

WINDFALL FOR ALL

How Connected, Convenient Neighborhoods
Can Protect Our Climate and Safeguard
California's Economy

Full Report



TRANSFORM



WORLD-CLASS PUBLIC TRANSPORTATION. WALKABLE COMMUNITIES.

Formerly TALC, the Transportation and Land Use Coalition

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Chapter 1: SB 375 Can Make California More Affordable

California has often led the country in developing innovative, successful responses to environmental crises. Over the past three years, California has taken a leadership role in addressing global warming. AB 32, passed in 2006, committed the state to significant greenhouse gas (GHG) emission reductions. This law is more than a symbolic gesture: California is the 15th largest producer of GHG emissions in the world.

Of those emissions, transportation comprises by far the largest and fastest-growing source, representing nearly 40 percent of all emissions in the state.

The groundbreaking state law, Senate Bill (SB) 375, passed in 2008, will make it easier for Californians to drive less. It will help to link local and regional planning to create more convenient and efficient communities, with shorter commutes and more transportation choices. Combined with already-approved approaches to cleaner fuels and efficient vehicles, SB 375 is pivotal for keeping the state on track to meet climate goals.

But while climate science tells us we must act quickly to reduce GHGs, the economic crisis is devastating consumers and government budgets. The crisis has led some to question whether we can afford to change course right now.

As this report demonstrates, however, current growth patterns are saddling households with unsustainable transportation expenses and burdening regions with expensive congestion and infrastructure demands. When examined with an economic lens, our current pattern of growth – fields of tract homes connected by billion-dollar highways to distant corporate parks and strip malls – is inefficient and unaffordable.

Smart planning can help us grow more efficiently by bringing more affordable living options to households, more sustainable tax revenue to cities, and tremendous infrastructure savings to regions as a whole. SB 375 is setting the stage for a fundamental shift in planning that can reduce the heavy strain on resources, as detailed in Chapter 4. It will also allow us to meet the market demand for new types of homes as demographics continue to shift toward a population of smaller households with fewer children.

Ultimately, the efficient planning we need to reduce GHG emissions can also help us to weather tough economic times and make our long-term economy more resilient.

But it is critical to get the planning right.

Major new investments in public transportation infrastructure, for example, need to be complemented by a mix of compact, walkable communities surrounding the stations, and a balance of retail, housing, and jobs along the transit corridors. Without such integrated planning, transit lines are likely to experience low ridership and create high costs for public transportation agencies (both in upfront and ongoing operating subsidies). In the end, a lack of such planning will force more cars on the road and prevent consumers from reaping the personal savings that can come with less driving and reduced car ownership.

The report begins by looking at how compact, walkable, transit-accessible communities can save households billions of dollars in their combined transportation expenses, while also generating lower GHG emissions. Chapter 3 examines the impact these lower transportation expenses can have on overall housing affordability.

The report also highlights what regions, cities, and developers have been doing across state and the country to reduce costs, attract jobs, and revitalize communities. It also demonstrates how these same strategies will reduce GHG emissions. With nine case studies, Chapters 4 through 6 describe key strategies for achieving these savings at the regional, city and project levels.

In a regional case study, the substantial infrastructure savings that Sacramento would experience from implementing their efficient growth blueprint brought together environmentalists, city leaders, public health professionals and fiscal conservatives to support the new vision.

In one particularly illustrative case study, the University of California at Diego saved so much money by providing transportation alternatives instead of more parking that they put off building 10 garages. This decision was based on a business case analysis that compared the direct cost of parking against the alternatives. As a side benefit, the funding going toward alternatives is helping to shrink the carbon footprint of UC San Diego and has put them on a path to meet their climate goal of having just 38 percent of commuters arriving alone by car. That number was 66 percent just eight years ago. Starting in 2009, the University of California system requires business case analysis to inform campus planning of alternative strategies any time a garage might be built on any of their campuses.

Chapter 7 details how building more accessible housing can meet the growing market demand for more convenient homes.

The report concludes with a series of policy recommendations – drawn in part from the lessons of the regional and city case studies – that will enable Californians to derive the full economic and climate benefits of more efficient planning.

The conclusions of the report are clear. If done well, the more efficient planning framework that SB 375 is meant to deliver will mean that:

- Households can save thousands;
- Cities and private institutions can save millions and become more attractive for employees;
- Regions can reduce infrastructure costs by billions.

SB 375 was passed to help the state meet GHG reduction goals. But it may also be part of the economic salvation that California residents and decision-makers so desperately need.

Chapter 2: Efficient Neighborhoods Save Billions

For decades, federal, state, and local government policies have worked together to subsidize a pattern of low-density, sprawling development in California. Transportation policies that give greater funding for highways than for public transportation – alongside tax policies that subsidize homeownership, not rentals – has supported a steady decentralization of housing and jobs. This creates a growing distance between where we are, and where we need to be.¹ Single-use zoning has further contributed to the spreading-out of California. It has ensured that stores and homes, schools, jobs and other services remain separated by long distances, and it has greatly increased the amount of driving necessary for the average family to accomplish their daily routines.

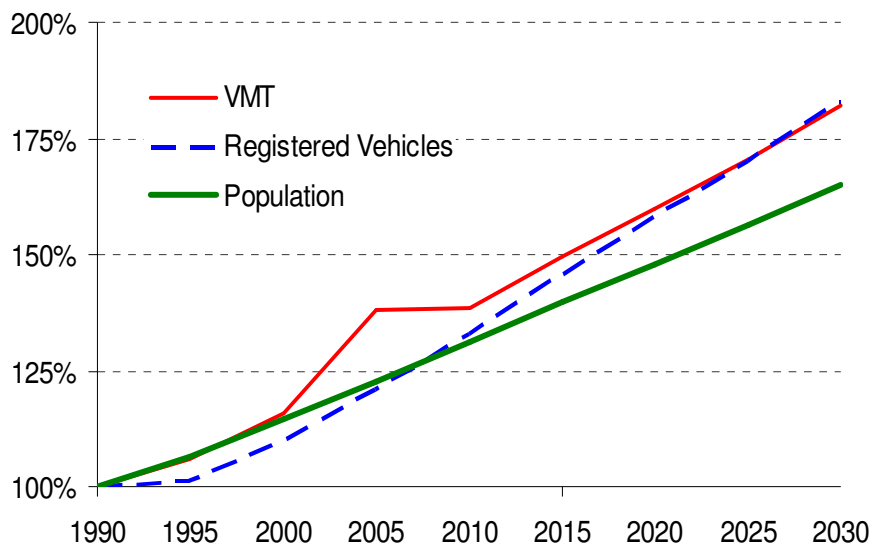


Our economy can no longer afford the high public and private costs of inefficient development.

What's more, the increase in driving is expected to continue statewide for the next 25 years – at a rate faster than population growth – as communities spread out even farther (Figure 1).

As a result, most homes in the Bay Area and California are highly car-dependent. This growth pattern undermines efforts to reduce GHG emissions while it saddles households and governments with high transportation costs. By

Figure 1. Vehicle Miles Traveled Is Increasing Faster than Population in California



Sources: California Air Resources Board, Caltrans, Department of Finance

¹ Ewing et al. 2008; de Alth and Rueben 2005; Lewis and Barbour 1999; Silva and Barbour 1999.

developing our urban areas more efficiently, we can substantially reduce these costs and their drag on our economy, and we can protect our environment at the same time. This chapter shows the costs and potential financial savings for California’s households.

Most Transportation Costs Are Out-of-Pocket

A tremendous amount of money is spent by public agencies to build and operate our roads and public transportation systems. Taking the nine-county Bay Area region as an example, the Metropolitan Transportation Commission’s 25-year transportation plan coordinates spending at an average of \$4.6 billion per year from federal, state, and local sources.

But as can be seen in Figure 2, this pales in comparison to the enormous amount spent on transportation by Bay Area residents over a single year: \$34 billion. (See Appendix B for calculations.)

Private transportation spending – mostly on owning and operating cars – dwarfs public costs by more than 7 to 1.

Figure 2: In a single year, the amount spent on transportation by individuals in the Bay Area is 7.4 times more than is spent by all public agencies in the region.



Calculated from ABAG 2009 and CNT 2009.

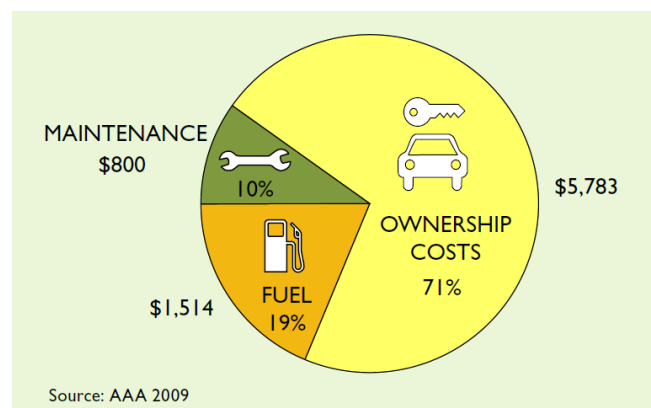
No Matter the Fuel, Driving Will Always Be Expensive

Owning and driving a car is expensive. Next to housing, transportation is the second greatest expense for the average American household. With gas and maintenance included, the total cost of owning and operating a new car in 2008 amounted to \$8,095 per year (AAA 2009). About \$5,800 of this amount is ownership costs, meaning car use is expensive even when gas prices dip (see Figure 3).

According to AAA, 71 percent of annual vehicle costs are for ownership, such as insurance, registration, and financing. Maintenance adds another 10 percent. Only about 19 percent of the money allocated for cars is spent on fuel.

There is, appropriately, tremendous excitement about the coming generation of cleaner electric and hybrid vehicles. These will help keep our transportation emissions from growing too quickly. But as long as families require two or three of these cleaner vehicles, transportation will remain a tremendous cost burden.

Figure 3: The cost of driving over one year.

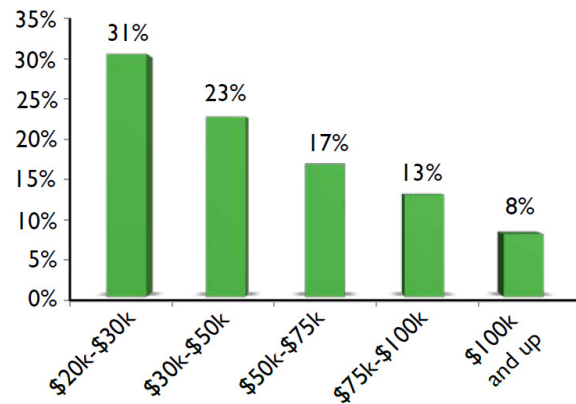


Source: AAA 2009

Lower-Income Families Are Hit Hardest

It is well established that the high cost of driving is placing a particular burden on lower-income families.² Inefficient transportation and land use planning is greatly reducing the ability families to invest in such important areas as education, home equity, health insurance and other expenses – let alone to save for the future. Figure 4 shows that as income lowers, a larger and larger percentage of income is spent on transportation. For households in the lowest income bracket shown here, transportation costs consume almost a third of their income.

Figure 4: Transportation spending as a percentage of household income, by income bracket.



Source: CNT 2009 & Virginia Tech 2006

Efficient Neighborhoods Save Families Billions

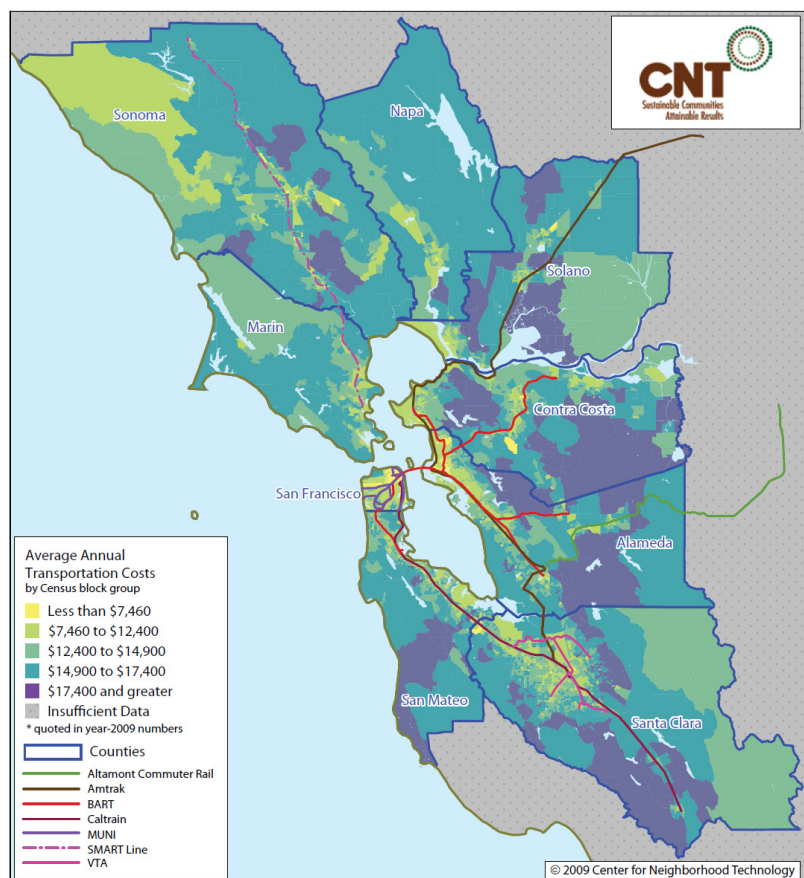
To examine the savings that are already being harnessed by the families living in more efficient neighborhoods, TransForm analyzed data provided by the Center for Neighborhood Technology.³

This was done for the four major regions of California where data was available – Southern California, San Francisco Bay Area, San Diego and Sacramento.

As evident in the map of the Bay Area (Map A), transportation expenses tend to be highest in areas not served by transit.

Instead, many of the Bay Area's most convenient neighborhoods

Map A: Household Transportation Costs by Census Block



The CNT dataset is based on the 2000 census; quoted in 2009 dollars.

² Center for Neighborhood Technology, Haas, Makarewicz, and Benedict; Virginia Tech, Sanchez, Dawkins, "Housing & Transportation Cost Trade-offs and Burdens of Working Households in 28 Metros", 2006. Appendix C page 7.

³ See Appendix A for a description of the dataset.

are the urban and suburban areas designed more than 75 years ago. They:

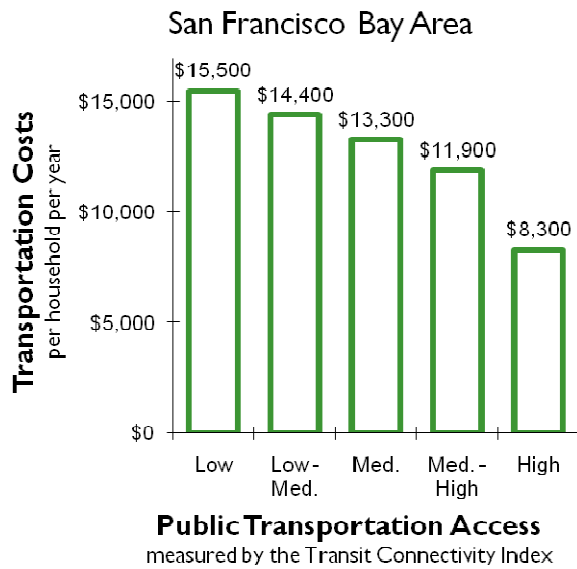
- put housing, jobs and services closer together;
- provide more compact and walkable areas than newer subdivisions;
- support more public transportation service because of the first two factors.

As indicated by the lighter colors on Map A, these communities enable households to save thousands of dollars each year.

To analyze the overall spending differences among communities, TransForm divided the region into five quintiles based on the level of public transportation access. (As mentioned above, public transit levels often correlate closely with community design and a mix of uses that supports it.)

The results are clear; neighborhoods that have very good access to public transportation spend significantly less on transportation each year – the better the access, the less that is spent. The one-out-of-five Bay Area households that have the best public transportation access benefit from 39 percent lower annual transportation costs than other households, on average. If the other communities had the same level of expenses, they would save a total of \$10.7 billion on transportation each year. That would give the average household \$5,450 more each year to spend on education, health care, etc.⁴

Figure 5: Transportation spending, in brackets of public transportation access.



Source: CNT 2009

If all residents in the Bay Area spent the same as those with the best public transportation, they would be spending almost

\$10.7 billion less

on transportation each year.

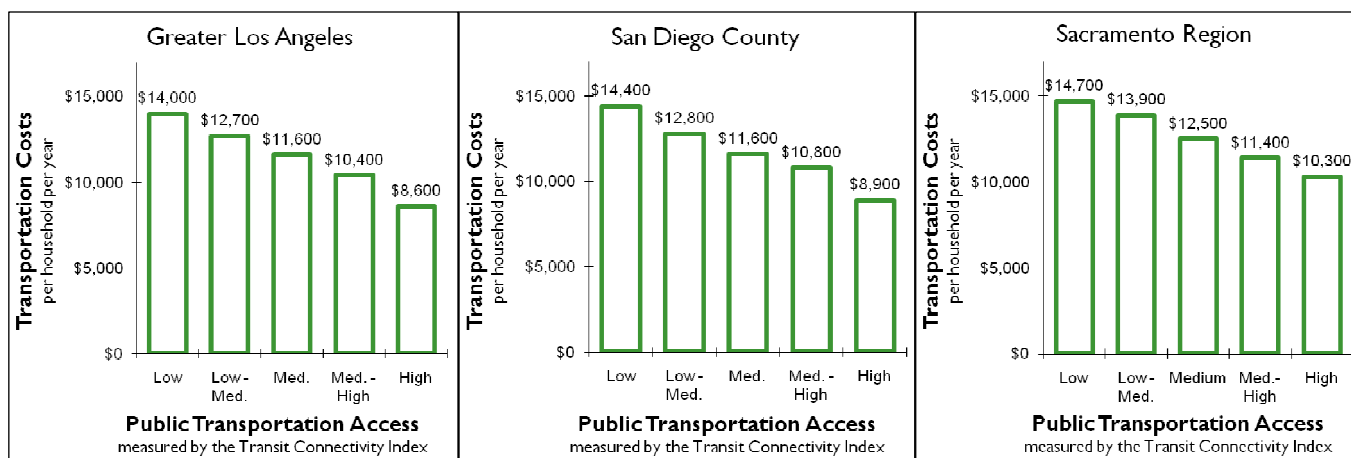
The trend toward lower transportation costs in neighborhoods with better public transportation holds true in regions throughout the state (Figures 6-8). Similar savings are available in other metropolitan areas. In Los Angeles, the spending difference between households located in neighborhoods with the best public transportation access compared to the rest of that region is \$3,600 per household on average. If the other neighborhoods had such low transportation spending, the region's residents

⁴ See Appendix B for statistical methods

would have saved a combined \$15.3 million. In San Diego County, the average difference per household is \$3,500, while the county-wide aggregate is \$2.8 million. In the Sacramento Region, the per household difference is \$2,800, which adds up to \$2.2 million region-wide.

The spending difference in each of the four metropolitan areas amounts to \$31.2 million in transportation costs.

Figures 6-8: Transportation Spending Trends as Access to Public Transportation Increases: Three major metropolitan areas of California.



Source: CNT 2009

Why the Savings?

To understand where the savings come from, TransForm conducted another analysis by categorizing all Bay Area neighborhoods according to a matrix of both land use density (including housing units and jobs per acre)⁵ and access to public transportation.

Three types were then examined for comparison purposes:

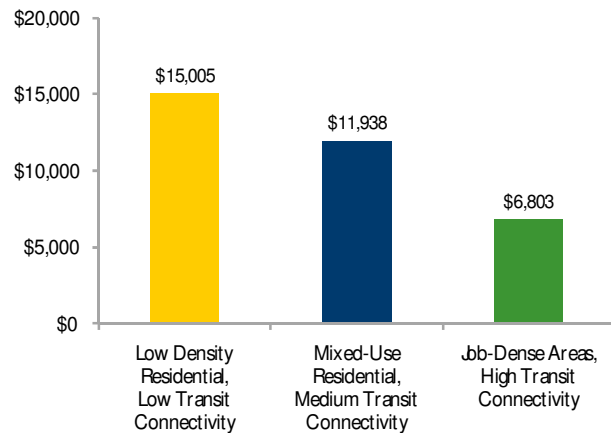
- households in areas that were dense with jobs and had the highest level of public transportation service;
- areas that were less job-dense and had “medium” public-transportation connectivity;
- and areas that have both low residential densities and low transit connectivity.

⁵ Population and household counts vary significantly between regions. The 2000 US Census lists the following number of households in each metropolitan region: San Francisco (9-county region) 2,466,019; Los Angeles 5,347,107; San Diego 994,677; Sacramento 665,298. See Appendix B for a description of the calculations. The San Joaquin Valley is another major region of California that merits analysis. However, being divided into 8 jurisdictions for separate Metropolitan Planning Organizations, it was not possible to include in this report.

Figure 9 compares three of the nine neighborhood types⁶ and shows a difference of about \$8,200 per household for transportation – about 10.6 percent of average household income. Households in transit-accessible, jobs-dense neighborhoods of the region spend less than half as much on transportation as households in the lowest density, least transit-accessible, residential-only neighborhoods.

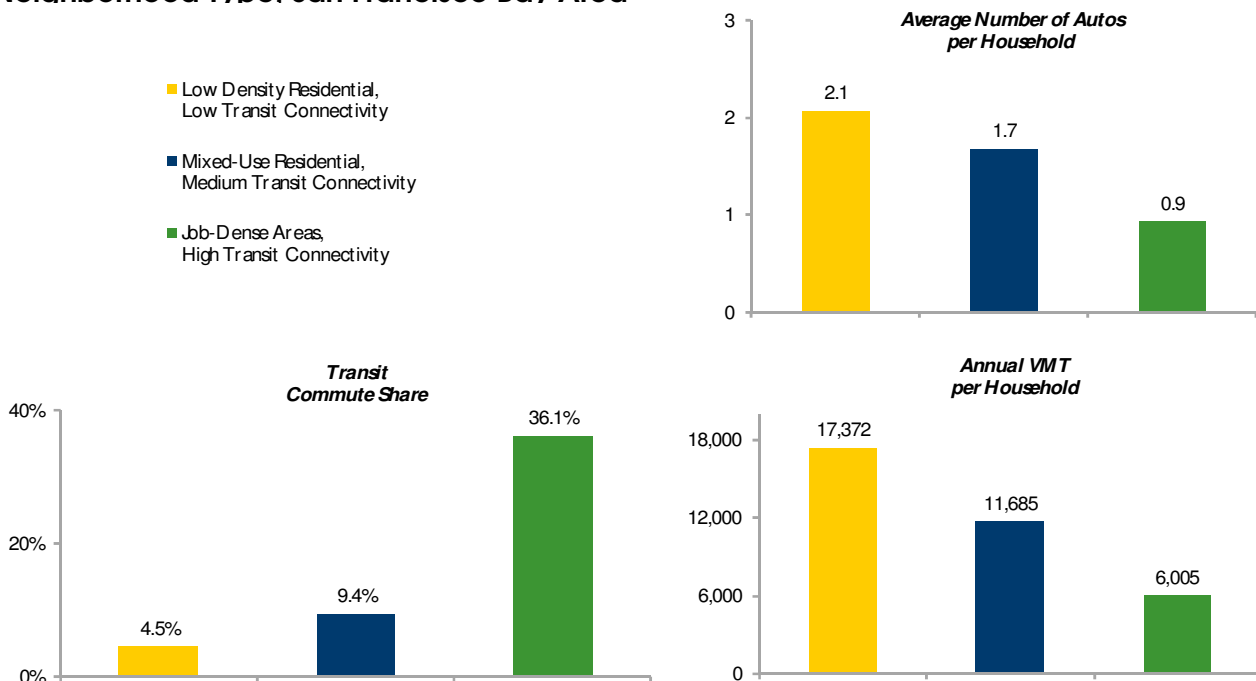
Efficient growth patterns reduce costs by reducing the number of cars each household needs for transportation, as well as by reducing the distance they drive in those cars. Households in areas with many jobs and high levels of public transportation service own one less car (from 2.1 to 0.9) on average, and drive 11,000 fewer miles each year than households in low-density residential areas with few jobs and little access to public transportation (Figure 10).

Figure 9. Annual Transportation Costs per Household by Neighborhood Type, SF Bay Area



Author's calculations from CNT 2009 data

Figure 10. Vehicle Miles Traveled, Transit Use, and Number of Cars per Household by Neighborhood Type, San Francisco Bay Area



Source: Authors' calculations from data from Center for Neighborhood Technology (CNT), 2009.

⁶ This analysis controls for variation in household income, size, and number of workers. A table comparing all the neighborhood types, which are based on residential density, job density, and public-transportation accessibility, is available in Appendix C.

Most of the spending difference comes from reducing auto-ownership rates. While people spend more on public transportation in efficiently laid-out areas, the private cost of public transportation pales in comparison to that of owning additional vehicles.⁷ This follows the logic other researchers have established.⁸

The second piece of the low-transportation-cost equation – dense, mixed-use neighborhoods – further reduces transportation expenses by making walking a realistic alternative for trips to frequent destinations such as groceries, dry cleaners and day care centers.⁹ Auto trips to these destinations are also shorter.

Once you have many people living and working within easy walking distance of a location, additional services become feasible there. For example, car-sharing services have taken off in more compact parts of the Bay Area, allowing thousands of people to shed either their second and/or their only automobile. Instead, they sign up to have one “on demand” through car-sharing services so that they only pay for a car then they really need it. Zipcar is now the largest national chain, and in the Bay Area the nonprofit City CarShare is enormously popular.



A Zipcar advertisement.

When gas prices rise again, differences in VMT will create even wider differences in transportation costs among neighborhoods.¹⁰

⁷ We infer this fact by considering the differential in VMT and number of autos per household between neighborhoods of Type 1 (low-density residential areas with little access to public transportation) and Type 3 (jobs-dense areas with high access to public transportation), in relation to the AAA data on car ownership and operating costs cited above.

⁸ Williams and Miller 2009

⁹ This analysis controls for variation in household income, size, and number of workers. A table comparing all the neighborhood types, which are based on residential density, job density, and public-transportation accessibility, is available in Appendix C.

¹⁰ See Appendix D for intra-city neighborhood analysis showing the significant differences in spending within cities.

Housing Plus Transportation: A More Comprehensive View of Affordability

Homes are often less expensive to purchase or rent if they are far away from key employment centers and older downtowns. That is why realtors coined the term “drive until you qualify.” But traditional assessments of housing affordability do not consider transportation costs.

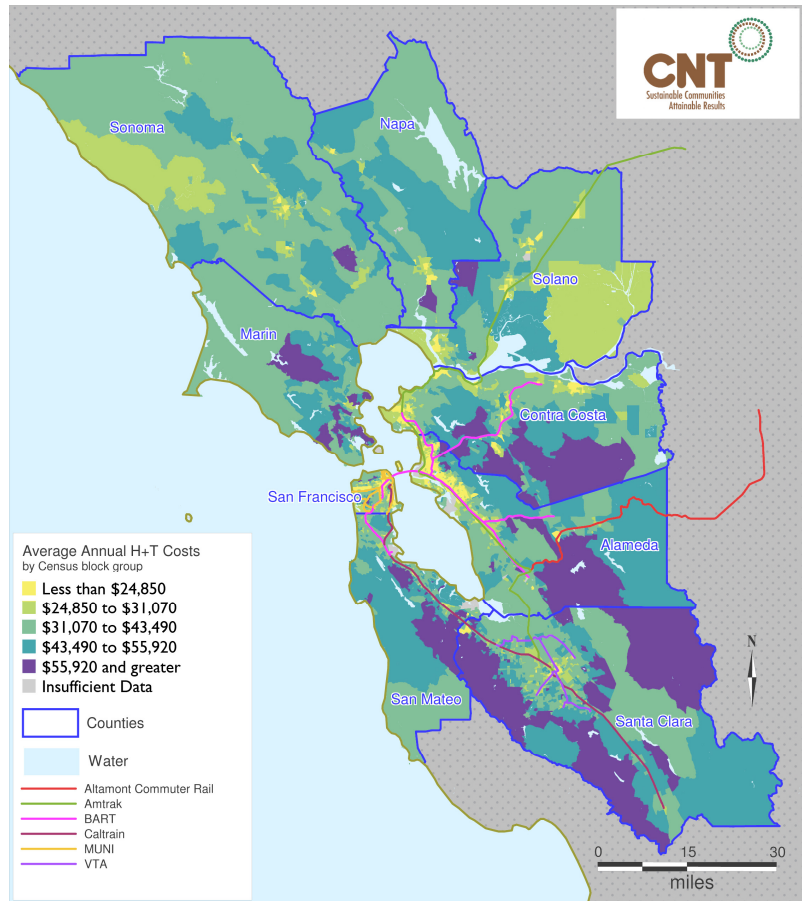
When we include transportation expenses for a more complete measure of housing-related costs, we see that many auto-dependent places are less affordable than is typically thought. Many households spend a sizeable portion of their budget to drive to and from homes in neighborhoods far from jobs and transit.

Using the Bay Area as an example again, most of the new, lower-priced homes affordable to very low- and moderate-income households are being built at the edges of the region or outside the region altogether — in locations such as Tracy and other parts of the Central Valley. But these areas typically have such long car commutes and such limited alternative options, that high transportation costs undercut much of the savings in buying or renting homes there.

Map B compares locations in the Bay Area using the comprehensive measure of affordability: housing plus transportation expenses. Now factoring in transportation, many areas outside the Bay Area’s core are shown as more expensive than might be expected, including central Sonoma and Napa counties, and eastern Alameda, Contra Costa and Santa Clara counties. Places well-served by transit are seen to be relatively more affordable.

On average, housing and transportation (H+T) costs consume 63 percent of household income for households earning between \$20,000 and \$50,000 in the Bay Area – the highest combined housing/transportation burden for this income bracket anywhere in the country (Lipman 2006). With an average of 35 percent of income spent on housing, plus an additional 27 percent for transportation, very little income remains for other household necessities, including food, education and health care. These

Map B: Housing + Transportation Costs by Census Block



The CNT dataset is based on the 2000 census; quoted in 2009 dollars.

unsustainable H+T costs have no doubt aggravated many foreclosure situations for households in outlying communities.

Figure 11 lists the Bay Area cities and towns with the lowest transportation costs, and their rank as affordable cities. Notice how different the rankings are (in the two right-hand columns). The least expensive overall are cities closest to major job centers and public transportation, including San Francisco, Oakland, and Berkeley. Even so, suburban towns such as Albany and Sausalito show that having vibrant downtowns and good public transportation can make any town a more affordable place to live. All but two of the Bay Area’s lowest transportation cost cities are in the top third of overall affordability.

The reverse is also true; high transportation-cost cities lose ground in their overall affordability ranking. For example, Oakley ranks 32nd in housing affordability among Bay Area cities. But when transportation is factored in, it drops to 51st overall.

Figure 11: Comparing measures of housing affordability for the 10 Bay Area cities with the lowest transportation costs per household.

City	Transportation Affordability Rank	Housing Affordability Rank	Overall (T & H) Affordability Rank
Emeryville	1	7	1
San Francisco	2	37*	11
Berkeley	3	27	8
Oakland	4	8	3
Sausalito	5	84	77
Albany	6	34	27
San Pablo	7	1	2
Alameda	8	29	21
Larkspur	9	76	69
Richmond	10	3	5

Source: Calculated from data from CNT for all of the 100 Bay Area cities and towns with populations over 3,000.

Chapter 3: The Climate Connection

Transportation is the largest, and fastest growing source, of California’s GHG emissions, accounting for 38 percent of total emissions.

Technological improvements will be crucial to help reduce GHGs from transportation, but research indicates that these improvements alone will not be enough.¹¹

Furthermore, these technologies face cost barriers and implementation constraints.¹²

Land-use and transportation systems need to improve our communities regardless of technological improvements. Recognizing this, SB 375 was passed to help reduce emissions from the growing amount of driving that takes place in California’s each day.

Growing Cooler

How much can we expect to reduce driving and GHGs from transportation? The analysis detailed in this chapter finds that people with strong access to public transportation¹³ in the four major metropolitan areas of California drive 27 to 42 percent less, on average. These findings are in the same general range of other established estimates.

In the most comprehensive analysis to date, the book *Growing Cooler* – published by the Urban Land Institute – uses a meta-analysis of two different bodies of regional modeling literature. The researchers find that more compact development has the potential to reduce Vehicle Miles Traveled (VMT) per capita by anywhere from 20 to 40 percent compared to more sprawling development.

An area’s actual reduction in VMT per capita depends on how much development patterns change according to five measures, commonly known as the “five Ds”:

- density
- diversity
- design
- destination accessibility
- distance to transit

The five Ds are qualities of the urban environment that planners and developers can influence in order to affect the travel patterns of residents.¹⁴ As the previous chapter showed, these factors can greatly reduce the cost of transportation for California households by reducing automotive travel and ownership.

¹² Even fully electric cars produce emissions indirectly, because electricity production results in GHG emissions except when through fully renewable sources. We are a long way from producing all our electricity through totally clean methods (CEC 2007, California ARB 2008).

¹³ Public transportation and land use are tied. Strong access to public transportation is generally associated with compact, walkable communities.

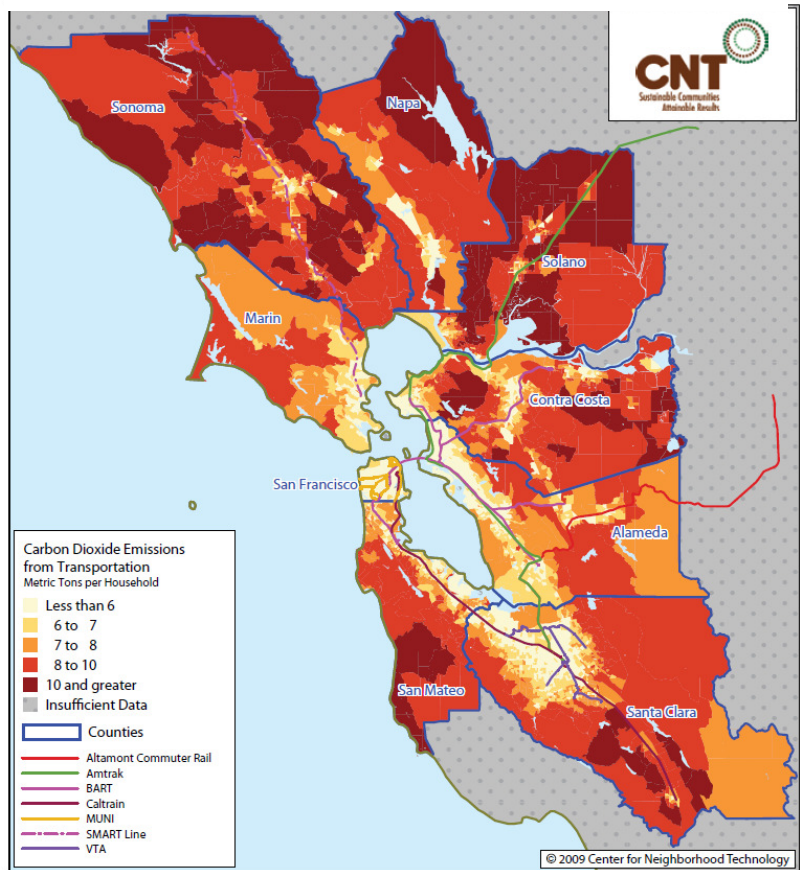
¹⁴ Ewing, Reid, Keith Bartholomew, Stebe Winkelman, Jerry Walters, and Don Chen, 2008.

Efficient Neighborhoods Are Also Low-Emission

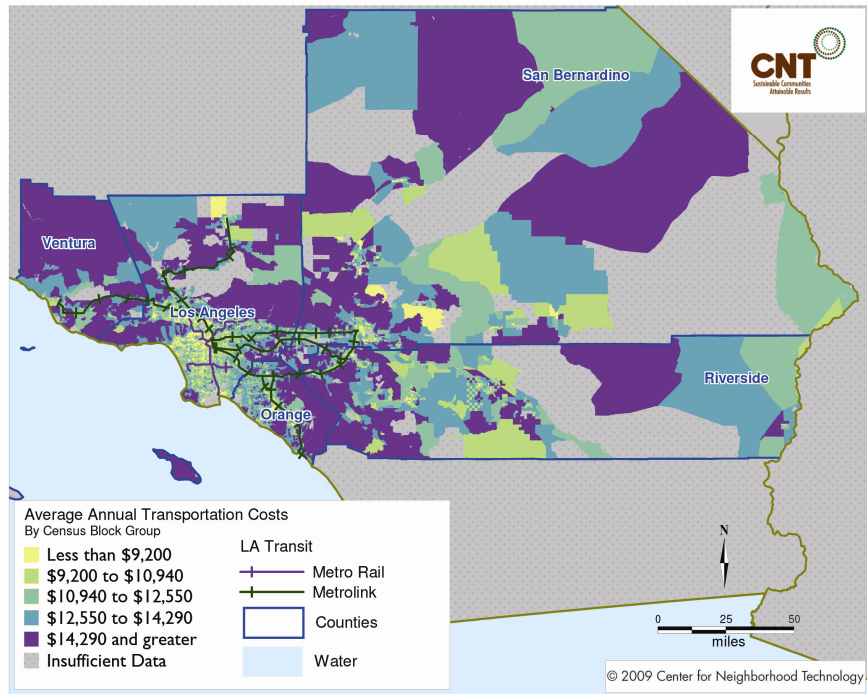
The following maps from California's four major metropolitan regions indicate the variation in carbon(CO₂) emissions from transportation by neighborhood. As the map of the Bay Area (Map C) indicates, CO₂ emissions from household transportation are much higher, in general, in outlying parts of the Bay Area and lower in more compact, urban and suburban areas that are well-served by public transportation. This map has a strong correlation to the transportation cost map in the previous chapter.

The transportation CO₂ maps-of Southern California, San Diego, and Sacramento show a similar trend.

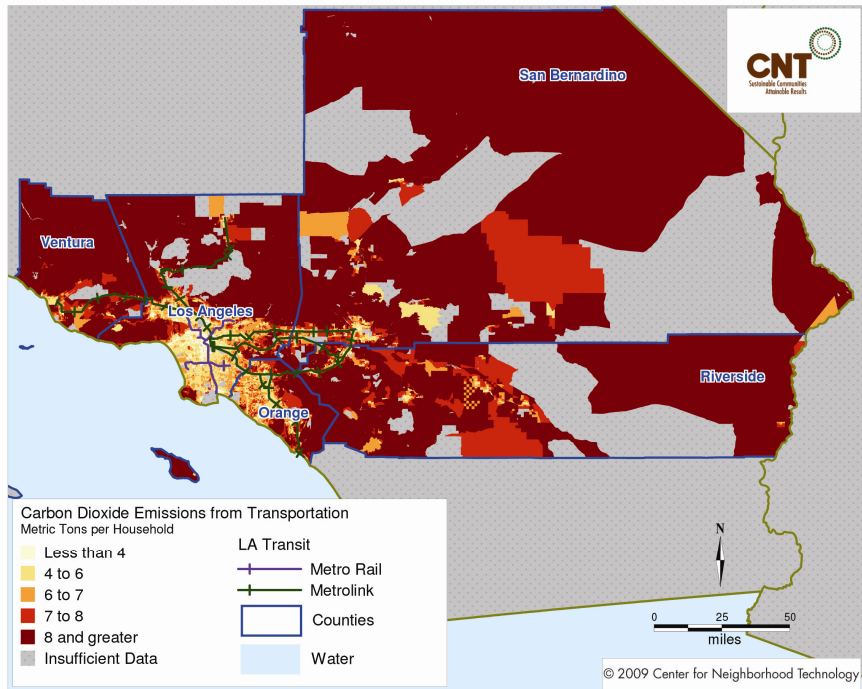
Map C: Transportation-related CO₂ Emissions per Household, by Census Block



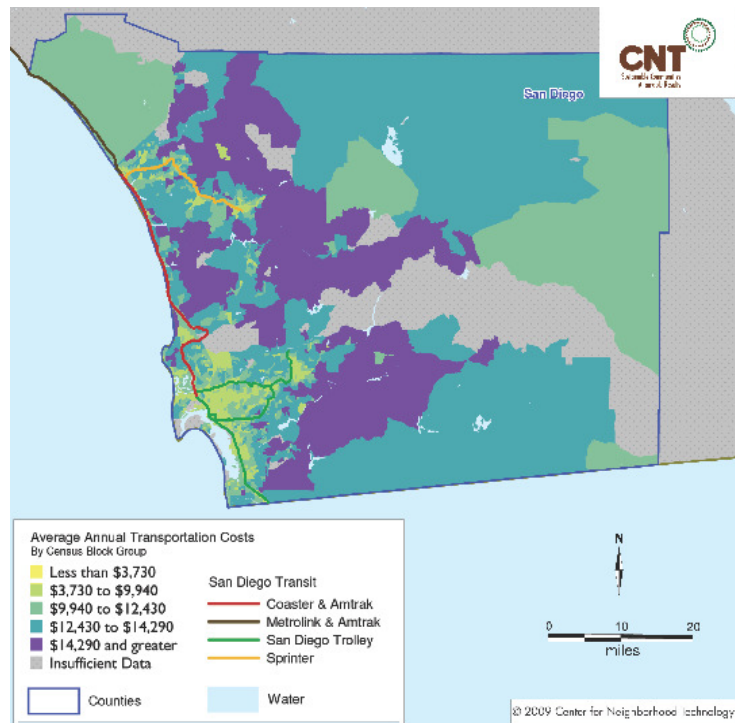
Map D: Greater Los Angeles Metropolitan Area, Annual Transportation Costs per Household Census Block



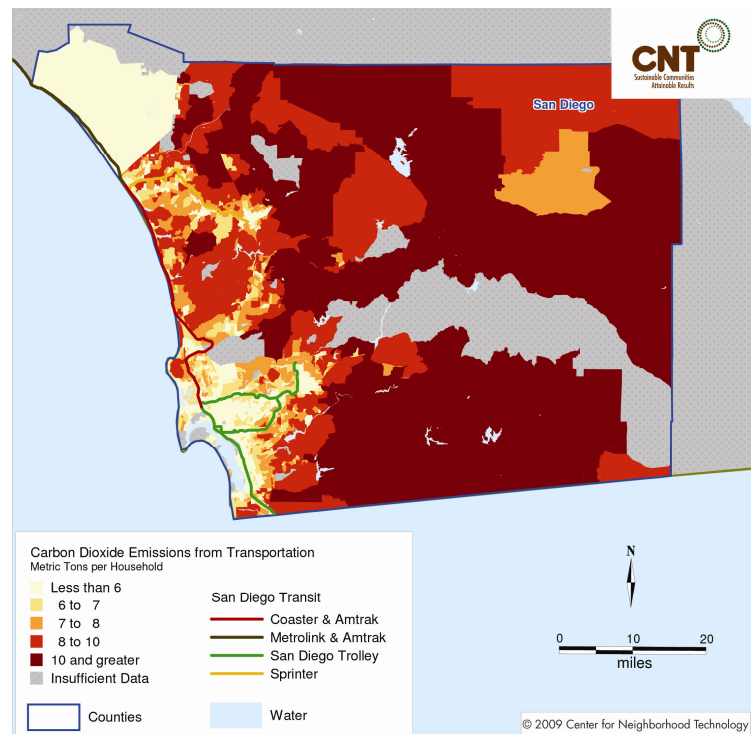
Map E: Greater Los Angeles Metropolitan Area, Annual Transportation-related CO₂ Emissions per Household Census Block



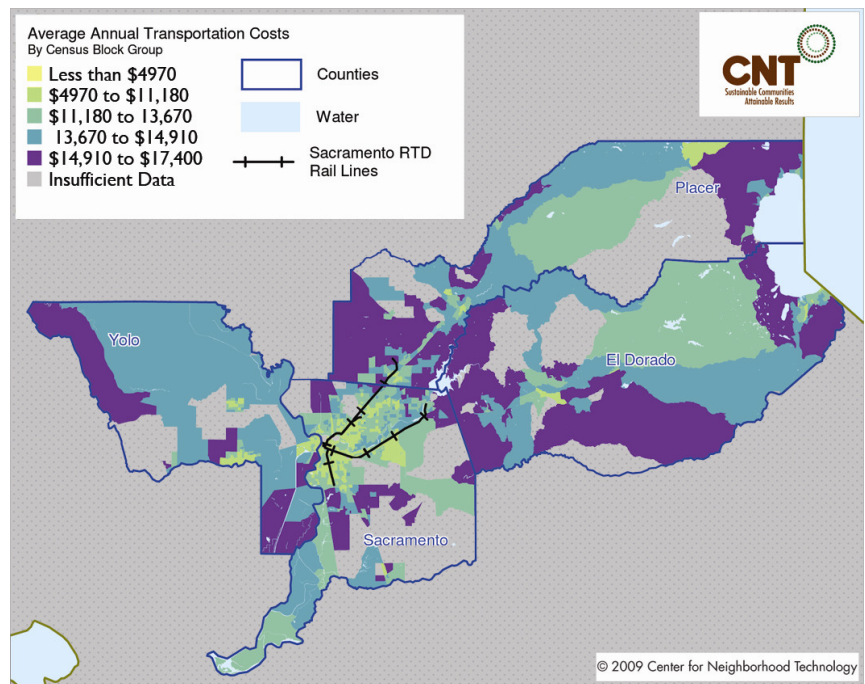
Map F: Greater San Diego County, Annual Transportation Costs per Household Census Block



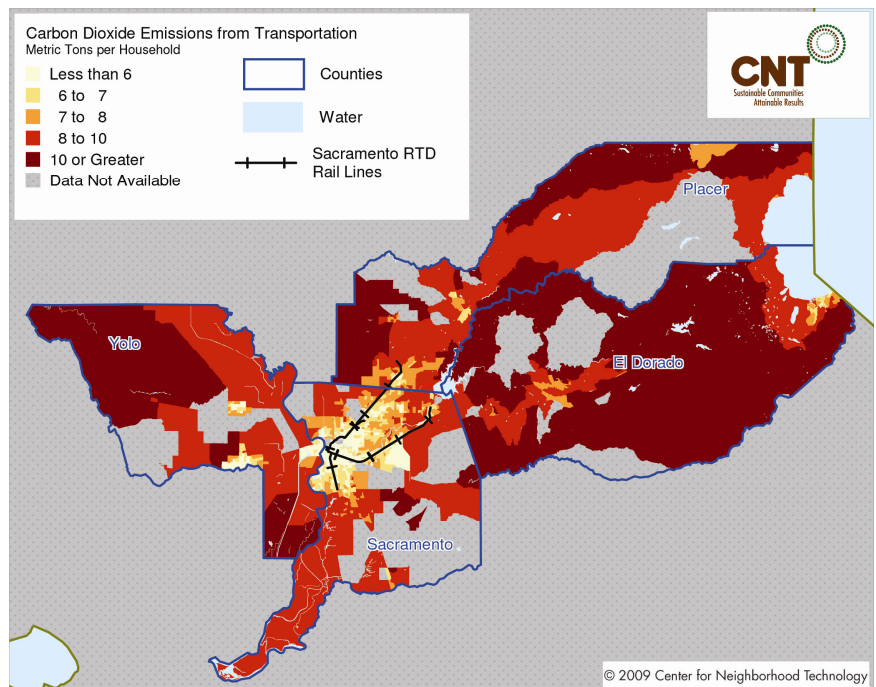
Map G: San Diego County, Annual Transportation-related CO₂ Emissions per Household Census Block



Map H: Sacramento Region, Annual Transportation Costs per Household Census Block



Map I : Sacramento Region, Annual Transportation-related CO₂ Emissions per Household Census Block

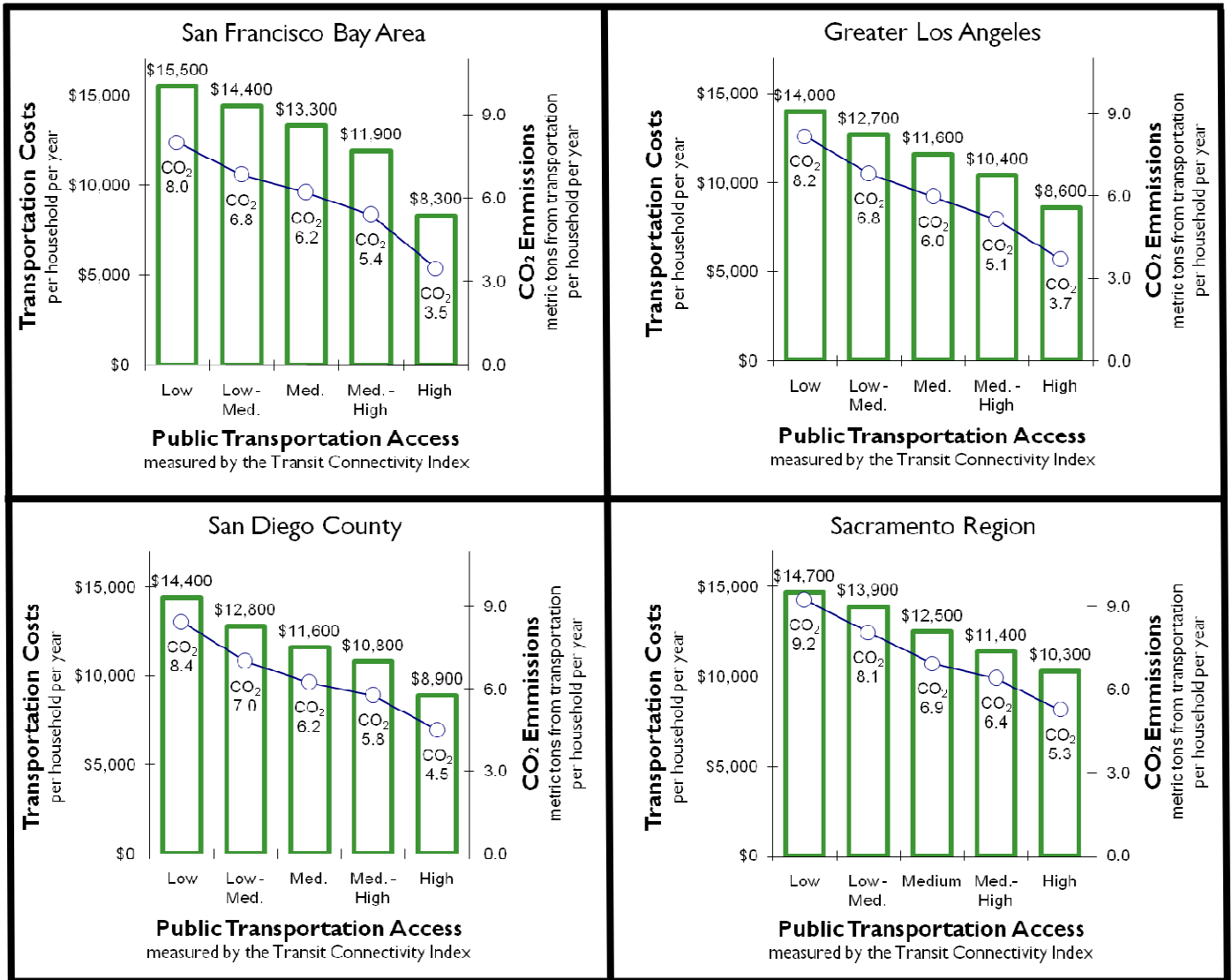


The Climate-Cost Connection

To see how closely CO₂ emissions correlate to transportation costs for each region, the two factors were graphed across each region's Transit Connectivity Index (TCI).

Figure 12, below, graphs CO₂ emissions on top of the transportation-cost bar graph from the previous chapter. Each regional graph produces a very clear conclusion: households that have greater access to public transportation not only save money but emit significantly less transportation-related CO₂.¹⁵

Figure 12: CO₂ emissions and Transportation Costs by Level of Access to Public Transit



Source: CNT 2009

¹⁵ As noted in the previous chapter, high levels of public transportation are closely related to compact community design.

Comparing the bar charts reveals the following points.

- The San Francisco Bay Area, which has the most extensive transit network in California, has the greatest differential on both cost and CO₂ emissions. Residents of the areas with the most public transportation service produced less than half the emissions of those with the least transit. If the entire region produced the same level of emissions as those with high transit, it would have emitted 42 percent less CO₂ from personal vehicles. This mimics the upper range of the *Growing Cooler's* conclusions. Households would also be spending \$5,450 less, on average. As the Bay Area now moves toward implementing new transit lines and refocusing growth toward their "Priority Development Areas," more communities should be able to gain a financial advantage.
- Los Angeles was not far behind the Bay Area. If the entire region produced the same level of emissions as those 20 percent of neighborhoods with the most public transportation, the region would have emitted 38 percent less CO₂ from personal vehicles. Los Angeles also had the next highest savings per household by those with strong public transportation access, amounting to \$3,600 in one year. Contrary to popular perception, the Los Angeles region has a more extensive public transit network and more compact, walkable land uses in many parts of the region. Analysis indicates that these urban assets are already combining for a powerful CO₂ benefit and financial savings. As Los Angeles County embarks on a new round of public transit expansions following Measure R, and as it refocuses growth toward existing transit corridors, it is possible that more areas of Los Angeles could ultimately become even less expensive.
- San Diego was next on each of the indices. Here too, an expansion of public transportation and a move toward regional smart growth vision – which has received some funding for implementation through a transportation sales tax – may help the region realize additional cost savings.
- Sacramento had the smallest differential between areas of high and low public transportation access. That is mostly because neither its public transportation network nor its downtowns have been as fully developed as in the three larger regions. These needs were noticed several years ago when the region's growth predictions were tremendously dominated by low-density development that would continue to drive up vehicle travel, costs, and emissions. The predictions then motivated the exemplary Sacramento regional blueprint process described later in this report. That blueprint is expected to cause private transportation cost savings as the region expands its public transportation network and refocuses growth. Throughout the region, in suburban Roseville as much as downtown Sacramento, there is a trend toward walkable, more compact communities.

The overall CO₂ reductions that arise in areas with the best public transportation range from 27 percent in Sacramento to 42 percent in the Bay Area – results that are very much in the range anticipated in *Growing Cooler*.

It is important to note that this presents snapshots of the regions as they exist. These statistics are not meant to imply that we can reduce per capita vehicle travel by up to 40 percent for any of these regions. Rather, it reveals that as regions redirect growth to areas that have higher levels of public transportation and create more walkable and compact areas, these are the levels of reduction we can expect to see for those new residents.

Existing areas that currently have high costs and high emissions can also improve. Smaller towns, like Windsor described later, can create vibrant, walkable community centers. They can focus activities in central places and, like in Windsor, they can increase public-transportation service levels once the design of the community and the population densities warrant it.

The following chapters provide excellent case studies of planning efforts that are spurring more efficient, low-cost, low-emission patterns of growth in cities and regions.

Figure 13: Savings and reductions if all neighborhoods in each region matched the 20% that have the best public transportation.

Region	CO2 reduction from Vehicles	Total Annual Cost Savings (billions)	Personal Cost Savings/household
SF Bay Area	42%	\$10.7	\$5,450
Los Angeles Region	38%	\$15.4	\$3,600
San Diego	30%	\$2.8	\$3,515
Sacramento	27%	\$2.2	\$2,825
TOTAL	34%	\$31.2	\$3,847

Author's calculations of CNT 2009 data.

Chapter 4: What Is Efficient Growth?

More efficient planning is as much about how we build as where we build. Efficient regional blueprints can only deliver the desired economic and environmental benefits if coordinated with on-the-ground efforts at the local level.

Unfortunately, local governments are facing fiscal crises and are more focused than ever on generating new revenue, particularly in this economic downturn. Cities and counties on the urban fringe are particularly vulnerable to poorly planned development, because they are desperate for dollars and compete with other communities for new development.

Yet cities embracing efficient neighborhoods are seeing substantial returns on their investments in the forms of significant new property tax revenue and growing sales tax revenue created by vibrant, mixed-use retail districts. This chapter looks at the key steps that cities need to take to achieve these benefits, and the importance of proactive measures to keep efficient neighborhoods affordable for a spectrum of incomes.

Unlike the cookie-cutter approach to building big box stores, office parks, and subdivisions, there is no single formula for creating great, efficient neighborhoods. But two critical principles should always guide planning efforts.

First, meaningful community involvement from the very beginning is crucial. It should identify what the community most wants to preserve, as well as new amenities that would benefit the neighborhood, whether it be more parks, safer streets, a library branch or affordable homes. Second, policies should be put in place so that existing residents and businesses are not pushed out as an area becomes more attractive.



The City of Oakland is doing a community visioning process for International Boulevard. Preserving affordable homes and local businesses will be a key focus.

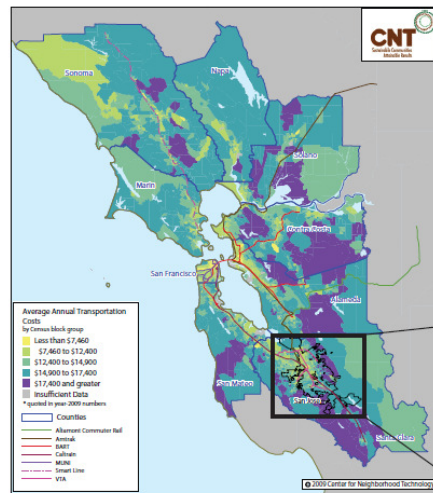
Image credit: Urban Advantage

Efficient Growth Requires Integrated Planning

Growing more efficiently will not just save households money, but also will reduce the costs of transportation infrastructure, generate city revenues, and could even reduce the cost of new homes. But, as with all things that sound too good to be true, there's a catch. If we want to reap the full benefits, we must change how we plan at five essential levels.

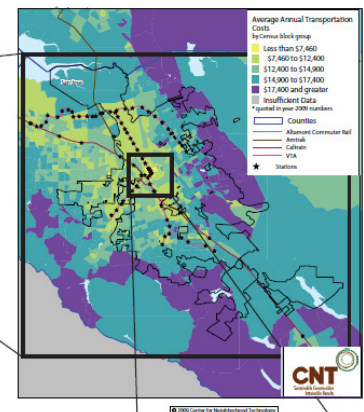
①

On the regional level, we need to stop subsidizing inefficient, auto-oriented growth that leads to higher ongoing household costs. Instead, we need to fix our crumbling infrastructure and invest in a balanced transportation system.



②

At the city level, we need to determine where to grow by identifying transit corridors and town centers that have capacity for more housing and jobs. This protects open spaces and ensures that more future residents live and work in low-cost areas. The maps on this page show great variations in affordability, even within just one city (in this case, San Jose).



④

In neighborhoods, we need to engage existing residents in planning their common future. It is at this level that the right mix of homes, within walking distance of jobs, parks, schools, and local groceries, can create inviting, vibrant places.

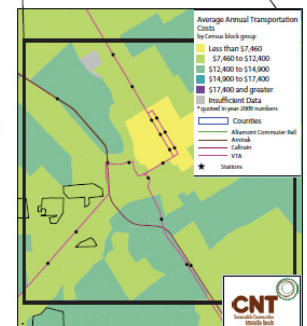


Image credit: Urban Advantage

⑤

At the building and street level, we need to design developments that prioritize pedestrians over parking.

③

Along public transportation lines, we need to ensure a good complement of land uses by linking or combining residential areas with major employment, education, and retail centers.

Connecting All the Dots in an Efficient Plan

Efficient neighborhoods and commercial districts are lively, livable places that came about through a combination of appropriate density, a mix of land uses, pedestrian-oriented design, appealing public spaces, and a diversity of housing choices, as discussed below.

Appropriate density. Housing development within walking distance of transit stops should be at least moderately dense, 20 units or more per acre, to maximize potential transit ridership and to create a base of support for local retail and other everyday services within easy walking distance. Significant rail investments should be accompanied by densities that are much higher than that.

Accessible destinations. Neighborhoods near transit should feature a mix of land uses, so that regular destinations such as dry cleaners, delis, cafes, and childcare are within easy walking distance. These neighborhoods should also feature a high degree of pedestrian connectivity to transit stations, so that stations can be easily reached by various means, especially by foot or bike.

Streets for all users. Street infrastructure plays an important role in making sure that walking and biking are safe, inviting and convenient. For pedestrians, such inviting streets offer shade, sufficiently wide sidewalks, benches and beauty. Effective design guidelines ensure buildings meet the sidewalk, provide a tight building wall, and offer high levels of interaction with the street. Efficiently designed districts also offer bike lanes, bike paths and streets with slow moving traffic to make cycling a viable alternative to driving. Ultimately walkable and bikeable streets are human-scaled and anticipate users such as children, seniors and handicapped individuals.

Appealing public spaces. Complete, walkable neighborhoods are livable. Well-designed public parks, green spaces or gathering places are safe and inviting to families, workers, and people of all ages.

Diversity of housing choices. Complete efficient neighborhoods offer housing alternatives that vary by tenure, type, price and size – creating opportunities for households at varying income levels and of varying sizes and stages in life. This means apartments as well as condos and other forms of attached housing. In some communities this may also mean allowing secondary units and smaller, single-family cottages.

SB 375 Sets the Stage for Efficiency and Savings

Senate Bill (SB) 375, authored by Senate President Pro Tem Darrell Steinberg, was signed into law on September 30, 2008. SB 375 is the most ambitious attempt by any state in the country to forge a closer link between transportation investments and land use decisions. The bill integrates planning processes that are currently disjointed for transportation, land use, and housing, with the goal of reducing the amount that people have to drive, along with associated GHG emissions. The major provisions of this lengthy and complicated bill are listed below.

1. Creates regional targets for GHG emissions reductions from cars and light trucks.

By September 30, 2010, the California Air Resources Board (ARB) must give each of California's 18 Metropolitan Planning Organizations (MPOs) targets for GHG reduction from cars and light trucks for 2020 and 2035. A Regional Targets Advisory Committee has prepared a report on the methodology and factors that ARB will consider in setting the targets and monitoring compliance.

2. Requires regional planning agencies to create a land use and transportation plan to meet the GHG targets.

As part of the Regional Transportation Plan (RTP) updates that are conducted every four or five years, each MPO must prepare a Sustainable Communities Strategy (SCS) that meets GHG targets, "if there is a feasible way to do so." The primary variables that make up the RTP are 25-year forecasts for land use, alternative transportation investment scenarios, and transportation prices and policies.

- Transportation models are to be updated and used that take into account the effects of land use and public transportation service on VMT.
- While SB 375 anticipates that regional growth projections will support reduced GHG emissions, federal regulations for RTPs require MPOs to "utilize most recent planning (land use) assumptions, considering local general plans and other factors." This may limit how aggressive MPOs can be in creating an SCS with much more compact land use forecasts than they previously had. Still, cities and regions can predict that by 2020 and 2035 general plans and zoning codes will be different from current practices. General plans and zoning codes drive the SCS; assumptions in the SCS do not supersede local codes or authority over land use in any way.
- RTPs will still be financially constrained, meaning that MPOs can only plan to use existing sources of funds, or new sources they could reasonably assume would come into being during the 25-year period. If MPOs were given more authority by the state and federal government to raise revenue and implement pricing mechanisms, it would make it easier to meet ambitious targets.
- An additional financial constraint is that MPOs often assume a huge number of investments are already "committed" and can not be changed under any of the alternative scenarios. This often includes projects that only have a small fraction of needed funding but that were included in a sales tax or other ballot measure. However, regions can change their definitions of "committed" so that scenarios can be more varied (and potentially effective).
- Transportation policies that reduce demand on the system – whether through financial incentives to use alternatives, employee flex-time to reduce commuting, road pricing, or other measures – could also be considered. Many of these measures are expected to be highly effective. In the San Francisco Bay Area Metropolitan Transportation Commission's recent RTP analysis, transportation pricing was shown to significantly reduce driving.

- The SCS will be a component of the Regional Transportation Plan. Therefore, transportation investments in the RTP must be consistent with the SCS. (The law creates exceptions for some existing projects.)

3. If the plan does not meet the targets, an “Alternative Planning Strategy” must be developed.

If MPO modeling shows that the SCS will not meet the region’s GHG targets, the MPO must prepare an Alternative Planning Strategy (APS) that does meet the targets.

- The APS is a separate document from the RTP, and it could include land use forecasts that are not necessarily realistic “current planning assumptions.” It would also look at infrastructure or pricing mechanisms that the MPO does not have the current resources, authority, or ability to implement. Essentially, it is supposed to be a step-by-step guide to what investments, policies, or changes in land uses it would take to meet the target.
- The transportation investments in the RTP do not have to be consistent with those in the APS, but they still must be consistent with an SCS, even if that SCS has not met the targets.

4. Reforms the Regional Housing Needs Allocations (RHNA) and Housing Element law to match regional planning processes.

- The RHNA will be based on the SCS, which means cities that have significant public transportation and potential for infill development are likely to have greater housing responsibilities.
- Each region must also plan to provide enough housing to match all anticipated job growth (i.e., no more exporting housing for local workers to other regions). They also must plan for homes that are affordable to each economic bracket.
- The RHNA cycle will be extended to eight years to match up with every other RTP cycle (most of which are four years).

5. Requires each city to change the Housing Element of its General Plan to show how it will be able to meet its allocation of housing for residents of different income levels.

- Housing Elements will be due 18 months after the SCS is adopted. Jurisdictions must then re-zone sites within three years of Housing Element adoption.
- If a jurisdiction does not re-zone, developers can propose projects for those sites at densities that would have been needed to fulfill the housing element.

6. Makes new California Environmental Quality Act (CEQA) exemptions and streamlining for certain projects consistent with a regional plan that meets the targets.

These CEQA exemptions apply to projects that are consistent with either an approved SCS or, if the SCS does not meet its targets, an approved APS.

- The most basic type of exemption is for projects that are consistent with the SCS or APS land-use forecasts and are residential or mixed-use projects (with at least 75 percent residential). These do not have to:

- analyze GHG emissions for cars and light trucks;
 - analyze growth-inducing cumulative impact on the regional road network;
 - analyze lower density alternatives.
- For projects that fall into the category of “Transit Priority Projects,” there are three potential types of CEQA streamlining. To qualify as one of these projects the development must be built for at least 50 percent residential use, have a minimum net density of 20 units per acre, be located within ½ mile of a rail stop, a ferry terminal, or a bus line with 15-minute frequencies, and not be surrounded by seas of parking.
 - Total CEQA exemption is possible for projects that are no bigger than eight acres or 200 units, and that meet a number of other provisions.
 - A short form analysis may be used by some.
 - If there are pre-established traffic mitigations for the area, the project must only do those mitigations.

Overall, SB 375 is a bold new step for California. But to make it work it must be matched by supportive state and federal policies. Some of these are explained in the final section of this report.

Mitigating Wasteful Growth

Experience shows that when links in planning break down, costs can be high. For example, the Bay Area spent \$1.5 billion for a BART extension to the San Francisco Airport which opened in 2003. This regional investment was not initially matched by compact housing or office space that would support the transit service, leading to ridership at only 52 percent of its projected passenger levels.

The city of South San Francisco, for example, allowed a Costco to be built near their new station. If medium-density

housing (45 units per acre) had been placed on that lot, its residents would have generated \$27 million more in fare revenue – over \$500,000 annually – for BART over the expected life of the Costco. Instead, low BART ridership has resulted in service cuts and fare hikes both on BART and on the county’s bus system, SamTrans. The San Mateo County Transit District was responsible for the operating subsidy for the extension, originally forecast at \$1.3 million. However, the low ridership on BART necessitated a drastically greater subsidy of \$20.8 million in 2004, forcing cuts in bus service. Families and other households lost out on the chance to live in an area with low transportation costs, while more commuters were forced to pack the roads. These expenses could have been prevented if local land use decisions and regional transportation planning had been integrated.



The Costco parking lot (foreground) is an inefficient use of land near to the South San Francisco BART station (pointed out in the background).

Chapter 5: Efficient Growth Works: Selected Case Studies

The more efficient planning framework of SB 375 will help focus future growth on low-emission, low transportation cost areas.

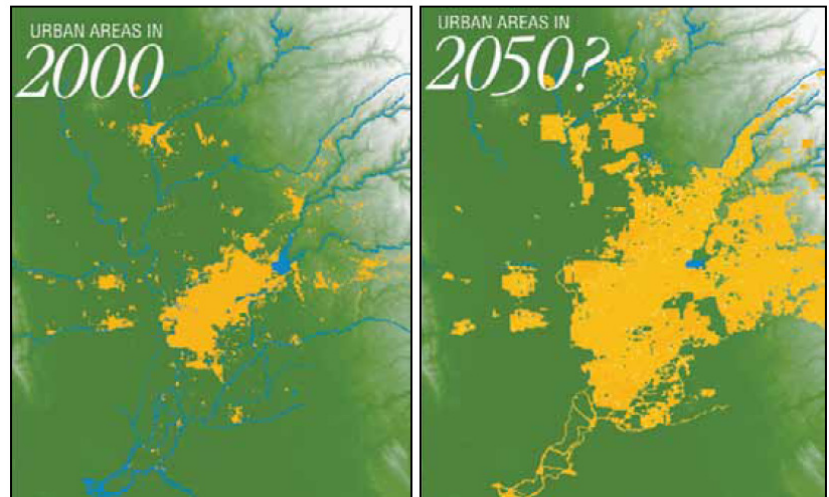
But as shown in the following case studies, such planning also can have environmental and financial benefits at the regional, city, and neighborhood levels.

- Sacramento, CA – regional level
- San Jose, CA – city level
- Santa Clara County, CA – public transportation corridor level
- Arlington County, VA – regional level
- Portland, OR’s Pearl District – neighborhood
- Windsor, CA – neighborhood
- San Leandro, CA – site level

In addition, two case studies in the following chapter exemplify two particular topics that are critical to making this work. First, a case study of Marin County shows that supplying homes local workers can afford is important to reduce long commutes from outside the county. Second, there is the excellent example of UC San Diego and how it is effectively reducing its costs by promoting transportation choices instead of building additional parking garages.

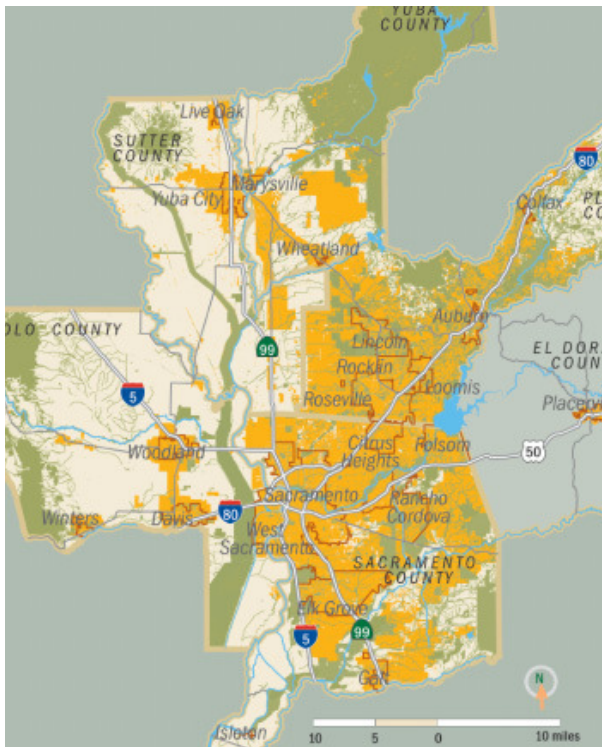
Sacramento Blueprint: Envisioning a Better Future

Since the early 2000s, regional planning agencies in California’s four major metropolitan regions (San Francisco, Los Angeles, Sacramento, and San Diego) have been developing a more coordinated approach to infrastructure and land use planning, which integrates regional transportation investment plans with local land use plans (Barbour and Teitz 2006). This approach, called “blueprint planning,” was made mandatory for all the state’s metropolitan regions with passage of SB 375. The cost savings and environmental benefits that can be achieved from a more coordinated approach to regional planning are evident in blueprint analysis from the Sacramento area.

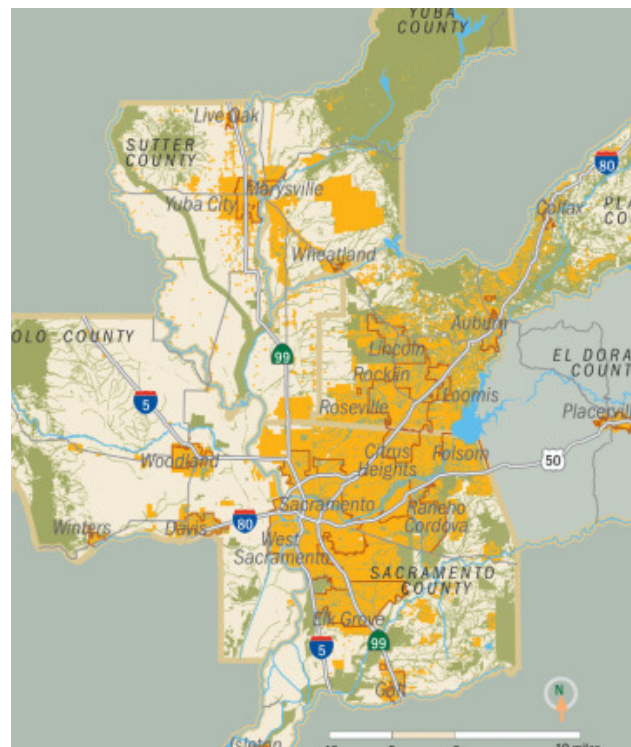


Outreach materials for the Sacramento Regional Blueprint process showed the sprawl the region was facing under development-as-usual.

Map J. Development Under Base Case Scenario, Sacramento Region, 2050



Map K. Development Under Blueprint Preferred Scenario, Sacramento Region, 2050



Source: Sacramento Area Council of Governments

Concerned about the pace and consequences of change in their area, regional leaders convened a public-engagement process from 2002 to 2004, to create a preferred future development pattern for the region. The outcome of the process was a blueprint for regional growth, ratified by local governments, which calls for more compact, transit-accessible development.

The process was spearheaded by the region’s MPO – the Sacramento Area Council of Governments (SACOG). SACOG engaged planners, elected officials, civic leaders, and ordinary citizens from across the multi-county region in a multi-year “visioning” process to consider alternatives for future growth and development. More than 5,000 people attended 38 workshops held in 2002 and 2003 to help develop a preferred scenario for regional growth.

Figure 14: Economic and Environmental Savings from the Regional Smart Growth Blueprint, Compared to “Business as Usual” Development Patterns, for the Sacramento Region from 2000 to 2050

- \$9.4 billion less for public infrastructure costs (e.g. transportation, water supply, utilities);
- 14% fewer CO₂ emissions;
- \$655 million less for residents’ annual fuel costs;
- \$8.4 billion less for land purchases to mitigate the environmental harm of development;
- 300% increase in public transit use;
- 6% to 13% growth in number of residents who walk or bike.

Source: SACOG Preferred Blueprint Alternative Special Report 2005.

The outcome – the regional blueprint – calls for more multi-family, compact, transit-accessible development than was projected to occur under business-as-usual – that is, with no changes to current local government land use plans (Maps J and K). Analysis indicates that the Sacramento region will save substantially by implementing the blueprint (Figure 14). A total of \$9.4 billion in public costs could be saved on infrastructure investments, such as for transportation, water supply, and utilities, from 2000 to 2050. Furthermore, residents of the region could save \$655 million annually on the cost of fuel. Expected environmental benefits are also significant, including \$8.4 billion that can be saved on land purchases necessary for environmental mitigation (such as for preserving habitat for at-risk species). CO₂ emissions are projected to be reduced 14 percent, region-wide.

Efficient Cities Attract Workers and Revenues

Studies confirm that compact, accessible regions and cities are wealthier and more productive (Muro and Puentes 2004). For example, one study indicated that metropolitan areas that practice growth management can improve their economic performance relative to other regions (with performance measured as personal income growth) (Nelson and Peterman 2000). Another study demonstrated that compact, accessible cities with efficient transportation links are more productive than more dispersed places (Cervero 2001). Denser local economies are also associated with increased patenting activity – a measure of idea-generation and economic vitality (Carlino 2001).

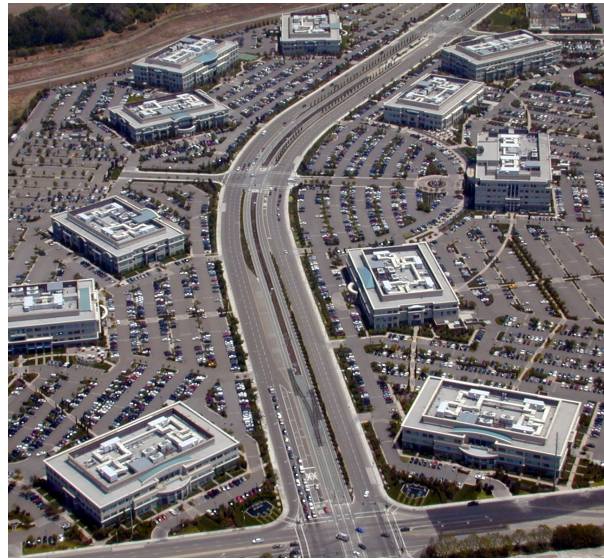
One explanation for the economic success of location-efficient regions is that livable, accessible, mixed-use urban areas provide fertile ground for attracting high-wage, high-growth employers and workers. Access to high quality transit is increasingly important to firms trying to attract professionals in the “knowledge economy” (Arrington and Cervero 2008).

City of San Jose: Building for the Future

The City of San Jose is facing major population growth – anticipating 400,000 new residents over the next 25 years, with a big increase in the proportion of young adults and seniors. Between 2007 and 2036, no net increase is expected in the 35- to 54-year-old population, but a significant increase is expected in 20 to 34 year olds (63 percent, from 178,000 to 291,000), and the 55+ population (111 percent, from 198,000 to 418,000). To meet this need, city leaders are developing plans to build on under-used land along transit corridors to create vibrant, mixed-use environments where there are currently parking lots and strip malls. This planning approach is a four-way financial win for the city: it creates room for additional jobs and (therefore) a larger tax base; attracts creative, skilled workers who do not want long commutes; supports underused public transportation lines with more riders and fares; and reduces the cost of infrastructure. On top of that, it will lower costs for residents. San Jose households living in locations with the most access to public transportation spend \$13,000 less per year on transportation than those in the most auto-oriented parts of the city – a greater differential than any other city in the region. A study of Santa

Clara County's light-rail corridor found transit-oriented development (TOD) residents chose transit as their main commute mode more than five times as often as residents countywide (Cervero et al. 2004).

The City of San Jose uses several efficient growth strategies detailed in its General Plan, including an urban service-area boundary (since 1970) and an urban growth boundary (since 1996). New development is directed to urban areas and away from wetlands and open space. The city has funneled more than \$1 billion to redevelopment in its downtown, catalyzing construction of a convention center, hotels, new office buildings, parks, museums, and compact housing (Greenbelt Alliance 2008, MTC 2006b; City of San Jose 2005).



Sprawling office parks in the North San Jose have huge redevelopment potential.

TOD is also central to the economic stability of San Jose's biggest sectors. Over the next 30 years, high technology firms in San Jose need to attract young talent to replace retiring employees of the Baby Boomer generation, says Kim Walesh, the city's chief strategist. While the city's overall population is expected to increase by more than 30 percent by 2035, the core of the professional population is not expected to increase at all. According to Walesh, corporate leaders realize that creative, skilled workers will be the key to innovation and prosperity in Silicon Valley. She says they also realize that what will attract these workers is not just high salaries, but the chance to live in "central city" places they love.

To become such places, the sprawling corporate offices of San Jose – especially in the North San Jose area – will undergo transit-oriented conversions. The North San Jose Area Redevelopment Policy splits up huge blocks using connector streets and creates a grid, which shortens distances for walking and biking. High-rise corporate headquarters will line the North First Street light rail corridor, which runs the length of the North San Jose area. Up to 26.7 million square feet will be built for more research and development or offices, which is expected to bring in more than 83,000 new jobs. Already, thousands of well-known technology companies employ more than 56,000 people in North San Jose. To offer them the chance to shorten their commutes, up to 32,000 high-density residential units will be built in the area, and at least 20 percent of these will be inclusionary, affordable housing. Parks, open space, and retail space will be included, while TDM measures, and an extensive set of urban design guidelines are being drafted to ensure that buildings create lively streetscapes to welcome both pedestrians and professional talent.

San Jose now leads the Bay Area region in infill development, and well-planned infill housing represents a concerted strategy on the city's part for maintaining long-term regional competitiveness as a center for high-tech innovation (Greenbelt Alliance 2008).

San Jose is one of the nation's largest producers of affordable housing, having spent \$300 million in local funds toward this purpose (ibid). Moreover, most new housing in San Jose is compact; four of every five homes built in San Jose are townhouses, apartments, or condominiums (Greenbelt Alliance 2008). Development downtown must be at least 25 homes per acre.

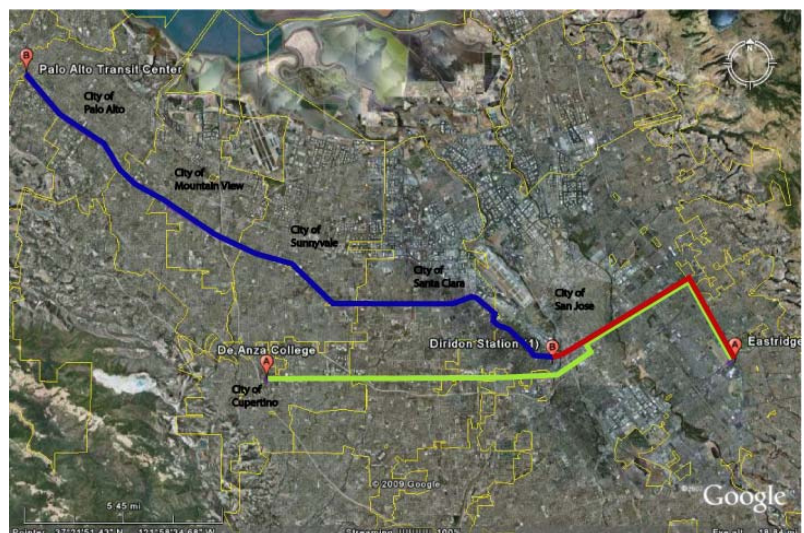
San Jose's strategies have paid off in providing desirable housing for area residents. By the late 1990s, for example, large apartments within 1/4-mile of light-rail stops commanded a land-value premium of 28 percent, compared with all land parcels within 4 miles of a light-rail station (Cervero et al. 2004). A recent study of potential infill opportunities in the Bay Area estimates that northern Santa Clara County – portions of San Jose, in particular – could accommodate 26 percent of new housing and 20 percent of new jobs projected to be added to the Bay Area region by 2035 (Greenbelt Alliance 2009).

As San Jose now undergoes an update of its General Plan, the city is considering some ambitious new objectives. For example, the Diridon Train Station and Transit Center, near downtown, could become a world-class transit hub, if underused land near the station is developed into a vibrant, mixed-use community. Already served by Caltrain, Amtrak, ACE and VTA's light rail, the Diridon Center is also targeted for future BART and high-speed rail connections. Other parts of the city, such as the North First Street area, show similar promise for creating new vibrant, transit-oriented urban neighborhoods.

The Silicon Valley Community Foundation has identified local and regional planning as a critical priority, and is working to ensure community groups have the resources to participate in these critical planning processes.

Extending Its Reach – Santa Clara's Bus Rapid Transit

Bold and innovative transit improvements are on their way to Silicon Valley. The Santa Clara Valley Transit Authority (VTA) is planning to introduce 30 miles of Bus Rapid Transit (BRT) through the cities of San Jose, Santa Clara, Sunnyvale, Mountain View, Los Altos, Palo Alto, and Cupertino. BRT is a new take on bus service that combines the frequency, speed, and capacity



Map of Santa Clara County's 30 miles of Proposed BRT routes.

of light rail with the convenience and affordability of buses. With the planned Alum Rock Corridor commencing service in 2013, Santa Clara will be the first county in the Bay Area with full-scale BRT. Additional BRT lines will follow, including the El Camino Corridor in 2015 and the Stevens Creek Corridor in 2018, according to VTA’s BRT Strategic Plan.¹⁶

BRT service in Silicon Valley will feature traffic signal priority and dedicated bus-only lanes, helping to make service over 30 percent faster and more reliable than current service. BRT vehicles will be greener diesel-electric hybrid engines, as well as wider doorways to allow people to enter and exit more quickly. The vehicles will also be fitted with GPS technology to provide real-time transit arrival information. BRT stations will be



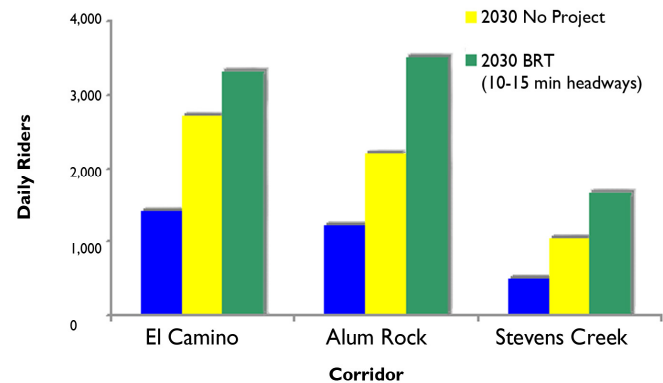
Santa Clara County is designing a flexible, efficient Bus Rapid Transit system that will be 10% the cost of light rail. Image credit: Santa Clara VTA

comfortable like traditional rail stations, including high-quality shelters, seating, landscaping, and public art that represent the preferences of surrounding communities. Level boarding platforms and ticket vending machines will allow riders to purchase their tickets and passes before boarding, helping to speed up service. Finally, BRT stations will be spaced farther apart compared to typical bus lines. This will help make speeds competitive with, and in some cases faster than, light rail. Just as importantly, service will be frequent with service every 10 minutes along most of the corridors and 5 minutes along the Alum Rock Corridor.

These BRT investments will take place along the Valley’s most heavily utilized public transportation corridors. Local bus service running along the planned BRT corridors currently serves one 1/5 of VTA’s public transportation riders, and projected population growth will further increase the demand for transit in these areas.¹⁷ BRT service is expected to net 100,000 daily riders by 2030, including 24,000 new users, or 40 percent more than what would be expected without the BRT investments.¹⁸ In other words, BRT will draw more people away from cars and towards public transportation, leading to healthier air quality and

Figure 15: Total Daily Ridership by Corridor (Existing vs. 2030 No Project vs. 2030 BRT 10-15 Scenarios)

Source: Santa Clara VTA BRT Strategic Plan ■ 2008 (July) ■ 2030 No Project ■ 2030 BRT (10-15 min headways)



¹⁶ Arup, 2009

¹⁷ Ibid.

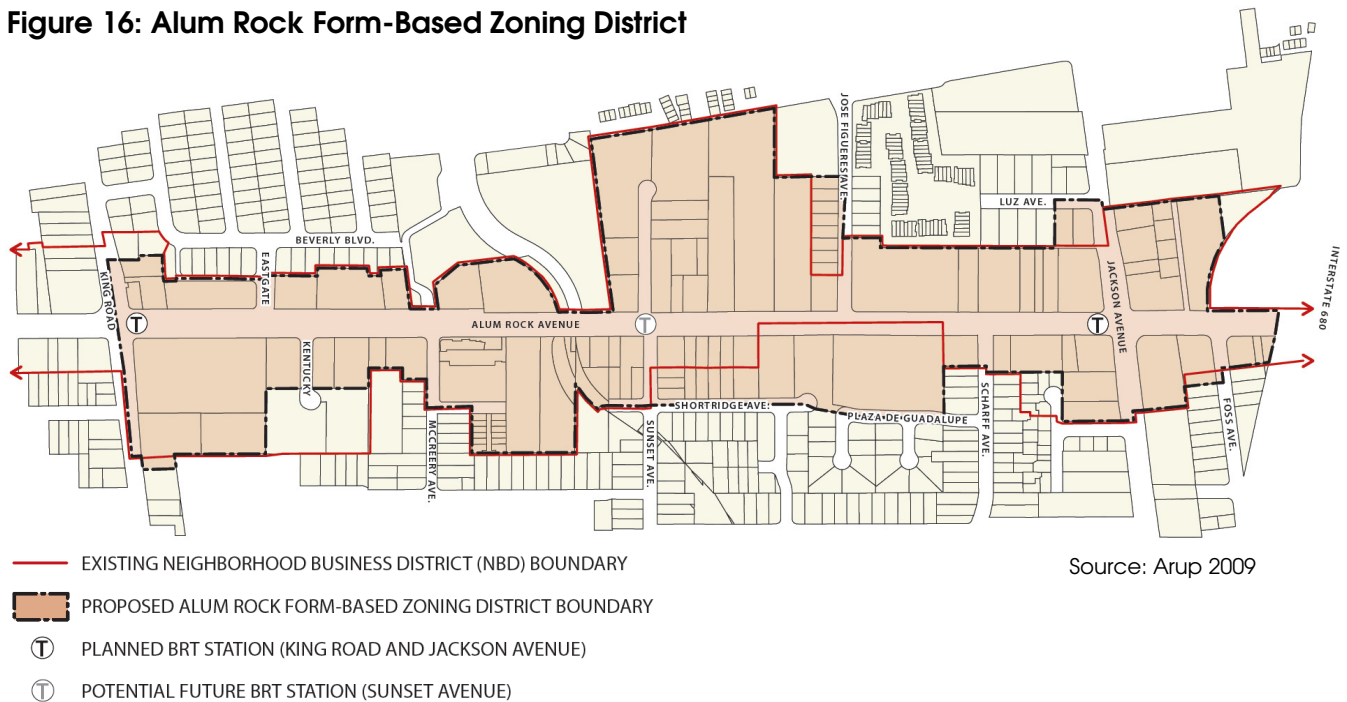
¹⁸ Ibid.

reduced GHG emissions. According VTA’s 2005-2006 On-Board Passenger Survey, Final Report, October 2006, one in five VTA riders would drive alone if public transportation were not available.¹⁹

Perhaps one of the most attractive features of BRT, especially during the current economic recession, is that it delivers similar benefits as rail transit, but at a fraction of the cost. VTA’s 30 miles of proposed BRT are expected to cost \$490 million, or \$15.3 million/mile.²⁰ In comparison, the 2.6 miles of light rail (LRT) proposed along Capitol Expressway is estimated to cost \$334 million, or \$128.5 million/mile.²¹ For the cost of building one mile of LRT, VTA can introduce up to 10 miles of BRT.²²

Finally, VTA’s BRT investments are helping to facilitate multiple forward-thinking planning processes. Cities of Santa Clara County are planning for compact, mixed-use, pedestrian-oriented communities near the BRT station areas through collaboratives such as the Grand Boulevard Initiative and General Plan Updates. The City of San Jose’s community based plan for “The Beautiful Way” along the Alameda, the Diridon Station Area Plan, and the Alum Rock Form-Based Zoning District will also leverage the BRT stations to spur more livable pedestrian and bicycle friendly communities.²³

Figure 16: Alum Rock Form-Based Zoning District



¹⁹ Valley Transportation Authority 2006. Santa Clara-Alum Rock Transit Improvement Project Final EIR

²⁰ Arup 2009

²¹ Valley Transportation Authority

²² Ibid.; Valley Transportation Authority,

²³ City of San Jose and Roma Design Group 2009

VTA's plans for Bus Rapid Transit in Silicon Valley show that communities can benefit from high quality and environmentally beneficial transit service that can be implemented quickly and cost-effectively.

Arlington County, Virginia: Prospering Through Efficient Growth

Arlington County, Virginia, provides strong evidence of the long-term economic benefits that can be achieved from consistent application of efficient growth development policies.

For the past 30 years, the county has channeled high-density, mixed-use projects to the Rosslyn-Ballston corridor, within walking distance of five Metrorail stations. The result has been a huge surge in development and property tax revenue, but with little of the traffic normally associated with this kind of growth, and in a relatively contained area of the county that has kept growth from encroaching on adjacent single-family neighborhoods.

Arlington County launched the redevelopment of the Rosslyn-Ballston Corridor in the 1970s to address a decline of commerce and population in the area. At the time, the corridor was an aging commercial strip, losing out to competition from more distant suburbs. The corridor lost 36 percent of its population between 1972 and 1980 (Leach 2004).

In addition to constructing the new Metrorail line, the county adopted a land use plan to concentrate dense, mixed-use development at rail stations, and developed sector plans for each station. The plans envisioned urban villages emphasizing pedestrian access and safety and incorporating public art, "pocket" parks, wide sidewalks with restaurant seating, bike lanes, street trees, traffic calming, and street-level retail (Cervero et al. 2004; Leach 2004; Nelson/Nygard 2006).

The county strategy has been very successful at concentrating development near rail stations. From 1970 to 2008, the amount of office space increased by more than 15 million square feet, and the number of housing units by nearly 20,000 (Arlington

The Rosslyn-Ballston Corridor is one of the most successful examples of TOD in the United States.

- More than 15 million square feet of office space, and nearly 20,000 housing units, have been added since 1970.
- Less than half (48%) of corridor residents drive to work, and 73% arrive at rail stations on foot.
- Arlington County's drive-alone rate is one-third lower, transit use is double, biking is triple, and walking is six times higher than in the region as a whole.
- About one-third of the county's real estate taxes are generated from the corridor, although it accounts for only 8% of its land area.
- The county has one of the lowest property tax rates in the region and has weathered the recession better than most of its neighbors.

County, Planning Division 2009). This growth would have consumed about seven times as much land at typical suburban densities (Leach 2004).

A mix of uses has been ensured through policies such as site plan review and zoning districts that require developers to build residential space before they can build the maximum allowable office density. The county has also promoted transit ridership by requiring developers to implement measures such as market-rate parking pricing and to fund streetscape improvements. Parking requirements are reduced close to stations, and waived altogether for some smaller projects (Nelson/Nygaard 2006).

The corridor's economic performance has been outstanding. Office developments have had very low vacancy rates compared to more auto-oriented parts of the region, and rents command a premium. About 1/3 of the county's real estate taxes are generated in the Rosslyn-Ballston corridor, although it accounts for only 8 percent of its land area (Leach 2004). This has helped Arlington County maintain one of the lowest property tax rates in the region (ibid; Arlington County, Planning Division 2009).

The corridor's transportation efficiency is also outstanding. Less than half (48 percent) of residents drive to work, and 73 percent arrive at rail stations on foot (Arlington County, Planning Division 2009). Compared with freeway median stations to the west, Rosslyn-Ballston stations have higher ridership and five times as many walk access trips (ibid; Nelson/Nygaard 2006). Arlington County's drive-alone rate is 1/3 lower, transit use is double, biking is triple, and walking is six times higher than in the region as a whole (Arlington County, Planning Division 2009).

Transportation efficiency produces cost savings for the county government. By promoting walk access, the county reduces the need to accommodate commuter parking. By 2002 the last remaining surface parking lots for commuters had been redeveloped for other uses (Leach 2004). At the same time, walk access reduces congestion.

Adjacent, single-family neighborhoods have been shielded from both development pressures and spill-over congestion. Low congestion reflects low auto-trip-generation rates for offices and residences near station stops, and low car-ownership rates for corridor residents as compared to residents of neighboring suburban areas (ibid; Arlington County, Planning Division 2009). More than 12 percent of Arlington County households and almost 20 percent in urban metro corridors have no vehicle. These rates contrast sharply with surrounding suburban counties, where car-free households are rare (e.g. 4 percent in Fairfax County) (Arrington and Cervero 2008).

What are the lessons in this case study? Arlington County shows that a transit-based efficient redevelopment strategy can unleash an economic juggernaut. The county successfully tied transit-oriented housing to transit-oriented employment and shopping (Arrington and Cervero 2008). Many observers attribute the county's success to the clarity and consistent implementation of its development plans, which provide developers with predictable expectations (Leach 2004; Cervero et al. 2004). The momentum of the county's efficient growth economy has been hard to stop,

even in the face of the recent recession; jobs and tax revenues have remained high compared to neighboring counties (Laris 2008; Martz and Dooley 2009).

Portland's Pearl District: Profiting from TOD/Transit Synergy

The most recent TOD success story from Portland is the remarkable transformation of a neighborhood known as the Pearl District. The district, a lively 90-block area with mixed-income housing, shopping, employment, and public parks, has become one of Portland's hottest neighborhoods (Cervero et al. 2004; Reconnecting America and CTOD 2007). It is credited with helping transform the downtown area.

The district's redevelopment was based on the construction of Portland's new Downtown Streetcar system, which opened in 2001. It is the first modern streetcar system built in the United States since the 1950s, and connects major destinations within the city, while also linking to regional light rail and bus service. The line has 38 closely spaced stations, allowing the streetcar to serve as a "pedestrian accelerator," promoting more walking trips and less parking demand (Reconnecting America and CTOD 2007).

The construction of the streetcar depended on careful coordination of TOD and transit strategies. The city used creative, mostly local funding approaches to launch construction. For example, the city increased parking charges and then issued bonds backed by future parking revenues, raising \$28.5 million. This strategy served to discourage driving, while also helping to build the transit alternative (ibid).

The city also leveraged future developer profits from TOD to raise funds to build the streetcar.

Demographic trends had created market demand for urban housing opportunities. The planned streetcar made higher-density development with lower parking ratios possible, which meant that developers could earn higher profits. On that basis, the city leveraged private sector



Photo credit: Cool Town Studios

Portland's downtown streetcar system helped launch redevelopment of the Pearl District.

- Creative finance strategies connecting TOD and TDM helped fund the streetcar, including bonds backed by future revenue from increased parking charge and a local improvement district funded by nearby property owners.
- More than \$2.3 billion in transit-supportive projects has been leveraged with average density of 120 housing units per acre.
- Journey-to-work travel within the district is now 51 percent by transit, walking, and biking trips.

contributions. For example, property owners along the alignment agreed to form a local improvement district, which provided \$10 million toward streetcar construction. Tax increment financing contributed another \$7.5 million (by which future tax revenues are used to pay for the revitalization efforts). New development has produced a sizeable stream of tax increment funds. A mix of other funding sources filled out a further \$11 million to complete the streetcar system (ibid).

The Pearl District has developed rapidly. By 2005, more than 100 projects worth more than \$2.3 billion had been launched or completed along the streetcar line (Ohland and Poticha 2009). This represents a stunning rate of return, considering an initial transit investment of less than \$60 million, most of which was initially borrowed. More than 7,000 residential units and almost 5 million square feet of non-residential space have been built or are expected to be built by 2009 (ibid; Reconnecting America and CTOD 2007). Average density is the highest in the city, at 120 housing units per acre. This density was possible, in part, because parking ratios for Pearl District development are low compared to the rest of the region; transit accessibility made less parking necessary (ibid).

The Pearl District has been an environmental as well as an economic success. Journey-to-work travel within the district consists largely of transit, walking, and biking trips (51 percent) and not many solo auto trips (less than 40 percent). More than 30 percent of households walk or bike to work (Reconnecting America and CTOD 2007).

However, the District's success has made it all the more important to be proactive about housing affordability. By the mid-2000s, the Pearl District's housing was the most expensive in the region on a per square-foot basis. A large percentage of new housing has been priced for households earning more than 120 percent of Portland's median family income. But ambitious goals and guidelines set by the city have helped ensure that about 1/4 of new housing units in the district is being kept affordable (ibid; Ohland and Poticha 2009), and that about 40 percent of total units are presently affordable to households earning less than 80 percent of the median family income (Portland Development Commission, 2007).

The Portland Development Commission has used a series of tools to produce housing at a diversity of affordable levels in the face of tremendous market pressure. In lieu of an inclusionary housing policy, the Commission has used a development agreement with the District's largest master developer to set development density, affordability, and unit size obligations. Other important tools have included tax increment financing, targeted funding strategies and efforts to preserve existing affordable housing (Portland Development Commission, 2007).

What are the lessons from the Pearl District case study? Portland's strategy shows the potential for public transportation to help turn areas of a city into destinations that generate tremendous value. (Cervero et al. 2004). The city used a forward-thinking "value capture" strategy in taking advantage of future economic benefits of TOD to

raise funds to launch the streetcar in the first place, ensuring that transit paid its own way. Finally, the Pearl District illustrates the importance of proactive, district-wide strategies to maintain affordability, given the potential for new districts built around transit to succeed beyond expectations and generate a strong market response.

Windsor, California: A Transit-Oriented Small Town Success

The small town of Windsor sits 60 miles north of San Francisco in Sonoma County along the Highway 101 corridor. Since it incorporated in 1992, the town has embraced the principles of TOD and efficient growth. Windsor is already benefitting from preparing to be a walkable public transportation center, even though trains won't arrive there until 2014.

The downtown's sales tax revenue increased tenfold over an eight-year period after the city created an accessible core of civic services, greenspace, and compact housing options for all incomes. Vacancy rates remain low, despite the national economic downturn.

Sonoma-Marin Area Rail Transit (SMART) – a new commuter rail system that will connect cities along the 101 corridor to the Larkspur Ferry and to the bus terminals that provide public transportation to San Francisco – was approved by voters in 2008. But for more than a decade already, Windsor has been preparing for the rail system. An inter-modal transit station that can fully harness the rail service was planned into the downtown revitalization efforts in the mid-1990s. Windsor invested more than \$15 million in projects to revitalize the downtown as the focus of the town's vision for community growth.

After the SMART system's approval, the intermodal station was leased to the Windsor Chamber of Commerce and Visitor's Center to aid in the attraction of new businesses – especially shops – to the downtown. In addition to the station, a central Town Green anchors the downtown and creates a vibrant economic environment.

Most businesses surrounding the Town Green are locally owned (Marketek 2008). Sales tax revenue increased steadily from about \$322,000 in fiscal year 1992-1993 to \$3.49 million in fiscal year 2006-2007 (ibid). Lease rates for retail space have been high and vacancy rates low, plus the projection for further retail development is strong (ibid). Even with the recent economic downturn, only 27 percent of surveyed businesses in town have reported a decline in sales.



Windsor's Town Green is well-used. The new buildings enhance the town's charm, and create an all-day clientele for the local shops.

Photo credit: Jeff Hobson

The Town Green itself is a 4.5-acre public park in the center of downtown, bordered by a library, civic center, and three-story mixed-use development. The Town Green provides open space, a historic oak grove, a children's play area, a tree-shaded area for events, a band stand, a great lawn, and a pedestrian path featuring a timeline walk detailing the history of Windsor and the region.

The Town Green draws people to the downtown and brings attention to the many nearby businesses located on the ground floor of the mixed use Town Green Villages project. Town Green holds community events throughout the summer, such as live music and kid's movies on a big screen, two farmers markets, and a Shakespeare festival.

Two- and three-story townhouses have been constructed in the downtown area. Bicycle and pedestrian trail systems have been developed. Thus the town aims to improve its walk/bike commute rate while providing homes for people at a range of incomes as well as shops to serve both residents and visitors from around the region.

Chapter 6: Efficient Parking Is Critical for Financial and Climate Savings

Efficient growth falls short of its promise without good design at the site level. It's not enough to locate housing, office space and other uses near transit. These developments must also feature appropriate density, pedestrian-friendly design, and opportunities for affordable housing to yield the fiscal, affordability, climate, and community benefits discussed in this report.

Each of these elements of good design hinges on getting the parking right at on individual projects. When "over-parked," sites near transit can accommodate fewer units, are less affordable, less walkable and create more traffic than necessary. Without efficient parking, overarching benefits of focused growth near transit are severely curtailed. The most comprehensive parking actually takes a district-wide approach, since sharing parking is generally much more efficient than requiring minimum amounts with each new development.

This section takes a closer look at two key components of efficient parking – right-sized parking ratios and comprehensive Transportation Demand Management (TDM) programs – and examines how each is already providing significant benefits to California jurisdictions and institutions.

The Problem of Excessive Parking

Many infill developments near transit are failing to deliver their promised benefits – if they are built at all – because they are saddled with excessive parking requirements and high traffic-impact fees. Many jurisdictions in the Bay Area, for example, still zone for two or more parking spaces per home or apartment – even in compact areas near jobs, services and transit.²⁴ Parking requirements commonly imposed on new development fail to recognize the lower trip-generation rates of TOD.²⁵ The problem arises because the data behind commonly-used parking standards are drawn from suburban areas with free and plentiful parking, and with low-density, single-use zoning. Current parking standards overestimate TOD parking needs by up to 100 percent.

This miscalculation comes at a price: structured parking costs at least \$25,000 per space, and underground parking can cost as much as \$45,000 per space.²⁶ These extra costs mean developers need more expensive units to recover their total costs, increasing the likelihood that lower and moderate-income households will be priced out. And with more parking spaces to accommodate in a given building footprint, developers have less space for homes. As a result, many housing developments near transit are accommodating many fewer units than they should, and are unaffordable to all but the highest-income households. This is a particularly wasted opportunity given the higher propensity of lower-income households to use transit.

²⁴ TransForm 2002

²⁵ Arrington and Cervero 2008

²⁶ Ohland and Poticha 2009

Lowering parking requirements, in recognition of the lower trip-generation rates of transit-accessible housing, enables higher TOD densities, lower per-unit costs, and lower development impact fees, saving developers millions and helping keep housing prices/rents affordable in infill areas well served by transit. TDM further reduces economic and climate costs by making still lower parking ratios possible, as well as higher transit usage.

One of the tools that planners used to successfully intensify development along the Rosslyn/Ballston Corridor was reducing minimum parking ratios from 2.2 spaces per unit to 1.1.²⁷ Indeed, scaled-down, context-appropriate parking is the thread that links many of the success stories in this report – from the Rosslyn/Ballston Corridor to Portland’s Pearl District to Downtown San Leandro (discussed below).

TCRP’s 2008 report titled *Effects of TOD on Housing, Parking and Travel* provides useful insight into the impact of efficient parking at the project scale. The authors modeled the physical, cost and transit-ridership impacts of reducing parking space ratios from 2.2 to 1.1 space per unit for various types of TOD housing developments. Without having to increase height limits, reduce building setbacks, or otherwise change the maximum building envelope, reducing parking ratios from 2.2 to 1.1 led to:

- a 20 percent to 33 percent increase in the number of potential units in a TOD, depending on development type;
- lower total construction costs for parking – even when more residential units were built – resulting in significant savings at moderate and higher densities; and
- higher transit ridership, and greater fare revenue, due to the higher number of potential residential units. (See Figure 17).

Figure 17: Impact of Lowering Parking Ratios from 2.2 to 1.1 Spaces per Unit for Four Prototypical TOD Developments

	Initial Density	Units Gained	New Density	Parking Capital Cost Savings
Garden Apartment (surface parking)	24 units per acre	60	32 units per acre	\$98,000
Townhomes (surface parking)	36 units per acre	96	48 units per acre	\$736,000
Mid Rise 6-Story (structured parking)	100 units per acre	162	120 units per acre	\$12,000,000
Texas Donut (parking structure surrounded by usable residential space)	92 units per acre	225	120 units per acre	\$5,300,000

Source: TCRP, *Effects of TOD on Housing, Parking and Travel*, 2008.

²⁷ TCRP, 2008

Here in the Bay Area, a recently approved, affordable housing development next to transit in Downtown San Leandro offers us a real-world case study of how a similar parking reduction impacted developer costs, the efficiency of city affordable housing assistance, and local amenities.

San Leandro: Affordable Housing for a Vibrant Downtown

In late 2007, the City of San Leandro adopted a downtown TOD strategy. They had learned that the community wanted safer streets, affordable places for families to live, a vibrant downtown and a childcare center near the BART station.

In March 2009, the San Leandro City Council unanimously approved 100 units of new affordable apartments next to the San Leandro BART Station. This new, mixed-use apartment building will be known as “The Alameda.” It is the first stage of a larger TOD called San Leandro Crossings. The TOD Strategy played a significant role in making the Crossings and the Alameda possible.

The Alameda at San Leandro Crossings will be San Leandro's first new apartment community geared toward low income families in over twenty years.²⁸ It will be built and managed by BRIDGE Housing Corporation. Forty percent of the homes in The Alameda will be 3-bedroom apartments to accommodate larger working families that often face overcrowded conditions elsewhere in the city.

At full build-out, The Crossings will add 600 market-rate units, reconnect the local street grid, and make other improvements to the pedestrian streetscape to enhance connections to the BART station.²⁹ BRIDGE expects to break ground on the Alameda in spring 2010.



This photo illustration shows how San Leandro's 2008 TOD strategy will make street life more lively, safe and attractive.

Image credit: Urban Advantage

²⁸ Interview with Kathleen Livermore, Planning Manager, City of San Leandro, May 2009.

²⁹ Interview with Ben Metcalf, Project Manager, BRIDGE Housing Corporation, May 2009.

The Benefits of Right-Sizing Parking Requirements

A major feature of the TOD Strategy is reduced parking requirements for sites near downtown BART. Previously, multi-family housing was required to provide 1.5 to 2.5 spaces per unit, depending on the number of bedrooms.³⁰

By cutting that requirement in half and allowing slightly taller buildings in this transit-oriented area, the city was able to bring forward a plan that generated tremendous community support. The plan makes room for more than 3,400 new homes, about seven times what the old zoning would have allowed



Affordable residences line the sidewalks in the Crossings plan.

Photo credit: David Baker and Partners

Reduced parking requirements have allowed The Alameda to reach a parking ratio of 1.02 spaces per unit. To understand the impact of this lower ratio, cost and other site data from BRIDGE Housing Corporation were used to model alternate development under the city's previous parking standards. Given its mix of one-, two-, and three-bedroom units, The Alameda would have been required to provide an average of 2.2 spaces per unit before the TOD Strategy changed downtown zoning requirements.

By lowering the minimum parking ratio for development in the downtown BART Station area to 1.0 space per unit, the city will be able to facilitate more affordable units next to BART – at 33 percent less subsidy per unit – than if higher parking requirements had remained in place for the downtown district.

This parking reduction will also enable The Alameda to feature a pedestrian-friendly ground floor – with walk-up units and a childcare center at street level – and enable the city to receive millions more in state infrastructure dollars than would have been otherwise possible.

To make The Alameda viable under parking requirements of 2.0 spaces per unit, the city would have had to allocate \$13 million in subsidy to produce 96 units – \$135,000 per unit. Currently, the city's subsidy for The Alameda is \$9.1 million, or \$91,000 per unit. By reducing parking requirements to 1.0 space per unit, the city stretches its subsidy dollar 33 percent further, saving \$44,000 per unit.³¹

According to San Leandro Planning Manager, Kathleen Livermore, it is unlikely the city would have had the additional funds to cover the costs of building the Alameda

³⁰ Op cit. Livermore 2009.

³¹ Op cit. Livermore 2009.

at 2.0 spaces per unit. As a result, BRIDGE would have had to significantly scale down the number of units in the Alameda to fit within the city's funding limits.³²

If done right, planning for great walkable places decreases costs for infrastructure, generates revenue, and makes these places more affordable for new homes and businesses. Meaningful, ongoing participation of local residents is crucial to this type of planning.

With fewer units, the Alameda would have commanded a far smaller infrastructure award for the city from the state's program to fund TOD. Since TOD infrastructure grants are tied to the number of housing units in a development – with affordable homes earning the highest award at \$50,000 per unit – a scaled-down development with 70 units would have reduced the city's infrastructure award by \$1.5 million.³³ This reduced award would have curtailed plans for street, sidewalk, lighting and landscaping improvements, or forced the city to find these funds elsewhere in its budget.

Applying the more conservative ratio of 2.0 spaces per unit would have resulted in:

- **\$3.9 million in additional construction costs** (to accommodate a new floor of above-ground parking and an elevator lift)
- **the loss of the ground-floor child care center**
- **the loss of about 30 affordable units** (4 from the ground floor)
- **elimination of street life on Martinez Street** (by replacing walk-up units and a childcare center with a parking garage wall.³⁴)

Ultimately, by reducing parking requirements in its *TOD Strategy* area to one space per unit, the City of San Leandro did more than reduce traffic in downtown San Leandro: it produced 100 high quality affordable homes at a third less subsidy per unit and generated more than a million dollars in additional state TOD infrastructure funds for the city, accelerating its efforts to revitalize the downtown while saving the city money.

³² *ibid.*

³³ Based on California Department of Housing and Community Development, *TOD Housing Program Guidelines*, December 2007.

³⁴ *Op cit.* Metcalf 2009.

Chapter 7: Affordable Homes and Cost Savings Are Key Ingredients

Diverse Housing Choices Keep Efficient Neighborhoods Affordable

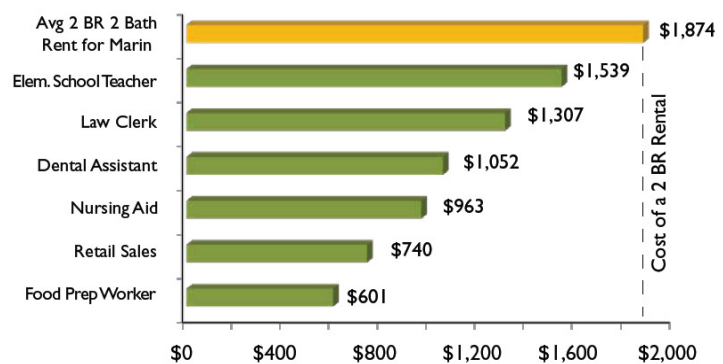
Convenient, walkable neighborhoods can cut transportation costs and long-distance commuting, but only if people can afford to live near their work. That is why building quality affordable housing near employment centers is critical to keeping commutes short. It's also why it is so important to implement mechanisms that maintain affordability for existing residents as areas near transit become more valuable over time.

The impact of a “jobs-housing mismatch” can best be seen in Marin County, the most expensive housing market in the Bay Area. While county policies promote environmental stewardship, constraints on development, combined with community opposition, have prevented the development of enough affordable homes.

In counties like Marin, low and moderate-income households make up a disproportionate share of in-commuters and extreme commuters. In Marin, 71 percent of in-commuters earned less than \$100,000 in 2000. As there has been an explosion of home prices since 2000, this percentage has likely only increased. With commutes averaging 31 miles one-way, and 95 percent of these commutes being by car, this group of in-commuters cumulatively drives 493 million miles per year, contributing more than 345,000 tons of CO₂ pollution each year.³⁵

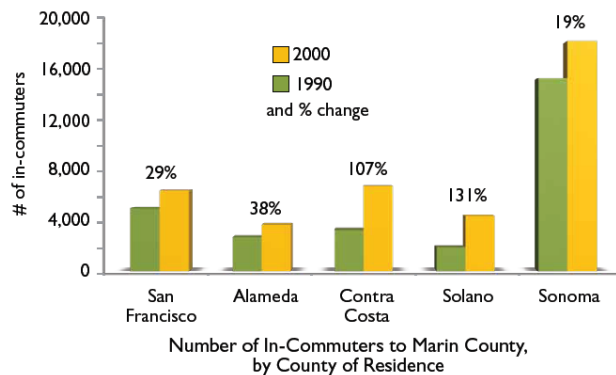
The number of extreme commuters – those commuting to Marin from outside the Bay Area – grew by 500 percent from 1980 to 2000. Cross-county commuting has increased, too. The number of in-commuters from (non-adjacent) Solano County increased 131 percent between 1990 and 2000.³⁶ Then communities in areas

Figure 18: Many workers can't afford rent in Marin County



Sources: CA Employment Development Department June 2009 and RealFacts IQ, Marin County Inventory Analysis, via EAH Housing.

Figure 19: Commutes into Marin County are growing



Source: Metropolitan Transportation Commission via the Marin County Community Development Agency

³⁵ MCHAI

³⁶ MTC, Journey to Work

like Solano County, and in spots outside the Bay Area, show up as having high transportation costs – not just because of poor local neighborhood design or a lack of quality transit service, but because of jobs-housing mismatches in other regions.

In 2008, the County of Marin conducted an extensive survey of the tenants of affordable housing rentals in the county. It found that 91 percent of affordable housing tenants worked within the county – considerably greater than the percentage of county residents overall (62 percent). Additionally, the county found that these tenants had consistently moved from housing with longer commutes (and larger carbon footprints).³⁷ Marin’s experience thus suggests that once tenants of affordable housing find housing near employment centers, they tend to work close by.

A greater diversity of housing options in Marin would have a big impact on in-commuting, extreme commuting, overall congestion and GHG emissions generated by the county. It would also lower transportation expenses for these households. And in very low transportation cost cities such as Larkspur and Sausalito, more affordable housing options would help create greater overall affordability for these households.

Recognizing this trend, Marin County and the Marin Community Foundation are now prioritizing development of more diverse housing options. Matching housing with jobs may be a critical way to meet SB 375 targets, while reducing transportation expenses.

More Low-Cost Housing Options in Efficient Neighborhoods Benefits All

Providing a mix of housing choices and prices in efficient neighborhoods enables us to better house the local workforce, reducing commuting, transportation costs and GHG emissions for the region as a whole.

Lower-income households are the most likely to take advantage of opportunities to drive less. As the most sensitive to high transportation costs, and the least likely to own cars, lower-income households are the most likely to take advantage of nearby transit. For the United States as a whole, more than half (59 percent) of all transit users are individuals in households earning less than \$37,000 annually. In the Bay Area, households in the region earning \$66,000 or less for a family of four are more than twice as likely to commute by bus than other households.

And because those without a car often use transit for non-work trips, too – trips to the store, school or recreation – low-income households also play a crucial role in filling public transportation seats during off peak hours, making transit service more cost-efficient.

Providing affordable housing choices in efficient, transit-accessible neighborhoods helps transit systems maximize ridership, and helps secure a strong base of riders for

³⁷ Marin County, *Affordable Housing Inventory 2008*.

transit systems, riders who might otherwise have to forgo transit proximity in searching for safe, affordable housing at the region's transit-poor edges.

But transit systems are not the only beneficiaries. All can benefit when transit systems have greater ridership. The revenue from high ridership enables transit systems to improve services for other households, increasing the frequency of service and affordability of fares, pulling still more riders off the road, and making it possible for more residents in more neighborhoods to drive less.

A diversity of housing choices in transit-accessible, walkable neighborhoods also pays dividends for the region through less congestion. More transit riders mean fewer drivers clogging the streets. Furthermore, a diversity of housing prices in efficient neighborhoods, where a mix of uses provides jobs, means more residents will be able to commute a shorter distance to work – whether by transit or by car.

Efficient cities, therefore, don't just offer its residents a realistic opportunity to drive less. They also offer an opportunity for the local workforce to live close by.

UC San Diego Reaps Windfall by Rejecting Parking and Supplying Alternatives

Various interests have expressed concern that policies to meet emissions targets in SB 375 will cost “a lot of money and pose huge economic risks to our economy” (Los Angeles County Economic Development Corporation, 2009). But when even a limited analysis is conducted – not including broader health, environmental and other benefits – efficient growth and transportation alternatives are often much less expensive.

At the margin, it is often much more expensive to increase parking supply than to reduce demand. Transportation Demand Management (TDM) uses a “push-pull” strategy to reduce driving and parking demand. “Push” strategies discourage driving through such means as increasing parking rates, while “pull” strategies ease the transition to more efficient modes of transport, for example by making it less expensive or easier to take transit, use carpools, or bike.

The University of California at San Diego provides an excellent example of what a push-pull strategy looks like in action. Too often, institutions seek to meet parking needs by supplying more spaces. UC San Diego managed its demand instead, putting off new parking facilities and funneling revenue from parking permit fees into programs that promote alternatives to driving for campus commuters, saving millions in the process.

This replicable model is paying dividends not only for the University as an institution, but also for students, staff, the surrounding community, the transit system and the environment – all of which benefit from the availability of lower-cost alternatives to driving to campus.

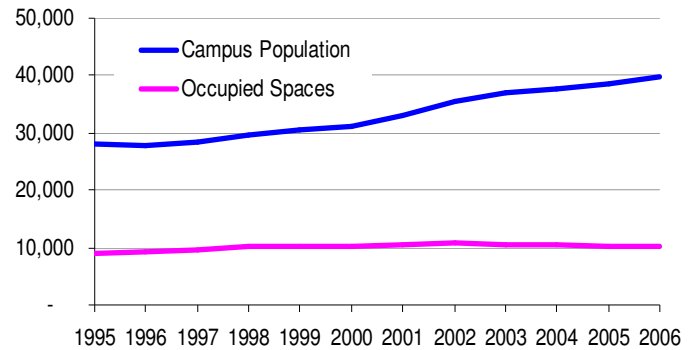
At first it may seem that raising parking fees would result in higher average costs for commuters, but that can only be ascertained once a full economic analysis is

applied. As shown below, UCSD’s approach can serve as a model for other large institutions and cities to follow.

The UCSD campus population exceeds 39,000 at its suburban La Jolla site. With little affordable housing located nearby, many faculty and students commute long distances (Corbett 2008a). The campus provides 16,000 parking spaces and had plans to build 13 new facilities by 2020, to add 11,500 additional spaces.

But in 2007, after building the first three structures, the University reassessed its plans for more garages. It noticed that – in spite of a 25 percent increase in campus population from 2001 to 2007 – innovative TDM measures, along with higher gas prices, enabled the campus to maintain a steady 20 percent parking space vacancy rate.³⁸(See Figure 20.)

Figure 20: UCSD Population and Parking Utilization, 1995 to 2006



Source: UCSD Transportation Services

The University decided to compare the cost-benefits of building new parking facilities versus continuing and expanding its TDM programs. Using an approach that can be easily replicated by other large institutions or even cities, the University estimated the cost for a number of possible parking structures, with those costs based on a full life-cycle – including “soft” costs of facility construction, such as planning and permit costs, hard costs for construction, and maintenance and operating costs. These costs were then compared on a per-commuter basis to other means for getting commuters to campus.

Using an approach that can be easily replicated by other large institutions or even cities, the University estimated the cost for a number of possible parking structures, with those costs based on a full life-cycle – including “soft” costs of facility construction, such as planning and permit costs, hard costs for construction, and maintenance and operating costs. These costs were then compared on a per-commuter basis to other means for getting commuters to campus.

The University’s analysis found that parking needs could be met much more cost effectively by enhancing alternative transportation programs, prohibiting resident freshmen from purchasing parking permits, and promoting variable work schedules (Campus Planning and Transportation and Parking Services 2007). New parking structures would have cost \$27 million to \$55 million each, or between \$29,100 and \$43,500 per net new space (Corbett, 2008a). By foregoing construction of just half the new facilities originally planned by 2020, and instead pursuing TDM programs on the same cost basis per commuter as in 2007, estimators found the school would save approximately \$5 million to \$12 million all-told on an annualized basis at full build-out (foregone).³⁹ The school decided to shelve its plans for new garages.

³⁸ Campus Planning and Transportation and Parking Services 2007

³⁹ This estimate is calculated from data from UCSD Transportation Services as follows: UCSD could save \$1000 to \$2000 per un-built parking space on an annualized basis (considering the annual net cost for adding an additional parking space as the net estimated costs per space for the Hopkins and Medical Center structures (two structures recently costed out which represent high- and low-cost estimates), and comparing that cost to the annual cost of supporting an alternative mode commuter, as seen in Figure 21, weighted for alternative mode

UCSD has used creative TDM measures to keep its parking demand flat. In 2001, the school increased the number of shuttle vehicles, adding or expanding routes, and lengthening hours of operation. Carpool, vanpool, and cycling membership programs were promoted offering various incentives such as free credits for car sharing, occasional use permits good for up to 10 free days of parking per quarter, and eligibility for up to three courtesy rides home per year. Transit subsidies were increased significantly. For example, a program entitling UCSD students and employees to ride certain city bus routes free-of-charge was expanded (ibid; Sundstrom 2007).

UCSD funds all its TDM programs using on-campus parking permit revenue. Parking permit prices have been raised 61 to 66 percent since 2000-2001, helping keep parking demand flat (Corbett 2008b).

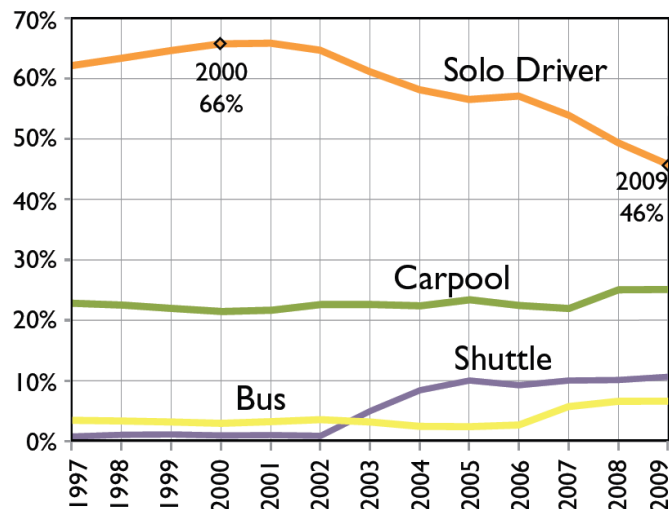
UCSD's funding method follows the push-and-pull approach that makes TDM pricing strategies work: when prices are increased for solo drivers, the revenue is funneled back into support for alternative modes, thereby easing a transition from driving for campus commuters.

These programs have had a significant impact in reducing solo driving. The share of faculty, staff and students who enter campus in single occupant vehicles declined

UCSD shelved plans to build 10 new parking facilities after determining that TDM programs have reduced parking demand.

- UCSD uses parking charge revenue to fund TDM programs such as carpool, vanpool, and cycling programs, and free bus rides on many routes.
- The share of commuters who enter campus in a single-occupant vehicle declined from 66% in 2001 to 46% in 2009.
- Use of campus shuttles increased by over fifteen-fold from 2002 to 2009. Bus use among campus commuters nearly tripled since 2006.
- UCSD is saving millions by foregoing construction of the new parking facilities. Compared to the annual per-commuter cost of alternative mode programs, UCSD would spend \$1000 to \$2000 more to build each new parking space.
- By foregoing construction of half the planned parking facilities and funding TDM programs instead, the school could save \$5 to \$12 million on an annualized basis.

Figure 21: Commuter Behavior Shifting at UCSD



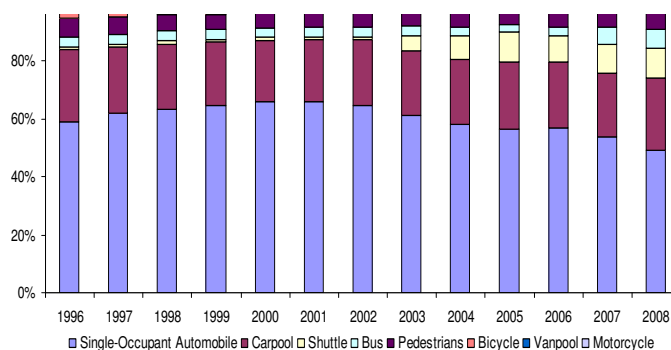
Source: UCSD Transportation Services (Sam Corbett)

shares). Multiplying the cost savings by half the number of new spaces called for under UCSD's pre-TDM development plan (11,500 total, or 5,750 half) amounts to a sum of \$5 to \$12 million at full build-out (foregone) on an annualized basis.

from 66 percent in 2001 to 46 percent in 2009 (Figure 21).

Among alternative modes, carpooling is most popular; one quarter of UCSD commuters entering campus in 2008 used a carpool. Other modes have grown faster, however, because of promotion campaigns (Figure 22). Use of campus shuttles has increased phenomenally, by more than ten-fold from 2002 to 2008. Bus use also has risen rapidly, nearly tripling since 2006 after UCSD began providing new incentives.

Figure 22: Ridership on Alternative Transportation Modes, UC San Diego Campus, 2001 to 2008



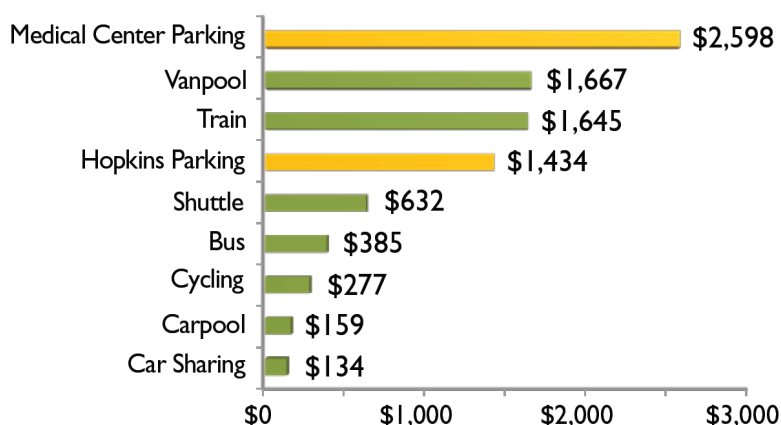
Source: UCSD Transportation Services

UCSD itself is not the only beneficiary of the TDM cost savings. The savings also spill over to benefit faculty, staff, students, and even public transit agencies and households in the area. Most UCSD commuters who have switched to alternative modes cite cost savings as the main reason (Sundstrom 2007). Without these programs, possibly thousands more students would need to own cars to get to school, adding costs of car ownership, maintenance, and operation, as well as parking permits, to their household budgets.

Residents of surrounding neighborhoods also benefit from UCSD's programs because of reduced traffic congestion resulting from lower auto use by UCSD commuters. Local taxpayers benefit because less maintenance and expansion of roadways near the school is necessary. In addition, local transit systems benefit from the subsidy UCSD provides in paying for free bus rides (1.8 million free bus rides in 2008-09 amounted to more than \$2 million),⁴⁰ as well as additional farebox revenue from UCSD transit riders paying a portion of their own monthly transit passes (typically about half), and greater induced ridership through other UCSD programs.⁴¹

UCSD is currently working to identify stable funding sources for its transit programs to help

Figure 23: UCSD Costs per commuter by mode



Source: UCSD (Sam Corbett) and Sundstrom

⁴⁰ Calculated from data in Tables 5 and 6 in Sundstrom (2007).

⁴¹ The increase in revenue to the transit system is offset, however, by the lower per-ride subsidy provided by UCSD for its free bus zone program (\$1.10 per ride in 2008-09) compared to the price of full-cost bus tickets. For the share of UCSD commuters that would have taken the bus without the UCSD subsidy, the difference represents a loss to the transit system. Data provided by UCSD Transportation Services.

reduce single-occupant vehicle use to 39 percent by 2018 – a goal specified in UCSD’s Campus Climate Action Plan.

In the meantime, UCSD’s example has fundamentally changed how schools elsewhere in California are evaluating options for meeting parking demand. The UC system now requires all its schools to cost out and compare a TDM-based approach before constructing new parking facilities.

TDM strategies are effective at both the district and project levels in managing transportation demand more cost effectively. At the district level, parking meter rates can be increased and used to improve local transit, or create better infrastructure for walking or biking, such as wider sidewalks and more bicycle lanes. At the project level, a specific office or housing development may reduce its supply of parking, without compromising access, by providing free transit “eco-passes,” bike amenities, guaranteed-ride-home programs, car-sharing opportunities, and other on-site amenities that reduce the need to drive.

Some TDM policies do not require an increase in the overall cost of driving. Instead, they work by rewarding efficient car use or by making alternative modes less expensive. One such policy is “parking cash-out.” Parking cash-out programs provide a cash equivalent to employees who do not use free parking provided by their employer. The “cash-out” saves employers money while providing a cash incentive to employees for taking alternative forms of transportation to work. Parking cash-out typically reduces automobile commuting by 10 to 30 percent, and it is more equitable because non-drivers receive benefits comparable to those offered motorists (Litman 2008).

Chapter 8: The Market Is Ready for a Shift

Efficient, compact development is in high demand. Fueled by growing popularity, anecdotal evidence suggests that during the most recent economic downturn, in several regions infill properties near transit held their value better on average than housing in surrounding areas.⁴² With demand projected to grow even further over the next two decades, it's not hard to posit that local governments can help better protect themselves from the next economic downturn by investing in more infill housing near transit.

There is substantial evidence of high consumer demand for compact, transit-accessible housing and commercial locations. Numerous studies document price "premiums" for homes and commercial properties in these areas. In many cases, properties near transit command a higher price per square foot than those in other locations. These premiums can range from 10 to 160 percent.⁴³

Strong consumer demand is driven by the high costs of transportation in auto-dependent communities, the expanding reach of many transit systems, and the growing numbers of smaller, childless households with a different set of priorities than families with children.

Consumer surveys confirm that the market for TOD is large and growing in the Bay Area. In a 2006 poll of Bay Area residents, a majority (55 percent) of respondents expressed a preference for living in a mixed-use neighborhood where they can walk to stores, schools and services.⁴⁴ In a 2007 poll, an even

From *Emerging Trends in Real Estate*, 2009 Best Bets:

Mixed Use, Infill

"Energy prices and road congestion accelerate the move back into metropolitan-area interiors as more people crave greater convenience in their lives. They want to live closer to work and shopping without the hassle of car dependence. Higher-density residential projects with retail components will gain favor in the next round of building. Apartment and townhouse living looks more attractive, especially to singles and empty nesters—high utility bills, gasoline expenses, car payments, and rising property taxes make suburban-edge McMansion lifestyles decidedly less economical."

Transit-Oriented Development

"Metropolitan areas nationwide realize they need to build or expand mass transportation systems in order to overcome road congestion, which strangles economic growth and increases carbon footprints. Increasingly, people want to drive less and seek subway, commuter railroad, or light-rail alternatives. Developers can't miss securing project sites near rail stops and train stations."

⁴² CTOD, *Realizing the Potential: One Year Later – Housing Opportunities near Transit in a Changing Market*, prepared for the Federal Transit Administration (FTA), 2008.

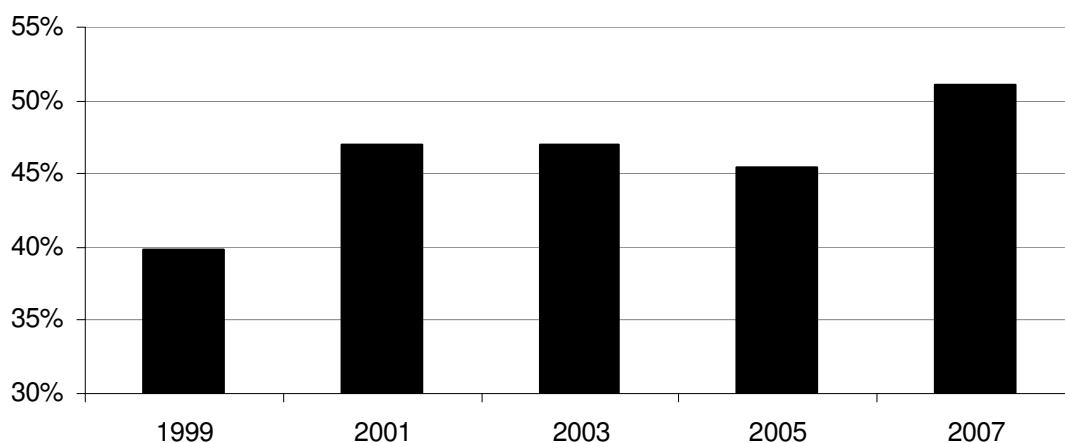
⁴³ (Leinberger 2007; CTOD 2008).

⁴⁴ (MTC 2006b).

higher share of respondents (74 percent) indicated a preference for a smaller home and short commute over a larger home and a long commute.⁴⁵

Investors have taken note. The annual “Emerging Trends in Real Estate” report has identified infill sites and sites near transit as a “best bet for investors/developers” five years in a row.⁴⁶ As housing prices increased dramatically during the early 2000s, congestion on roads soared, and more people became attracted to walkable urban and suburban core areas, the market began to respond to the demand TOD. Multi-family housing has been rising as a share of all housing permits in the Bay Area in recent years (Figure 24).

Figure 24: Multi-family Building Permits as Share of Total Building Permits, San Francisco Bay Area, 1999-2007



Source: Construction Industry Research Board

But price premiums for compact, transit-accessible housing show that demand still exceeds supply.

Demand for Transit-Oriented Development Continues to Grow

Consumer demand for compact, transit-accessible housing is projected to grow even more in coming years due to demographic shifts. The types of households who tend to seek out TOD most – singles, baby-boomer couples without children, and low-income non-white households – are also the same groups expected to grow most quickly through 2030.⁴⁷

In the Bay Area, a recent study estimated that all nine counties will experience a significant increase in demand for housing and jobs near public transit over the next 25 years. Currently, about 600,000 households in the Bay Area live within a half mile of an existing rail transit or bus station. Over the next 25 years, an estimated additional 250,000 households will be seeking transit-oriented homes, an increase of 40 percent

⁴⁵ (MTC 2008c).

⁴⁶ PricewaterCoopers, ULI, *Emerging Trends in Real Estate 2009*.

⁴⁷ Ewing et al. 2008, MTC 2006b.

(MTC 2006b). This estimate of potential demand for TOD is conservative, because it includes only a modest rise in consumer preference for this kind of housing. Future demand could be higher, if, for example, gasoline prices increase over the long term (ibid). In either case, this new demand is consistent with the level of demand needed to increase the total percentage of households living in compact, walkable neighborhoods by 5 percent.

Efficient Growth Builds Long-Term Housing Market Resiliency

Compact, infill development near transit may be an important component of the future housing market and overall economic stability. A national review by HUD and FTA in 2008 found that homes near high quality transit in multiple regions held their value better during the recent economic downturn than housing with less transit accessibility.⁴⁸

Neighborhoods that offer alternatives to driving further stabilize the local housing market by insulating residents from future gas price shocks.

By facilitating more efficient growth at the five levels as outlined in the following section, jurisdictions can help meet consumer demand, save residents money, and assist in stabilizing their housing market.

Most of the Buildings That Will Be on the Ground in 2050 Have Not Yet Been Built

Even if the “market is ready for a shift”, many people suspect that land use change comes too slowly to be an important strategy in addressing the dangers of climate change. But it turns out land use changes much faster than most people think, especially in a fast growing state like California. In fact, the analysis in this chapter indicates that about one quarter of the buildings expected to be on the ground in 2020 are not yet built, meaning the potential for change is profound.⁴⁹

With this fast rate of change, there is also significant potential for a statewide percentage reduction in VMT per capita, the metric that will be used for SB 375 regional GHG targets.

Census data for 1990 and 2000 indicate that 0.50 percent of California’s housing stock is rebuilt annually through reconstruction, rehabilitation, and other means. This implies that the average residential unit lasts nearly 200 years. Figure 25 estimates the impact of housing stock renewal and growth over the coming decades. About 17.5 percent of all units on the ground in 2020 will have been built in the ten-year span between 2010 and 2020.

⁴⁸ CTOD, *Realizing the Potential: One Year Later – Housing Opportunities near Transit in a Changing Market*, prepared for the Federal Transit Administration (FTA), 2008.

⁴⁹ All information and analysis in this section is provided by Professor Arthur C. Nelson of the University of Utah.

Figure 25. Forecasts of New and Redeveloped Housing Units in California

	Estimates: 2010 to 2020	Estimates: 2010 to 2050
Total Replacement (Redeveloped) Housing Units	800,317	3,858,401
Total New Residential Units	1,910,565	7,914,080
Sum of New + Replaced Residential Units	2,710,882	11,772,482
Total % Change of Units from 2010	17.5%	56.5%

Source: Arthur C. Nelson based on California-specific annualized residential unit loss rates.

This analysis does not account for the most rapidly changing segment of the real estate market: nonresidential development. Nonresidential space includes structures for retail, office, industrial, government, and other uses. Together, these account for about a quarter of all built space. In 2010, there will be an estimated 9.9 billion square feet of nonresidential space in California, which together with the 31.3 billion square feet of residential space leads to a total of 41.2 billion square feet of built space.

Between 2010 and 2020, about 5.5 billion square feet of nonresidential space will be built. About two-thirds (3.7 billion square feet) of that will come from the redevelopment of existing space.⁵⁰ The net effect of these changes mean that by the year 2020, about 11.7 billion square feet of nonresidential space will exist in California, and about half of this space will be built after 2010.

Much of the built environment existing in 2010 will remain through 2020, of course, including most existing residential stock, institutional buildings, and high-rise structures. Nonetheless, due to rapid growth and replacement of nonresidential space, we may assume that about one quarter of the development on the ground in 2020 will have been developed or redeveloped between 2010 and 2020.⁵¹ The one quarter figure is a weighted average of residential and nonresidential development, with each equally weighted considering that nonresidential development is replaced at a faster pace than residential.

When we look at 2050, the results are much more dramatic. Over 56 percent of the residential units that will be available at that time have not yet been built. No estimate is made for nonresidential space but it would certainly increase the overall 2050 change beyond 56 percent. This chapter indicates the intense importance on getting started immediately on implementing SB 375; land use change seems slow and incremental, but since it is steady and cumulative the impact over a decade can be tremendous.

⁵⁰ Normally, when nonresidential space is redeveloped it becomes more dense and it often includes a residential component.

⁵¹ Based on the estimate the built environment will include 46.8 billion square feet of space in 2020. Between 2010 and 2020, California may see the construction of 5.4 billion square feet of new and replaced residential space, and another 5.5 billion square feet of new and replaced nonresidential space for a total of nearly 11 billion square feet of new construction, or 23.3 percent of the total available space.

Chapter 9: Recommendations

The Time to Act Is Now

Across California, we are starting to see a shift in the approach to transportation and growth issues. Cities, developers, and private institutions are experimenting, innovating, and changing the way local planning has worked for the past 50 years, refocusing on walkable neighborhoods. At a regional scale it is now understood that growing more efficiently in just a few neighborhoods is not enough to confront our most pressing issues, such as global warming, traffic congestion, high personal transportation costs and disappearing farmland. The need for integrated planning to confront these issues is what inspired regional blueprints and the passage of Senate Bill (SB) 375.

Windfall for All highlights the tremendous potential financial benefits of efficient neighborhoods and improved transportation choices. SB 375 is a great start in aligning local and regional planning so we can identify better outcomes. But to fully realize the economic benefits of SB 375, we need to shift policies and investments to support this new planning paradigm. Critical recommendations include:

Integrate Full Economic Analysis into Planning

The huge dividends from efficient land use become evident once personal costs and public budgets are considered together. Without such multi-perspective analysis, we will continue to promote plans and policies that cost too much for families, businesses and taxpayers.

These analyses should be applied at every level of planning. For example, at the regional level we have to get more sophisticated about understanding the long-term total costs and benefits of different transportation and land use scenarios. This needs to include the full range of costs, from life-cycle maintenance to the operation of public transportation and personal vehicles. External costs that can be quantified, such as health impacts from air pollution, can also improve decision-making.

Without this depth of analysis, many public costs to support infill development or public transportation can seem too large at first glance, even when they make the most sense overall. For example, Bay Area cities that have designated certain places to be “Priority Development Areas” have estimated that improving infrastructure in those areas to accommodate that infill development could cost \$24 billion. But that cost needs to be compared to the long-term costs of more spread out development – both public and private. Efficient design such as infill in Priority Development Areas is likely to show tremendous economic benefits overall and a much smaller carbon footprint.

Two particular case studies in this report, from UC San Diego and San Leandro, show how an economic analysis at the local level can reveal the economic benefits of more efficient growth.

Provide Cities and Counties with an Infusion of Planning Funds to Engage the Community and Eliminate Obstacles

The state should make funds available for updating zoning codes and parking policies to use land and resources more efficiently. Without changes to these plans, there will simply be no way for SB 375 to achieve its goals. Currently, most cities are being forced to cut planning staff and pull back on community-based processes.

The responsibility for developing a Sustainable Communities Strategy falls on Metropolitan Planning Organizations (MPOs) and local governments. But significant proportions of regional budgets are committed to maintenance and operation of existing systems, and only a small percentage is typically available to create new transportation options. Similarly, local government planning funding is in short supply, and existing planning staffs are struggling to keep pace with current demands, leaving little capacity for comprehensive, sustainable, long range planning. Both entities would benefit from additional funding and other mechanisms to realize their visions for mixed-use, walkable communities with transportation choices.

The state should grant new authorities to help regions reach their GHG targets. The authority for new revenue mechanisms may either be given directly to an MPO, Council of Governments, or local government, or it could allow them to bring proposals to the voters in the form of ballot measures (as fees they would require a simple majority vote). Certainly larger fees would have to be brought to the voters, at least while Governor Schwarzenegger remains in office. Some of the primary mechanisms could include a climate impact fee on gasoline, on VMT, on vehicles themselves, or on CO₂ emissions.

Fortunately, some funding will soon be made available through Proposition 84 by the Strategic Growth Council, but it simply will not be enough. Rather, the state should dedicate a source of funds for planning, or local authorities should be given new tools to raise these funds. A perfect opportunity was lost when Governor Schwarzenegger vetoed SB 406 in 2009, which would have allowed regional agencies to adopt a vehicle license fee of up to \$2 to fund local and regional planning. That minor fee could have been a wonderful financial investment by helping create more efficient communities in the long-term. All planning funds should have requirements for significant and early community participation.

As can be seen throughout this report, rational parking policies are critical to reaping greater efficiency and savings from new developments. The Bay Area's Metropolitan Transportation Commission has produced an excellent toolkit for considering what policies are appropriate in different places. They will soon be distributing funds for innovative parking programs as part of their new Transportation Climate Action Program.

Restore Funding for Cost-Effective Public Transportation

The state needs to provide leadership and restore funds for public transportation, as well as make it easier for regions to raise new revenues with climate-impact fees.

Unfortunately, state policy has been going in the wrong direction on this issue. The State Transit Assistance program, the only source of state operating funds for public transportation, was recently eliminated through 2013. This has forced cuts of 10 to 30 percent at public transportation agencies throughout California, along with a round of fare hikes. With cuts to capital projects for public transportation, the total loss of funding statewide during the fiscal year 2009-10 amounts to over \$1 billion. Public transportation is such an essential component of refocusing growth and reducing emissions that these recent cuts are now the top argument for those who say the state should set very low GHG reduction targets for SB 375.⁵²

In September 2009, the California State Supreme Court upheld an appeals court's opinion that the raids made by the legislature on public transportation funds were illegal and should be repaid⁵³. This decision will make it more difficult for the state to siphon away voter-approved public transportation funding in the future without a change of law or policy. It is likely that 2010 will be a decisive year on this issue.

While a limited analysis of new fees to consumers may create the impression that public transportation projects are too expensive to implement during a recession, the findings of this report clarify that there will be larger costs if we continue down our current path of cutting public transportation, reducing our ability to refocus development around public transportation, cutting capital funds for expansions, and forcing many more people to shift from low-cost public transportation to greater or exclusive reliance on expensive private transportation. Once congestion, air pollution and other impacts are included in the analysis, a ten-cent climate impact fee on gasoline, if invested well, will look like a real bargain.

Innovate, Evaluate and Replicate.

There are dozens of innovative programs that can be grown quickly – whether a single strategy such as car-sharing, or a comprehensive rewards approach such as UC San Diego's.

But cutting-edge approaches have trouble obtaining public funds. This makes it difficult to pilot innovative ideas, as well as to bring existing successful programs to a larger scale (to test whether larger program can increase the economies-of-scale and cost-effectiveness). Another big obstacle to proving the efficacy of these programs has been ineffective evaluation.

To overcome these barriers, TransForm has been calling on the Bay Area's Metropolitan Transportation Commission to launch a Transportation Climate Action Program. This program will seed, evaluate and replicate such innovative programs. This program will be considered for adoption by MTC in December, 2009.

A primary goal would be programs that could deliver quantifiable reductions in GHGs and VMT. The initial round of programs would be completed by the summer of

⁵² The issue is brought up repeatedly as an obstacle in the SB 375 Regional Targets Advisory Committee Report.

⁵³ Court of Appeal of the State of California, Third Appellate District. June 30, 2009.

2012, to better understand the potential for such demand reduction and innovative programs to reduce GHGs as part of the 2013 Sustainable Communities Strategy.

The likely program structure will include funding for innovative grants, Safe Routes to Schools expansion in each Bay Area county, outreach and education to businesses and consumers, and an entire component focused on evaluation.

New Development Should Minimize Pollution from New Residents – or Pay to Mitigate It.

The San Joaquin Valley Air Pollution Control District adopted a rule in 2005 to encourage efficient development. Known as Indirect Source Review (ISR), the rule requires that developers take into account how the design, location, and other characteristics of their projects affect air pollution. An ISR requires that developers make changes either on-site or off-site that will reduce pollution caused by vehicle use linked to the development project, in energy use by the project, both during construction and over the life of the project's operation. In other words, new developments that don't provide walkable communities with convenient transportation choices must mitigate the costs of the air pollution that will be generated by future residents.

ISR's have now been upheld in court as an allowable way to reduce "criteria" pollutants (i.e., pollutants that are controlled under federal and state air quality regulations).

These programs should also be allowed as a way to reduce GHG emissions, especially from generating excessive vehicle travel. The California Air Resources Board should also consider whether such a program can be implemented statewide. This would help reduce the risk that an ISR implemented in one region would encourage development to move to an adjacent region.

Ideally these programs would also be revenue neutral from a development standpoint, i.e., any off-site mitigation fees should be passed on to subsidize low GHG development in other parts of the region.

Other Recommendations

An excellent report released in October, 2009, from UC Berkeley's Center for a Sustainable California gives a comprehensive overview of some of the obstacles facing SB 375 implementation and a host of important recommendations. Titled *Make it Work: Implementing Senate Bill 375*, the report discusses steps the state government can take to direct its resources and programs toward SB 375 objectives, as well as options that empower regions and localities to address these objectives with more appropriate tools.

Other states and federal agencies are closely watching SB 375 implementation. Together we can create a paradigm shift toward more efficient communities that meet environmental, social and economic goals while creating a true national model.

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Appendix A. HTAI Dataset and Methodology

The Housing + Transportation Affordability Index (HTAI) is used for all maps and analysis in this report on housing and transportation cost patterns. The HTAI was produced by the Center for Neighborhood Technology (CNT) and the Center for Transit Oriented Development with support from the Brookings Institution. The HTAI cost index has been applied to 52 metro areas in the United States, and is unique in measuring joint transportation and housing affordability at a neighborhood level (see www.htaindex.cnt.org).

The transportation costs estimated in this model include trips to and from work, school, and other travel destinations that make up the household daily routine. The methods for the cost model draw from peer-reviewed research on factors that drive household transportation costs. Specifically, the transportation cost model incorporates four neighborhood variables (residential density, average block size, transit connectivity index, and job density) and four household variables (household income, household size, workers per household, and average journey to work time) as independent variables.

These variables are used to predict, at a neighborhood level (census block group), three dependent variables—auto ownership, auto use, and public transit usage—that determine total transportation costs. CO₂ emissions comprise a fourth dependent variable, and are calculated based on the estimated VMT (at a ratio of about 0.999 pounds per VMT).

Housing costs were determined using the census variables under Selected Monthly Owner Costs (SMOC) for Owners with a Mortgage and Gross Rent for Renters Paying Cash (GR). SMOC is defined as the sum of payments for mortgages, deeds of trust, contracts to purchase, or similar debts on the property; real estate taxes; fire, hazard, and flood insurance; utilities; and fuels. It also includes, where appropriate, monthly condominium fees or mobile home costs. Gross Rent is defined as the contract rent plus the estimated average monthly cost of utilities if these are paid by the renter. Housing costs are estimated using only renters paying cash and owners paying mortgages. Renters paying with vouchers (e.g., subsidized housing) and owners who no longer have mortgage payments are excluded.

For a full description of the methods used in the original Housing + Transportation Affordability Index, see: http://htaindex.cnt.org/model_summary .

Appendix B. Statistical Methods

Total Public Spending on Transportation in a Single Year in the Bay Area Region (\$4.6 billion) was derived from the Transportation 2035 Plan for the San Francisco Bay Area, produced by the Metropolitan Transportation Commission (MTC). The report cites aggregate expenditures for the 25-year planning period as \$218 billion, in year-of-spending dollars. Based on 3 percent and 5 percent interest rates, as provided by MTC, the author calculated what portion of the aggregate amount that would be spent each year, with the simplifying assumption that "real" expenditures would be constant from year to year. The author expressed the expenditures in year-2009 dollars.

Total Private Spending on Transportation in a Single Year (\$34 billion) in the Bay Area Region was calculated from the Center for Neighborhood Technology (CNT) dataset, described in detail in Appendix A, the Association of Bay Area Governments (ABAG) Bay Area Consumer Price Index, and the ABAG report, *Projections 2009*. The CNT dataset provided the average transportation spending per household in the Bay Area in the year 2000. That number was then inflated to year-2009 dollars, and multiplied by the number of households projected to live in the Bay Area for the year 2010 in order to be more comparable to the public transportation spending aggregate (above).

Potential Savings for Neighborhoods with Better Public Transportation was calculated through the following steps for each of the regions.

Quintiles were defined for each region by ordering all block groups ("neighborhoods") according to the Transit Connectivity Index (TCI) score, developed and provided by CNT. The TCI is a measure of the level of residents' ease of access to public transportation. It is based on a given block group's proximity to a transit line, and in the case of the Bay Area, also by those lines' frequency of service. The set of all block groups for a region was then divided into five equal quintiles. Each quintile's average annual transportation-related CO₂ emissions and average annual transportation spending was correlated from the CNT dataset. Dollar amounts were inflated from year-2000 to year-2009 values.

Because each region's quintiles were assessed separately, the TCI scores for one quintile are not the same as the TCI scores for the corresponding quintile in another region. Thus, the most transit-connected quintile of the San Francisco Bay Area represents a different level of connectivity (on average) than the most transit-connected quintile of the Greater Los Angeles Metropolitan Area.

Using household and population counts (from the 2000 Census), average per-household spending and emissions were calculated and compared between quintiles for each region, and then as a set of four major metropolitan regions. Due to a lack of data with consistent geographic boundaries for all areas, figures were not scaled up according to growth estimates. Thus, aggregated figures likely represent

underestimates of the total fiscal impact of the assessed land-use and transportation planning choices.

The calculation of potential savings compares the average of the four quintiles with lower TCI scores with the quintile of highest-TCI score for each region. Thus, the amount of potential savings is constrained by each region's existing types and amount of land uses, transportation options, and other factors which affect transportation spending. However, if each region were to promote more efficient developments that reduce transportation spending by increasing public transportation, the quintiles would shift to reveal steeper potential savings. The same applies to CO₂ emissions reductions. Though hypothetical, the TCI quintiles analysis thus illustrates the dynamics of landuse planning and transportation and provide a rough estimate of potential impacts due to these dynamics.

Appendix C. Neighborhood Types Breakout Table

Table B-1. Transportation Costs by Neighborhood Type for the Average Bay Area Household by Income, Size, and Number of Workers, 2000(in 2009 dollars)

	Annual Household Transportation Costs			Transportation Costs as Share of Regional Median Household Income*			Number of Households by Neighborhood Type		
	Low	Medium	High	Low	Medium	High	Low	Medium	High
Neighborhood Transit Connectivity Level**									
Low Job-Density Residential Neighborhoods (Less Than 4 Jobs per Acre)									
Housing Units per Acre:									
Less Than 7	15,036	14,271	13,839	24%	23%	22%	618,977	209,046	16,938
7 to 15	13,753	13,435	12,807	22%	22%	21%	163,406	366,509	157,435
15 or More	12,414	12,142	11,313	20%	20%	18%	23,055	82,793	175,589
Mixed Use Residential (4 to 25 Jobs per Acre)									
Housing Units per Acre:									
Less Than 15	13,669	13,457	12,729	22%	22%	21%	23,055	82,793	175,589
15 or More	NA	11,963	10,069	NA	19%	16%	NA	102,994	53,953
Job-Dense Neighborhoods (25 or More Jobs per Acre) ***									
Housing Units per Acre:									
15 or More	NA	NA	6,817	NA	NA	11%	NA	NA	106,828

Source: Authors' calculations from data from the Center for Neighborhood Technology (CNT)

Note: The three neighborhood types shown in Figures 9 and 10 in the main report are circled here in red. "NA" reflects categories with fewer than ten neighborhoods that meet the criteria.

The residential density thresholds are based on published research indicating that densities of 7 and 15 housing units per acre form the minimum thresholds necessary for "bus-based neighborhood transit-oriented development" and "premium bus service," respectively.

Likewise, the job density cut-off of 25 jobs per acre has been determined as the minimum threshold needed for high-frequency transit. Relevant research is cited in Cervero et al., 2004.

* Median household income in the region in 2000 was \$77,237 (or \$62,024 in year-2000 dollars).

** The transit connectivity measure is based on CNT's Transit Connectivity Index (TCI).

The TCI employs bus and train system route and service data to estimate the quality of transit in proximity to a census block group by measuring the frequency and location of the bus and train routes and train stations.

A high TCI score represents frequent and extensive transit in relation to other locations within the region. "Low," "medium," and "high" TCI levels are measured by splitting the TCI index into thirds.

*** Almost all job-dense neighborhoods have high residential density (15 or more occupied units per acre).

Appendix D. Intra-city Neighborhood Type Analysis

Annual Transportation Costs for the Regional Average Household in Terms of Income, Size, and Number of Workers, in Four Bay Area Cities, 2000(in 2009 dollars)

	San Jose			Santa Rosa			San Francisco			Oakland		
	Neighborhood Transit Connectivity Level									Low	Medium	High
	Low	Medium	High	Low	Medium	High	Low	Medium	High			
Low Job-Density Residential Neighborhoods (<i>Less Than 4 Jobs per Acre</i>)												
Housing Units per Acre:												
Less Than 7	14,533	14,038	13,847	14,966	14,570	-	-	13,847	-	14,534	14,134	13,900
7 to 15	13,611	13,350	12,939	13,916	13,695	13,242	-	12,786	11,958	-	13,195	12,677
15 or More	11,692	11,995	11,834	-	-	12,571	-	12,733	10,882	-	12,239	11,501
Mixed Use Residential (<i>4 to 25 Jobs per Acre</i>)												
Housing Units per Acre:												
Less Than 15	13,439	13,262	12,516	13,951	13,982	13,436	-	-	11,379	-	13,169	12,500
15 or More	11,830	11,508	11,388	-	12,539	12,336	-	-	8,887	-	11,934	10,612
Job-Dense Neighborhoods (<i>25 or More Jobs per Acre</i>)												
Housing Units per Acre:												
15 or More	-	-	9,413	-	-	12,250	-	-	5,932	-	-	8,634

Source: Calculations from data from the Center for Neighborhood Technology

TransForm works to create world-class public transportation and walkable communities in the Bay Area and beyond. We build diverse coalitions, influence policy, and develop innovative programs to improve the lives of all people and protect the environment.

For the full report, please visit our website at TransFormCA.org

TransForm's Offices

Oakland
436 14th Street, Suite 600
Oakland, CA 94612
510.740.3150 ext. 325

San Jose
48 South 7th Street, Suite #102
San Jose, CA 95112
408.406.8074

Sacramento
717 K Street, Suite 330
Sacramento, CA 95814
916.441.0204