines the sale of homes by seniors to younger households, which is why homeownership

TABLE 2.3 **U.S. Homeownership Rate, 2006–2020**

Year	Ownership Rate (%)	Change from 2010 (%)
2006	68.8	
2007	67.8	
2008	67.6	
2009	67.3	
2010	66.4	
Prudential 2011	66.0	–0.6
Prudential 2012	65.0	–2.1
Prudential 2013	65.0	–2.1
Prudential 2014	64.5	–2.9
Prudential 2015	64.0	–3.6
Nelson 2020	63.5	–4.4
ULI High 2020	64.0	–3.6
ULI Low 2020	62.0	–6.6

Sources: Figures for 2011–2015 from Prudential Real Estate, http://news.prudential.com/images/20026/ApartmentsPRU.pdf. "Nelson 2020" from Arthur C. Nelson, University of Utah, as reported in *USA Today*, August 6, 2009, http://www.usatoday.com/news/nation/2009-08-05-rental_N.htm. "ULI" from McIlwain (2009).

in younger age categories will continue to lag in California.[11] Third, seniors will begin flooding the market with homes to sell, but younger, probably less affluent, age groups will be able to purchase them only if they are offered at steep discounts from housing values of just a few years ago. This situation could result in more seniors aging in place for longer periods of time than they desire and could slow the normal intergenerational turnover in homeownership.

Recent analysis by Dowell Myers (2011), a professor of planning and demography at the University of Southern California, shows while the number of households grew by 1.1 million in California during the 2000s, the number of owner-occupied homes grew by fewer than 500,000, or just 45 percent. As Myers (2011, 14) observes:

> In recent years, the white population has been shedding many more homeowners at older ages than it has been adding at young ages. The white population has not been replacing its own homeownership demand, leaving the burden to Latinos and Asians, the two growing groups. For this transition to be successful, if they are to serve well as generational replacements in the homeownership market, it seems necessary to elevate the homeownership rates of younger Latinos in particular.

Even without looming demographic, economic, and regulatory changes, historic trends indicate California's homeownership rate would be expected to fall from the roughly 57 percent it is in 2010 to between 52 percent and 54 percent by 2020. Given these drivers, however, assuming a 52 percent homeownership rate by 2020 may be prudent—staying roughly ten points below the national average and assuming it does not go below 62 percent.

This report assumes that the homeownership rate in 2020 and 2035 will be 5 percent lower than the rate in 2010. Still, a scenario where the 2035 rate is 10 percent lower than in 2010 seems clearly viable. This estimate of homeownership is called the *market trend scenario*. It differs from the *market preference scenario*, which is discussed in the next chapter. The effect of the market trend scenario is illustrated in two tables. Table 2.5 shows estimates of homeownership rates by MPO area for 2020 and 2035. It considers projected changes in the demographic profile of the MPO areas reported by the California Department of Finance.[12] Because most growth to 2020 and 2035 will be among demographic groups that have lower homeownership rates than non-Hispanic whites in 2010, overall homeownership will decline.

TABLE 2.4 Distribution of Homeownership by Age Group

Age of Homeowner (Years)	United States (%)	California (%)
15 to 24	15.3	9.4
25 to 34	42.6	28.2
35 to 44	63.4	50.9
45 to 54	72.7	63.5
55 to 59	77.4	69.8
60 to 64	79.9	73.1
65 to 74	81.3	75.1
75 to 84	79.4	75.6
85 and over	69.3	70.9
All Ages	65.9	56.6

Source: Adapted by author from U.S. Census Bureau (2011).

TABLE 2.5 Homeownership Rates under the Market Trend Scenario

MPO	2010 Homeownership Rate (%)	2020 Homeownership Rate @ 95% of 2010 Rate (%)	2035 Homeownership Rate @ 95% of 2010 Rate (%)
SACOG	61.7	58.2	57.4
MTC/ABAG	57.4	53.4	52.7
SCAG	55.2	50.9	49.6
SANDAG	54.8	52.2	51.7
Largest MPOs	56.0	52.2	51.2

Source: Author.

Note: The estimates for 2020 and 2035 consider changes in racial and ethnic composition of the population since 2010.

TABLE 2.6 Rental Demand Share of New Housing Demand under the Market Trend Scenario

MPO	2010–2020 @ 2010 Ownership Rates (%)	2010–2035 @ 2010 Ownership Rates (%)	2010–2020 @ 95% of 2010 Ownership Rates (%)	2010–2035 @ 95% of 2010 Ownership Rates (%)
SACOG	47	45	93	60
MTC/ABAG	52	49	84	60
SCAG	52	55	72	66
SANDAG	49	50	81	64
Largest Four MPOs	52	52	76	64

Source: Author.

Note: The estimates for 2020 and 2035 consider changes in racial and ethnic composition of the population since 2010.

The biggest change in tenure may occur before 2020 because by then the market should have fully internalized new rules such as QRM, the loss or scaling back of Fannie Mae and Freddie Mac, and structural changes in the economy after the Great Recession. After that, the market for owner-occupied homes is assumed to remain reasonably stable to 2035. The greatest change in tenure demand, therefore, will be during the 2010s.

As seen in table 2.6, even if homeownership rates do not change, the sheer magnitude of change in the demographic composition of the population will mean the demand for new rental housing in each MPO area will account for about half or more of the new demand for housing between 2010 and 2020. The likely alternative, where the homeownership rate falls by 5 percent, means that about three-quarters, or more, of the net new demand for housing will be for rentals between 2010 and 2020, and will be about 60 percent to two-thirds of the demand over the entire scenario period from 2010 to 2035.

These changes in tenure demand analysis do not mean that most of the new units constructed between 2010 and 2020, or between 2010 and 2035, will be apartments. They could mean a combination of several things. Apartments and other forms of explicit rental housing will certainly be constructed, but large shares of townhouses, multiplexes (two-, three-, and four-unit structures), and even small-lot homes will be built initially for renting with the intent of selling later. Second, one could see a rise in accessory dwelling units, multigenerational households occupying single-family detached homes, and other multihousehold configurations on single-family lots. Third, one may see new forms of multifamily housing.

The next chapter examines emerging housing preferences.

CHAPTER 3

Housing Preferences

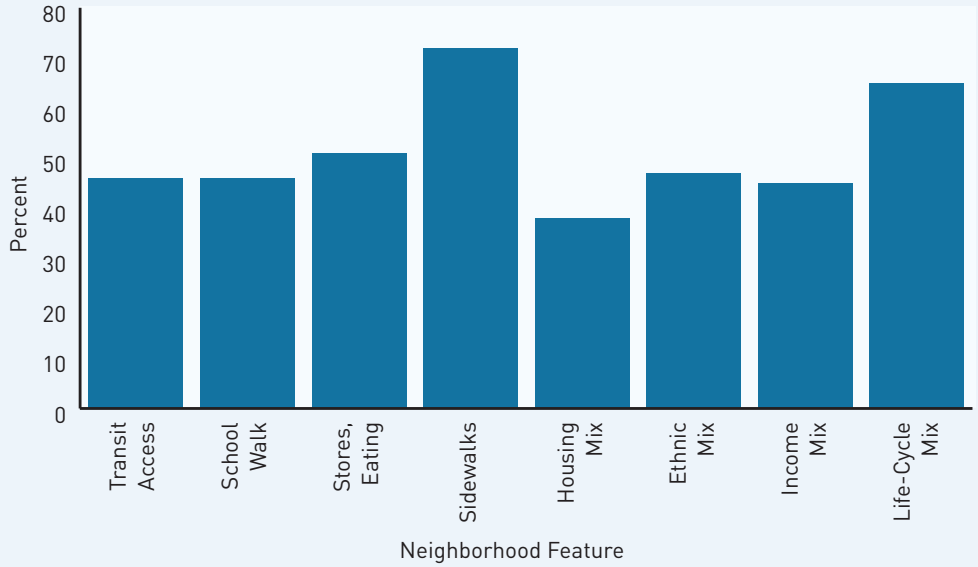
This chapter explores emerging preferences for housing and neighborhoods based on several surveys that were conducted between 2001 and 2011. Emerging housing preferences are considered for the nation as a whole as well as for California, and implications are identified.

National Preferences

When asked what they want, about 70 percent of Americans say they prefer a large home on a large lot,[13] based on a survey commissioned by the National Association of Realtors (NAR) and Smart Growth America. In a more recent survey conducted in 2011 and commissioned by the NAR, fully 80 percent of the respondents would prefer to live in a single-family detached home right now if they had the option (Belden Russonello & Stewart 2011). Yet when confronted with choices of neighborhood and housing attributes they most prefer, people's decisions differ. For instance, although nearly everyone wants his or her own castle, the NAR's 2004 survey found that nearly half also wanted access to transit and to be able to walk to schools, and nearly 40 percent wanted a mix of housing opportunities.[14] These are features usually associated with smaller lots (see figure 3.1).

Market studies attempt to tease out choices people will make given roughly equal choices within a budget constraint. Many studies also attempt to gauge differences in choices based on such factors as age, ethnicity, and education. In recent years, three national studies have reported broad national preference trends for housing. For instance, in assessing an NAHB study, Myers and Gearin (2001) noted that by about 2015 up to 17 percent of American households would want

FIGURE 3.1 **Neighborhood Attribute Preferences**



Source: Belden Russonello & Stewart (2004).

the option to live in a townhouse (see table 3.1). Nelson (2006) synthesized numerous studies from the middle 1990s to the early 2000s to estimate the distribution of housing choice options people wanted (see table 3.1). In 2008, RCLCO conducted a national survey that found gen-X (those born between 1965 and 1978) and gen-Y (those born between 1979 and 1996) ownership-seeking households preferred roughly the same distribution of residential units by type.

The RCLCO survey focused especially on generation Y. With more than 80 million people, the gen-Y market segment will dominate the demand for new forms of housing over the next generation. In contrast, the baby boom (1946–1964) market is composed of about 75 million people who are either downsizing or aging in place, and gen-X (1965–1978) numbers only about 50 million. Here are some highlights of gen-Y housing and neighborhood preferences reported by RCLCO:[15]

- Overall, for those who are moving, the most interest is for close-in neighborhoods, followed by urban locations.
- They have a strong preference for walkability.
    - This preference is driven by convenience, connectivity, and a healthy work/life balance to maintain relationships.
    - One-third will pay more to walk to shops, work, and entertainment.
    - Two-thirds say that living in a walkable community is important.
    - More than one-half of gen-Yers would trade lot size for proximity to shopping or to work.
    - Even among families with children, one-third or more are willing to trade lot size and "ideal" homes for walkable, diverse communities.
    - Even in the suburbs, the majority of gen-Yers prefer characteristics of urban places, particularly walkable environments.
- Regarding family changes:
    - Seventy percent do not believe they have to move to the suburbs once they have children; and
    - Only half are confident they will need a single-family home once they have children.
- Community and neighborhood needs reflect the following:
    - Diversity is a key ingredient—generation Y wants diversity in housing types, styles, groups of people, and household composition.
    - More than half report that having a community and home designed to meet certain "green" objectives plays an important role in their purchase or renting decision.

Preferences have to be converted into demand for discrete types of housing. Although consensus exists among surveys on what constitutes attached units, such as apartments, condominiums, cooperatives, and townhouses, less agreement exists on what constitutes "small" or "large" lots. For instance, a survey conducted by Nelson (2006) defined "small" lots as one-sixth acre (six units per acre). RCLCO's 2008 survey defined small lots as one-quarter acre (four units per acre). (Table 3.1 compares the supply of these two small-lot definitions for 2009 based on the 2009 *American Housing Survey* [AHS].[16]) In contrast, two surveys specific to California (reviewed in detail later) implied a small lot was one-eighth acre or smaller (eight or more units per acre)

TABLE 3.1 Comparative Demand by Housing Unit Type, National Surveys

Housing Type	Nelson Total Demand 2006 (%)	RCLCO Owner Demand 2008 (%)	Myers and Gearin Townhouse Demand 2001 (%)	AHS Supply[a] 2009 (%)	AHS Supply[b] 2009 (%)
Multifamily	23	24	—	23	23
Townhouse	15	10	17	5	5
Small Lot	37	35	—	15	25
Conventional Lot	25	31	—	57	47

Sources: Myers and Gearin (2001); Nelson (2006); RCLCO (2008); U.S. Census Bureau (2010).

Note: — not available.

a. Small lot = one-sixth acre.

b. Small lot = one-quarter acre.

because research shows this size is the minimum detached residential unit density that supports transit use (see Baldassare 2001, 2002).[17] That survey and its implications for this report are discussed later. Tables 3.1 and 3.2 illustrate density examples.

From a national perspective, table 3.1 shows that a mismatch exists between the emerging demand for housing by type of unit and the current supply. Principal reasons include changing preferences over time and the sheer numbers of homes built to meet needs of earlier generations. For instance, the baby boom generation has dominated the nation's housing needs and until recently has favored new, mostly single-family homes on large lots in the suburbs over other options. The number of homes built between about 1950 and 1985 to meet this demand is staggering—about 60 million—and accounts for about half the nation's current supply of homes. Even in a good year, new-home construction is less than 1.5 percent of the current supply. At this rate, even if all new housing construction were to be other than large lot, more than a generation could be needed to shift the total housing supply to meet future demand. McIlwain (2009) observes that the following four demographic groups will drive housing markets between 2010 and 2020, with trends affecting future housing markets for decades beyond:

- Older baby boomers who will constitute a senior population unprecedented in size;
- Younger baby boomers, many of whom will be unable to sell their current suburban homes to move to new jobs;
- Generation Y, which will be renting housing far longer than did past generations; and
- Immigrants and their children, who will want to move to the suburbs but may find housing there too expensive even after the current drop in prices.

A recent survey conducted for the NAR by Belden Russonello & Stewart (2011) of more than 2,000 respondents further explores these trends. Because of its large sample size, national preferences can be compared to California preferences, as shown in table 3.2.[18] For the most part, Californians' preferences coincide with those of the nation as a whole, with one glaring exception: Californians consider transit options to be far more important in choosing a place to live than the rest of the nation, by 71 percent to 47 percent.

The focus now turns to California's emerging housing demand characteristics.

TABLE 3.2 Comparing Selected National and California Preferences

Living Preferences	Nation (%)	California (%)
Smaller houses on smaller lots with shorter commute to work, 20 minutes or less	59	55
Own or rent an apartment or townhouse with easy walk to shops and restaurants and have a shorter commute to work	38	42
Community with a mix of single-family detached houses, townhouses, apartments, and condominiums on various sized lots; all streets have sidewalks; shopping, restaurants, library, school within a few blocks of home and can either walk or drive; parking limits; public transit nearby	56	60
Public transit is very important or somewhat important	47	71

Source: Belden Russonello & Stewart (2011).

California Preferences

California is the nation's largest and most ethnically diverse state. This section reviews numerous surveys relating to Californians' preferences for walking and biking, living in smart growth communities, having certain housing and neighborhood features, commuting with special reference to transit accessibility, and desiring particular density and lot size. In several surveys, respondents must choose between options; so, for instance, more than 80 percent of Californians want to own a single-family detached home (Baldassare 2001, 2002, 2004; Belden Russonello & Stewart 2011), but when choosing between living in a suburban home on a large lot with a long commute to work and living in an attached home near transit, about one-third of Californians prefer the latter.

This section looks first at Californians' preferences for walking or biking to work, shopping, and transit, and the extent to which they support and would want to live in smart growth communities. Data from Porter Novelli, a global public relations firm, inform the responses for both sets of questions.[19] Annually, Porter Novelli conducts consumer research to track a variety of consumer preferences regarding lifestyles and health behaviors. In 2003 and 2005, the surveys were conducted by mail, using Synovate's Consumer Opinion Panel. Response rates were 59 percent and 80 percent, respectively.[20] Data were postweighted by gender, age, income, race, and household size to reflect the demographic proportions in the U.S. Census Current Population Survey for each year.

In the 2003 and 2005 surveys, Porter Novelli gauged market preferences for a variety of smart growth attributes, including, for this report's purposes, the extent to which people believe the ability to walk or bike to work, shopping, and transit is important or very important, and their level of support for and willingness to live in smart growth communities. The walk/bike questions are addressed first.

The surveys are quite large, composed of 5,873 respondents in 2003 and 4,943 in 2005. Because Porter Novelli asked the same questions in those years, the total sample size is 10,816. Given this large sample size, one can parse respondents based on a number of key demographic indicators such as age, income, and household composition. The large sample size allows a focus on the 1,202 respondents living in California.

TABLE 3.3 Important or Very Important to Be Able to Walk or Bike to Work, for Shopping, or to Transit in California

Demographic Group	Walk/Bike to Work (%) (*N* = 1,197)	Walk/Bike to Shopping (%) (*N* = 1,202)	Walk/Bike to Transit (%) (*N* =1,196)
All	25	26	28
Household Type			
Single	29	36	39
Household without Children	26	26	25
Household with Children	24	24	27
Age			
18–34	29	28	35
35–54	24	25	24
55–69	21	25	27
70+	31	34	34
Income			
<80% AMI	33	32	36
80–120% AMI	25	23	25
>120% AMI	16	20	18

Source: Porter Novelli; used with permission.

Note: *AMI* means area median income for the state as reported by HUD for 2003 and 2005 (HUD 2011).

The Porter Novelli surveys are of interest because of three key questions both surveys asked: based on a scale of 1 ("not at all important") to 5 ("very important"), how personally important is it to you to

- Be able to walk or bike to work
- Be able to walk or bike to shopping
- Be able to walk or bike to transit

Table 3.3 summarizes survey findings. Overall, a quarter or more of the respondents believed it would be important or very important to be able to walk or bike to work, shopping, or transit. Nationally, between 22 and 23 percent of respondents overall responded this way.[21] Of course, this finding means that up to three-quarters of Californians do not think so. In contrast, the *2009 National Household Travel Survey* (Federal Highway Administration 2011) indicates that fewer than 5 percent of all people actually do walk or bike to work, shopping, or transit. Thus, substantial upside potential exists for increasing this share based on apparent market preferences. For instance, the *2009 National Household Travel Survey* shows a third of Americans walk or bike to work and nearly half walk or bike to shopping when those destinations are within one mile of the origin (see chapter 5).

Another set of questions had respondents read the following description, which is the definition of a "smart growth community" used in this report (see also Handy et al. 2008, 210).[22]

> In recent years, there has been a greater interest in developing communities with a town design in place of today's suburbs. Such communities have a town center that is surrounded by residential neighborhoods. The town center has small shops, restaurants, government buildings, churches, and public transit (bus, rail) stops. Residential neighborhoods are clustered around the town center, providing easy access to work and shopping. Each neighborhood has a variety of housing types (apartments, townhomes, and single-family homes) and houses are built on smaller lots and are closer to the street.

> Streets are designed to accommodate cars, pedestrians, and bicyclists. In residential areas streets are narrower, slower, and quieter with sidewalks, trees and on-street parking. In commercial areas, sidewalks are wide and comfortable, streets are lined with trees, and parking lots are less conspicuous. The community includes a network of parks and trails for walking and biking. It also has a clearly defined boundary in order to preserve open space for parks, farmlands, and forests.

Respondents were then asked, "How much would you support the development of communities like this in your area?" They were asked to respond using a seven-point scale from "would not support at all" (1) to "would fully support" (7). Choosing the midpoint (4) on this scale meant a respondent "would somewhat support" the development of such communities.

A second question asked: "If there were communities like this available in your area, how much would you want to live in one?" Again, respondents were to answer on a seven-point scale, this time ranging from "definitely not" (1) to "definitely would" (7). The midpoint (4) in the range of responses to this question was "maybe." These questions are used in this report to measure *support* of (in the first case) and *interest* in (in the second case) traditionally designed communities within the context of the respondent's existing community. As noted earlier, the phrase "smart growth community" was not used in the survey; instead, respondents were asked to answer questions in reference to the description above. These questions were identical in the 2003 and 2005 surveys.

Table 3.4 reports results for California. Here one sees that most Californians would support proposals for smart growth communities near them and would want to live in one. This response is consistent with the national sample.

Next, Californians' housing preferences are examined. These are reported in a series of surveys conducted by the Public Policy Institute of California (PPIC) (Baldassare 2001, 2002, 2004). These surveys were conducted during a time of relative stability in the California housing market and also before recent spikes in gasoline prices. Preferences revealed in these surveys are used to

TABLE 3.4 Would or Definitely Would Support Proposals for a Nearby Smart Growth Community and Would Want to Live in One in California

Demographic Group	Would Support Smart Growth Communities (%) (*N* = 1,198)	Would Live in a Smart Growth Community (%) (*N* = 1,198)
All	55	51
Household Type		
Single	58	56
Household without Children	53	48
Household with Children	55	52
Age		
18–34	64	61
35–54	53	50
55–69	51	47
70+	48	43
Income		
<80% AMI	53	52
80%–120% AMI	56	52
>120% AMI	56	48

Source: Porter Novelli; used with permission.

Note: *AMI* means area median income for the state as reported by HUD for 2003 and 2005 (HUD 2011).

estimate the future demand for multifamily, townhouse, and small- and conventional-lot homes for each MPO. Because more recent surveys indicate the market is shifting increasingly in favor of attached and small-lot options (see Handy et al. 2008), the estimates of the future demand for attached and small-lot demand may be low. Even using the more conservative estimates, however, this report's analysis shows that essentially all new housing demand between 2010 and 2035 will be constructed to meet those options anyway. The 2001 and 2002 surveys included these questions, respectively:

> Would you choose to live in multistory, multifamily housing such as a condominium or apartment if it means you could walk to shops, schools, and mass transit?
>
> Would you choose to live in a high-density neighborhood where it was convenient to use public transit when you travel locally?

The term "high-density neighborhood" used in the 2002 survey is interpreted to be comparable in meaning to the term "multistory, multifamily housing such as a condominium or apartment" used in the 2001 survey. Table 3.5 summarizes the results. Given housing market (especially financing) and energy conditions, these are assumed to be the minimum preferences for multi-family attached-unit living that is accessible to transit in 2010 and beyond.

The 2004 survey included a similar question focusing on the subset of condominium and town-house options with transit accessibility, which is summarized in table 3.6:

> Would you choose to live in a condominium or townhouse if it was convenient to use public transit to commute and travel locally?

Because California-specific surveys did not include the townhouse option explicitly, it is addressed as follows.[23] From Myers and Gearin (2001), one knows that the national demand for townhouses is 17 percent of all households (as high as 24 percent for persons over 55). Myers and Gearin, however, did not define or describe what a townhouse was. For instance, various forms of two-, three-, and four-plex structures are configured as townhouses, but survey respondents might not consider this option when providing answers. Multiplexes can also be condominiums, although perhaps most respondents visualize them as high rise—which overlaps with the responses noted in table 3.5.

Demand for townhouses and multiplexes, as distinguished from condominiums in high-rise structures, is thus derived as follows. AHS data indicate that, generally, townhouses[24] and multiplexes[25] account for roughly three-quarters of the sum of townhouses, multiplexes, and condominiums. The figures in table 3.6 are therefore adjusted by 75 percent to estimate the demand for townhouses and multiplexes in each of the MPOs.

TABLE 3.5 Preference for Multistory, Multifamily Housing/High-Density Neighborhood with Transit Accessibility

Year	State (%)	Central Valley (%)	San Francisco Bay Area (%)	Los Angeles (%)	Other Southern California (%)
2001	32	23	34	39	30
2002	31	26	39	33	26
Mean	32	25	37	36	28

Sources: Baldasarre (2001, 2002).

TABLE 3.6 Preference for Condominium or Townhouse If Convenient to Transit

MPO	Preferred (%)
SACOG	22
MTC/ABAG	35
SCAG	26
SANDAG	32
Largest MPOs	26

Source: Adapted from Baldasarre (2004).

All three surveys had respondents indicate their preference between single-family detached homes with large and small backyards, apparently holding attached residential options constant. The questions posed in the 2002 and 2004 surveys were, respectively:[26]

> Would you choose to live in a small home with a small backyard, if it means you have a short commute to work?
>
> Other things being equal, would you choose to live in a small home with a small backyard if it means you have a short commute to work?

Table 3.7 summarizes results for all three surveys. For reasons noted earlier, these are assumed to be the minimum preferences for single-family homes with small backyards and a short commute to work for 2010 and beyond. A small backyard is also interpreted as implying a small lot. A *small lot* is defined as being about 5,000 square feet or one-eighth acre in size, implying at least eight residential units per acre. This definition appears to be consistent with SCAG's application of the term.[27] The conventional-lot category would be all other lots larger than small lots. Because the term "townhouse" or "townhome" was not included as an explicit choice, one can assume the question was interpreted by respondents as only the detached single-family home option.

Demand for types of residential units varies by ethnicity, as seen in all three PPIC surveys. Given limitations of sample size, housing demand is differentiated here between white non-Hispanic households and all other households noted as "minority."

The total demand for living within TSAs or near transit is also estimated. From tables 3.2 and 3.5, one knows the preference for living in multifamily and townhouse units that are accessible or convenient to transit, adjusting demand for townhouses based on table 3.2. What about the demand for transit accessibility or convenience for those preferring small lots? From the 2004

TABLE 3.7 Preference for Small Single-Family Detached Homes on Small Lots with Short Commute

Year	State (%)	Central Valley (%)	San Francisco Bay Area (%)	Los Angeles (%)	Other Southern California (%)
2001	50	48	59	46	50
2002	49	42	56	51	43
2004[a]	53	43	61	54	*55*
Mean	51	44	59	50	49

Sources: Baldasarre (2001, 2002, 2004).

a. The 2004 survey separated the Orange/San Diego and the Inland Empire subareas from the "Other Southern California" area used in the 2001 and 2002 surveys. The combined mean for those two subareas is reported here.

PPIC survey, this demand is calculated as the share of respondents who preferred both the small-lot and condominium/townhouse options with transit accessibility, which also varies by ethnicity.[28]

Table 3.8 shows the multipliers used to estimate future demand for residential units by general category that are convenient or accessible to transit—a proxy for TSA demand—by ethnicity. This table is used to estimate residential demand for 2010, 2020, and 2035, results of which are seen in later sections. The residential categories for this paper include the following:

- Multifamily, typically characterized by apartments and condominiums in structures of five or more units;
- Townhouses and two-, three-, and four-plex units (townhouse/plex);
- Small-lot (at least eight single-family detached units per net acre[29]) homes; and
- Conventional-lot (density of less than eight single-family detached units per net acre) homes.

Preferences among households of seniors were also considered, especially because they will dominate growth among all household groups to about 2030. For the most part, seniors' preferences are for the kind of unit they already have, especially because nationally about 80 percent of them own their homes, the most of any household cohort. They are also likely to stay in place as long as they can, especially because Proposition 13 would punish them financially for first selling a home they may have owned for decades and then buying a home that has an effective property tax rate many times higher than they were accustomed to. But when they move, seniors are likely to relocate into apartments, as shown in table 3.9. Nationally, about 20 percent of seniors live in apartments—reflecting the fact that about 80 percent own their homes. When they move, however, about 60 percent relocate to apartments—thus implying homeownership falls by half to about 40 percent. Seniors move at a rate of about 3 percent annually, or about half the national average. Still, of those turning 65 in 2011 (the first year baby boomers become seniors), 60 percent will have moved into apartments by 2029 (the year after the last of the baby boomers turns 65).

TABLE 3.8 Residential Unit Preferences for Housing Near Transit, by Ethnicity

MPO	SACOG (%)	MTC/ABAG (%)	SCAG (%)	SANDAG (%)
Minority (Including Hispanic)				
Multifamily	41	41	44	45
Townhouse/Plex	20	40	28	23
Small Lot	18	12	15	20
Conventional Lot	21	7	13	12
White Non-Hispanic				
Multifamily	17	32	27	31
Townhouse/Plex	22	33	25	36
Small Lot	28	24	28	19
Conventional Lot	33	12	19	15
All (Weighted Average in Middle 2000s)				
Multifamily	24	35	34	35
Townhouse/Plex	20	35	26	32
Small Lot	25	20	22	19
Conventional Lot	31	11	17	13

Source: Adapted by author from Baldasarre (2001, 2002, 2004).

TABLE 3.9 Share of All Seniors in Apartments and Share Relocating to Apartments in Most Recent Move

Year	Share of Seniors in Apartments (%)	Share of Seniors Relocating to Apartments in Most Recent Move (%)
2009	19	53
2007	20	57
2005	20	59
Mean	20	56

Source: Adapted by author from the *American Housing Surveys* for 2005, 2007, and 2009.

Table 3.10 compares the estimate of demand for residential units by type in 2010 to supply, using California State Department of Finance 2011 data for housing units by type and by county, assembled into the MPOs.[30] These data show the distribution of residential units by type: detached homes including mobile homes, townhouses as attached single-family units and units in structures of two to four units (these categories are combined into townhouse/plex), and units in structures of five or more units (defined as multifamily).

The AHS is used to apportion detached single-family units in 2010. The AHS conducts a national survey of American households every odd year, most recently in 2009 (published in late 2010). Because the AHS includes more than 70,000 cases, one can disaggregate national survey records to California's largest metropolitan areas to estimate current housing conditions. In addition, several of California's metropolitan areas have been surveyed on their own, with about 3,000 or more respondents. Among the items for which information is collected is the lot size of detached homes. The AHS reports several lot-size categories; the category of lots one-eighth of an acre or less (about 5,500 square feet and smaller) is most important for the purposes of this paper. The percentage of single-family detached units that are on such lots is examined to estimate demand for small-lot housing for a given MPO, using whichever is higher: the percentage reported in the metropolitan survey or the percentage disaggregated to the MPO from the national survey.

According to these estimates, as of 2010 the four largest MPOs may have nearly 3 million more units on conventional lots (those larger than one-eighth acre) than the market may demand. The underserved markets appear to be roughly evenly split between multifamily and small-lot options. The townhouse/plex market is underserved by nearly half.

These mismatches between supply and demand may be a function of market demand changing faster than supply. Leinberger (2007) observes that even in good years the existing supply of housing grows by roughly 2 percent only. If market demand shifts substantially, the housing market could take decades to catch up. Plus, the existing supply is highly durable. On average, residential structures will last 170 (see Nelson 2006) to 500 (see Pitkin and Myers 2008) years, undergoing renovations along the way.[31] This means that the ability of markets to meet emerging needs is compromised, so the supply for other types of housing may lag behind demand for decades.

TABLE 3.10 Supply and Demand for Major Residential Unit Types, Four Largest MPOs, 2010

Unit Type[a]	Estimated Supply 2010	Estimated Demand 2010[b]	Difference between Demand and Supply	Demand Compared to Supply
Multifamily	2,899,000	3,755,000	–856,000	–23%
Townhouse/Plex	1,757,000	3,198,000	–1,442,000	–45%
Small Lot	1,813,000	2,383,000	–571,000	–24%
Conventional Lot	4,676,000	1,807,000	2,869,000	159%
Total	11,144,000	11,144,000		

Source: Author, based on references noted.

Note: Small lot means detached units at more than eight units per acre.

a. Multifamily and townhouse from California State Department of Finance (2011). Small lot estimated from U.S. Census Bureau (2010) with other lot being the residual of all single-family detached units plus mobile homes from the Department of Finance.

b. Demand estimates from table 2.3 multiplied by total units in 2010.

Demand has another element: the desire to live where transit is accessible or convenient. The PPIC surveys generally did not ask about preferences for living in apartments, condominiums, or townhouses, but rather about those residential options in relation to transit accessibility or convenience to transit.[32] To this preference is added the demand for small lots accessible or convenient to transit (see table 3.7). Table 3.11 compares the current supply of homes in TSAs to 2035 demand. The supply for 2010 is based on estimates of supply for 2000 from the Center for Transit Oriented Development (2011) and assumes TSAs accounted for all new multifamily and townhouse development between 2000 and 2010—which is probably an overstatement used to make a point. The point is that even if all future residential development occurs within TSAs, less than 60 percent of the demand for living in TSAs will be met. Chapter 5 shows that existing and planned TSAs have more than enough capacity to meet residential demand to 2035 and perhaps through the end of the 21st century.

In considering development capacities of TSAs, one must also be mindful, however, of the need to make up the deficiencies in parks, schools, and other community facilities. These needs already exist in many existing communities and will need to be addressed in the planning and development of future communities. Some residential, commercial, or institutional land may need to be converted to these uses, especially if necessary to ensure equity across communities. Planners and policy makers need to be sure they do not encourage high residential densities in areas with deteriorating infrastructure, lack of publicly accessible open space, and stressed community facilities.

Chapter 4 presents the residential demand analysis for the MPOs individually and as a group.

TABLE 3.11 TSA Demand in 2035 Compared to TSA Supply in 2010, and 2010 Supply with All New Residential Units 2010–2035

Measure	SACOG	MTC/ABAG	SCAG	SANDAG	All MPOs
TSA Demand 2035	566	2,802	4,926	865	9,159
TSA Supply 2010[a]	82	552	451	148	1,234
All New Units 2010–2035	260	1,294	1,921	264	3,738
Supply 2010 Plus All New Units 2010–2035	342	1,846	2,372	412	4,972
Unmet TSA Demand 2035	224	956	2,554	453	4,187

Source: Author.

a. Residential units from 2000 based on data from Center for Transit Oriented Development (2011) plus all multifamily and townhouse units built between 2000 and 2010 from the California Department of Finance (2011).

CHAPTER 4

Residential Demand Scenario

This chapter combines insights from the previous two chapters to create a scenario for residential demand for California's four largest MPOs between 2010 and 2020, and between 2010 and 2035. It explores how the supply of conventional subdivision lots (those at densities of less than eight units per acre) exceeds current demand and projected demand through 2035. In contrast, the demand for locations near transit exceeds supply and will continue to do so through 2035 and likely beyond.

Four major housing types are addressed: "multifamily," which can include apartments, condominiums, and cooperatives; "townhouse/plex," which includes townhouses on individual lots and two-, three-, and four-plex buildings whether individual units are on individual lots or not; "small lots," which are homes on lots less than one-eighth of an acre (about 5,500 square feet); and "conventional lots," which are homes on lots of more than one-eighth of an acre. Some caveats apply as follows:[33]

- The existing supply of entitled but undeveloped conventional lots will need to be absorbed. Much of the entitled inventory will probably be discounted, sometimes heavily, to encourage the marketplace to absorb it. In high-value niche markets, however, prices may not be discounted very much. Thus, more conventional-lot development may very well occur in the future despite current excess supply, but the volume will be a function of niche markets' absorption of existing entitled inventories.
- Small lots are defined as those in which the actual area of the property is less than one-eighth of an acre (about 5,000 square feet), *net* of streets, easements, steep slopes, waterways, ravines, and other protected areas. Many thousands of lots may be larger than one-eighth of an acre, but their actual building area is one-eighth of an acre or less because of these factors. Thus, they would be considered small lots.

Stacked townhouses in San Mateo, California *http://www.parkbayshore.com/*

- Master-planned communities in high-value locations will likely include a small share of lots larger than one-eighth of an acre in an overall mix that is largely made up of attached and small-lot products. Larger lots in master-planned communities may not have more than about 5,000 square feet of net building area, however, and would be classified as small lots because their large size may be attributable to open-space easements and otherwise unusable land area.
- "Small lot" does not mean "small house." A 3,000-square-foot lot could accommodate a 4,000-square-foot house with three floors of 1,000 square feet each plus a full basement.
- Some of the undeveloped inventory of conventional lots may be replatted into smaller lots, especially where entitlements are near existing or planned transit infrastructure.

Small lots must also be differentiated from attached townhouses. To some extent they serve the same market, since both sit on lots. Not too long ago, for instance, single-family detached homes were built at densities lower than about eight units per acre. Townhouse developments went from about nine to 15 units per acre. Walkup garden apartments ranged from about 16 to 24 units per acre. This has all changed. Numerous examples exist of successful small, detached homes on lots as small as 2,000 square feet with densities of about 20 units per net acre or sometimes more. Indeed, one of the most desirable residential areas in all of California is found in Pacific Grove, where lots in the historic area of the city run about 30 by 60 feet. Table 4.1 surveys small-lot options in selected California cities.

Although townhouse developments range up to about 24 units per acre, a variation called "stacked towns"[34] can range about 25 to 40 units per net acre (see photo, page 37). A further variation of the townhouse that appears to be gaining favor is "plex" homes, including duplex, triplex (also known as three-plex), and four-plex options. These are often in the same structure (see photo, below). This family of residential options is called the "townhouse/plex" category in this report.

Four-plex unit in Los Angeles, California *http://micarabineau.com/images/listing/1032orangebig.png*

TABLE 4.1 Small-Lot Options in Selected California Jurisdictions

Los Angeles	• Small lots allowed in multifamily and commercially zoned districts. • Lots can be as small as 600 square feet with a minimum width of 16 feet; structures may cover up to 80 percent of the lot area. • Design guidelines address site layout, building design and materials, but no discretionary review (i.e., design review or conditional use permit) exists to enforce guidelines.
Marysville	• Large lots can be subdivided into 3,000-square-foot lots in designated areas. • Developments must be at least the same or greater size as the majority of the existing residentially zoned lots within a 200-foot radius.
Merced	• Small lots allowed in Planned Development zones. • Two sets of design guidelines exist for lots based on width and area. • Guidelines require 60 percent lot coverage, 10 percent open space, and minimum lot areas of 1,950 to 3,000 square feet. • A discretionary development plan review or a conditional use permit is employed.
Modesto	• Small lots allowed in Specific Plan areas and in Planned Development zones. • Separate guidelines are established for lots from 3,000 to 5,000 square feet and less than 3,000 square feet. • A discretionary review process is used to evaluate compliance with guidelines.
Napa	• Small lots are permitted in all residential zones that allow single-family residences or duplexes. • No limit is placed on lot size and width. • A use permit is required to ensure that the proposed subdivision is compatible with existing neighborhood development patterns and to control building size.
Oakland	• Allows a minimum lot area of 4,000 square feet and a lot width of 25 feet in certain zones. • The maximum building height, minimum yard, lot area, width, and frontage requirements may be waived or modified in residential and commercial zones. • A conditional use permit is required.
Santa Rosa	• Small lots are allowed in single-family and multifamily zones. • Allows minimum lot size of 2,000 square feet and a density of 18 units per acre. • Requires a conditional use permit with the land division map.

Source: Los Angeles County (2009).

This chapter shows that demand for multifamily, townhouse/plex, and small lots will dominate the housing markets of the SACOG, MTC, SCAG, and SANDAG MPOs over the next few decades. Half or more of this demand will be for locations near transit. At the moment, however, some misconceptions may exist about how higher-density housing near transit performs in the marketplace. The availability of high-quality townhouses and condominiums remains relatively low, and until people have had positive experiences living in townhouses, condominiums, and apartments, they will not seek to buy these housing options.

Small MPOs, especially those in the Central Valley, are growing substantially; many are growing at a faster rate than the four largest MPOs. Moreover, the Central Valley is not as constrained topographically as the MTC, SCAG, and SANDAG MPOs, making it more prone to lower-density, single-use development. In some respects, the overall success of SB 375 may be decided in high-growth areas of the Central Valley.[35]

The challenge for both the private and public sectors is to design attractive multifamily and townhouse opportunities. Two California examples of attractive, high-density residential

The Crossings, Mountain View, California *Business, Transportation and Housing Agency, Statewide Transit-Oriented Development Study (2002) Photo: Parsons Brinkerhoff and the California Department of Transportation*

Apartments within an easy walk of the San Diego light-rail stop, part of more than 1,000 in the same master-planned development immediately adjacent to the station *Business, Transportation and Housing Agency, Statewide Transit-Oriented Development Study (2002) Photo: Parsons Brinkerhoff and the California Department of Transportation*

development near transit stations are illustrated here, both offered by CalTrans (Business, Transportation and Housing Agency 2002; see also Cervero 2004). The first is the Crossings in Mountain View (see photo, page 40, top). Residential development ranges from about 15 to about 30 units per acre. The second is of residential development in San Diego's Rio Vista West (see photo, page 40, bottom), designed as a pedestrian-friendly environment where people can live, work, and shop in the same community.

The chapter now turns to the demand for housing by major category in the four largest MPOs over the periods 2010–2020 and 2010–2035.

SACOG

A recent paper published by SACOG (2011) outlines the challenges and opportunities it faces as demographic composition and demands change. It starts with this overall assessment:

> The U.S. housing market in the coming decades will differ significantly from recent decades. The new housing stock that is produced will need to change, too. Evolving demographics and preferences held by specific demographic groups, or generational cohorts are driving the change. On the housing demand side, the aging of the large baby boomer generation, the preferences of the even larger Generation Y cohort (those born between 1978 and 1994) as well as continued immigration will have a major impact on demand. On the supply side, the type and location of new housing construction over the past few decades may not match anticipated future demand according to many researchers. This poses both constraints and opportunities for future development, redevelopment and reuse. (SACOG 2011, 1)

It proceeds to assess many of the challenges identified for this paper that California's major metropolitan areas, including SACOG, will face.

Exploring the implications of these trends for SACOG, this section begins with a summary of the market trend scenario, which is shown in table 4.2, illustrating the effects of changing ownership rates on overall housing demand. If one assumes the middle alternative where the homeownership rate drops by 5 percent between 2010 and 2020, rental units will account for more than 70 percent of total new demand for housing. The share between 2010 and 2035 falls to about 60 percent because the biggest shift in tenure overall would occur during the current decade as markets reequilibrate.

TABLE 4.2 Scenario Change in Tenure, SACOG, 2010–2035

Tenure	Based on 2010 Ownership Rate 2010	Assuming 2010 Ownership Rate Reduced by 5% 2020	Assuming 2010 Ownership Rate Reduced by 5% 2035
Total	945,000	1,062,000	1,205,000
Own	585,000	619,000	692,000
Rent	360,000	443,000	513,000
Change		117,000	260,000
Own		34,000	107,000
Rent		83,000	153,000
Rental Share of New Demand		71%	59%

Source: Author.

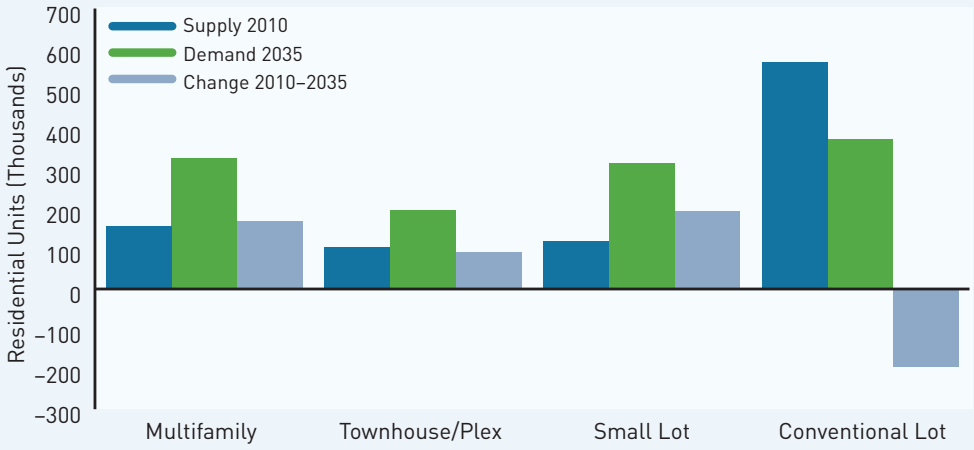
TABLE 4.3 **SACOG 2020 and 2035 Demand, Compared to 2010 Supply, by Major Residential Unit Type**

Unit Type	Estimated Supply 2010	Estimated Demand 2020	New Unit Demand 2010–2020	Estimated Demand 2035	New Unit Demand 2010–2035
Multifamily	157,000	273,000	116,000	325,000	168,000
Townhouse/Plex	104,000	173,000	69,000	195,000	91,000
Small Lot	119,000	282,000	163,000	313,000	194,000
Conventional Lot	565,000	334,000	–230,000	372,000	–193,000
Total	945,000	1,062,000	117,000	1,205,000	260,000

Source: Author.

Note: Supply in 2010 based on California Department of Finance 2010 data for apartment/condominium, townhouse, and detached (including mobile home) units, and share of detached homes in small lots based on *American Housing Survey 2009* of lots one-eighth acre or less using data disaggregated to SACOG area.

FIGURE 4.1 **Demand in 2035 for Residential Units in the SACOG MPO Area by Major Category, Compared to Supply in 2010**



Source: Author.

Turning to a review of the market preference scenario, one must estimate current supply and future demand for major housing unit types. The most recent estimate of total housing needs for SACOG includes only 2035, which totals about 1.2 million homes.[36] Housing needed to 2020 is interpolated by taking the proportionality of units for both 2035 and 2020 projected in Metropolitan Transportation Plan 2035 Projections issued in March 2010,[37] which comes to about 1.0 million homes. Supply in 2010 is estimated from the California State Department of Finance data with the small-lot estimate from the *American Housing Survey*, disaggregating the survey to the Sacramento metropolitan area. Results are reported in table 4.3 and illustrated in figure 4.1.

The columns showing the estimated demand and new unit demand for 2020 and 2035 are based on extrapolations for SACOG. This assumes that the excess supply of homes on all other lots is reduced substantially. In table 4.4, the columns indicating new units needed by holding excess capacity constant show how net new units may be apportioned to meet demand. Even if no net additions are made to the supply of homes on all other lots, new construction for all other cat-

TABLE 4.4 SACOG 2020 and 2035 Distribution of Net New Residential Units, 2010–2020 and 2010–2035

Unit Type	New Units Needed 2010–2020, Holding Excess Supply Constant	Share of Demand (%)	New Units Needed 2010–2035, Holding Excess Supply Constant	Share of Demand (%)
Multifamily	39,000	33	96,000	37
Townhouse/Plex	23,000	20	52,000	20
Small Lot	55,000	47	111,000	43
Conventional Lot	0	0	0	0
Total	117,000		260,000	

Source: Author.

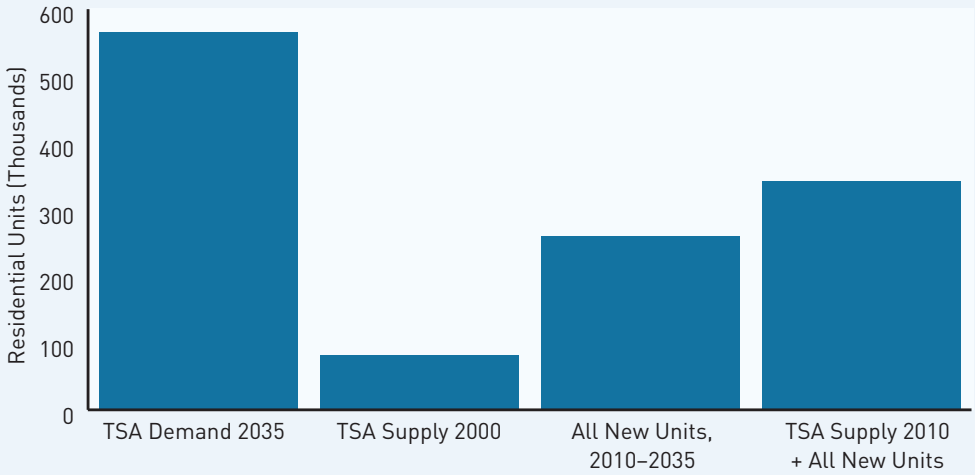
TABLE 4.5 SACOG TSA Supply and Demand Comparisons, 2010–2035

Measure	Number
TSA Demand 2035	566,000
TSA Supply 2000	82,000
All New Units, 2010–2035	260,000
TSA Supply 2010 Plus All New Units	342,000
Unmet Demand 2035	224,000

Source: Author.

Note: TSA supply 2010 based on Center for Transit Oriented Development residential units within 0.5 miles of a TSA plus all attached units constructed between 2000 and 2010 from California Department of Finance data. TSA demand 2035 based on PPIC 2001 and 2004 survey data.

FIGURE 4.2 SACOG Housing Units in TSAs 2010, Compared to TSA Housing Unit Demand in 2035



Source: Author.

egories is likely to fall below demand over both planning horizons. This table shows that more than half of all new residential units added between 2010 and 2020 should be in various forms of attached housing and a little less than half in small-lot options. Over the period 2010 to 2035, the demand for attached-housing options will approach 60 percent.

The demand for living in TSAs is also compared to supply. As seen in table 4.5 and figure 4.2, by 2035 the demand for living in or near TSAs will be about 570,000 dwelling units, compared to about 80,000 in supply estimated for 2010. Even if all new units built in the SACOG MPO area were located in TSAs, perhaps 60 percent of the demand for TSA residential options would be met.

In summary, the residential market in the SACOG area over the next generation appears headed toward more rental units and increased demand for TSA residential options. The demand for attached products will exceed the demand for detached ones, although about 40 percent of the attached unit demand will be for townhouse/plex units, which easily bridge the tenure (owner and renter) markets.

ABAG/MTC

The Association of Bay Area Governments, serving the same nine-county jurisdiction as the Metropolitan Transportation Commission (the MPO for ABAG), projects households but not housing units.[38] The most recent estimates are for 2035 only and do not estimate housing demand. One household per occupied housing unit is assumed.[39] The housing unit vacancy rate published by the California Department of Revenue, averaged over the period 2000–2010, was used to estimate total housing units. For 2035, about 3.7 million housing units are estimated to be needed; for 2020, the need is estimated through interpolation at about 3.1 million units. ABAG is anticipating major changes to housing demand, as noted in the following passage:[40]

TABLE 4.6 Scenario Change in Tenure, MTC/ABAG, 2010–2035

Tenure	Based on 2010 Ownership Rate 2010	Assuming 2010 Ownership Rate Reduced by 5% 2020	Assuming 2010 Ownership Rate Reduced by 5% 2035
Total	2,760,000	3,027,000	3,715,000
Own	1,575,000	1,617,000	1,960,000
Rent	1,185,000	1,410,000	1,756,000
Change		267,000	955,000
Own		42,000	384,000
Rent		225,000	571,000
Rental Share		84%	60%

Source: Author.

TABLE 4.7 MTC/ABAG 2020 and 2035 Demand, Compared to 2010 Supply, by Major Residential Unit Type

Unit Type	Estimated Supply 2010	Estimated Demand 2020	New Unit Demand 2010–2020	Estimated Demand 2035	New Unit Demand 2010–2035
Multifamily	717,000	1,115,000	398,000	1,385,000	668,000
Townhouse/Plex	508,000	829,000	321,000	1,027,000	519,000
Small Lot	545,000	700,000	155,000	840,000	294,000
Conventional Lot	990,000	384,000	–606,000	464,000	–526,000
Total	2,760,000	3,027,000	268,000	3,715,000	956,000

Source: Author.

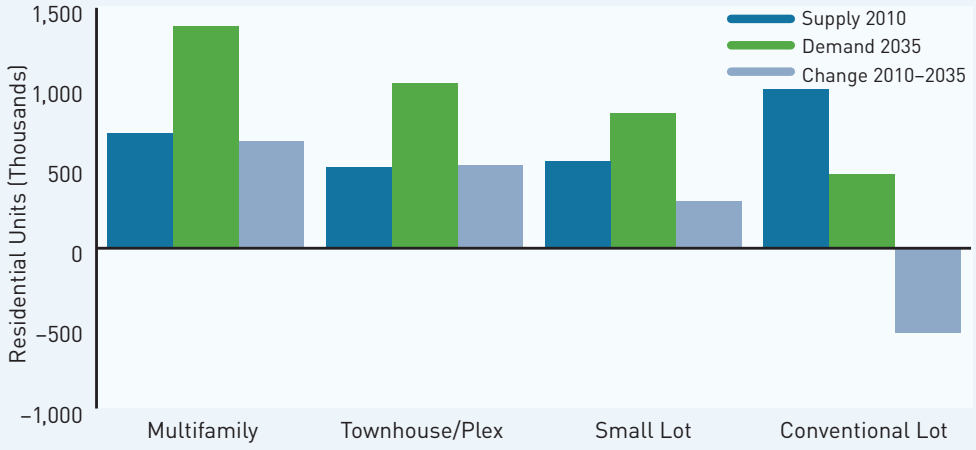
Note: Supply in 2010 is based on California Department of Finance 2010 data for apartment/condominium, townhouse, and detached (including mobile home), and share of detached homes in small lots is based on *American Housing Survey 2009* of lots one-eighth acre or less using data disaggregated to MTC/ABAG area.

> Over the next several decades, the number of people over 65 and over 80 years old will nearly triple. By 2035, one quarter of the population, almost 2.3 million people will be 65 years or older. Over 3 million people will be over 55; this is one-third of the Bay Area's projected population. As we plan our communities, and move forward with the development of the Sustainable Communities Strategy, we will need to consider the needs of a much older, and perhaps significantly greater non-driving population, including the need for non-auto dependent mobility and smaller homes.

The market trend scenario shows the effects of changing ownership rates on overall housing demand (table 4.6). If one uses the middle alternative where the homeownership rate drops by 5 percent between 2010 and 2020, rental units will account for about 84 percent of total new demand for housing. The share between 2010 and 2035 falls to about 60 percent because the biggest shift in tenure overall would occur during the current decade as markets reequilibrate.

Turning to a review of the market preference scenario, one must estimate current supply and future demand for major housing unit types. This is done in table 4.7, which reports the estimate of residential unit demand by major type over the period 2010–2035; major trends are illus-

FIGURE 4.3 **Demand in 2035 for Residential Units in the MTC/ABAG MPO Area by Major Category, Compared to Supply in 2010**



Source: Author.

TABLE 4.8 **MTC/ABAG 2020 and 2035 Distribution of Net New Residential Units, 2010–2020 and 2010–2035**

Unit Type	New Units Needed 2010-2020, Holding Excess Supply Constant	Share of Demand (%)	New Units Needed 2010–2035, Holding Excess Supply Constant	Share of Demand (%)
Multifamily	122,000	46	431,000	45
Townhouse/Plex	98,000	37	335,000	35
Small Lot	47,000	18	190,000	20
Conventional Lot	0	0	0	0
Total	268,000		956,000	

Source: Author.

trated in figure 4.3. As seen, no demand for new units may exist in the category of all other lots, whereas the demand for all other housing types is robust.

In table 4.8, the distribution of the net new demand for residential units is estimated by type, holding the current excess supply of conventional lots constant. Here one sees that about 80 percent of the demand for new residential units will be for attached options.

In addition, the demand for living in TSAs is compared to supply. Table 4.9 reports and figure 4.4 shows that by 2035 the demand for living in or near TSAs will be about 2.8 million dwelling units, compared to a supply of about 550,000 units in 2010. If all new units built in the MTC/ABAG MPO area were constructed in TSAs, about two-thirds of the demand for TSA residential options would be met.

In review, between 2010 and 2020, rental options may account for about 80 percent of the net new demand for housing units while about 80 percent of the net new demand for housing will be for attached options. The demand for TSA residential opportunities will be robust and unlikely to be met completely by 2035.

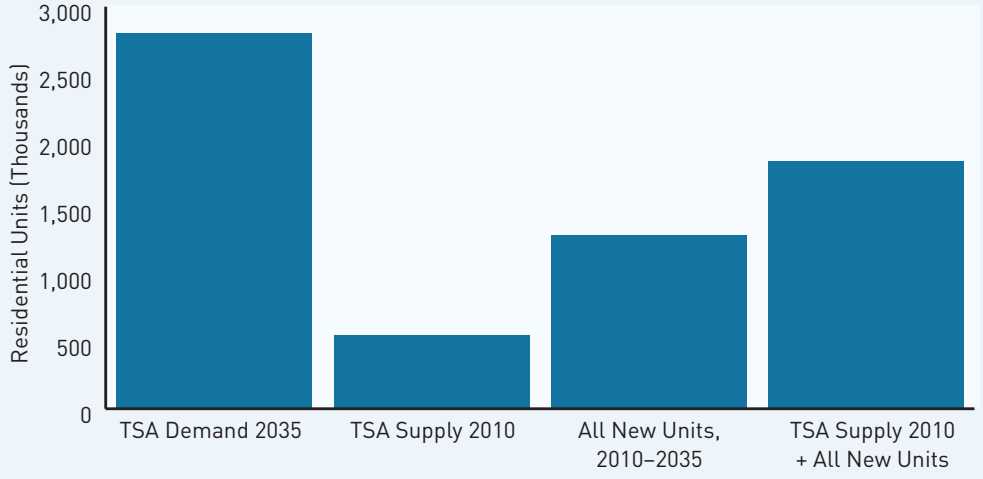
TABLE 4.9 **MTC/ABAG TSA Supply and Demand Comparisons, 2010–2035**

Measure	Number
TSA Demand 2035	2,802,000
TSA Supply 2010	552,000
All New Units, 2010–2035	1,294,000
TSA Supply 2010 Plus All New Units	1,846,000
Unmet Demand	956,000

Source: Author.

Note: TSA supply 2010 is based on Center for Transit Oriented Development residential units within 0.5 miles of a TSA plus all attached units constructed between 2000 and 2010 from California Department of Finance data. TSA demand 2035 is based on PPIC 2001 and 2004 survey data.

FIGURE 4.4 **MTC/ABAG Housing Units in TSAs 2010, Compared to TSA Housing Unit Demand in 2035**



Source: Author.

TABLE 4.10 Scenario Change in Tenure, SCAG, 2010–2035

Tenure	Based on 2010 Ownership Rate 2010	Assuming 2010 Ownership Rate Reduced by 5% 2020	Assuming 2010 Ownership Rate Reduced by 5% 2035
Total	6,285,000	7,280,000	8,206,000
Own	3,426,000	3,703,000	4,070,000
Rent	2,859,000	3,577,000	4,136,000
Change		995,000	1,921,000
Own		278,000	644,000
Rent		717,000	1,277,000
Rental Share		72%	66%

Source: Author.

TABLE 4.11 SCAG 2020 and 2035 Demand, Compared to 2010 Supply, by Major Residential Unit Type

Unit Type	Estimated Supply 2010	Estimated Demand 2020	New Unit Demand 2010–2020	Estimated Demand 2035	New Unit Demand 2010–2035
Multifamily	1,691,000	2,754,000	1,063,000	3,205,000	1,515,000
Townhouse/Plex	961,000	1,458,000	497,000	1,653,000	692,000
Small Lot	996,000	1,734,000	738,000	1,877,000	881,000
Conventional Lot	2,637,000	1,335,000	–1,303,000	1,470,000	–1,167,000
Total	6,285,000	7,280,000	995,000	8,206,000	1,921,000

Source: Author.

Note: Supply in 2010 is based on California Department of Finance 2010 data for apartment/condominium, townhouse, and detached (including mobile home), and share of detached homes in small lots is based on *American Housing Survey 2009* of lots one-eight acre or less using data disaggregated to the SCAG area.

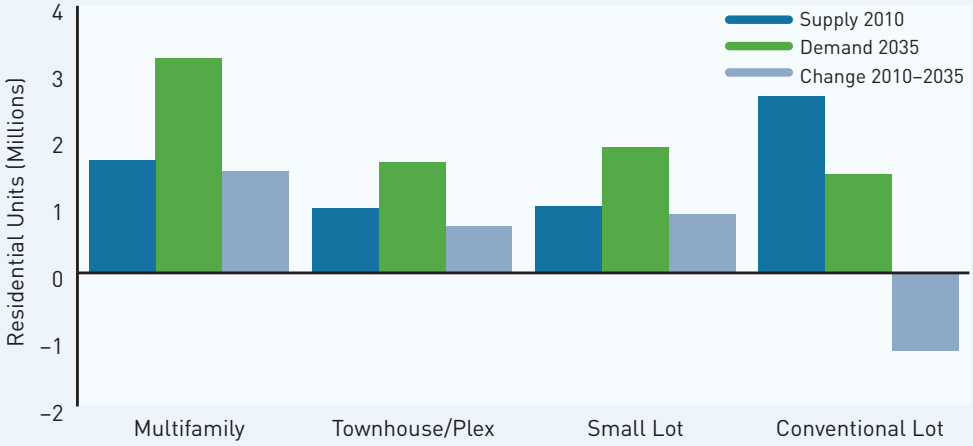
SCAG

A summary of the market trend scenario is presented in table 4.10. Here one sees the effects of changing ownership rates on overall housing demand. If one assumes the middle alternative where the homeownership rate drops by 5 percent between 2010 and 2020, rental units will account for more than 70 percent of total new demand for housing. The share between 2010 and 2035 falls to about two-thirds because the biggest shift in tenure overall would occur during the current decade as markets reequilibrate.

For a review of the market preference scenario, an estimate of current supply and future demand for major housing unit types is needed. Like ABAG/MTC, SCAG projects households but not housing units,[41] so the distribution of housing units is estimated in a manner similar to that used for ABAG. An estimated 7.3 million residential units are needed for 2020 and 8.2 million units for 2035. The estimate of residential unit demand by major type over the period 2010 to 2035 is reported in table 4.11. Long-term trends are shown in figure 4.5. As seen elsewhere, the demand for new units in the category of all other lots may be nil, whereas the demand for all other housing types is substantial.

Table 4.12 estimates the distribution of net new units by major residential unit type, holding the current excess supply of conventional single-family homes constant. Here one sees that about half the demand for all new units in the SCAG area will be for multifamily homes; together with the townhouse/plex option, the demand for attached products may be about 70 percent of the total demand for new units to 2020 and again to 2035.

FIGURE 4.5 **Demand in 2035 for Residential Units in the SCAG MPO Area by Major Category, Compared to Supply in 2010**



Source: Author.

TABLE 4.12 **SCAG 2020 and 2035 Distribution of Net New Residential Units, 2010–2020 and 2010–2035**

Unit Type	New Units Needed 2010–2020, Holding Excess Supply Constant	Share of Demand (%)	New Units Needed 2010–2035, Holding Excess Supply Constant	Share of Demand (%)
Multifamily	460,000	46	942,000	49
Townhouse/Plex	215,000	22	430,000	22
Small Lot	319,000	32	548,000	29
Conventional Lot	0	0	0	0
Total	995,000		1,921,000	

Source: Author.

TABLE 4.13 **SCAG TSA Supply and Demand Comparisons, 2010–2035**

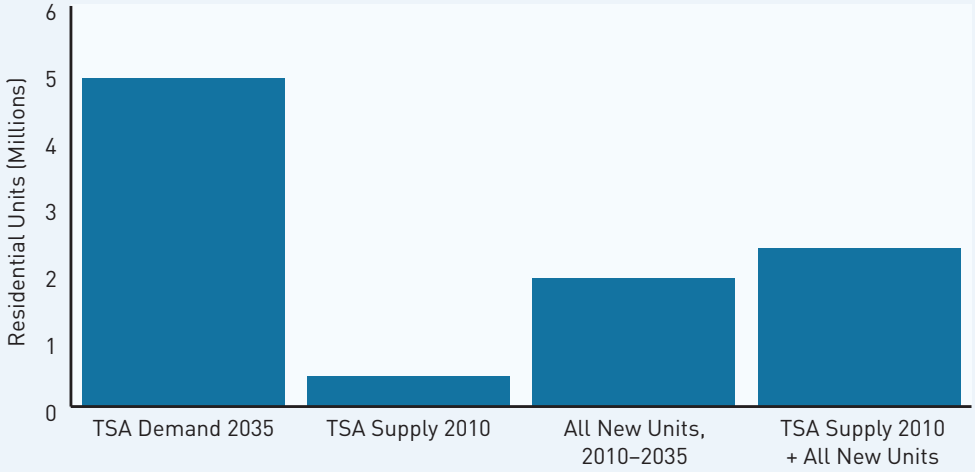
Measure	Number
TSA Demand 2035	4,926,000
TSA Supply 2010	451,000
All New Units, 2010–2035	1,921,000
TSA Supply 2010 Plus All New Units	2,372,000
Unmet Demand	2,554,000

Source: Author.

Note: TSA supply 2010 is based on Center for Transit Oriented Development residential units within 0.5 miles of a TSA plus all attached units constructed between 2000 and 2010 from California Department of Finance data. TSA demand 2035 is based on PPIC 2001 and 2004 survey data.

Assessing the demand for living in TSAs compared to supply, table 4.13 presents and figure 4.6 demonstrates that by 2035 the demand for living in or near TSAs will be nearly 5.0 million dwelling units, compared to a supply of about 450,000 in 2010. If all new units built in the SCAG MPO area were constructed in TSAs, only about half the demand for TSA residential options would be met.

FIGURE 4.6 SCAG Housing Units in TSAs 2010, Compared to TSA Housing Unit Demand in 2035



Source: Author.

TABLE 4.14 Scenario Change in Tenure, SANDAG, 2010–2035

Tenure	Based on 2010 Ownership Rate 2010	Assuming 2010 Ownership Rate Reduced by 5% 2020	Assuming 2010 Ownership Rate Reduced by 5% 2035
Total	1,154,000	1,262,000	1,418,000
Own	639,000	660,000	733,000
Rent	515,000	603,000	684,000
Change		108,000	264,000
Own		20,000	94,000
Rent		88,000	170,000
Rental Share		81%	64%

Source: Author.

Overall, rental housing demand may account for more than 70 percent of all new housing demand between 2010 and 2020, and about two-thirds over the period ending in 2035. The demand for attached products will mostly parallel the rental trend. The demand for residential options in TSAs will be strong, with perhaps only half that demand met by 2035 even if all new housing were constructed within TSAs.

SANDAG

A review of the market trend scenario, presented in table 4.14, shows the effects of changing ownership rates on overall housing demand. If one assumes the middle alternative where the homeownership rate drops by 5 percent between 2010 and 2020, rental units will account for about 80 percent of all new housing demand. The share between 2010 and 2035 falls to about 64 percent because the biggest shift in tenure overall would occur during the current decade as markets reequilibrate.

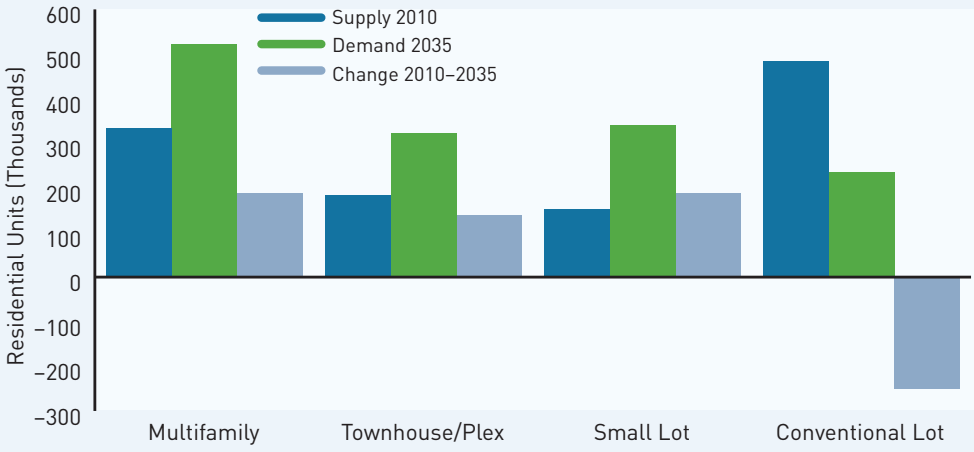
TABLE 4.15 SANDAG 2020 and 2035 Demand, Compared to 2010 Supply, by Major Residential Unit Type

Unit Type	Estimated Supply 2010	Estimated Demand 2020	New Unit Demand 2010–2020	Estimated Demand 2035	New Unit Demand 2010–2035
Multifamily	334,000	459,000	124,000	522,000	187,000
Townhouse	184,000	290,000	107,000	322,000	139,000
Small Lot	152,000	303,000	151,000	340,000	188,000
All Other Lot	484,000	210,000	–274,000	234,000	–250,000
Total	1,154,000	1,262,000	108,000	1,418,000	264,000

Source: Author.

Note: Supply in 2010 is based on California Department of Finance 2010 data for apartment/condominium, townhouse, and detached (including mobile home), and share of detached homes in small lots is based on *American Housing Survey 2009* of lots one-eighth acre or less using data disaggregated to SANDAG area.

FIGURE 4.7 Demand in 2035 for Residential Units in the SANDAG MPO Area by Major Category, Compared to Supply in 2010



Source: Author.

TABLE 4.16 SANDAG 2020 and 2035 Distribution of Net New Residential Units, 2010–2020 and 2010–2035

Unit Type	New Units Needed 2010–2020, Holding Excess Supply Constant	Share of Demand (%)	New Units Needed 2010–2035, Holding Excess Supply Constant	Share of Demand (%)
Multifamily	35,000	33	96,000	37
Townhouse	30,000	28	71,000	27
Small Lot	43,000	39	97,000	37
All Other Lot	0	0	0	0
Total	108,000		263,000	

Source: Author.

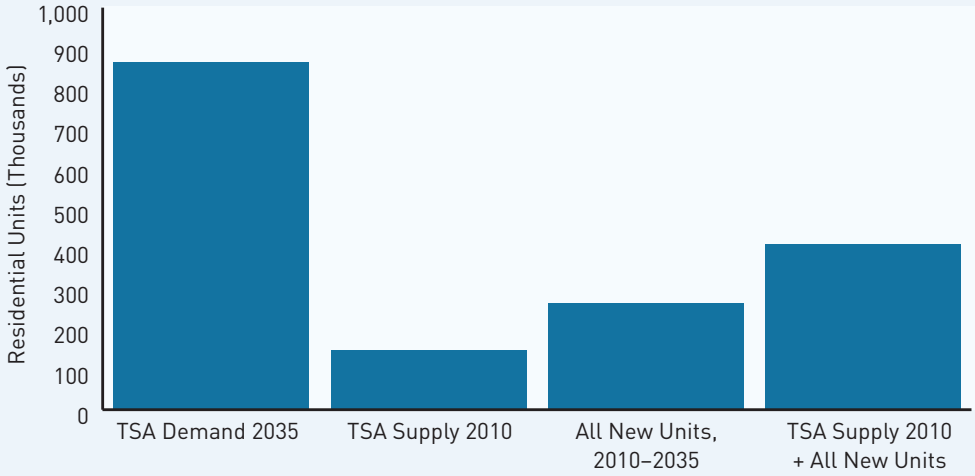
TABLE 4.17 SANDAG TSA Supply and Demand Comparisons, 2010–2035

Measure	Number
TSA Demand 2035	865,000
TSA Supply 2010	148,000
All New Units, 2010–2035	264,000
TSA Supply 2010 Plus All New Units	412,000
Unmet Demand	453,000

Source: Author.

Note: TSA supply 2010 is based on Center for Transit Oriented Development residential units within 0.5 miles of a TSA plus all attached units constructed between 2000 and 2010 from California Department of Finance data. TSA demand 2035 is based on PPIC 2001 and 2004 survey data.

FIGURE 4.8 SANDAG Housing Units in TSAs 2010, Compared to TSA Housing Unit Demand in 2035



Source: Author.

Next the market preference scenario is reviewed, which requires estimating current supply and future demand for major housing unit types. SANDAG projects housing units by major type (without differentiating between lot sizes) for every year to 2050.[42] SANDAG estimates that nearly 1.3 million residential units are needed by 2020 and more than 1.4 million units by 2035. The estimate of residential unit demand by major type over the period 2010 to 2035 for this paper is reported in table 4.15, and overall trends are illustrated in figure 4.7. As in the other major MPOs, one sees new unit demand for only multifamily, townhouse, and small-lot options.

Table 4.16 shows the distribution of demand for new residential units, holding constant the excess supply of homes on conventional single-family lots. Attached options will account for an estimated 60 percent of the demand for net new units in both time periods.

Next the demand for living in TSAs is compared to supply. Table 4.17 and figure 4.8 show that by 2035 the demand for living in or near TSAs will come to about 900,000 dwelling units, compared to a current supply of about 150,000 units in 2010. Even if all new units built in the SANDAG MPO were located within TSAs, less than half the demand for TSA residential options would be met.

TABLE 4.18 **Scenario Change in Tenure, Four Largest MPOs, 2010–2035**

Tenure	Based on 2010 Ownership Rate 2010	Assuming 2010 Ownership Rate Reduced by 5% 2020	Assuming 2010 Ownership Rate Reduced by 5% 2035
Total	11,144,000	12,632,000	14,543,000
Own	6,225,000	6,599,000	7,455,000
Rent	4,919,000	6,033,000	7,089,000
Change		1,488,000	3,400,000
Own		374,000	1,230,000
Rent		1,114,000	2,170,000
Ownership Rate	56%	52%	51%
Rental Rate	44%	48%	49%
Rental Share of Change		75%	64%

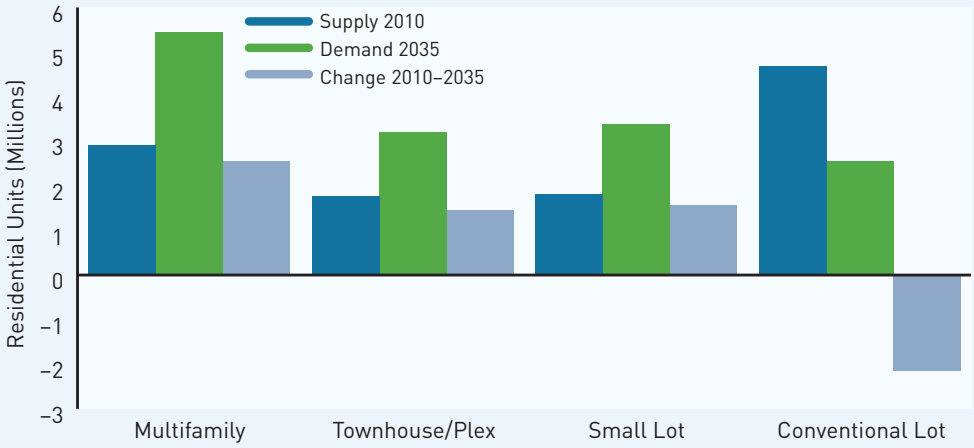
Source: Author.

TABLE 4.19 **Four Largest MPO 2020 and 2035 Demand, Compared to 2010 Supply, by Major Residential Unit Type**

Unit Type	Estimated Supply 2010	Estimated Demand 2020	New Unit Demand 2010–2020	Estimated Demand 2035	New Unit Demand 2010–2035
Multifamily	2,899,000	4,601,000	1,702,000	5,437,000	2,538,000
Townhouse/Plex	1,757,000	2,750,000	993,000	3,197,000	1,441,000
Small Lot	1,813,000	3,018,000	1,206,000	3,370,000	1,558,000
Conventional Lot	4,676,000	2,263,000	–2,413,000	2,540,000	–2,136,000
Total	11,144,000	12,631,000	1,487,000	14,544,000	3,400,000

Source: Author.

FIGURE 4.9 **Demand in 2035 for Residential Units in the Largest Four MPO Areas by Major Category, Compared to Supply in 2010**



Source: Author.

From 2010 to 2020, rental demand will account for perhaps 80 percent of the total new demand for housing, reaching about two-thirds of the total demand between 2010 and 2035. Thereafter, about 70 percent of the net new demand for housing may be for attached options, based on market preferences. Finally, even if all new housing were built within TSAs, less than half the market demand for residential options in this location would be met by 2035.

Summary for the Largest Four MPOs

This section synthesizes the findings relating to MPO residential market and preference demand. With respect to the market trend scenario, presented in table 4.18, one sees the effects of changing ownership rates on overall housing demand. If one assumes the middle alternative where the homeownership rate drops by 5 percent between 2010 and 2020, rental units will account for about 75 percent of total new demand for housing. The share between 2010 and 2035 falls to about 64 percent because the biggest shift in tenure overall would occur during the current decade as markets reequilibrate.

TABLE 4.20 Largest MPOs 2020 and 2035 Distribution of Net New Residential Units, 2010–2020 and 2010–2035

Unit Type	New Units Needed 2010–2020, Holding Excess Supply Constant	Share of Demand (%)	New Units Needed 2010–2035, Holding Excess Supply Constant	Share of Demand (%)
Multifamily	649,000	44	1,559,000	46
Townhouse/Plex	379,000	25	885,000	26
Small Lot	460,000	31	957,000	28
Conventional Lot	0	0	0	0
Total	1,487,000		3,400,000	

Source: Author.

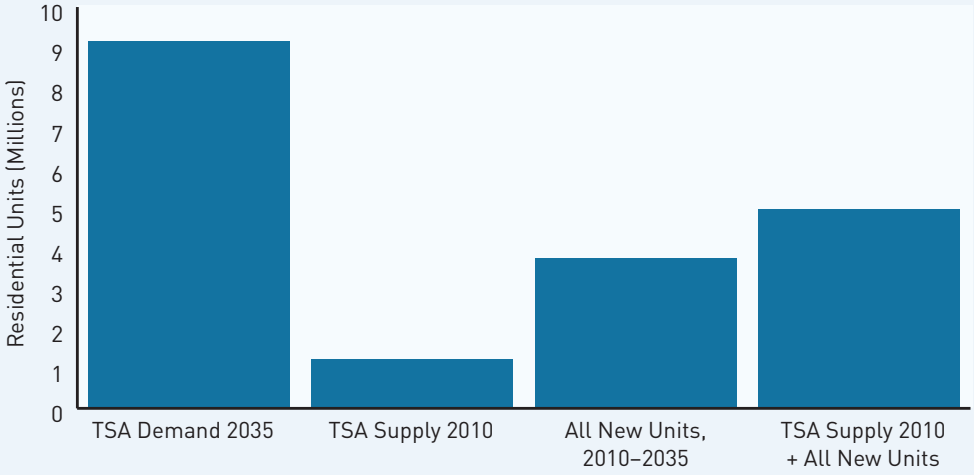
TABLE 4.21 Largest Four MPOs TSA Supply and Demand Comparisons, 2010–2035

Measure	Number
TSA Demand 2035	9,159,000
TSA Supply 2010	1,234,000
All New Units, 2010–2035	3,738,000
TSA Supply 2010 Plus All New Units	4,972,000
Unmet Demand	4,187,000

Source: Author.

Note: TSA supply 2010 is based on Center for Transit Oriented Development residential units within 0.5 miles of a TSA plus all attached units constructed between 2000 and 2010 from California Department of Finance data. TSA demand 2035 is based on PPIC 2001 and 2004 survey data.

FIGURE 4.10 Largest Four MPO Housing Units in TSAs 2010, Compared to TSA Housing Unit Demand in 2035



Source: Author.

For the market preference scenario, trends are combined and summarized for the four largest MPOs for the years 2020 and 2035 in table 4.19 and illustrated to 2035 in figure 4.9. The current supply of homes on conventional single-family lots will exceed demand in that category by more than 2 million homes in 2035. For all other residential unit types, the supply in 2010 will have to be doubled or more to meet apparent demand. This increase will be compromised, of course, because the excess supply of homes on conventional lots will dampen the ability of the market to meet emerging needs.

Holding constant the excess supply of homes on conventional lots, table 4.20 shows the distribution of new residential unit demand for the four largest MPOs in California. Moreover, table 4.21 and figure 4.10 show that by 2035 the demand for living in or near TSAs will reach about 9.2 million housing units while the supply in 2010 was probably about 1.2 million units. Adding all new units to TSAs, a little more than half the demand for TSA residential options would be met by 2035.

Finally, the current oversupply of homes on conventional large lots will remain substantial in 2035. In contrast, the demand for rental options will dominate all MPOs over both periods, 2010–2020 and 2010–2035. Attached products will account for about 70 percent of the net new demand for residential units, holding the current excess supply of homes on conventional lots constant. In short, local and regional planning and zoning may need to be redoubled to accommodate unprecedented demand for new rental housing and attached residential options in these MPOs, if not statewide.

CHAPTER 5

Nonresidential Development Scenario

This chapter explores nonresidential development demand with an eye to redevelopment and with it opportunities for meeting some share of future residential development demand. This chapter has three parts: (a) projecting space-consuming employment; (b) estimating new and replaced nonresidential space needs; and (c) discussing implications.

Space-Consuming Employment Projections

Each MPO prepares its own employment projections. Table 5.1 summarizes the most recent projections offered by SACOG,[43] ABAG/MTC,[44] SCAG,[45] and SANDAG.[46]

New and Replaced Nonresidential Space Projections

To determine how much space these workers need, one must convert the figures in table 5.1 into space projected to be supported for each of the horizon years. Space supported includes gross occupied and vacant space, and space in transition between users or uses. Space estimates are derived separately for manufacturing, and commercial and institutional[47] activities, assuming regional average square feet per worker in the commercial and institutional sectors and the national average for manufacturing.[48] For the U.S. Census Pacific Division,[49] of which California accounts for about three-quarters of the jobs, nonresidential space consumed per commercial/institutional worker is about 402 square feet.[50] The national average for manufacturing is about 626 square feet per worker.[51] These figures may vary slightly over time but tend to be quite stable for long-range planning purposes (see Nelson 2004). For the purposes of this paper, the assumption is an average of 400 square feet of nonresidential space for all workers. Table 5.2 shows the

TABLE 5.1 Employment in the Four Largest MPOs, 2010–2035

MPO	2010	2020	2010–2020	Percent Growth 2010–2020	2035	2010–2035	Percent Growth 2010–2035
SACOG	1,047,000	1,172,000	125,000	12	1,364,000	317,000	30
MTC/ABAG	3,735,000	4,041,000	306,000	8	4,493,000	758,000	20
SCAG	8,349,000	9,183,000	834,000	10	10,287,000	1,938,000	23
SANDAG	1,342,000	1,605,000	263,000	20	1,798,000	456,000	34
Total	14,473,000	16,001,000	1,528,000	11	17,942,000	3,469,000	24

Sources: Levy (2010) for SACOG; ABAG (2011); SCAG (2008); SANDAG (2010).

TABLE 5.2 Nonresidential Space Supported and Change, Four Largest MPOs, 2010–2035 (Millions of Square Feet)

MPO	Space Supported in 2010	Space Supported in 2020	Change 2010–2020	Space Supported in 2035	Change 2010–2035
SACOG	419	469	50	546	127
MTC/ABAG	1,494	1,616	122	1,797	303
SCAG	3,340	3,673	334	4,115	775
SANDAG	537	642	105	719	183
Total	5,789	6,400	611	7,177	1,388

Source: Author.

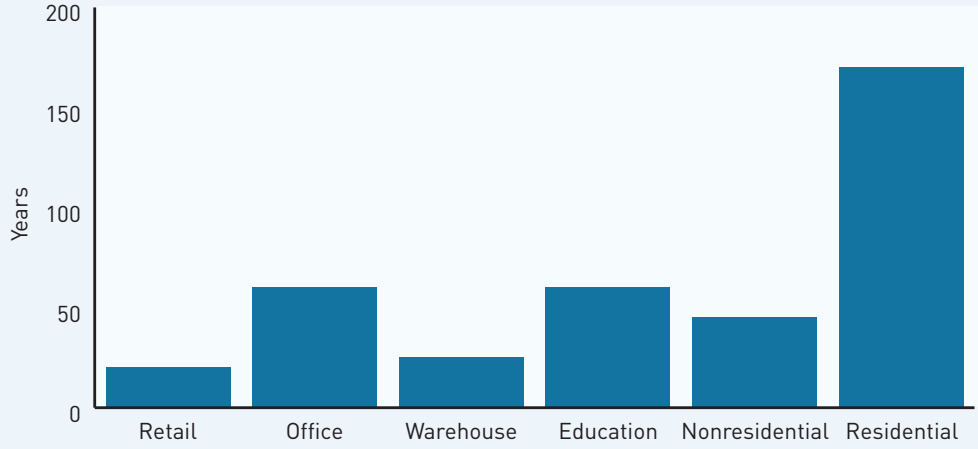
projected amount of nonresidential square feet needed for the four largest MPOs for 2010, 2020, and 2035, including net additions to the nonresidential space during those periods.

The amount of space needed to support space-consuming workers is impressive. Between 2010 and 2020, more than 600 million square feet will need to be added to the inventory of total nonresidential space, with nearly 1.4 billion square feet between 2010 and 2035. In all, the inventory of nonresidential space will need to grow by about 20 percent between 2010 and 2035. The growth in nonresidential space is smaller than the percent change in jobs because, following national trends, California's job market is moving away from manufacturing, which requires relatively large amounts of space per worker, to commercial/institutional sectors where less space is needed per worker.

Compared to residential units, nonresidential space is not as durable. As noted earlier, the typical residential unit will last easily up to two centuries and perhaps several more. In contrast, the typical nonresidential space is not durable, lasting on average around 40 to 45 years for states in the Pacific Census Division, as illustrated in figure 5.1. Over time, nonresidential space will need to be recycled through demolition, rebuilding, or repurposing through renovations that renew the structure for different kinds of uses than those for which it was originally built.

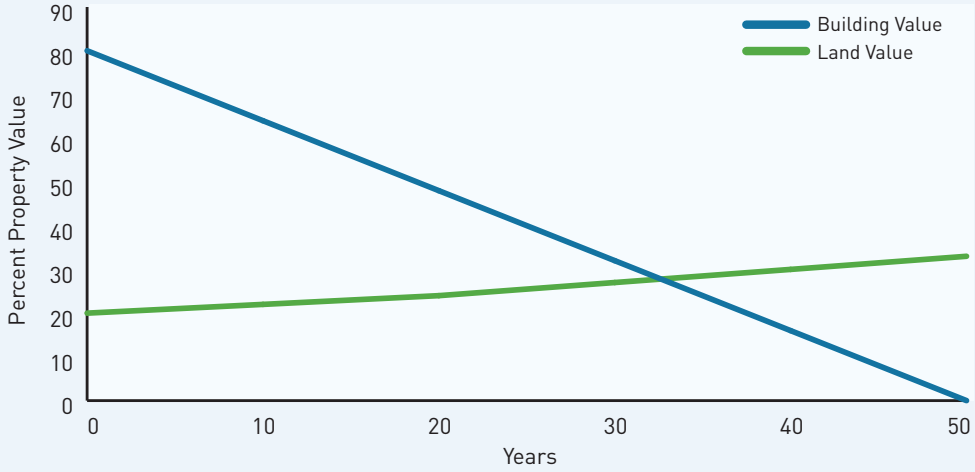
The rapidity with which nonresidential structures are recycled depends on two major factors: the rate of depreciation of the building and the rate of appreciation of the land on which it sits. Buildings depreciate at widely varying rates. Depreciation for most kinds of properties ranges from about 30 years to about 60 years (Marshall & Swift 2010), assuming the structure is used until its intended purpose has run its course. In dynamic metropolitan areas, few nonresidential structures are used for their intended purpose through the expected useful life of the building because as the structure depreciates, land value appreciates, and at some point the land is worth more than the structure. The owner of the structure may see a better return on investment by recycling the building with a new use.

FIGURE 5.1 **Pacific Census Division Average Lifespan of Major Building Classes before Recycling**



Sources: Author. Nonresidential figures based on the U.S. Energy Information Administration's *Commercial Buildings Energy Consumption Survey*. Residential figure based on author's estimates of residential longevity using the 1990 and 2000 U.S. Census and includes manufactured homes.

FIGURE 5.2 **Recycling Ripeness of 50-Year Depreciation Structures**



Source: Author.

Note: A 50-year building depreciating at 2 percent annually will be worth less than land appreciating at 1 percent annually (after inflation) in the 33rd year. This is the point after which the structure is likely to be recycled.

Consider how the recycling decision is made. Assume the structure has a depreciable life of 50 years, which is a common period for nonresidential structures. Suppose that when the structure is built, about 80 percent of the total property value is in the structure itself and 20 percent is in the land. Suppose also that the average annual appreciation of land (after inflation) is 1 percent. A 50-year structure depreciating at 2 percent annually with land appreciating at 1 percent annually (compounded) will be worth less than the land in about the 33rd year, as illustrated in figure 5.2. At about the 30th year, if not before, the property owner will begin to consider recycling the structure. However, the actual moment of recycling is often deferred until market forces justify the cost of demolition and reinvestment. Thus, the typical structure in the Pacific Census Division recycles about every 40 years.[52]

For this analysis, it is assumed that the average life of all nonresidential structures will be about 40 years. Certainly, some structures such as cheaply built big-box stores may become ripe for recycling after just 15 years or so, whereas Class A structures may last a century or longer. The choice of 40 years may underestimate the pace at which nonresidential structures will become ripe for recycling, considering land value appreciation. In addition, the depreciation "clock" is started in 2000; that is, ripeness for recycling is calculated assuming all existing structures were built in 2000.[53] The 40-year clock assumes all stock will become ripe for recycling in the 40th year, but this figure is applied to all stock after 2010 so the amount of recycling in one year will be more than in the previous year. Still, these assumptions lead to conservative estimates of nonresidential space recycling over the analysis periods because much of the current stock was built prior to 2000. Table 5.3 reports the nonresidential space estimated to be ripe for recycling between the periods 2010–2020 and 2010–2035. In essence, 85 percent of the space existing in 2010 will have been recycled by 2035, with some structures recycled twice.

The amount of property and corresponding developable area that is available to be recycled is many times greater than the projected market demand for nonresidential space. According to these conservative estimates, about 1.6 billion square feet of developable property will become ripe for recycling by 2020, compared to about 600 million net square feet of additional space of

TABLE 5.3 Nonresidential Space Ripe for Recycling, Four Largest MPOs, 2010–2035 (Millions of Square Feet)

MPO	Space Supported in 2010	Space Recycled 2010–2020	Space Recycled 2010–2035
SACOG	419	117	358
MTC	1,494	418	1,276
SCAG	3,340	935	2,852
SANDAG	537	150	458
Total	5,789	1,621	4,944

Source: Author.

projected market demand. By 2035, about 4.9 billion square feet of space will become ripe for recycling, compared to the need to increase total inventory by nearly 1.4 billion square feet. Table 5.4 illustrates these relationships.

Nonresidential Development Implications

Table 5.4 shows that between 2010 and 2035, California's four largest MPOs are likely to build about 6.3 billion square feet of nonresidential space, only about a fifth of which will be net additions to the supply existing in 2010. Recycling the land on which nonresidential spaces already exist will probably be sufficient to accommodate a substantial share, if not all, of the additions to the nonresidential inventory. For instance, the typical floor/area ratio (FAR) of land occupied by nonresidential uses in the four largest MPOs is about 0.35, which means that the actual square footage of such space is equal to about 35 percent of the total land area. Consider, for example, that a 350,000-square-foot shopping center sitting on a 1 million-square-foot piece of land has an FAR of 0.35, meaning that about 65 percent of the land area is in asphalt.

Much of the land that will be redeveloped will result in a higher FAR. Indeed, to accommodate the net new nonresidential space needed, the FAR need increase to only about 0.42. Moreover, through only modest design improvements, redeveloped nonresidential parcels can increase their FAR by up to about 1.50 and still provide sufficient parking (Dunham-Jones and Williamson 2009). Indeed, between 2010 and 2035, net new demand for multifamily residential development could conceivably be included in the redevelopment of existing nonresidential parcels and accommodate replacement of existing space. In this scenario, the addition of new space and these multifamily units would not add to the inventory of developed land and the resulting FAR would be only about 0.70.[54]

TABLE 5.4 Net Additions and Recycled Nonresidential Space, Four Largest MPOs, 2010–2035 (Millions of Square Feet)

MPO	Space Supported in 2010	Net Addition 2010–2020	Recycled 2010–2020	Total Space Built 2010–2020	Total Space Built 2010–2020 Compared to Space in 2010 (%)	Net Addition 2010–2035	Recycled 2010–2035	Total Space Built 2010–2035	Total Space Built 2010–2035 Compared to Space in 2010 (%)
SACOG	419	50	117	167	40	127	358	484	116
MTC	1,494	122	418	541	36	303	1,276	1,579	106
SCAG	3,340	334	935	1,269	38	775	2,852	3,627	109
SANDAG	537	105	150	255	48	183	458	641	119
Total	5,789	611	1,621	2,233	39	1,388	4,944	6,331	109

Source: Author.

CHAPTER 6

The Role of TSAs in Reshaping Metropolitan California

This chapter reviews the role of TSAs in absorbing the demand for new residential and non-residential land use. A national survey of market preferences conducted for the NAR (Belden Russonello & Stewart 2011) found that 50 percent more Californians believe transit options are more important in choosing a place to live than the rest of the nation (71 percent in California, compared to 47 percent nationally). Furthermore, rental housing will dominate the demand for all new housing to at least 2035, given best available information. The rental products can range from multifloor structures to attached single-family structures such as townhouses to small-lot, single-family detached units. All are appropriate for location in or near TSAs, depending on the features of any given TSA.

Earlier, this report showed that more demand will exist to live in TSAs than there are units within TSAs now plus all new units built between 2010 and 2035. Put differently, all new residential units could be directed to TSAs between now and 2035 and still not meet the demand for living in TSAs.

Once again, one needs to differentiate between *transit-station areas* (TSAs) and *transit-oriented development* (TOD). TSAs refer to the area around any transit station, whether planned, such as through a specific area plan, or developed as part of the master development plan. TODs refer to development occurring pursuant to a master development plan whether consistent with a specific area plan or an approved development plan. TSAs include TODs, but TODs presume a higher level of planning and development coordination so they do not include all TSAs. This chapter uses the term TSA to include TODs.

The question this chapter addresses is the extent to which TSAs can absorb residential and non-residential development between 2010 and 2035, and beyond, assuming that by 2035 all planned transit stations are built. The actual areas TSAs serve, however, vary. Nationally, the planning area around TSAs varies widely, with most settling on a half-mile radius. Canepa (2007) goes further, however, showing through planning and design that people are willing to walk much farther than one-half mile. He notes (Canepa 2007, 34):

> The impact of planning policies could well expand the range of TOD radii beyond the half-mile border and ensure a greater amount of mixed-use development. This expansion presents massive implications for communities as the amount of investment and density surrounding a transit development could increase nearly threefold.

Using the half-mile radius for TSA planning areas, table 6.1 reports the development capacity of existing and potential TSAs. The analysis is based on existing and potential rail and bus rapid-transit stations in each of the four largest MPOs.[55]

Net buildable area for TSA development is assumed to cover 20 percent of this half-mile circle. The capacity of TSAs to accommodate future development depends on the ability of land around them to be developed. Studies by Calthorpe Associates[56] and the Center for Transit Oriented Development (2010) in the highly urbanized San Francisco peninsula indicate that about 15 per-

TABLE 6.1 Development Capacity of TSAs

Measure	SACOG	MTC/ABAG	SCAG	SANDAG	Total
Existing and Potential TSAs[a]	59	399	221	83	762
Acres, Half-Mile Radius	29,657	200,559	111,087	41,720	383,023
Net Adjustment (%)	20	20	20	20	20
Net Acres	5,931	40,112	22,217	8,344	76,605
Average FAR	2.50	2.50	2.50	2.50	2.50
Building Square Feet (Millions)	646	4,368	2,419	909	8,342
Residential Share (%)	67	67	67	67	67
Residential Square Feet (Millions)	431	2,912	1,613	606	5,561
Average Residential Unit Size (Gross Square Feet)	1,500	1,500	1,500	1,500	1,500
Residential Unit Capacity	287,000	1,941,000	1,075,000	403,000	3,708,000
Employment Square Feet (Millions)	215	1,456	806	303	2,781
Square Feet per Job	400	400	400	400	400
Employment Capacity (Jobs)	538,000	3,640,000	2,016,000	757,000	6,952,000

Source: Author, based on data provided by the Center for Transit Oriented Development (2011).

a. Existing and potential TSAs for all rail modes from Center for Transit Oriented Development.

TABLE 6.2 Share of Jobs by NAICS Category Attracted to TSAs, Preliminary Assessment

NAICS Category	Percent TSA Attractiveness
Farming and Related	0
Forestry and Related	0
Mining	0
Utilities	0
Construction	0
Manufacturing	0
Wholesale	0
Retail	25
Transportation and Warehousing	0
Information	33
Finance and Insurance	33
Real Estate	33
Professional and Technology	33
Management	33
Administration and Waste	33
Education	33
Health and Related	33
Arts and Related	33
Accommodation and Food	33
Other Services	33
Federal	33
State and Local	33

Source: Author.

cent of the land area is available for new development. Around new stations or stations in less urbanized areas, the figure could be 25 percent or higher. In addition, a very high share of the existing nonresidential stock will be replaced between 2010 and 2035 for reasons noted earlier. Thus, on average, 20 percent of the land area within a half-mile of transit stations—the TSA—is assumed to be available for development or redevelopment at an average FAR of 2.50 (see below) between 2010 and 2035.

TABLE 6.3 Estimate of Jobs Attracted to TSAs, 2035

MPO	TSA Job Attractiveness, 2035
SACOG	341,000
MTC/ABAG	1,123,000
SCAG	2,572,000
SANDAG	450,000
Total	4,486,000

Source: Author.

TABLE 6.4 Share of Employment Growth in California's Largest Metropolitan Areas Compared to Selected Others

MPO	Share of New Jobs 2002–2008 Locating in TSAs (%)
California MPOs	
Sacramento	–23
Bay Area	6
Los Angeles	20
San Diego	30
Selected MPOs	
Chicago	100
Washington, D.C.	72
Atlanta	40
Dallas	28
Portland	70

Source: Adapted by author from Center for Transit Oriented Development (2011).

An FAR of 2.50 is equivalent to a low-rise, three- or four-floor structure (typically below the tree line) sitting on about half the site (50 percent land coverage ratio), providing ample open area and parking. The assumption here is that two-thirds of the TSAs will be used for housing and one-third for nonresidential uses. This relationship roughly achieves jobs/housing balance. This chapter also assumes 1,500 gross square feet per residential unit (inclusive of common and maintenance areas) and 400 square feet per worker—both generous assumptions for urban areas and likely to underestimate actual capacity. It is estimated that existing and potential TSAs have about 1.2 million residential units within them and can accommodate another 2.5 million units for a total of 3.7 million residential units. The number of units accommodated can be increased by one or more of the following methods: increasing the FAR, reducing average unit size, or increasing the area allocated for residential uses.

The analysis now moves to consider the ability of TSAs to absorb jobs. For one thing, most jobs do not lend themselves to TSA locations; they are either land-extensive by nature or need to locate where most of the population already lives. Some jobs, such as medical, science, and industrial research and development, should be located away from residential areas.

This analysis begins with an initial assessment of the share of jobs by major NAICS[57] firm code that may be attracted to TSA locations, which is shown in table 6.2.[58] About a quarter to a third of all jobs in the four largest MPOs may be appropriate for locating within TSAs. Table 6.3 provides an estimate of the number of jobs that may be attracted to TSAs. Clearly, with a capacity for up to 7.0 million jobs (table 6.1), existing and potential TSAs could have the ability to absorb all the jobs that may be attracted to them (table 6.3).

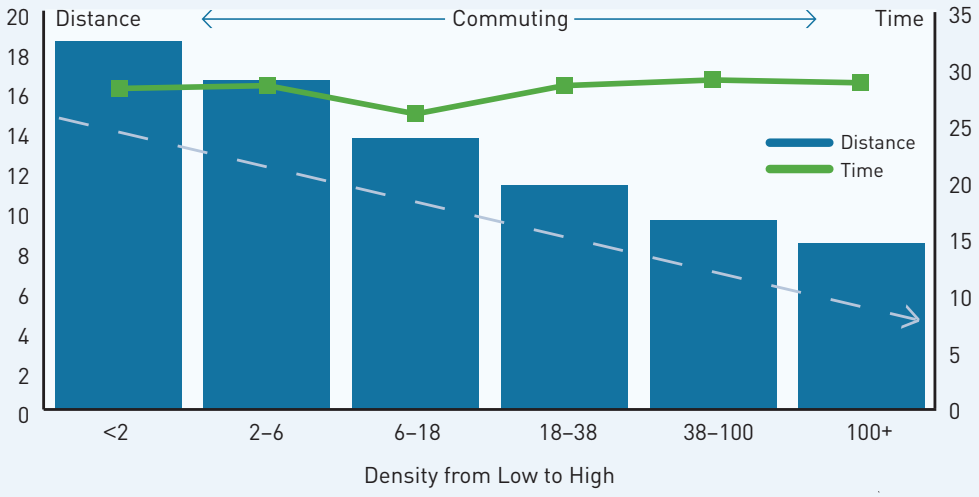
To date, however, the actual share of development attracted to TSAs seems unimpressive, at least compared to other metropolitan areas around the United States. Consider table 6.4. It shows the share of regional employment growth during 2002–2008 that was absorbed by TSAs, based on estimates of the Center for Transit Oriented Development (2011). The four largest MPOs in California generally do not compare favorably to these other metropolitan areas.

TSAs in Chicago, for example, seem to have absorbed all net new jobs in that metropolitan area while the Washington, D.C., metropolitan area absorbed about 72 percent of the job growth. Even the sprawling metropolitan areas of Atlanta and Dallas—with no barriers to continued outward expansion—did as well or better than the California metropolitan areas. TSAs in metropolitan Portland, which is about the same size as Sacramento and which has a light-rail system of comparable age and extent, absorbed about 70 percent of that region's net new jobs. Key reasons for these disparities may include lack of comprehensive, long-range planning around transit stations and failure to link economic activities between stations; local government planning and zoning barriers; and insufficient assessment of market demand for the TSA options (see also Rose 2011). This report offers recommendations for expanding TSA options later.

In short, existing and planned TSAs could accommodate all residential demand and most of its employment growth between now and the later part of the 21st century. As stations are added or intensity of development is increased (above the modest 2.5 FAR used in table 6.1), TSAs seem easily able to accommodate development that would be attracted to them.

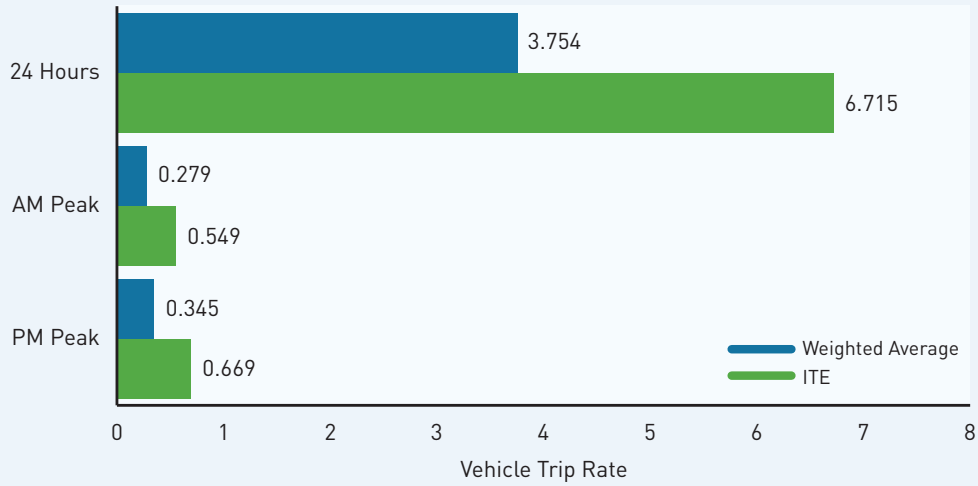
Meeting the market demand for TSA options can help California's four most populous MPOs comply with SB 375. The Center for Transit Oriented Development (2010) observes that in California, transportation accounts for about 40 percent of all GHG emissions (U.S. Environmental Protection Agency 2009). Because TSAs provide a mix of residential and commercial development within walking distance of transit, they can reduce GHG emissions by more than 40 percent.

FIGURE 6.1 **Relationship of Residential Unit Density per Acre to Commuting Time and Distance**



Source: Hu et al. (2011).

FIGURE 6.2 Comparison of Weighted Average Vehicle Trip Rates: TSA Housing and ITE Estimates for Non-TSA Locations



Source: Arrington and Cervero (2008).
Note: ITE = Institute of Transportation Engineers.

Moreover, the *2009 National Household Travel Survey* (Federal Highway Administration 2011) indicates that when people live within a mile of "earning a living," about a third walk or bike to work, and when they live within about a mile from family or personal business errands, nearly half walk or bike to them.[59] Even when people use vehicles instead of walking, biking, or using transit, commuting distances drop considerably as density increases, as illustrated in figure 6.1.

Finally, Arrington and Cervero (2008) point out that TSAs reduce the mean VMT per residential unit by about 44 percent on an average day, which is illustrated in figure 6.2. Reductions were also higher for the morning and evening peaks at 49 percent and 48 percent, respectively (Arrington and Cervero 2008, 4). They also found that households living in TSAs are half as likely to own a car and own roughly half as many cars as comparable households not living in TSAs (Arrington and Cervero 2008, 1).

Based on their review of research, Arrington and Cervero report that TSA residents use transit two to five times more than other households in the region; the variation depends on relative automobile travel times and the extensiveness of transit service. They also find that transit use increases as the transit network extends to more employment, educational, and cultural centers (Arrington and Cervero 2008, 2).

A key factor is the proximity of jobs accessible by transit; distance to transit has more influence on transit use than land use mix or the walking environment. The most effective strategy to increase transit ridership therefore is to increase development densities near transit stations. Moreover, because employment densities at trip destinations have more influence on ridership than population densities at trip origins, locating jobs near transit is important to attract households to TSAs. TSAs are more than just employment centers, however. Although employment access is a primary consideration in successful TSA planning and design, mixed uses such as local restaurants and urban design such as pedestrian pathways are needed to attract residents, visitors, and customers (Arrington and Cervero 2008, 3).

The benefits of residential TSAs cannot be understated but are hindered by land use regulations that result in "overparking" residential development. Arrington and Cervero reviewed site plan case studies and learned that, under certain conditions, lowering residential parking ratios by half in TSAs with good-quality transit service can (a) increase residential density by a fifth to a third; (b) reduce parking costs by 5 percent to 36 percent; and (c) increase developer rates of return or increase housing affordability through higher densities and lower capital costs for parking. Savings could also be gained by reducing transportation impact fees to reflect reduced VMT from residential (and nonresidential) development in TSAs (Arrington and Cervero 2008, 4–5).

This report embraces Arrington and Cervero's recommendation to "rightsize" parking ratios in TSAs. Rightsizing would have important benefits, such as (a) making development approvals easier for TSA developers to obtain; (b) lowering traffic-related impact fees and exactions reflecting VMT savings paid by TSAs; (c) decreasing the need to construct roadway improvements for TSA-related traffic unlikely to materialize; (d) creating more compact development patterns that support higher-quality pedestrian environment; and (e) increasing residential densities (and nonresidential intensities) because less land would be needed for parking (Arrington and Cervero 2008, 5).

In conclusion, this scenario reveals that much of California's residential and employment development demand could, in theory, be accommodated in TSAs. For this scenario to be realized, however, many other factors would need to addressed, including comprehensive long-range planning around transit stations and revised zoning, encompassing reduced parking requirements. Also, this scenario needs additional assessment of the state of basic community facilities—such as parks and schools—in current and future TSAs.

CHAPTER 7

Conclusion

California is the nation's most populous state and will add more people between now and 2035 than any other state. For decades, homeownership rates in the state have been well below the national average. Many of California's metropolitan areas are among the nation's most densely settled—topped by Los Angeles. Substantial public ownership of land combined with sensitive and fragile landscapes reduces the supply of greenfield land available for urban development, making efficient use of remaining available land and underused previously developed land paramount. Although California leads the nation in many urban planning innovations, more needs to be done to align public policy and regulations to a rapidly shifting housing market and emerging consumer preferences. Housing preferences of the past, driven by the baby boom, are not the same as contemporary or projected preferences exhibited by generations X or Y—or the aging baby boomers—many of whom prefer urban environments that offer neighborhood walkability and transit access.

The changing demographic composition of California's metropolitan areas tends to favor more central locations—including centrally positioned suburban locations—for their access to transit and services. Those locations also correspond well to the location preferences of a large share of gen-Y households—a generation that is bigger than the baby boom. On the whole, half or more express preference for mixed-use development with transit options. The combined impact of energy costs and costs associated with automobile ownership is likely influencing changing market preference patterns, probably favoring more compact land uses over the long term.

Reinforcing this trend are the publicly stated proposals to revise homeownership finance in the United States. The current proposed revisions could create a new residential financing framework that makes buying homes more expensive and challenging. More expensive home financing on top of stagnating wages and demographic shifts will have a combined effect that translates into lower homeownership rates in California—perhaps in the range between 5 and 10 percent below 2010 levels.

The state's four largest MPOs—SACOG, MTC/ABAG, SCAG, and SANDAG—account for about 80 percent of the state's residents. Using a combination of market trends and projections by the individual MPOs, this report estimates the market trend for owner- and renter-occupied housing and market preferences for multifamily, townhouse, small lot (less than one-eighth acre), and other formats of residential development.

In the market trend context, analysis shows that between 2010 and 2020, the demand for new rental housing will be roughly equal to the demand for new owner-occupied housing, if the homeownership rate of 2010 remains the same. If homeownership rates in the four MPOs fall by 5 percent—statewide from about 58 percent to about 54 percent—new rental housing demand will represent about 75 percent of total new housing demand. This outcome would seem likely, considering the demographic, economic, and regulatory changes poised to occur during this decade. If the homeownership rate falls by up to 10 percent from 2010 levels—a conceivable outcome if proposed changes to home mortgage finance are adopted—a wholesale shift will take place from owner-occupied homes to rental homes or split-tenure homes, where owners open their existing homes to renters on a large scale. Between 2020 and 2035, markets presumably will have reequilibrated to account for demographic and mortgage finance shifts.

In the market preference context, between 2010 and 2035, the demand for townhouses and small-lot homes will more than double, while that for multifamily units will increase by up to half in some MPOs. The demand for homes on conventional lots will fall by more than a third. However, the current excess supply of housing in this scenario may keep the market from meeting future demand for other options.

Both perspectives need to be weighed together. If market trends assuming a 5 percent reduction in the homeownership rate are reasonable, roughly three-quarters of all new housing constructed in the largest four MPOs would need to be for renters, likely in multifamily arrangements composed of apartments and condominiums. The rest of the new housing demand would be met by the construction of townhouses and single-family detached homes on small lots.

Concurrent to these changes, the inventory of nonresidential spaces is aging rapidly in these MPO areas. The life cycle of a typical nonresidential structure—strip commercial centers, low-rise office and institutional buildings, warehouses, and the like—lasts between 20 and 40 years before being torn down, rebuilt, or repurposed to accommodate new needs. As properties recycle, the intensity of land being used for nonresidential uses usually increases and so does its attractiveness for a mixture of land uses, including residential uses.

Several overarching conclusions stem from this analysis:

- Adding to the current inventory of large-lot homes contributes to the excess of existing supply. The effect could be further erosion of housing values in overbuilt markets. Exceptions may be where large-lot homes are delivered as a component of mixed-use master-planned communities and in other situations where the buildable area of lots is relatively small (less than 5,000 square feet), but because of open spaces, easements, and other factors the actual lot would be considered large.
- All new residential development could be absorbed in existing and planned TSAs. After all, preference surveys note that Californians consider transit options to be far more important in choosing a place to live than the rest of the nation, by 71 percent to 47 percent. Yet even if all new residential development were constructed in TSAs between 2010 and 2035, at least a third of future the demand for living in TSAs would still not be met.
- The supply of existing developed land used for nonresidential purposes can conceivably be redeveloped to absorb all new and recycled nonresidential development demand to 2035.[60]
- Assuming modest land use intensities (averaging 2.5 FAR) and generous space allocations for dwellings and jobs, existing and planned TSAs in California's largest four metropolitan areas could have sufficient capacity to absorb all development needs[61] to 2035 and probably through much of the rest of the 21st century.
- The location preferences associated with long-term market demand suggest a general market orientation that does not contradict the type of compact development measures required to comply with the performance metrics contained in California's GHG legislation.

More research is necessary to fully explore the relationship between market trends, regulatory barriers, and necessary infrastructure investments. Each of these factors needs to come together in a location- and community-specific manner to make potential land use outcomes a feasible reality However, this report provides a synthesis of current data and an analysis of California's demographic and economic trends that can better inform scenario planning at the MPO level.

Notes

1 SB 375 is used in this paper as shorthand for the *Sustainable Communities and Climate Protection Act of 2008*.

2 The author is grateful to Eliot Rose for these insights.

3 For details, see chapter 4.2 of the *California Public Resources Code*, http://www.leginfo.ca.gov/cgi-bin/calawquery?codesection=prc&codebody=&hits=20.

4 The coefficient of determination ($R2$) is 0.83; the t-ratio is 6.68; and $p > 0.01$.

5 See Credit Risk Retention, accessed April 24, 2011, http://www.fdic.gov/news/board/29Marchno2.pdf.

6 Considering there were about 75 million homeowners in 2010, losing 5 million would reduce the homeownership rate from above 66 percent to about 60 percent—a rate not seen since 1960.

7 See "Diverse Groups Respond to Proposed Rule for Qualified Residential Mortgages," National Association of Home Builders, accessed April 24, 2011, http://www.nahb.org/news_details.aspx?newsID=12403 (emphasis added).

8 Both Fannie Mae and Freddie Mac are government-sponsored enterprises, operating with a charter from Congress with oversight from the Department of Housing and Urban Development. Otherwise, they operate as firms with publicly traded stocks.

9 See "What the Demise of Fannie Mae and Freddie Mac Means for the Future of Homeownership," March 16, 2011, *Knowledge@Wharton*, accessed April 24, 2011, http://knowledge.wharton.upenn.edu/article.cfm?articleid=2737.

10 Ibid.

11 See "Dowell Myers on Proposition 13, Demographics and Housing: The New Reality after the Crash," September 9, 2009, *Urban Planning Research Essays on Real Estate,* accessed April 25, 2011, http://planning-research.com/proposition-13-demographics-and-housing-the-new-reality-after-the-crash/.

12 See http://www.dof.ca.gov/research/demographic/reports/projections/p-1/.

13 See Gregg Logan, Stephanie Siejka, and Shyam Kannan, "The Market for Smart Growth," http://www.epa.gov/smartgrowth/pdf/logan.pdf.

14 A sizable percentage wanted a detached home on a one-acre lot within walking distance of transit.

15 Ibid.

16 This report makes numerous references to the U.S. Census Bureau's *American Housing Survey*. Reports and data are found at http://www.census.gov/hhes/www/housing/ahs/ahs.html.

17 Research indicates eight units per acre is the minimum density needed to support regular transit services. See Parsons Brinckerhoff Quade and Douglas (1996) and Cervero and Seskin (1995).

18 The national sample size is 2,153, and the subset for California is 220. The California subset falls within the 90 percent confidence level with an error of +/–5.5 percent.

19 Porter Novelli is a global public relations company. Its website is www.porternovelli.com. Data are used with permission.

20 Respondents were given small incentives (worth less than $5) for their participation. They were not required to participate, and no personal identifiers are provided with the data set.

21 Californians are slightly though not substantially more prone to favor walking or biking to work, shopping, or transit than the national average.

22 Handy et al. (2008) defined smart growth communities as "traditionally designed communities." The actual Porter Novelli survey did not define what these communities were but rather focused on describing two different choices from which respondents could choose.

23 PPIC's 2004 survey included an option for condominiums and townhouses, but not for townhouses specifically. About 26 percent of the respondents indicated a preference for condominiums or townhouses "if it was convenient to use public transit to commute and travel locally."

24 *Townhouse* is defined as "single-family attached" structures.

25 *Multiplex* is defined as units in structures comprised of two to four residential units.

26 The 2001 survey asked: "Would you choose to live in a single-family detached home with a backyard in the suburbs—if it means you would live far from work and have a long commute?" and allowed "yes" and "no" options. Here, the "no" option is interpreted as comparable to preferring a single-family detached home with a backyard or a small backyard if associated with a short commute.

27 See www.scag.ca.gov/sb375/data/clus/CLUS_DevelopmentType.xls, accessed February 20, 2011, which assumes 7.9 units per acre for "small" lot development, 4.5 units per acre for "medium" lot, and 2.6 units per acre for "large" lot. This paper combines medium- and large-lot categories into "other" lot. In some jurisdictions, such as Seattle, a small lot can be 2,500 square feet, or more than twice the density. See Seattle Municipal Land Use Code, http://clerk.ci.seattle.wa.us/~public/toc/23-43.htm.

28 Roughly about a third of those preferring small lots also preferred condominium or townhouse options convenient to transit.

29 *Net acre* is total land area less land used for roads, rights-of-way, open spaces, public facilities, and other purposes.

30 See California Department of Finance, http://www.dof.ca.gov/research/demographic/reports/view.php#objCollapsiblePanelEstimatesAnchor.

31 How long homes will last before being replaced by another land use is debatable. For planning purposes, assuming that nearly all existing homes will remain over a normal planning horizon is usually best. Homes on very large lots may see the property receive infill development, but the home would still remain, albeit renovated as needed to meet current market needs.

32 The estimate of the total demand for those units for this paper is based on their accessibility to transit, so to the extent that respondents would prefer these kinds of units but not access to transit, the demand for these units has been understated.

33 For a review of major housing types, densities, and visual examples, see Metropolitan Design Center, University of Minnesota.

34 These are townhouses above townhouses where the townhouse lot is under joint ownership. Sometimes both townhouse units have second floors or lofts.

35 The author acknowledges Eliot Rose for this insight.

36 "MTP [Metropolitan Transportation Plan] Update 2035," PowerPoint presentation, December 2010.

37 See Draft Regional Growth Projections, SACOG, Government Relations & Public Affairs Committee, March 31, 2010, http://www.sacog.org/mtp/2035/mtpupdate2010-11/Projections.pdf.

38 See ABAG Projections 2009: Regional Projections, http://www.abag.ca.gov/planning/currentfcst/regional.html.

39 See "E-5 Population and Housing Estimates for Cities, Counties and the State, 2001–2010, with 2000 Benchmark," California Department of Finance, Sacramento, California, May 2010, http://www.dof.ca.gov/research/demographic/reports/view.php#objCollapsiblePanelEstimatesAnchor.

40 ABAG staff memo to MTC Planning Committee, ABAG Administrative Committee, Joint Policy Committee, Employment Forecasting Method & Determining 25 Year Regional Housing Need, November 5, 2010, accessed February 21, 2011, http://apps.mtc.ca.gov/meeting_packet_documents/agenda_1570/3_Nov2010_PlanningComm_Emp_HF_HN_draft.pdf, p. 10. This estimate was updated with Plan Bay Area: Land Use Scenarios Initial Vision Scenario, March 11, 2011, accessed April 25, 2011, http://www.onebayarea.org/plan_bay_area/land_use.htm.

41 See Southern California Association of Governments, Adopted Growth Forecast, http://www.scag.ca.gov/forecast/adoptedgrowth.htm.

42 See Annual Projections, http://datawarehouse.sandag.org/Excel/Annual%20Projections%20-%20Regionwide.xls.

43 SACOG 2010 estimate interpolated between 2008 and 2020, and for 2035, from SACOG (2010).

44 MTC 2010 and 2020 estimates from http://www.abag.ca.gov/planning/currentfcst/regional.html and 2035 estimate from ABAG (2010), http://apps.mtc.ca.gov/meeting_packet_documents/agenda_1570/3_Nov2010_PlanningComm_Emp_HF_HN_draft.pdf, both accessed February 21, 2011. This was updated with Plan Bay Area: Land Use Scenarios Initial Vision Scenario issued March 11, 2011, and accessed April 25, 2011 from http://www.onebayarea.org/plan_bay_area/land_use.htm.

45 SCAG (2008), accessed April 22, 2011, http://www.scag.ca.gov/forecast/adoptedgrowth.htm.

46 SANDAG (2010), accessed April 22, 2011, http://www.sandag.org/index.asp?projectid=355&fuseaction=projects.detail.

47 These are the North American Industry Classification System (NAICS) categories of wholesale trade, retail trade, transportation and warehousing, information, finance and insurance, real estate, professional and technical services, management, administration, education, health care and social services, arts and entertainment, accommodation and food service, other services, federal civilian employment, and state and local employment.

48 Public domain figures specific to California cannot be used because (a) the state does not have a uniform property assessor reporting system providing centrally accessible records, and (b) local assessor records are not available on readily accessible Internet platforms.

49 This division comprises the states of Alaska, California, Hawaii, Oregon, and Washington.

50 This figure is derived from the *Commercial Buildings Energy Consumption Survey* for 2003, U.S. Department of Energy, Energy Information Administration.

51 This figure is derived from the *Manufacturing Energy Consumption Survey* for 2002, U.S. Department of Energy, Energy Information Administration.

52 See U.S. Energy Information Administration, *Commercial Buildings Energy Consumption Survey* for 2003, http://www.eia.gov/emeu/cbecs/contents.html.

53 About 70 percent of all space in 2010 was in place in 2000, based on estimates derived from the *Commercial Buildings Energy Consumption Survey* for 2003.

54 This scenario assumes an average unit size of about 1,200 square feet per residential unit or about 1,500 square feet per unit including common and maintenance areas.

55 The data come from the Center for Transit Oriented Development. The estimate is high because it includes all modes and assumes all stations either will be or can become a TSA, according the Center for Transit Oriented Development. At the low end, 425 stations existed in 2005, projected to grow to 574 by 2050, limited mostly to light rail, heavy rail, and commuter rail. A next step in long-term planning is to identify stations that will be truly TSAs in planning and design, and market responsiveness.

56 Author interview with Peter Calthorpe, June 9, 2011.

57 North American Industrial Classification System codes for firms.

58 The author is not aware of any research that addresses this issue.

59 Estimated from U.S. Department of Transportation, Federal Highway Administration, NHTS Tables, http://nhts.ornl.gov/det/Extraction4.aspx.

60 Individual circumstances may require other development solutions. For instance, life sciences and other emerging industry clusters require careful land use considerations and sometimes buffers from residential land uses. New high-density residential infill development could threaten such industries.

61 Special kinds of development may exist that should not colocate within TSAs, but they would be rare and likely not absorb large shares of residential or employment-based development.

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