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Transportation Research at the University of California

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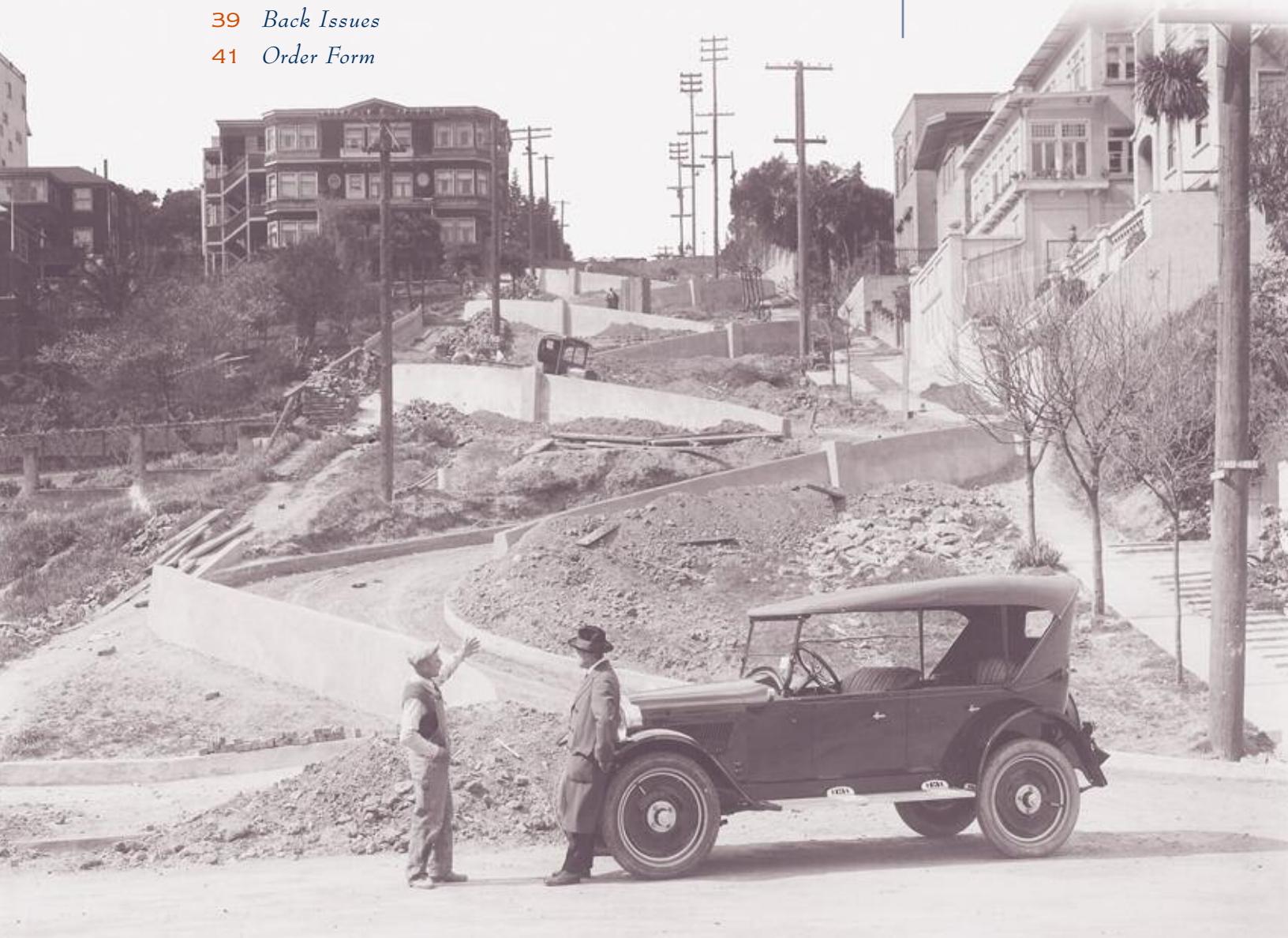
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California's Growth: An Uncertain Future

BY MICHAEL B. TEITZ

Editor's note: This issue of ACCESS is Part 1 of a two-part series about the challenges facing California in the coming years. Look for Part 2 in Fall 2008.

FEW THINGS ARE SADDER THAN THE SIGHT OF a friend in the grip of undernourishment, addiction, and delusion. That beloved friend is California—undernourished in what is necessary for its collective health, addicted to the consumption of public services, delusional about the necessity to pay for them. The word “crisis” is used far too frequently in public discourse, but it is hard to avoid the conclusion that California is now facing a serious crisis. The dimensions of that crisis go far beyond the range of the papers in this—and the next—issue of *ACCESS*: inadequate health care and insurance, a failing K-12 public school system, an underfunded and over-stressed higher education system, a public fiscal system that seems to be in permanent structural deficit with a form of governance full of incentives to keep it that way, and the likelihood of a recession. To all these, we may add the prospect of millions more added to the population, housing prices that are still far above the US median even with the current real estate collapse, insufficient and undermaintained infrastructure, water shortages exacerbated by climate change, and urban development that is inefficient and unhealthy.

Yet there are reasons for optimism. First, throughout its history, California has demonstrated enormous resilience in the face of great challenges. Earthquakes, fires, drought, robber barons, economic depressions, wars (at a distance), environmental devastation (from logging and hydraulic mining), vast sudden migrations, booms and busts—all have been taken in stride, absorbed, and somehow transcended. Second, California's citizens and government have managed to respond creatively to change, albeit finding that sometimes solutions beget more problems. Third, California has been the dynamic source of innovations in technology and culture that have resulted in entire new industries, providing employment and income for millions of people and changing the way the entire world behaves. Fourth, there is no lack



of perceptive analyses of California's problems, nor is there a shortage of well-crafted prescriptions for addressing them.

But resilience has its limits. Societies do fail, as Jared Diamond so eloquently tells us in his book, *Collapse*—and they fail in part because they no longer have the ability or will to adapt to change. Resilience in the face of sudden adversity is very different from resilience in response to slow, seemingly remorseless changes in a society and its environment. Many states in the eastern US have long experienced far slower rates of growth and much greater loss of key employment sectors than California, yet, with some exceptions, they have successfully managed the transition to a service-based economy. Far less successful have been some cities and metropolitan areas within them—consider Buffalo in contrast with Boston. In some cases, the loss of a fundamental economic base could not be offset by other means, but ➤

in others, strong and imaginative leadership, combined with good human and social capital assets, has found ways to weather storms greater than any faced by California.

California is not—or at least not yet—faced with the loss of its economic base. Indeed, in the globalizing world of the twenty-first century, it may be remarkably well placed. With an unmatched agricultural sector, and with innovative and creative industries ranging from entertainment to biotechnology, the state seems positioned to continue to lead. The threat comes from a different direction: from growth itself, and from the social and economic stresses that it generates. California’s population has grown almost without ceasing for over 150 years. At the same time, the standard of living expected by that population has grown as fast, if not faster. That this has been possible is due to continuing growth in labor productivity with enhanced technology and rising human capital, built on a foundation of extraordinary natural resources, combined with a physical and social infrastructure that supports and maintains growth. Of course, there was a huge, largely ignored, cost, especially in the destruction of native peoples and the natural environment. But the society that emerged seemed committed to a path of growth that distributed wealth broadly, albeit unequally, and offered opportunity to the great majority of its citizens.

Now this virtuous circle seems to be cracked, if not broken. Income inequality in California has grown rapidly over the past three decades, and the path to opportunity has narrowed, especially for the least advantaged. Access to health care and housing has decreased, with the foreclosures of the subprime crisis falling most heavily on those unable to bear them. And, finally, the essential infrastructure on which the prosperity of the state depends—transportation, water, education, and health care—are all under stress, in part simply due to growth in demand, and in part due to the lack of capital investment and maintenance needed to meet and sustain that demand.

Does this have to be California’s future? Clearly, not so. This state is wealthy beyond the dreams of most of the world’s societies. It has resources—human, technical, capital, and natural—that per capita still outweigh those of virtually anywhere else. And ways to restore the state’s infrastructure are known and tested. The contributors to this issue of *ACCESS* and the next make many of them clear. California’s infrastructure system needs to be viewed within a broad strategic framework, taking advantage of both public and private sources of capital and enterprise, and engaging all levels of government. David Dowall’s paper lays out an ambitious agenda, but it should not be seen as utopian or unrealistic.



The elements of his four-level policy framework have been put into practice in a range of countries and situations. Inherently, there is no reason why they couldn't work in California.

We begin with a look at the issue of accommodating future growth in California as outlined by Elizabeth Deakin. It is a daunting, multifaceted task ahead of us. Then Deakin and Robert Cervero together discuss a wide range of specific policies for transportation planning and investment that could address rising travel times and commute costs, as well as energy use and GHG emissions. Cynthia Kroll and Krute Singa discuss California's housing problem, emphasizing the issues of cost and location—how to get housing that people can afford where it is needed. They call for targeting bond funds to affordable housing, privileging projects that improve transit access and housing supply in urban core areas, and giving priority to rental housing. All of these are sensible and achievable.

In the next issue of *ACCESS*, we will continue to study the ramifications of California's growth. Adib Kanafani will focus on transportation, identifying a key need for a comprehensive, multi-modal perspective, seeing the possibility of gaining both efficiency and effectiveness through coordinated, mutually supportive transportation investments. Marlon Boarnet will discuss ways to plan a functional transportation infrastructure for the growing state. And William Eisenstein and Mathias Kondolf will take a comprehensive view of water. They recommend that the state emphasize integrated regional water management and diversified supply options; support conjunctive management of surface and groundwater resources, so that groundwater storage can become fully viable; and recognize that the waterscape has as much to do with land use as it does with infrastructure. This final recommendation, echoed also by Deakin and Cervero, involves a key issue for the state: land use planning and regulation.

Any solution to California's infrastructure problems must address land use regulation and growth management. California prides itself on its tradition of local home rule, that is, local control of land use decisions. That tradition is unlikely to be overturned. Yet home rule is a product of state legislation and policy; it exists in the context of a larger network of mutual support and obligation between the state and local communities. And increasingly, the obligations are playing out in spheres larger than any local government, but smaller than the state. For metropolitan areas, Councils of Governments (COGs) and Metropolitan Planning Organizations (MPOs) serve as first approximations of the necessary entities for regional policy implementation. In some places, regional Blueprint planning efforts have attempted to create conditions for effective growth management and infrastructure. However, for very large metropolitan areas, such as the Los Ange-

les area, existing institutional structures are simply inadequate for the task. With the emergence of even larger "megaregions," the problem simply gets more difficult. Some smaller area organizations within them, for example, the Western Riverside Council of Governments (WRCOG), are effective, but they are rare, and even in the best instances there is a key missing piece to the policy puzzle—namely the state.

Despite efforts to generate resources for infrastructure investments through the bond elections of 2006, the plain fact is that California has little in the way of coherent strategy for their use. The first rounds of expenditures of bond money were allocated for long-sought local projects, with little or no attention given to larger priorities. For the state to realize broader objectives through the allocation of bond and other funds for infrastructure, there must be links between allocations and goals for reduction of greenhouse gases (GHGs), improved air quality, reduction in vehicle miles traveled, habitat and species conservation, and social equity. These goals will not be reached easily. Their realization depends on whether the state establishes ground rules for development, together with incentives and disincentives sufficient to convince local governments that new forms of development are in their interest. Among those incentives and disincentives might be higher priority for development at a density and in locations conducive to travel by transit rather than automobiles, modifications of CEQA, and encouragement of Blueprint planning processes and their incorporation into local governments' general plans.

No one would expect such proposals to be adopted easily; local governments are adamant about the perceived loss of any home rule powers. Nonetheless, they should not be written off for that reason. Change must always start somewhere. The state could exercise leadership in establishing broad, strategic goals for future development that would form a framework for discussion of specifics. Then the hard work of negotiating real change could be based on a common understanding. Without it, California's resilience may not be enough. ♦

FURTHER READING

Elisa Barbour and Michael Teitz. *Blueprint Planning in California: Forging Consensus on Metropolitan Growth and Development* (San Francisco: Public Policy Institute of California, 2006).

Jared Diamond. *Collapse: How Societies Choose to Fail or Succeed* (New York: Viking Books, 2005).

California Futures

ACCOMMODATING GROWTH IN AN ERA OF CLIMATE CHANGE AND RISING FUEL PRICES

BY ELIZABETH DEAKIN

SOMETIME BETWEEN 2025 AND 2030, CALIFORNIA'S POPULATION will reach 50 million. During this same period, the state (and indeed the entire world) must find effective ways to substantially reduce greenhouse gas (GHG) emissions in hopes of slowing and reversing climate change. California has committed to such reductions in SB 32 and Executive Order S-3-05; the state has pledged to reduce GHG to 2000 levels by 2010 (11 percent below business-as-usual), to 1990 levels by 2020 (25 percent below business-as-usual), and to eighty percent below 1990 levels by 2050.

Accomplishing these reductions will take considerable effort from every sector of the economy.

Reducing emissions from current levels is a major challenge in part because the state has already adopted and implemented the "easy" things, and they are not enough. For example, the state has green building standards applying to construction materials and practices, appliances, lighting, and HVAC, as well as requirements that electric utilities increase the share of renewable energy in their source mix. In AB 1493, California called for new state limits on greenhouse gases from passenger cars and light-duty trucks, though to implement them the state must obtain a waiver from the federal government, which has so far been refused. Under SB 32 the state has identified additional "early action items," ranging from reductions in PFCs and SF₆ to requirements that tune-up and oil-change technicians insure that tires are properly inflated. California also is pursuing low carbon fuels standards and supporting research, development, and testing of alternative fuel vehicles, including plug-in electrics and hydrogen fueled vehicles. The state, in short, has made major commitments to change and is pushing ahead on implementation.

The best estimates are, however, that we can get only halfway to the needed GHG reductions with the already-adopted measures. Thus the Air Resources Board, as the lead agency for CO₂ reduction, is currently preparing a scoping plan, due January 1, 2009, for further GHG reductions. Most analysts agree that demand management and changes in urban growth practices will be needed if the GHG targets are to be met.

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CALIFORNIA IN A WORLD CONTEXT

While CO₂ reduction is undoubtedly the most critical environmental issue facing the nation and the earth, “business as usual” projections of energy use show what a daunting task achieving those reductions will be. California cannot solve the GHG problem on its own; at current rates, one year of growth in emissions from China will wipe out multiple years of California’s projected savings. But unless California and other advanced economies can show serious progress in reducing *per capita* emissions, which are far higher than China’s, it seems extremely unlikely that China will take serious steps to, for example, reduce its reliance on coal-fired power plants.

The worldwide challenge is substantial and, like it or not, it will shape California’s efforts. The International Energy Agency (IEA) forecasts that in the absence of new government policies or accelerated deployment of new technology, world primary energy demand is set to rise by 59 percent from 2004 to 2030, and 85 percent of that increase will be in the form of carbon-emitting fossil fuels: coal, oil, and natural gas. Two-thirds of the new demand will come from the developing world, especially China and India.

Oil demand is a growing concern for the US and California. At present the US consumes about a quarter of the world’s total oil production, and its transportation systems are almost entirely dependent on oil. World competition for oil is mounting sharply; by 2030, the IEA’s “business as usual” projection is that global oil consumption will rise from 85 million barrels a day today to about 120 million barrels a day. While the IEA is optimistic that this much >



oil is available, there are concerns about whether investments will be made to increase production accordingly, as well as about the political geography of oil (since a growing share of future supply will have to come from the Middle East and North Africa.) New fuels, including biofuels, are being developed but it is unlikely that they will displace petroleum in a significant way in the near future. Indeed, anxiety about the diversion of food crops to fuel has caused riots in several countries and is pushing up prices even in the US.

Even if energy supply keeps up with demand, there are price concerns. Fuel prices are one of the reasons for a spate of bankruptcies in the airline industry in recent months. Oil prices have risen above \$130 a barrel, and at-the-pump fuel costs have topped \$4.50 a gallon in some locations in the US. Because Americans travel more miles per capita than residents of any other nation, in vehicles only two-thirds as efficient as those of their European and Japanese counterparts, the transportation sector's escalating fuel costs pose serious economic and social challenges.

CALIFORNIA CHALLENGES

While global warming and energy prices are significant issues for California, the state has many other important environmental and social concerns that are tied directly or indirectly to transportation. Housing affordability is a major problem for many of our low- and moderate-income households—one that has by no means been alleviated by the current subprime mortgage debacle. The crisis revealed, among other things, the problems with locating new housing tracts far from jobs and services. Agriculture is a major enterprise in California, and the Central Valley produces half of the US's fresh fruits and vegetables; but prime farmland is being removed from production as sprawl development continues and high energy prices diminish farm incomes. Water is a scarce resource in California, but current regulatory and pricing regimes permit waste. California is home to a large number of rare or endangered species, many threatened by development, drought, and climate



change. Income disparities are increasing in many parts of the state, urban and rural. And current transportation choices, largely dependent on autos in our spread-out, low-density development patterns, expose our populace to congestion, pollution, and crashes.

If California is to manage its growth successfully, providing a high quality of life for its residents while improving environmental, economic, and social conditions throughout the state and setting an example for the rest of the world, “business as usual” cannot be the order of the day. We will need aggressive applications of the best new technologies to move us toward our GHG reduction targets. Yet while supply-side strategies are critical, they are not likely to be enough. We also will need to develop new policies and practices for sustainable growth, integrating new technologies into the best practices in land use, transportation, and environmental planning. Addressing these mandates while maintaining and improving the quality of life for all Californians is a challenge, but it need not be beyond our reach. We know what to do, for the most part, but we need the will, strategy, and financial mechanisms to do it.

UNDERSTANDING CALIFORNIA’S GROWTH

California is the most populous of the US states, and its economy today is nearly as large as that of France. Its growth is occurring in the context of globalization, with economic sectors increasingly interconnected, but it is also driven by immigration and natural increase. The state’s benign climate and natural resources certainly have been important factors, but so have excellent educational institutions and a legacy of public investments in growth-supporting infrastructure, including ports and airports, urban transportation systems, and water projects.

In keeping with worldwide trends, most of California’s population growth and economic action has been concentrated in metropolitan regions. Today, California’s four major metropolitan areas contain over three quarters of the state’s population. However, the >

metropolitan regions themselves have been changing, with multi-nucleation—multiple centers within regions—becoming increasingly common. Regional growth is both up and out, with infill and renewal of healthy centers, including those in previously edge suburbs, occurring at the same time that regions are expanding. Employment is increasingly locating outside of traditional centers, in office parks and stand-alone locations. One result of this pattern of growth is the emergence of “megaregions,” as edges and economies of previously distinct metro areas begin to overlap.

Push and pull factors work in tandem to produce this growth pattern. The high costs of development in traditional centers have pushed growth outward, while the lower costs of land and development at the edge have attracted it. Environmental amenities at the metro edge also attract many, but so do amenities in the successful urban centers. On the other hand, crime or the perception of it pushes people and business away from some centers toward the more controlled environments of edge communities and business parks. School quality is a significant factor in location choice for many households. Image, lifestyle, and lifecycle considerations have also shaped choices for both housing and business location, as have tax policies and incentives.

Whether a growth pattern similar to that of recent decades will hold over the next twenty years is a matter of continued debate and research. Demographic trends suggest that California’s population, like that of the rest of the US, will become older on average, with more childless couples and more singles. These demographic changes, along with higher prices for building materials and transportation fuels, may signal shifts in demand for housing (the principal use of urban land), both in terms of location and size. Changes in employment opportunities and even in shopping habits could also reshape the pattern of development. But where and in what form growth occurs will also be shaped by public policy.

BUSINESS AS USUAL

What’s at stake if we continue along current trajectories? John Landis’s study in the late 1990s of “business as usual” in California growth still offers a number of insights. Landis projected where development would occur if it followed the patterns permitted under the city and county plans and zoning in place at that time. Figure 1 shows the results. New development, occurring mostly at the edge of existing cities and towns but also scattered along highway corridors, would likely lead to continuous belts of urbanization down the Central Valley. Additional belts of development would link the Bay Area with Sacramento and Los Angeles with San Diego.

The costs of this pattern of growth would be measured in lost habitat and wetlands, lost prime farmland, and loss of a sense of place. Other costs of business as usual would be seen in the transportation system. Because housing development would mostly occur at low densities (five to six housing units per acre or less), transit and non-motorized modes would be of little use to large numbers of California’s residents. Many would therefore face congestion without good options. Other transportation externalities also would be high, including highway crashes and their attendant deaths, injuries, and property loss, as well as pollutant emissions and noise. And greenhouse gas emissions would increase, not decrease, absent technological breakthroughs well beyond those currently anticipated.

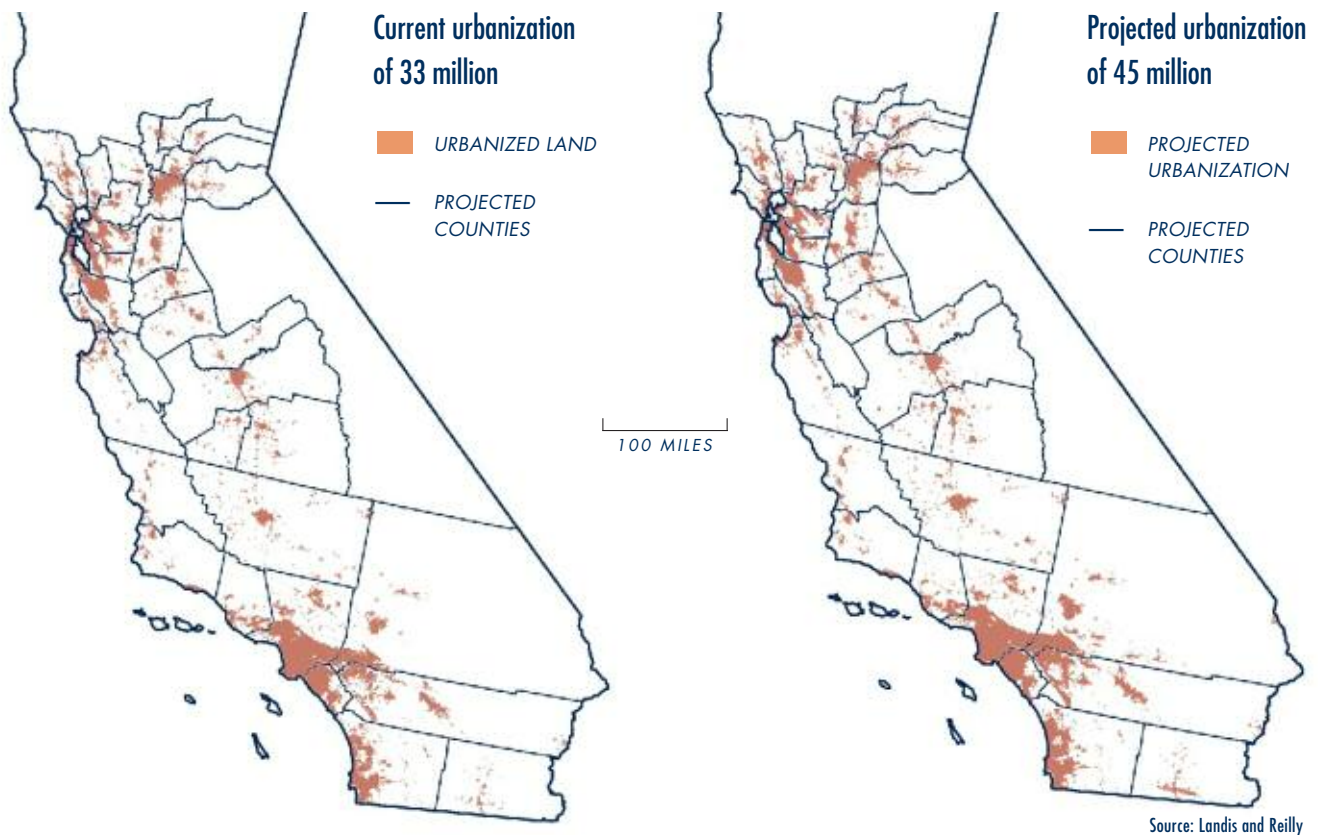


FIGURE 1
Projected urban growth in California

VOTER BONDS AND LEGISLATIVE ACTION—NEW OPPORTUNITY FOR CHANGE?

While business as usual presents a worrisome picture, new policies are emerging that offer opportunities for positive change. The voter-approved 2006 Bond Package includes \$42.7 billion for investments in transportation, housing, water, schools, flood protection, and water and resource projects, including parks and open space. While some of the funds are reserved for specific projects, others could be directed in a coordinated fashion toward a more sustainable vision of growth. The problem, of course, is that the state has not yet developed a coherent vision of growth nor planned for the infrastructure that it would require.

Some of the groundwork for such a vision has been laid by regional Blueprints, which are planning documents that look toward a more sustainable future. The problem is that most of these Blueprints are not yet backed by an implementation strategy. Yet here state law gives us a framework for action, for example with legislation calling for consistent state agency policies and greenhouse gas reduction strategies. From the framework already in hand, we can develop both a statewide vision and a strategic plan for California growth that will help us determine what actions are needed, choose the best projects and implementation mechanisms, evaluate how well we are performing, and adjust direction as needed. ♦

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Elisa Barbour and Michael Teitz. *Blueprint Planning in California: Forging Consensus on Metropolitan Growth and Development* (San Francisco: Public Policy Institute of California, 2006).

John Landis and Michael Reilly, "How We Will Grow: Baseline Projections of the Growth of California's Urban Footprint through the Year 2100," Institute of Urban and Regional Development, IURD WP-2003-04, August 2003. http://www.iurd.ced.berkeley.edu/pub/abstract_wp200304.htm

The Challenge of Urban Transportation in California

BY ELIZABETH DEAKIN AND ROBERT CERVERO

As California grows, increased travel from more households, business activity, and goods movement will surely increase greenhouse gas emissions, lead to more congestion and air pollution, and damage ecosystems and neighborhoods—unless we change the basics of travel in California. We need to take action now to deliver a sustainable transportation system that provides the mobility and accessibility necessary for a prosperous economy, and to find ways of doing so that also assure a healthy environment, social equity, and a high quality of life. Here are some ideas for managing, improving, and reworking our urban transport systems that are proven best practices and, with legislative leadership, could be more widely utilized. ➤

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URBAN TRANSPORTATION SYSTEMS: THE CHALLENGE

For many decades, in the US and elsewhere, growth has been associated with increasing use of motor vehicles and increasing vehicle miles of travel. Even if current high fuel prices and economic woes moderate VMT increases, population growth in California will continue to push VMT upward. In addition, the private automobile totally dominates travel. For the journey to work, arguably the most transit-amenable trip, less than three percent of California's workforce uses transit. Similarly small shares of the populace walk or bike to work on a regular basis. For other trip purposes such as shopping, the auto is even more dominant. In most areas fewer than one percent of non-work trips are on transit and only a few percent are on foot.

The most obvious reason that auto use is prevalent is that for most trips, it is by far the most convenient means of travel. For most of us, the car provides door-to-door service, protection from the elements, and speeds higher than the competition, even during congested periods. Another reason for auto dominance is that single-use, low-density land development creates conditions where distances are too long for walking or biking to be practical, and demand is too low to justify intensive transit services.

Critics also point out that the automobile has been under-priced. Motorists cover only some of the costs of the streets and highways they use and do so indirectly, so that the costs are hidden (e.g., through developer exactions or sales taxes rather than gas taxes or other user fees.) As Donald Shoup has often pointed out, "free" parking supports considerably more auto use than would occur if parking were priced to recover its costs. In addition, the costs of air pollution, noise, habitat disruption, water pollution from runoff, greenhouse gas emissions, auto-related deaths and injuries, and congestion and delays are either externalized completely or are only partially covered by auto users. Certainly the under-pricing of auto use has led to over-subscribed roads and highways, but with nearly everyone dependent on autos for transportation, changing direction is both politically difficult and could have some unintended effects on social equity and the economy.

However there are increasing reasons to search for a new direction. With half of California's greenhouse gases coming from transportation, over four-fifths of that from urban travel, meeting the state's climate change targets will be difficult unless a new paradigm emerges. More energy efficient cars and low carbon fuels will certainly have to be a big part of the shift, but it is unlikely that either will be sufficient to achieve climate stabilization targets in the time available. Nationally, a recent study by the Center for Clean Air Policy estimated that even with an aggressive expansion of low-carbon-emitting vehicles, CO₂ emissions will still increase

by forty percent between 2005 and 2030 due to more and longer motorized trips. That is, VMT increases will swamp the effects of cleaner-fuel technologies. Therefore demand management must be considered the complement to new technologies.

INNOVATIVE PARTNERSHIPS TO REDUCE TRANSPORT DEMAND

As part of a broader agenda for advancing sustainable transportation solutions, more aggressive demand-side initiatives are needed. An important point here is that demand management covers a wide range of strategies, allowing measures to be matched to specific needs and opportunities. For example, strategies for managing demand can range from greater use of time scheduling (e.g., flextime, four-day workweeks, telecommuting) to expanded mobility options (transit pass programs, carsharing, shuttle services) to pricing strategies (congestion pricing, carbon fees, parking fees) to coordinated land use/transport planning (pedestrian-friendly communities, transit-oriented development). The central idea is to make more efficient use of scarce resources, be they fuel supplies, clean air, or peoples' time, by shifting demand by hours of the day, modes of travel, and locations of urban activities.

Public-private partnerships can be a key approach for each of these strategies. For example, public-private partnerships that invest in and encourage commuting by transit, carpool, bike, and foot could transform transportation opportunities for commuters. Employers, commercial building managers, office park developers, and organizations funded by these private sector groups would work with employees to support commuting by public transport, company buses, carpooling, cycling, or walking. Cities could also allow these same organizations to follow flexible parking standards—i.e., to provide fewer spaces—when adopting these other enhanced mobility options. A lower parking requirement would be a cost savings that could help fund alternative modes. It would also make housing more affordable for those who opt to live near transit stations, increasing transit ridership in the process.

Private partners could introduce such measures as deep-discount or free transit passes, shuttles to and from transit stops and other important destinations, commute allowances, and pricing parking to rebalance commute options in favor of more sustainable modes of travel. They could offer private shuttles to bring their employees to work and home again. They could make carsharing available to employees for midday trips and emergency travel, reducing their need for cars. These measures would reduce total demand and thus lower greenhouse gas emissions, congestion, and other traffic problems, while maintaining good access and mobility for the travelers. While more pro-active employer

participation might be rewarded by a more productive workforce, for other private interests, direct financial incentives might be necessary to prod them into action. Carbon credits or corporate tax write-offs are two possible examples.

While private sector actions could make important contributions on their own, and deserve support for that reason, far more could be accomplished by coordinating public sector investments with private sector initiatives. For example, public agencies could invest in transportation improvements that would make transit use, carpooling, and walking excellent choices for commuters. Promising measures would include priority treatment for transit and other high-occupancy vehicles, high frequency and direct or express transit services to major employment centers, and high-quality bike and pedestrian networks linking employment centers to transit stations, restaurant districts, residential areas, and other desired destinations. On the land-use front, governments can also lead by example in many ways: for instance, by siting public offices near transit stations, or by following the lead of the state of Maryland, which offers “Live Near Work” relocation allowances and financial incentives for civil servants.

Public-sector partners could further reward high-performance employment centers—for example, those that achieve at least 25 percent of their work travel by modes other than drive-alone—by funding part of the cost of the workplace-based programs. Over time, as transit and other commute alternatives improve and ridership grows, targets for performance could be stepped up and rewards increased (consistent with increasingly rigorous targets for greenhouse gas reduction.) Similarly, local governments could offer credits and offsets against impact fees and exactions for projects in walkable, mixed-use communities and locations well-served by public transit—i.e., the kinds of places that reduce vehicle trips and thus relieve the need for expanding road capacity.

Successful examples of employer-based programs abound in the Bay Area—Google’s far-reaching employee shuttles, Bishop Ranch’s award-winning commute alternatives program, UC Berkeley’s deep-discount transit passes for students and employees, and dozens of companies that offer shuttles to get employees the “last mile” from the transit station to the workplace and back again. Companies also provide commute allowances and/or parking cash-out (the funds can be used to pay for parking, transit passes, or a new bike for commuting), offer non-drivers guaranteed rides home in case of emergencies, and, increasingly, participate in carsharing programs so employees have access to a car when they need one without having to drive theirs to work.

As another option, employers and local governments could run shuttles jointly, not just for employees but serving other



community residents as well. Community partnerships could help visitors, hotel guests, and community residents get to transit all day long, as well as get employees to work in the morning and help everyone travel to restaurants, gyms, doctor’s appointments, or shopping. The Emeryville-Go-Round, a free shuttle paid for by employers, hotels, and retail establishments, is an example. Employers are also key implementers for flextime and telecommuting, as a way to reduce travel at peak times and throughout the day. Local governments could work with major employers to help them adjust work schedules in coordination with additional or shifted public transit schedules. They could also seek to more evenly spread the days of the week when employees on four-day work schedules work at home.

By rewarding success in such programs with public investments targeted to make them even more effective, the public sector would forge a valuable partnership for transportation sustainability. By giving California travelers top-quality travel alternatives and incentives for using them, particularly during congested commute periods, we can go a long way toward achieving sustainability goals. ➤

GETTING THE PRICE RIGHT FOR TRANSPORT SERVICES

Transportation bottlenecks in the state's large metropolitan areas threaten our economic competitiveness, but our pricing strategies for transportation provide no incentive for more efficient use. Our cents-per-gallon gas taxes, same-price-all-day bridge tolls, and flat-rate (or free) parking spots hide the true costs that heavy auto use imposes—in time, money, and community and environmental damage—especially in the congested peak periods.

Getting the price right while maintaining mobility and access for everyone is not easy, but it is proving to be an increasingly important strategy across the US and abroad, as shown by experiences with congestion pricing in Stockholm, London, and Singapore. Charging more for peak period travel not only reflects its true higher cost, it also generates funds needed to improve transport facilities (roads, transit, and other commute alternatives). In fact, this is one of the few strategies that can both help tame congestion and raise the revenues needed to offer good alternatives and offset the cost for low-income travelers.

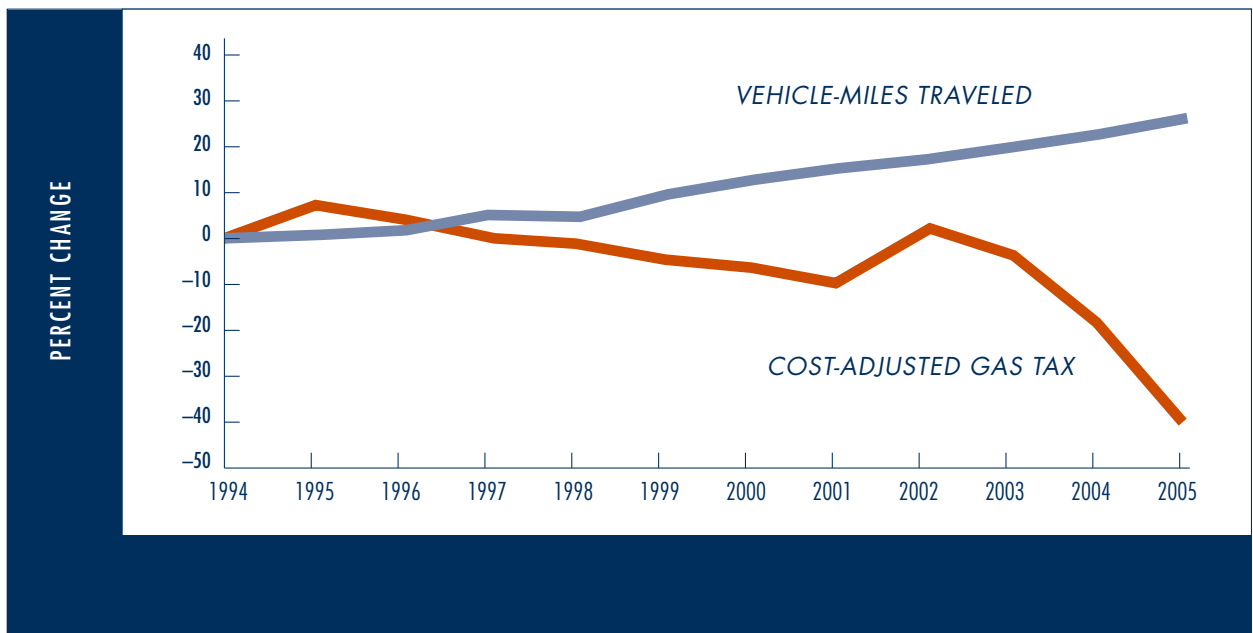
Three strategies are increasingly being implemented across the US and abroad: high occupancy/toll (HOT) lanes, parking pricing, and cordon pricing. HOT lanes help vans, shuttles, buses, and carpools travel fast during peak periods, avoiding congestion; those solo drivers who are in a hurry could also use HOT lanes,

paying tolls that not only help pay for the lanes themselves but also support commuter transit, shuttles, and carpools. Experiences with HOT lanes in California, notably SR 91 in Orange County and I-15 in San Diego, show these facilities are hardly “Lexus Lanes,” instead being used by people of all income levels as needed, such as when running late for work or when personal stress is high. Parking pricing, which could be implemented by both public and private sectors, might not only recover the costs of these expensive facilities but also generate funds to pay for commute alternatives and mitigate environmental problems from parking, such as water run-off. Finally, in certain highly congested districts and corridors, such as downtown San Francisco or the Livermore Pass, road pricing could help the many people who work and do business there travel faster and more reliably, with revenues from tolls going to support transit services not only in the city itself but in outlying counties.

Pricing strategies could not only help moderate, reduce, or shift transportation demand, but also could help offset declining gasoline taxes. Fuel-efficient vehicles, while good news from an energy conservation and greenhouse gas perspective, will exacerbate transportation funding shortfalls as long as the gas tax is a fixed cents-per-gallon. Also, rapidly rising highway construction costs during a period of rapid increases in travel have dramatically

FIGURE 1

Percent changes in travel and gas tax (adjusted for highway construction costs) in California, 1994–2005
(Note: Recent gas price increases coupled with economic downturn have flattened VMT growth.)



eroded the purchasing power of gas-tax proceeds (Figure 1). The seriousness of this problem has finally been recognized at the federal level, but so far no clear policy direction has emerged from the commissions that have been studying options. An increase in the state gas tax could be coupled with other pricing strategies. Alternatives to consider are fees based on miles traveled using available GPS and information systems technologies, weight-distance fees for commercial vehicles (as currently practiced in Oregon), carbon taxes, and peak-period surcharges (for cars and transit).

While the equity implications of such fees certainly need to be evaluated, previous work makes it clear that sales taxes, which many counties have used to supplement their transportation revenues, are in fact far less equitable than other transportation pricing approaches. Sales taxes have also proven to be problematic in periods of economic downturn, when they decline sharply. Because they are not directly tied to transportation use, they provide no information to consumers about the costs of travel. Given the need to find new revenue sources for transportation, a serious evaluation of the economic, social, and environmental effects of different instruments is in order. Pricing strategies, we believe, should be toward or at the very top of revenue options considered by local and state leaders.

INTEGRATED TRANSIT NETWORKS THAT SHAPE REGIONAL GROWTH

Transit has maintained ridership but has lost mode share in most of the US. If transit systems are going to play a role in shaping California growth and reducing greenhouse gas emissions, they must be competitive and extensive. Conventional forms of transit don't perform well in the low-density suburbs that characterize much of California's growth. However, in at least some of these suburbs, lower-cost shared-ride services—such as community shuttles, shared-ride taxis, dynamic ridesharing, and electric-powered station cars—could serve a useful transit-like function or provide low impact access to transit stations.

Today, however, in much of the state, transit services are narrowly conceived and not well coordinated. Few transit agencies see their job as offering mobility services; instead they see themselves as bus or rail operators. They have failed to offer a full range of services matched to markets. Transit agencies in adjacent districts or counties too often operate on uncoordinated schedules, with different hours of operation and different fare policies and payment media—a problem particularly magnified in the Bay Area, where 27 operators ply their trade. Transit agencies also have been stymied from providing the best possible service by the inaction of



street and highway operators and local governments. Too often, transit is not given priority for road space in the cities and regions it serves. Buses are stuck in traffic instead of enjoying dedicated lanes and priority treatment. Transit routes and stations often lack the pedestrian and bike networks, bike parking, passenger shelters, and information systems that would make transit use faster, more convenient, safer, and more enjoyable. Where public transport offers a reliable, customer-service-oriented alternative to driving, it has been able to capture a substantial share of travel. Transit agencies and their partners must tackle the service/pricing/institutional integration issues that limit transit effectiveness, or regional agencies should be given the mandate to step in and do so.

COORDINATING LAND USE AND TRANSPORTATION

While much can be done to manage demand through travel choices and pricing, the pattern of land use strongly shapes how transportation services are used, as well as what transportation services can be offered cost-effectively. The most basic strategy for changing travel behavior is to create more walkable communities. This means not only having safe and comfortable facilities for walkers—sidewalks and trails—but also places to go that are within walking distance. Cities planned with shopping and employment within walking distance of many residents will be more convenient, more sustainable, and healthier places than those that rely almost entirely on motorized travel. ➤



Coordinating land use with transit investment allows for larger scale and higher density development and can shape a regional development strategy. Transit-oriented development, or TOD, has been proven to reduce travel by ten to forty percent compared to the auto-dependent single-use development patterns common in many suburban areas. The sizeable range reflects, among other things, the quality of transit service offered at the TOD, and the size and configuration of the TOD itself. In the case of the Montelena apartment complex near the Hayward BART station, a 2007 study found the average daily number of vehicles coming in and out of the project was 63 percent less than what the Institute of Transportation Engineers (ITE) *Trip Generation* manual predicts. This is mainly because households that live in TODs, even when adjusting for income, tend to own fewer autos. This should be accounted for not only in setting parking codes but also in granting mortgages to home-buyers, since fewer outlays for owning and using a car frees up money for housing purchases.

TOD reduces trips by providing moderate- to high-density housing, employment, and services within walking distance (ten to fifteen minutes) of a well-served transit station. Space is provided in the TOD for land uses that meet the TOD population's daily needs (e.g. groceries, pharmacies, cafes and restaurants, banks, bookstores, clothing stores, office supplies, small offices) perhaps in the first floor of office buildings, perhaps in a Main Street shop-

ping district. Special attention is given to making the TOD a comfortable and attractive place for walking, biking, and enjoying the urban environment, as well as a good place to catch a train or bus.

Some people may choose to live and work in the same TOD; others will live there and use the TOD's high-quality transit service to commute to work and elsewhere; still others use their cars for commuting but will walk around the TOD to shop, attend an event, or do business. Because it accommodates a mix of housing types and provides convenient, nearby services, TOD—if it is well planned—can simultaneously help meet housing needs for a variety of incomes, age groups, and life styles, including families, singles, and seniors; reduce auto dependence; create environmentally sound, economically robust, successful communities; *and* deliver riders to the transit system. It also enriches choices in living environments, something that is woefully in short supply in many of California's suburbs and exurbs.

While in some places TOD takes decades to develop, the fast growth rate in California provides an advantage—the state can accommodate substantial amounts of our future growth in TOD. Also working on California's side is its demographics, notably a large population of immigrant households, many from places with a heritage of transit-oriented living. However, TOD also faces barriers, including the higher costs and complexities of infill and mixed-use development. Impact studies that assume that, regardless of location, all development will generate the same auto ownership rates (hence parking requirements) and the same auto trip generation (hence traffic impact fees) are also a substantial barrier and should be changed. Incentives to provide mixed-income housing in TODs are necessary so that TOD doesn't become priced beyond the reach of the workers providing services there.

TOD also will be less effective if it is treated as “transit station exceptionalism” rather than a key strategy for regional development. Building a few mixed-income projects around TOD will increase housing and travel choices for some, but will not make a big difference in congestion, emissions, or greenhouse gas emissions if at the same time local jurisdictions continue to approve low-density single-use housing tracts scattered across the landscape. A few islands of TOD in a sea of auto-oriented development will fail to draw many Californians to trains and buses. International experiences, such as from Stockholm, Copenhagen, Tokyo, and Singapore, show that TOD works best when designed and coordinated along linear axes, forming a “necklace of pearls.” As regions in both northern and southern California expand beyond their traditional boundaries, either far more explicit and forceful inter-regional coordination or state intervention is needed to keep growth patterns sustainable and transit services effective.

TRANSIT-ORIENTED CORRIDORS:

TOD AS A STRING OF PEARLS

California has two major growth issues on which to focus. One is the role of metropolitan and intercity transport infrastructure—including both roads and possible high-speed rail investments—in shaping urbanization, especially in the Central Valley. The second area needing attention is the un(der)planned spillover of growth into agricultural areas and the Sierra foothills and deserts around the San Diego-LA and Bay Area-Sacramento “megaregions.” In both cases, the emerging growth patterns are tied to transportation investments, but are driven in large part by housing affordability and quality-of-life issues in existing cities. Unless it is well managed, growth in these areas could easily have serious negative impacts on the state’s waterscape, its native species, and its agriculture. Multi-sectoral coordination of planning, implementation, and state funding is urgently needed. Clearly, metropolitan planning organizations (MPOs) currently lack the authority to manage growth that spills well beyond their boundaries but nonetheless affects their traffic, environmental quality, and economic well-being. Pro-active action at the state level is needed. The current Blueprint planning efforts taking place around the state are a good start, but they must be tied to performance measures and implementation mandates if they are to be truly effective.

POLICIES AND RECOMMENDATIONS

While urban growth in California faces major challenges, growth also provides an opportunity to reshape cities and regions for a more sustainable future. The need to reduce greenhouse gases and maintain global competitiveness means that new directions must be found, including new technologies for transport, but going well beyond that to demand management and greater coordination of transportation and urban development. Innovative public-private partnerships for commuting and beyond, the use of pricing for parking and road use, improved transit coordination and services, investment in transit-oriented development, and better management of growth associated with new transportation infrastructure are important strategies for reducing total travel demand without reducing access and mobility. Directing discretionary funds toward these ends would be a start. Specific actions that could be funded with current and future revenues and supported with legislation include the following:

- Providing new incentives and rewards for employers and private sector managers to implement flexible parking, employer shuttles and other mobility options, flextime, and telecommuting.

- Granting MPOs and congestion management agencies and cities the authority to test and evaluate road pricing and tolling in those areas and corridors where public support for such actions can be developed—and possibly funding pilot demonstrations.
- Establishing benchmarks for transit performance, with funding and technical assistance tied to meeting the initial benchmarks and then to improving them; encouraging coordination among adjoining transit districts, employers, and cities.
- Assisting local governments and transit agencies to design land use plans, zoning, ordinances, and building codes for TOD; providing funding for hard-to-finance pre-development costs for TOD plans, coordinated with affordable housing plans.
- Taking a leadership role in coordinating urban development around high speed rail and other major intercity transport investments.
- Creating a stronger institutional framework for managing growth in the Central Valley and Sierra foothills. ♦

FURTHER READING

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A STRATEGY FOR INFRASTRUCTURE

THE CALIFORNIA INFRASTRUCTURE INITIATIVE

BY DAVID E. DOWALL AND ROBIN RIED

CALIFORNIA'S PERFORMANCE-BASED INFRASTRUCTURE INITIATIVE



California has an enormous backlog of infrastructure investment needs, estimated to be in the range of \$80 billion over the next decade. The state also faces substantial shortfalls in tax receipts due to faltering economic conditions, so its ability to finance this investment is not certain. To attempt to fix this state of affairs, Governor Schwarzenegger announced a Strategic Growth Plan in 2006; in the same year, voters overwhelmingly supported a package of new bond issues totaling \$43 billion. Then this year the governor proposed two critical infrastructure policy institutions: The Strategic Growth Council and the Performance-Based Infrastructure Initiative (PBI California). The Council's objective is to improve interagency infrastructure planning and coordination, and to better align investment proposals with strategic development and sustainability objectives. The proposed PBI California Initiative focuses on infrastructure procurement and project delivery. It has the potential to deliver significant payoffs, such as faster and more cost-effective delivery of projects, value for money invested, and the possibility of attracting private capital for infrastructure investment.

Both of these initiatives are a good start. However, state-level elected officials and key stakeholders have raised broader concerns that also need to be addressed. These include dialogue about how the state's infrastructure investment priorities should be set, especially when trying to balance investments across different sectors such as transportation, education, water, and facilities. State and local agencies need tools to help them identify the most efficient projects to meet consumer and business demand for services, as well as better manage existing infrastructure services to improve productivity and accountability.

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This paper outlines a series of actions that the state might consider to broaden the governor's current initiatives. Throughout the paper we refer to these proposals as the California Infrastructure Initiative (CII). The overarching goal of CII is to provide customers—citizens, taxpayers, businesses, and other stakeholders—with the most efficient and sustainable infrastructure services at the lowest possible cost, holding public and private sector providers and managers of infrastructure more accountable to customers. CII can also help tap new sources of capital to finance infrastructure.

In broad terms the CII policy framework operates at four levels: 1) helping set infrastructure investment priorities that meet state strategic development goals; 2) identifying which infrastructure projects most effectively provide critical services; 3) determining the most effective project delivery method; and 4) ensuring that existing infrastructure services are provided efficiently. ➤

Infrastructure services—mobility, safe and reliable sources of water, sustainable development, knowledge creation and transfer, and personal security—are critical determinants of a society’s current and future well-being.

The CII framework is based on several key premises. First, infrastructure services—mobility, safe and reliable sources of water, sustainable development, knowledge creation and transfer, and personal security—are critical determinants of a society’s current and future well-being. High-quality infrastructure helps businesses compete for expanded economic opportunities in a globalizing world. It also protects our environment from the threats of climate change and natural and man-made hazards, and creates a socially cohesive and high quality of life. Therefore governments like California, Canada, Spain, and the UK are realizing that they must carefully target infrastructure investments to achieve strategic goals.

The second premise is that decisions about infrastructure planning, delivery, and management should be guided by outcome-oriented measures rather than input or budget amounts. Outcomes such as the quality of services and how they are valued by customers should be measured in economic terms so that comparisons can be made across sectors and among alternative projects. This includes new investments as well as existing infrastructure services.

Thirdly, the CII policy framework adopts a flexible and performance-based approach to determining the most efficient method for infrastructure delivery. Should the public sector provide the service? Or should the private sector do so? Which offers the most value for money? CII provides the metrics to make meaningful comparisons across different types of infrastructure investments. It offers tools to ensure accountability and creates incentives for infrastructure service providers to deliver value for money. It also helps policy makers identify the most effective and efficient means for project delivery.

The CII framework includes eight interrelated activities. The activities include visioning, determining what infrastructure services are needed, choosing the best method of project delivery, ensuring value for money, promoting demand aggregation, providing technical and policy assistance, helping negotiate, and sharing knowledge. Each of these elements is outlined below. Some of them can be implemented individually, in clusters, or as an integrated package.

VISIONING

Currently, California does not engage in the preparation of strategic development plans, visioning processes, or multi-sector investment planning. Fortunately both the legislature and the administration recognize these shortcomings. The governor’s office has acknowledged the limits of the current “silo approach” to capital investment planning, and the legislature has adopted several important pieces of legislation to improve cross-sector coordination and to more closely link investments with statewide strategic development goals. AB 1473 and AB 32 lay the groundwork for more strategic, coordinated, and outcome-oriented capital investment planning. These intentions from the legislature and the administration are very positive and consistent with the types of visioning and strategic planning tools used successfully by other governments to help policy makers set investment priorities, coordinate cross-sector investments, and ensure maximum synergies.

Canada, for example, prepared a long-term strategic economic plan, called Advantage Canada, that outlines several areas the government will focus on in the years ahead. Areas include a “tax advantage” (lower, more competitive rates), a “fiscal advantage” (reduce and eliminate debt), an “entrepreneurial advantage” (lower taxes, less red tape), a “knowledge



advantage” (highly-educated and trained knowledge workforce), and an “infrastructure advantage” (ensuring the seamless flow of people, goods, and services).

The Government of Canada then developed a comprehensive, long-term infrastructure planning and development initiative, Building Canada, that provides a framework for the federal government to manage and coordinate federal investments and collaborate with provinces, territories, and municipalities to meet goals of supporting the well-being of Canadians and competing internationally. Federal government representatives met with leadership from provinces, territories, and the municipal sector to discuss and design the plan. Provincial governments also prepared their own strategic plans, based on explicit core values and naming specific goals.

The Australian provinces of Victoria and New South Wales, the city of New York, and the state of Washington have also recently launched processes to engage constituents in defining a baseline for service provision upon which a comprehensive infrastructure plan can be developed. These processes have delivered significant benefits, including defining goals for service delivery; ensuring consumer-based service delivery by engaging a diverse range of constituents; creating the basis for setting investment priorities and balancing competing needs across sectors; providing a natural framework for measuring performance and accountability; and earning broad-based public support and responding to public concerns early on.

Each city, state, and province has crafted the visioning process to inform its larger program for improving infrastructure and service delivery. Victoria, for example, >

As the intensity of public engagement increases, the need for greater management and oversight is likely to increase.

developed a plan called Growing Victoria Together (GVT), which offers a broad framework to guide government planning and decision-making over a ten-year period. It spells out ten broad economic, social, and environmental goals for Victoria. Each goal is matched with a set of clearly defined “progress measures” to guide government policy and action, inform the annual budget process and long-term capital investment plan, and provide the means for tracking progress to 2010 and beyond.

Citizen involvement lies at the heart of GVT, both in shaping the plan and in ensuring its long-term success. The Victorian government led discussions with community and stakeholder organizations and established an interactive website, asking the public for feedback on an initial draft of GVT.

Unlike other initiatives, the state of Washington did not engage the public at large in its visioning exercise, demonstrating one example along the spectrum of approaches that California has at its disposal in developing the CII. This spectrum highlights some of the tradeoffs associated with public engagement: as the intensity of public engagement increases, the need for greater management and oversight is likely to increase, as does the expense of public engagement. On the other hand, as demonstrated by Victoria, high levels of public engagement may ensure a more accurate representation of demand for services and provide a stronger foundation for performance-based planning and accountability. Regardless of the selected method, however, there are dynamic and compelling examples of how visioning and strategic planning can be used to enhance infrastructure outcomes and performance.

DETERMINING WHAT INFRASTRUCTURE SERVICES ARE NEEDED

The next step of the CII is to determine which critical infrastructure services are necessary to achieve goals by examining alternatives. Can objectives be met through adjustments and enhancements to existing facilities and services? AB 1473 provides the legal and administrative framework for preparing capital investment plans, and much of the groundwork was established in California’s Performance and Results Act. The Department of Finance developed a performance budgeting pilot project, which proposed using a value-for-money analysis process to determine the most cost-effective method of service delivery.

An outcomes-oriented approach to infrastructure service provision allows governments to explore various ways of delivering desired outcomes, including alternatives that don’t involve capital investments. Prior to proposing new facilities, the CII would encourage—or perhaps require—project proponents to explore the full range of options available. Unfortunately, California agencies are not currently required to prepare such evaluations as a component of their capital budgets. The US federal government as well as other countries and governments offer some useful examples of how this can be done.

At the federal level, the United States Office of Management and Budget (OMB) and the Government Accountability Office (GAO, formerly the US General Accounting Office) prepared the 1997 Capital Programming Guide, which provides detailed guidance to federal agencies on planning, budgeting, acquisition, and management of capital assets.

It recommends that federal agencies consider a wide range of alternative approaches to satisfy their needs before purchasing or constructing facilities. It suggests that agencies consider options beyond direct service provision supported by capital assets, such as regulation, user fees, and human capital. Frequently, opportunities for achieving greater efficiency and efficacy can be identified by analyzing and comparing various means of providing services.

This CII element could be implemented independently. Visioning and strategic planning would of course be helpful, but requiring agencies to consider all options for meeting targets could be accomplished as a stand-alone initiative.

CHOOSING THE BEST METHOD OF PROJECT DELIVERY

There are a range of possibilities to consider when building new facilities or systems, including public provision, public private partnerships (P3s), outsourcing, leasing, and privately-built turnkey arrangements. The objective of this element is to explicitly consider all options and then select the one that is the most efficient. Current California law does not require state agencies to consider alternatives. The United Kingdom, Australia, and Canada are leaders in facilitating, implementing, and developing a market for P3s as an alternative method for delivering infrastructure services.

In 1992, the United Kingdom established the Private Finance Initiative (PFI), a national-level vehicle for facilitating public P3s, intended to open up opportunities for more private sector involvement in public services. Under PFI, the public sector procures services to the quality standards required by the government, rather than the government procuring a capital asset or other equipment and then operating it itself. PFI also entails transferring the risks associated with public service projects to the private sector in part or in full.

The Province of Victoria, Australia, developed Partnerships Victoria based on the UK's experience. The policy focuses on whole-of-life costing and full consideration of project risks. As the first of its kind in Australia, the policy aims to use the innovative skills and abilities of the private sector in a way that will most likely deliver value for money and improved services.

In Canada, the government established the Public Private Partnerships Fund to develop and facilitate P3s to finance and deliver infrastructure projects throughout Canada. The \$1.25 billion fund is geared toward expanding infrastructure financing alternatives in Canada, providing incentives for private investment, and increasing knowledge and expertise in alternative financing.

ENSURING VALUE FOR MONEY

Certainly, trying to choose the best method of project delivery is a significant step toward ensuring value for money. However, the process should be an ongoing one at all stages of government procurement, management, and operation. Some countries even require value-for-money audits. California does not currently have legislation requiring value-for-money audits or assessments of alternative procurement methods. The concept can be applied to all approaches to infrastructure delivery—public provision, design build, outsourcing, and P3s.

Washington state, for example, supports design-build as an alternative means for project delivery. Design-build involves bundling design and construction services by the private sector, whereas traditional methods typically separate design and construction into two distinct phases. A relatively new form of contracting, design-build can expedite delivery and potentially save costs, and it has been accelerated by federal programs in recent years, particularly in the transportation sector. More than half the states use this form of contract, but California currently does not. In 2003, Washington completed a highway interchange project via design-build that was equivalent in cost to a similar, traditionally delivered project, but saved about half the time. However, potential time savings may come at the expense of other values, including environmental review and organized labor, and thus >



this method may not be advantageous for all projects. Design-build should be assessed against other delivery options to determine which alternative offers the most value with respect to the state's goals and priorities.

As a platform for exploring alternatives, CII would provide a framework to assess the potential value and viability of delivering California's infrastructure projects through design-build versus traditional and other alternative methods. Value-for-money assessments could be independently initiated by the state of California through legislation or changes to the State Administrative Manual.

PROMOTING DEMAND AGGREGATION

One piece of low-hanging fruit, in terms of ensuring value for money, is demand aggregation. When multiple locations are buying similar products or services, demand aggregation—coordinating and consolidating purchases—offers benefits for both buyers and suppliers. Demand aggregation can lower infrastructure service costs in several ways, including volume discounts and reduced transaction costs—the costs of searching for providers, evaluating bids, and negotiating contracts. In California, demand aggregation is practiced, but not to the fullest extent possible. PBI California could expand demand aggregation across state agencies and promote it at the local and regional level.

The British experience demonstrates the advantages of demand aggregation, often referred to as bundling. In 2003, the UK Department of the Treasury introduced a system of bundling together smaller projects and then matching the bundles with a range of appropriate procurement models that offer value only on a larger scale.

Demand aggregation could be independently implemented without other CII elements and could achieve cost savings. However, an institution or agency will be needed to oversee the process and to facilitate and encourage it. The scope of the agency could be limited to aggregating demand, or it could be expanded to include other elements of CII.

PROVIDING TECHNICAL AND POLICY ASSISTANCE

CII will need to provide ongoing support to state and local agencies. The state should consider forming a CII office to build management capacity within state agencies and local governments. Comprehensive assistance programs are invaluable elements of the most successful initiatives to improve service delivery, including the United Kingdom's Partnerships UK initiative, Canada's Building Canada, and Partnerships Victoria programs.

The United Kingdom offers a sound model for providing technical assistance. Partnerships UK gives technical assistance to public sector partners and formal training in the technical skills and knowledge base needed to launch, manage, and evaluate public private partnerships.

HELPING NEGOTIATE

Support for state agencies and local governments negotiating complex procurement contracts is not now offered in California, but it is an element of the PBI California proposal. CII can look to several international examples to see how to offer effective support. For example, Building Canada promotes knowledge management with incentives to promote research, planning, and capacity-building with capital infrastructure funding. It also oversees a \$45 million program to support research, planning, and feasibility studies at the national level. Through these investments, the government of Canada aims to increase the knowl-



edge base available to support policy development and decision making at the provincial, territorial, and local levels, with the idea that this will reduce the cost of future infrastructure capital investments across Canada.

SHARING KNOWLEDGE

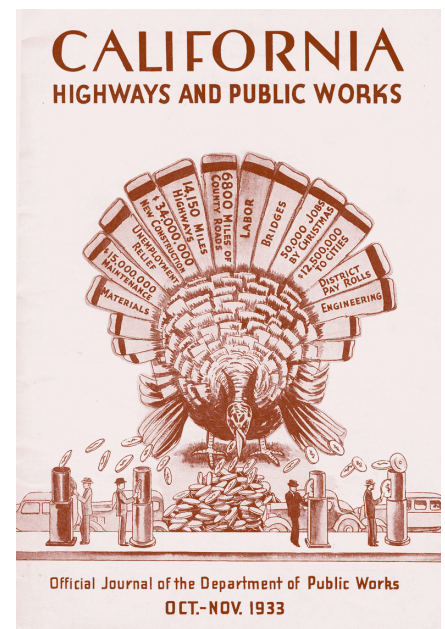
For the CII to succeed, agencies and leaders with knowledge about best practices and successful experiences must disseminate this knowledge across agencies and supply it to practitioners. At present, California does not have an agency tasked with knowledge leadership or technical assistance. The UK offers a useful example of how it can be done. Its departmental Private Finance Units have been structured to supply best practice information and support to procuring authorities, provide strategic management of the department's projects, and serve as centers of expertise on policy. The UK's PFI Operational Taskforce also offers a range of skills relating to financial, legal, and operational management. These include monitoring and maintaining a record of issues raised by the public sector, providing a help-desk facility for public sector managers, and gathering information on trends in issues that have been raised by the public sector and using this to inform guidance and best practice. The task force also responds to contractor difficulties, provides advice and guidance to the public sector, and gathers information across sectors on potential issues and conflicts so as to give early warning of problems.

IMPLEMENTING THE CII

Fortunately, the Governor's Office and the legislature have already taken a number of important steps to lay the groundwork for implementing the CII. Assembly Bill 1473 requires the administration to prepare a five-year state infrastructure plan. AB 857 requires any revision to the State Environmental Goals and Policy Report to be reviewed to ensure that changes are consistent with state planning priorities. The bill defines those priorities, including an emphasis on infill development and redevelopment, cultural and historic resources, environmental and agricultural resources, and efficient development patterns. AB 32 offers strong incentives to develop smart and sustainable infrastructure plans and programs that reduce greenhouse gas emissions. The Governor's Office has proposed a Strategic Growth Council to coordinate cross-sector infrastructure investment planning and programming, and the PBI California Initiative to foster performance-based infrastructure planning, project delivery, and management.

Now, the main challenge will be for the administration and the legislature to agree on how to build on existing legislation, and how to adopt CII's eight elements to foster efficient and sustainable infrastructure development. Since the details of the composition and work-scope of the Strategic Growth Council and the PBI California proposal are not fully developed, it would be possible for the administration and the legislature to collaboratively develop an acceptable model for implementation.

What we are proposing is not radical. CII is a comprehensive strategy, policy framework, and implementation tool for improving infrastructure planning, provision, and management. The CII builds on existing administrative and legislative initiatives and provides a road map for developing a more sustainable and efficient platform for building California's future. It can be used to help implement existing laws in a cost-effective manner. Most importantly, CII is based on tried and tested methods that have been successfully pioneered elsewhere. ♦



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California's Housing Problem

BY CYNTHIA KROLL
AND KRUTE SINGA

California's Department of Finance predicts that by 2030 the state's population will reach fifty million people—twelve million more than today. This will result in an estimated 2.7 million new households in the state. How should the state allocate resources to house the new population, and how will choices made today affect the state's economic, social, and environmental performance in the future?

California has faced two housing-related issues for decades: cost and location. In many urban centers, low- and moderate-income households live with home prices and rents that far outstrip basic affordability standards. Even upper income households pay more for housing relative to their income in California than in most other parts of the US. And what new affordable housing there is has largely been added in nonurban places and at urban peripheries, resulting in steadily increasing traffic congestion and commute times in the state's urban areas.

The housing “crash” of recent months might lead to the expectation that California's housing problems are ending. However, although plummeting home prices and home sales may provide some breathing room in a very tight market, larger issues remain regarding where housing is built, how related infrastructure is financed, and who can afford to live in and move into the state.

CALIFORNIA'S HOUSING SUPPLY

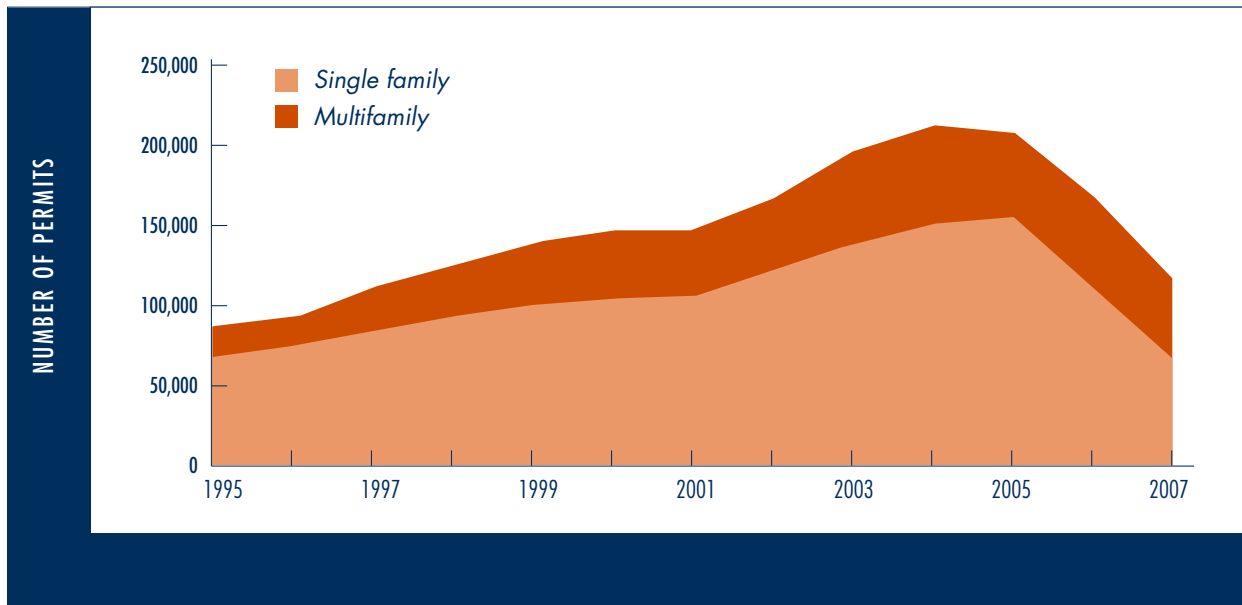
With home prices falling and subdivisions standing empty, it is hard to argue that California does not have enough total housing stock. New housing construction has been fairly strong since 2000. California housing stock grew from 12.2 million in 2000 to 13.3 million in 2007, an increase of about 1.1 million homes, or 9 percent. The number of households grew by 8.9 percent.

Housing and households lagged behind population, which grew by 11.2 percent from 2000 to 2007. This is at least in part due to differences in household size and growth rates by ethnicity; the Hispanic population, which has traditionally had a larger average household size than other groups, has grown faster than other population cohorts in California. During periods of strong population growth, California has had low rental and homeowner vacancy rates. In 2004, only Vermont and New Hampshire had lower rental vacancy rates than California; the state also had the third lowest homeowner vacancy rate (less than one percent) of states with populations of five million or more.

By 2007, California's rental vacancy rate had eased only slightly, but the homeowner vacancy had moved much closer to the US median. Strong residential building activity since 2000 contributed to this change. In 2004 and 2005, California single-family residential building permits reached their highest level since 1989 (see Figure 1). In the past two years this construction level has declined. The current low rental vacancy rate suggests that the building boom of the mid-2000s was not sufficient to overcome shortfalls in rental housing that built up in the 1990s. ➤

FIGURE 1

California total residential building permits, 1995–2007 (single family plus multifamily)



Source: California Construction Industry Research Board

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HIGH COSTS AND LIMITED AFFORDABILITY

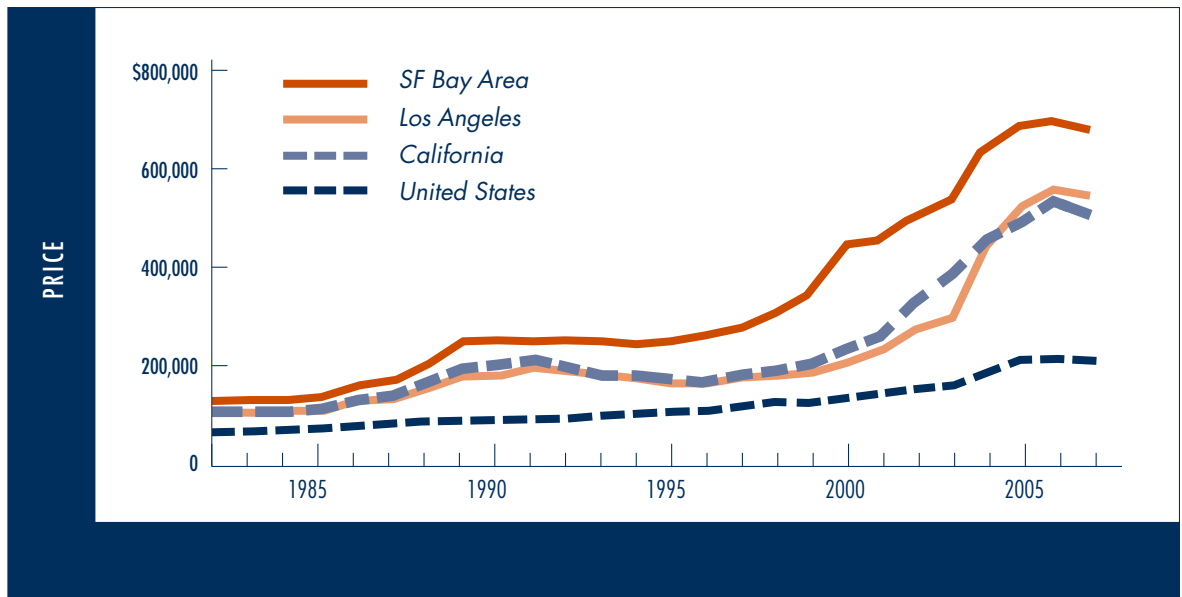
California housing costs are far higher than the nationwide average. Figure 2 shows that California median home prices were almost 2.5 times the national level in 2007, and San Francisco Bay Area prices were more than three times the US level. Quality of life, the global housing market affecting some of the state's major urban centers, and constraints on adding new supply all contribute to this difference. Rental differences are less extreme, although gross rent for Californians is 35 percent higher than national levels. California household median incomes are higher than US median incomes by 17 percent, not nearly enough to outweigh the higher costs of buying a house.

Statewide, Californian renters pay on average 32 percent of their household income on rent, compared to 30 percent nationally. This seems like a small difference, but it masks the significantly higher shares of low- to moderate-income workers who pay more than 35 percent of their household income for rent (as shown in Figure 3).

The rental housing situation varies widely among counties. Detailed data is not available for many counties, so we use a modified version of a rental affordability measure developed by the California Budget Project in *Locked Out 2004*. We examine how much of their income full-time workers at the median wage level and at the 25th percentile wage level must pay to afford a fair market rent in each county. The least affordable counties are coastal urban markets where job growth has been strong and supply constrained by factors such as growth controls, water requirements, land availability, congestion management, habitat and coastal protection, and homeowner protests. The most affordable are north central nonmetropolitan counties with limited employment opportunities and fewer supply constraints (see Figure 4). ➤

FIGURE 2

Median home price, existing homes, 1982–2007

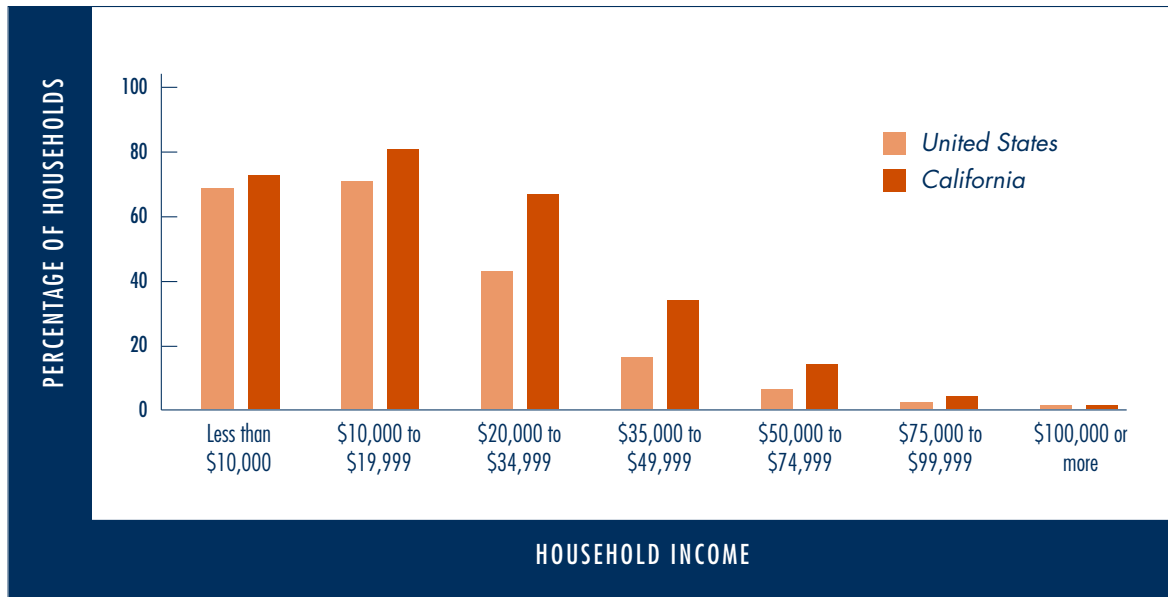


Source: California Association of Realtors & National Association of Realtors

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FIGURE 3

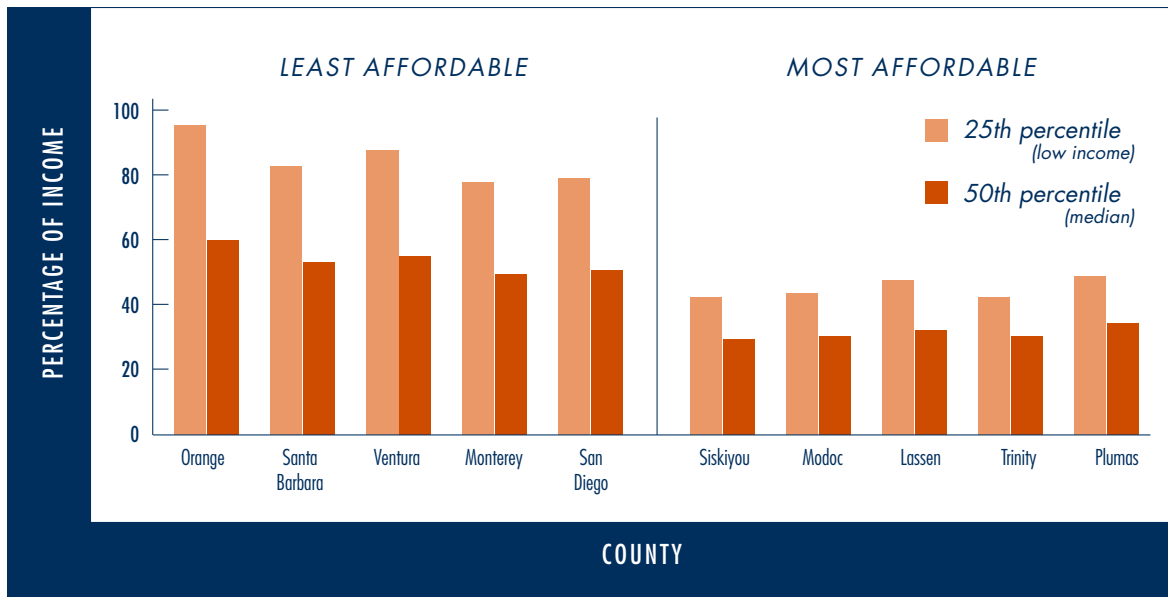
Households that spend more than 35% of their income on rent



Source: US Census Bureau, 2006 American Community Survey

FIGURE 4

Least and most affordable rental markets in California (percentage of income needed to rent a two-bedroom apartment)



Source: Employment Development Department and California Budget Project

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THE MORTGAGE MELTDOWN AND CALIFORNIA HOUSING

National economic and policy factors have also helped push the housing market into its current condition. The ready availability of credit for home buying during the past decade certainly affected the California market. The homeownership rate rose from close to 55 percent in the mid 1990s to over sixty percent in 2006. California home values rose an average of ten to eleven percent *annually* from the first quarter of 1995 to the middle of 2006. The first three of those years involved price recovery from the previous recession, but over ninety percent of the growth occurred after 1998. While home prices in California have recently dropped, state prices are still well above the national average. (Even if prices were to drop thirty percent, there would still be a large cost gap between California and the rest of the US.)

California is more heavily exposed to the subprime problem than many other parts of the US. Of all outstanding home loans in California in December 2007, 15.4 percent were subprime loans, compared to 12 percent nationwide. Almost thirty percent of California's subprime loans were delinquent at least sixty days in December 2007. The more affordable parts of the state had a higher share of subprime borrowers, and now face higher levels of default and foreclosure (see Figure 5). Many of the more expensive areas in the state have been much less affected by both exposure to the problem (in terms of the share of subprime loans) and current levels of defaults and foreclosures. Thus this crisis, at least for the present, is skewing home prices by lowering them further in the more affordable markets, rather than where prices are highest.

JOBS-HOUSING BALANCE AND THE COMMUTE CONNECTION

Where people live in relationship to their jobs determines not only the length of their commutes, but the modes they choose, how much time they spend traveling, their commute costs, and environmental consequences of their travel. Traffic congestion increases and commutes lengthen as people move farther from their work because housing growth and affordable housing have failed to keep up with demand generated by population and employment growth. One way to look at the relationship between job growth and housing growth is by examining the jobs/housing balance.

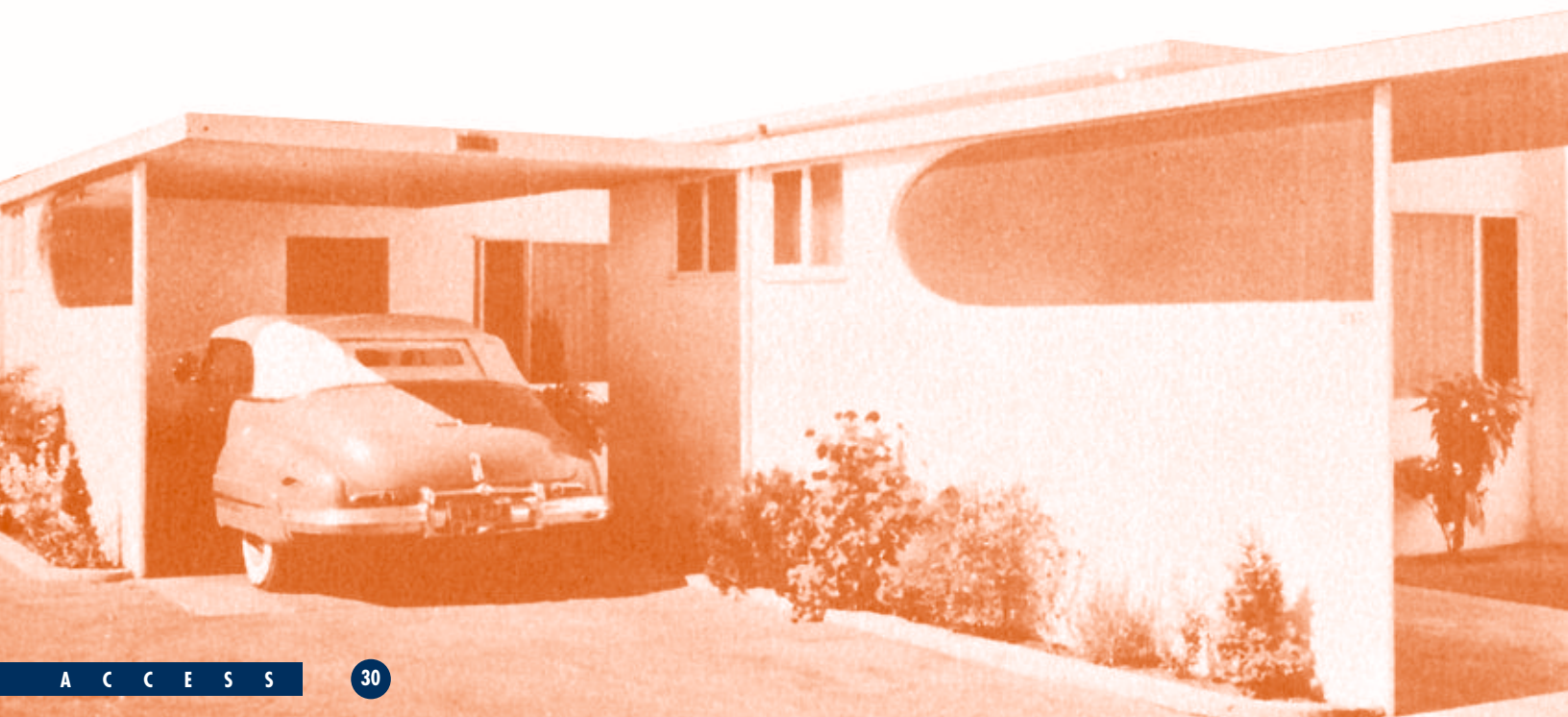
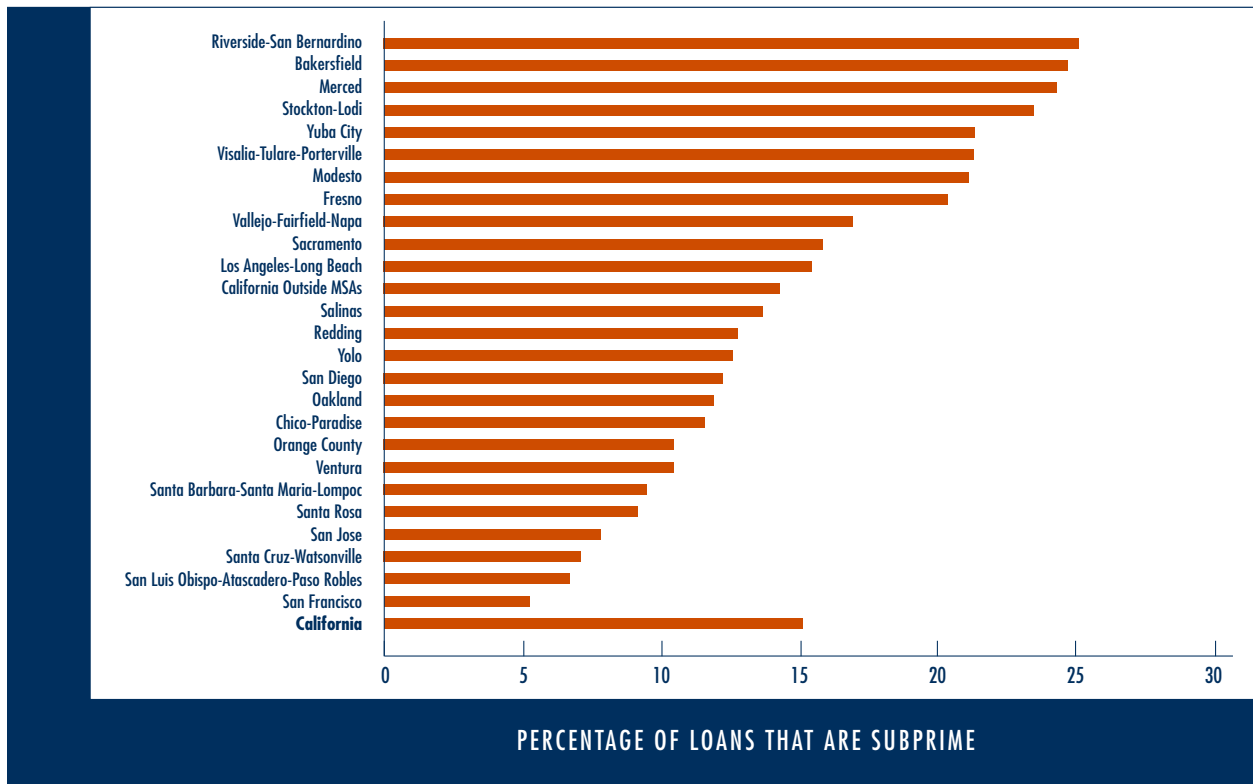


FIGURE 5

Subprime loans as share of loans outstanding



Source: First American CoreLogic, Loan Performance

If we only consider statewide averages, it might seem that California is doing well on this measure. Because California lost jobs or experienced very low employment growth between the third quarter of 2001 and the fourth quarter of 2003, state housing growth looks good relative to job growth: California added 1.7 housing units for every new job between 2000 and 2006. Since California's households have an average of 1.3 workers, this seems a more than adequate ratio of housing construction to job creation.

However, the picture is more complicated at the county or metropolitan area level. Some counties with job losses or slow employment growth have improved their housing situation. For example, between 2000 and 2006, the San Francisco Bay Area still had not regained jobs lost since 2000, but added almost 135,000 housing units. Los Angeles County added 4.6 housing units for every new job. But other urban areas where job growth was strong did a much poorer job of meeting housing need. San Diego County added only 0.75 housing units per job, and Orange County only 0.38 housing units per job.

In contrast, a number of Central Valley places added more housing than jobs in anticipation of growing demand. San Joaquin, Stanislaus, and Merced counties exemplify the spread of relatively affordable housing to (or beyond) the periphery of a metropolitan area, in this case the San Francisco Bay Area, to serve existing jobs in the core metro area as well as expected job growth in the future. These areas are now ground zero of the subprime meltdown. Meanwhile, traffic congestion has grown in all California metropolitan areas, >

and those areas where housing growth lagged behind job growth have experienced the biggest increases in congestion (see Figure 6).

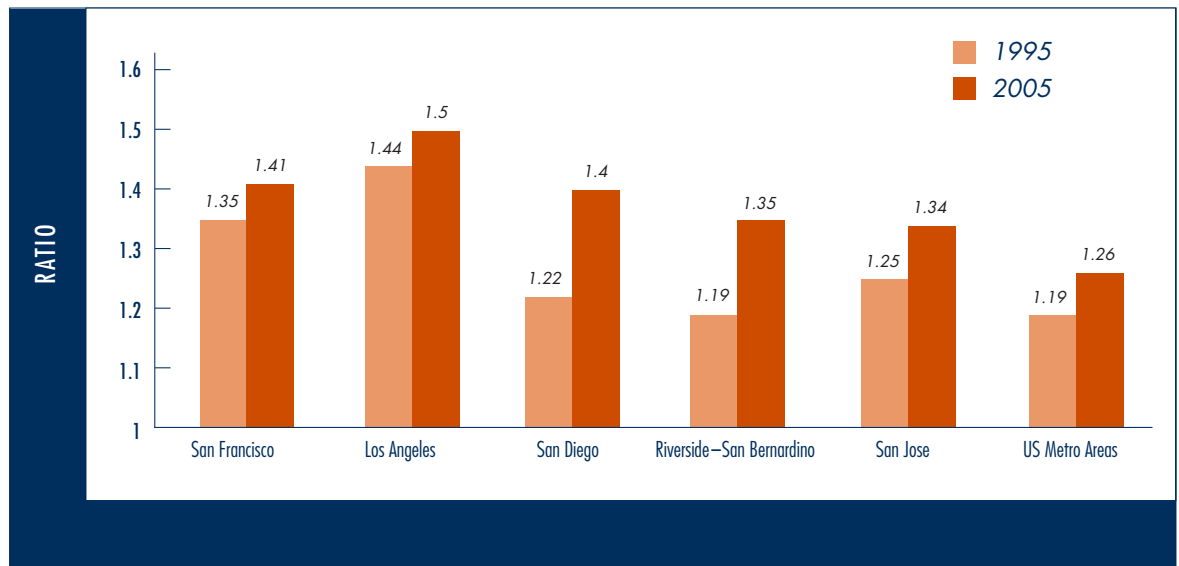
Our research shows that housing costs are higher where there are fewer housing units per job. Even strong housing development can fail to make housing more affordable if it does not keep pace with even stronger job and household growth. For example, the Riverside and San Bernardino areas grew their housing supply between 2000 and 2007, but the job supply grew even faster, and the number of households grew faster than housing units. Both counties have high rents relative to wage levels, due to a combination of relatively few multifamily units and relatively low wages compared to other parts of the state.

Not surprisingly, at the more expensive end of the housing market, the problems are worse. Ventura and Orange counties, with the least affordable housing in the state, have low housing-to-job ratios, and housing construction has been lagging behind job and household growth.

Figure 7 shows which counties had the lowest housing-to-jobs ratios in 2006 as well as how much of the median gross income was needed to afford a two-bedroom rental in the county. The counties topping the lists for low housing-to-job ratios and high percentages of income needed for rent should be top priority for affordable housing policies and implementation. Counties with somewhat low housing-to-job ratios and moderate price levels (such as Yolo or Sacramento) could become less affordable if housing production were to slow down and job growth continue. In areas that currently have plenty of affordable housing but are seeing very rapid job growth (such as San Benito, in the sphere of the San Jose metropolitan area), public action may be needed to avert problems in the near future.

FIGURE 6

Travel time index, California metro areas, 1995 and 2005



Source: Texas Transportation Institute

Travel time index is the ratio of travel time in the peak period to travel time at free-flow conditions. A value of 1.35 means that a 20-minute free-flow trip would take 27 minutes at peak travel times.

County	Ratio of housing to jobs	Percent of median county income required for 2BR rental
Orange	0.67	60%
San Francisco	0.69	47%
Santa Clara	0.69	35%
Yolo	0.70	36%
Napa	0.79	44%
San Mateo	0.80	47%
Alameda	0.81	38%
Santa Barbara	0.81	54%
Los Angeles	0.82	50%
Monterey	0.83	50%
Ventura	0.84	55%
Fresno	0.85	36%
San Diego	0.85	51%
Sacramento	0.87	35%
Tulare	0.90	32%
California	0.85	

FIGURE 7
Counties with the lowest housing-to-jobs ratios, 2006

Sources: California Department of Finance and Employment Development Department, and authors' rental affordability analysis.

LONGER-TERM FACTORS FOR HOUSING POLICY

Factors other than quantity, affordability, and location play an important role in the type of housing needed now and in the future. Ethnicity and age, for example, affect household size and household location preferences and needs. California expects striking changes in population mix—in terms of race, ethnicity, and the age distribution of household heads. For example, the largest ethnic category by 2030 will be Hispanic (increasing from 32 percent of the population to 45 percent). If the Hispanic population continues to have lower incomes and larger households than other groups, then the need for *affordable* larger housing units will intensify, but the *number* of units needed will grow more slowly than the overall population.

At the same time, the percentage of the population 65 and older will increase, and therefore there will be more households headed by retirees. These households will require smaller units at a range of prices that reflect diversity in their income levels. Many elderly will seek out areas that provide proximity or convenient access to health care, personal services, family and friends, and leisure activities; housing demand in those areas will likely increase. ➤



HOUSING PRIORITIES FOR THE FUTURE

Key findings from our research show where California’s housing policies need to focus. First, affordability—rather than production and supply—is California’s key housing issue. Although low- to medium-wage workers earn more than their counterparts in many other US locations, they pay a higher share of their wages for housing. Large urban areas with low housing-to-job ratios have the greatest affordability problems.

The past ten years have seen significant investments in somewhat denser housing in many of the most expensive parts of California. This has not resolved the affordability problem, because much of the investment has been in high-end units (and skewed toward homeownership rather than rental housing). On the other hand, those locations have seen less of an increase in traffic congestion than other parts of the state. Those areas where suburbs expanded have provided some affordable housing, but at the cost of sharp increases in traffic congestion, household transportation costs, and commute times for their residents. Addressing these issues will require coordination across land development and transportation sectors.

Many local governments face tight operating budgets that lead them to evaluate new developments largely in terms of potential revenue and cost to the city. New construction is expected to pay the marginal costs of new activities (residential and otherwise) resulting from it. As a result, builders tend to focus on more expensive units, since their buyers can better absorb incremental costs associated with fees for roads, sewer and water services, education, and other social services.

Without more coordination, direction, and support from the state level, communities will continue to make decisions on housing construction versus job growth based on immediate effects on the city budget, local opposition to growth, and difficulty in finding land and funding for affordable housing, rather than on longer term cumulative impacts on quality of life, worker availability, commute costs, congestion, and affordability.

These findings point to where California housing priorities should focus. The first priority is affordable housing. Funds for affordable housing should target locations and population groups whose need is greatest—families, low- to moderate-income retirees, and housing types with the tightest supply. Moreover, California must recognize rental housing as a key component of an affordable housing strategy, and rental housing should have priority for bonds and direct assistance to low- and moderate-income families. Some homeownership programs would also be appropriate, but these need to recognize that the transition to homeownership may not be smooth, and must include requirements for education and safeguards regarding financial management.

Second, California should give priority to projects that reduce their “carbon footprints” through design, energy conservation and renewable systems, waste management, and other processes, including supporting transit use and increasing housing supply in redeveloping core urban areas. Such projects will produce both direct and indirect benefits and help the state implement its greenhouse gas laws.

Third, California must coordinate affordability goals and environmental goals. More affordable housing, including multifamily housing, is a critical component of housing policies that reduce traffic congestion and land use consumption. The “fair share” element of California’s housing planning requirements is beginning to encourage denser and more affordable housing in some parts of the state. Further incentives and perhaps different targets may be necessary to bring about an urban form that provides affordable housing accessible to employment. One alternative would be to allocate affordable housing funding to priority need areas that are implementing plans in compliance with Housing and Community Development fair share requirements.

Other types of support will also contribute to meeting statewide affordability and environmental goals. Communities may need additional technical assistance or non-housing funding, such as redevelopment funds for infrastructure and water, in order to build more housing. Directing bond funds—for parks, transportation, housing, and water resources—to produce sustainable, affordable communities will benefit the state.

These strategies will take place effect in the context of other state, regional, and local policies. Implementation of state laws, including AB 32, add a layer of complexity to decisions balancing affordable housing, transportation, and environmental needs. Blueprint projects in many metropolitan areas provide a context for addressing these multiple elements. A strategic plan that identifies spending priorities and project delivery mechanisms could not only improve California’s housing opportunities but produce a more sustainable future. ♦

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