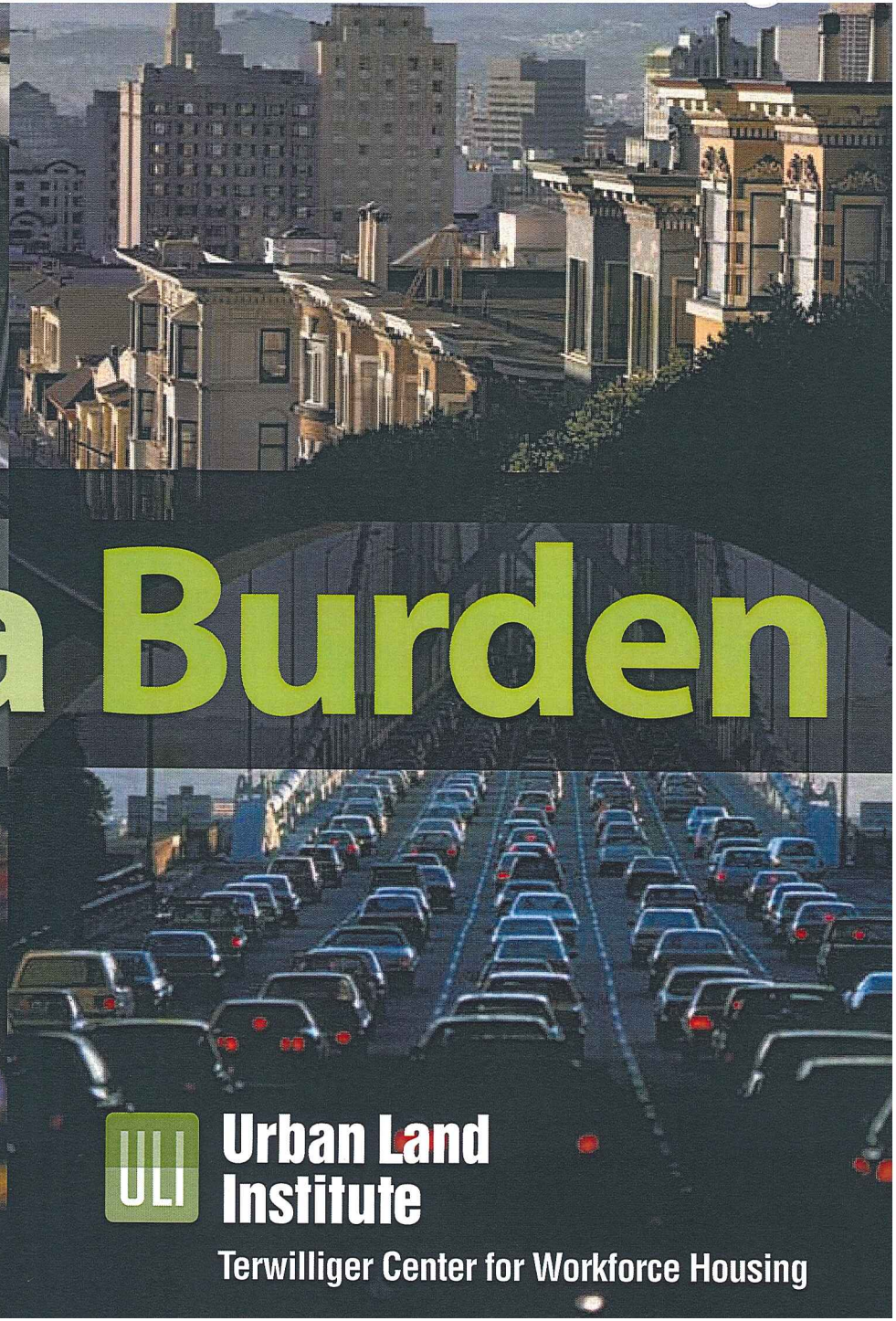
Examining the Costs and Impacts of Housing and Transportation on Bay Area Residents, Their Neighborhoods, and the Environment

Bay Area Burden



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About the Urban Land Institute

The Urban Land Institute is a 501(c)(3) nonprofit research and education organization supported by its members. Founded in 1936, the Institute now has more than 32,000 members worldwide representing the entire spectrum of land use and real estate development disciplines, working in private enterprise and public service. As the preeminent, multidisciplinary real estate forum, ULI facilitates the open exchange of ideas, information, and experience among local, national, and international industry leaders and policy makers dedicated to creating better places.

The mission of the Urban Land Institute is to provide leadership in the responsible use of land and in creating and sustaining thriving communities worldwide. Members regard ULI as a trusted idea place where leaders come to grow professionally and personally through sharing, mentoring, and problem solving. With pride, ULI members commit to the best in land use policy and practice.

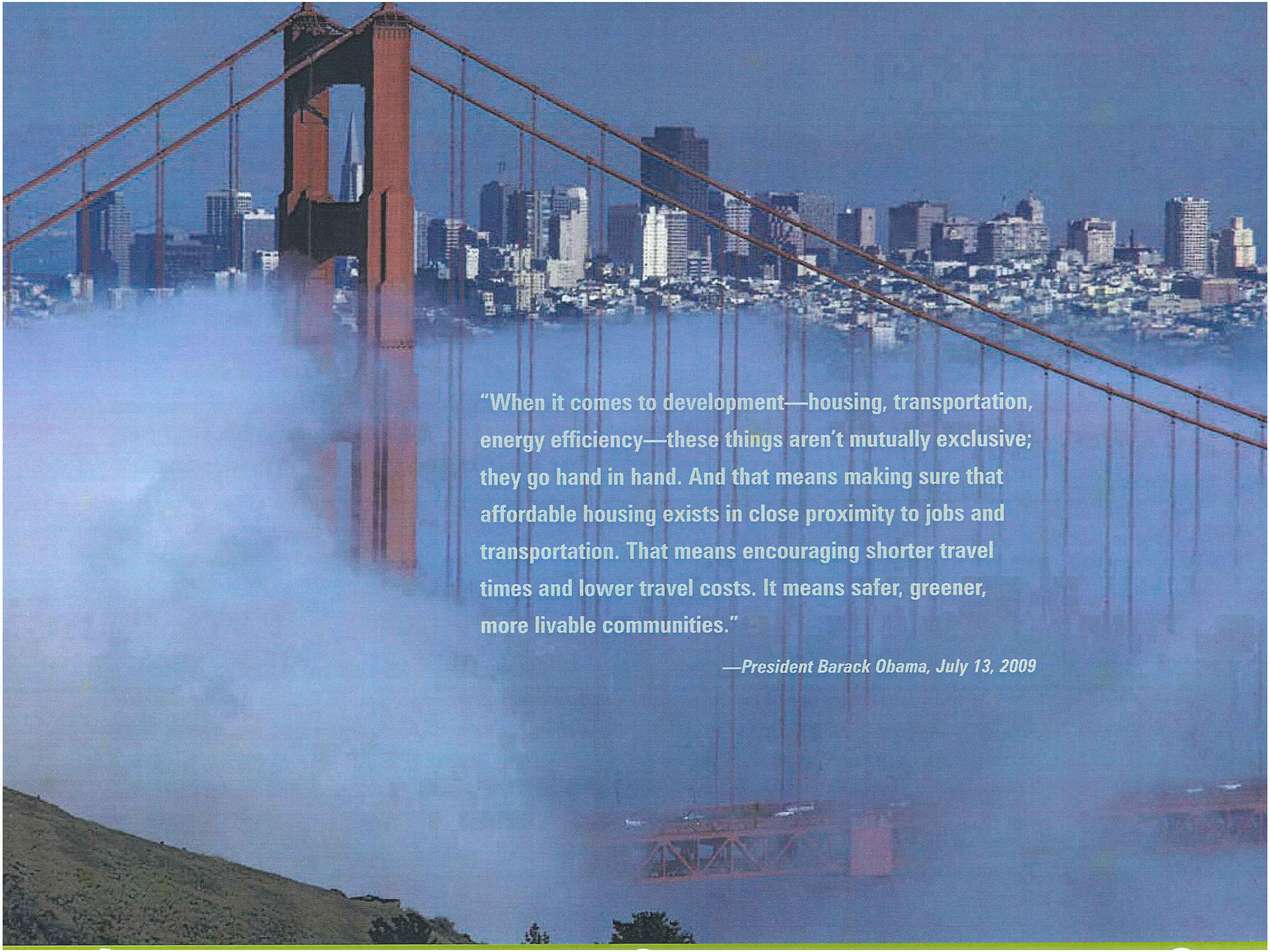
About the ULI Terwilliger Center for Workforce Housing

The ULI Terwilliger Center for Workforce Housing was established by J. Ronald Terwilliger, chairman and CEO of Trammell Crow Residential, to expand housing opportunities for working families. The mission of the Center is to serve as a catalyst in increasing the availability of workforce housing in high-cost communities by harnessing the power of the private sector.

The Center supports the development of mixed-income communities close to employment centers and transportation hubs. Through a multifaceted approach, the Center facilitates research, advocates for public policy change, publishes best practices, convenes housing experts, and works to eliminate regulatory barriers to the production of workforce housing.

Acknowledgments

This report was prepared by the ULI Terwilliger Center for Workforce Housing and the Center for Housing Policy, based on research conducted by the Center for Neighborhood Technology. Through the generous support of ULI Trustee James J. Curtis, III, the ULI Terwilliger Center for Workforce Housing is working with the ULI Curtis Regional Infrastructure Initiative to examine how the intersection of land use, housing and transportation can foster the creation of sustainable communities.



"When it comes to development—housing, transportation, energy efficiency—these things aren't mutually exclusive; they go hand in hand. And that means making sure that affordable housing exists in close proximity to jobs and transportation. That means encouraging shorter travel times and lower travel costs. It means safer, greener, more livable communities."

—President Barack Obama, July 13, 2009

Executive Summary

BAY AREA BURDEN provides a comprehensive analysis of the "cost of place" in nine counties located throughout the San Francisco region by examining the costs and impacts of housing and transportation on Bay Area residents, their neighborhoods, and the environment.

THE IMPACTS OF HIGH HOUSING AND TRANSPORTATION COSTS

Bay Area households spend an average of more than $28,000 annually on housing—about 39 percent of the area median income. In addition to the high cost of housing, Bay Area households spend nearly $13,400 annually on transportation. Combined, this cost burden of $41,420 per year represents 59 percent of the median household income in the Bay Area. The high combined costs of housing and transportation leave many Bay Area households with insufficient remaining income to comfortably meet their basic needs. This underscores the importance of broadening our understanding of housing affordability to consider the combined costs of housing and transportation, as well as the impacts of longer commutes on the environment and quality of life.

Housing Plus Transportation Costs in the Bay Area

Average Annual Housing Costs	+	Average Annual Transportation Costs	=	Average Annual Housing + Transportation Costs
$28,045		$13,375		$41,420
% of Income		% of Income		% of Income
39%		20%		59%

IMPORTANCE OF LOCATION EFFICIENCY

This report exposes the complexity of the interaction of housing and transportation choices as well as expenditures, and the unintended consequences on the natural environment when they work at cross purposes. The report also highlights the importance of "location efficiency"—the proximity of housing to transportation hubs, employment, and retail centers—as a driver of both affordability and environmental sustainability.

ALIGNING LAND USE, HOUSING, AND TRANSPORTATION POLICIES

Land use decisions play a critical role in determining the availability of housing that is affordable to Bay Area working families in locations that are near employment centers and transit. By strengthening the coordination of land use, housing, and transportation policies, Bay Area jurisdictions could create, preserve, and expand communities that are both environmentally sustainable and affordable to Bay Area households.

Housing Costs

HOUSING COSTS IN THE BAY AREA are among the highest in the country, ranking number one in median home value, median monthly costs for homes with a mortgage, and median gross rent (Table 1).

Despite a relatively high median income of $72,630—in comparison to the national median of just over $50,000[1]—housing in the Bay Area remains generally unaffordable. While about one-fourth of renters spend more than half of their incomes on housing in both the Bay Area and nationally, a substantially larger share of Bay Area owners (20 percent) spend more than half their income on housing than is true for the U.S. overall (12 percent).[2]

Jurisdictions throughout the Bay Area have had difficulty permitting and building a sufficient number of housing units to meet demand. The total number of permitted units affordable to low- and moderate-income households in the Bay Area between 1999 and 2006 met only 47 percent of the target for such housing set forth in the regional plan. As shown in Table 2, rates of permitted housing (relative to goals) were particularly low for households with very low incomes (44 percent) and moderate incomes (37 percent).

Bay Area Meets only 37 Percent of the Demand for Housing Affordable to Moderate-Income Households

TABLE 1] The Bay Area Consistently Tops the Charts in Housing Costs

Rank		Median Home Value
1	San Jose—San Francisco—Oakland, CA	$694,700
2	Salinas, CA	$658,700
3	Santa Barbara—Santa Maria—Goleta, CA	$641,800
4	San Luis Obispo—Paso Robles, CA	$578,900
5	Honolulu, HI	$574,400

Rank		Median Monthly Costs for Homes with a Mortgage
1	San Jose—San Francisco—Oakland, CA	$2,803
2	Santa Barbara—Santa Maria—Goleta, CA	$2,471
3	Salinas, CA	$2,438
4	New York—Newark—Bridgeport, NY—NJ—CT—PA	$2,432
5	San Diego-Carlsbad-San Marcos, CA	$2,412

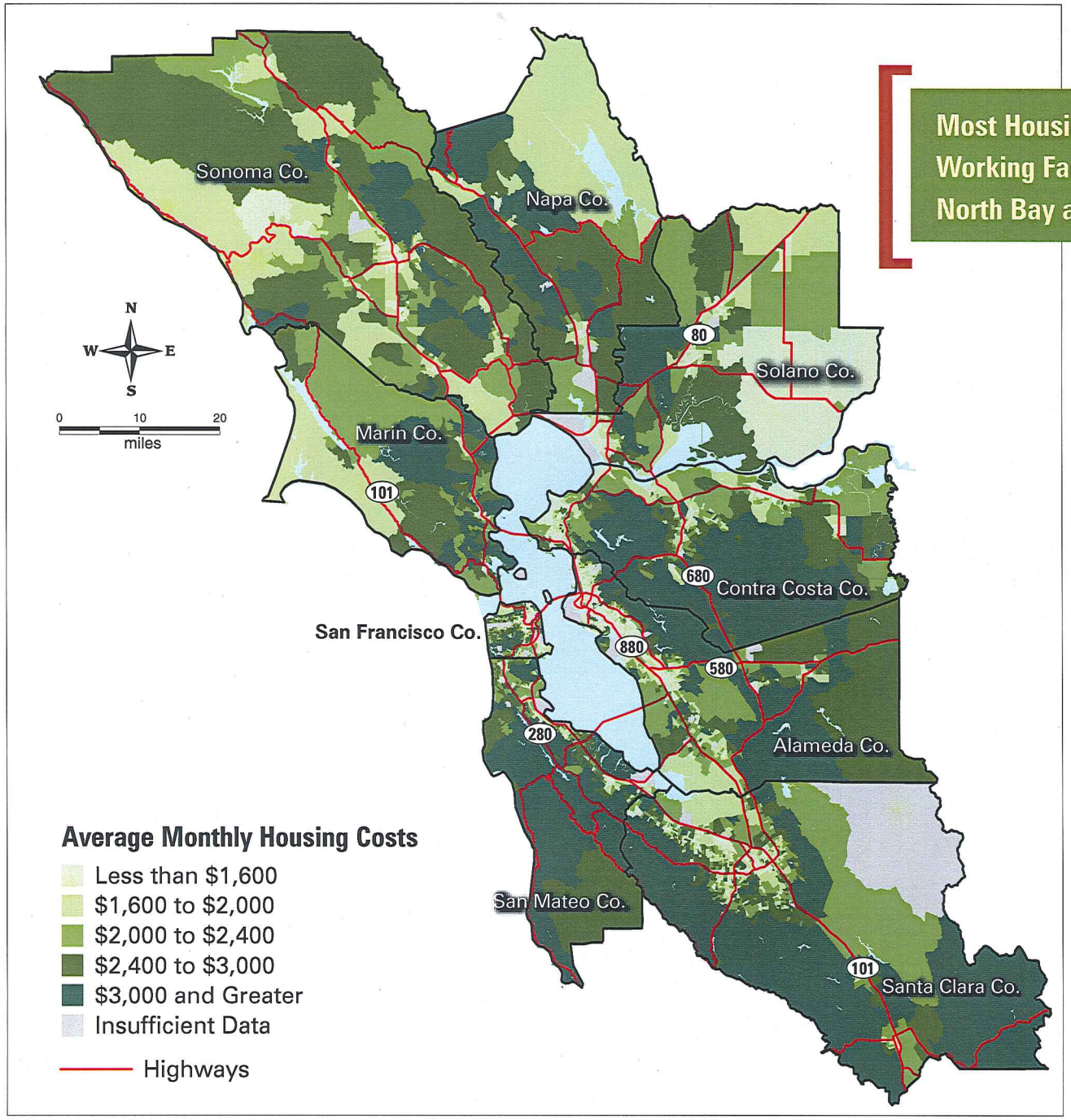
Rank		Median Gross Rent
1	San Jose—San Francisco—Oakland, CA	$1,221
2	Honolulu, HI	$1,206
3	Santa Barbara—Santa Maria—Goleta, CA	$1,205
4	San Diego—Carlsbad—San Marcos, CA	$1,168
5	Los Angeles—Long Beach—Riverside, CA	$1,099

Source: 2007 American Community Survey.

TABLE 2] Percent of Regional Housing Needs Assessment Goals Successfully Permitted, 1999—2006

San Francisco & Select Inner East Bay Cities	Very Low (0-50% AMI)	Low (51-80% AMI)	Moderate (81-120% AMI)	Above Moderate (>120% AMI)	Total
Berkeley	68%	171%	30%	167%	107%
Fremont	33%	22%	19%	67%	44%
Hayward	6%	5%	98%	167%	92%
Oakland	27%	71%	8%	267%	107%
San Francisco	80%	52%	12%	156%	86%
Total Bay Area	**44%**	**75%**	**37%**	**153%**	**92%**

Source: Association of Bay Area Governments. 2007. A Place to Call Home.



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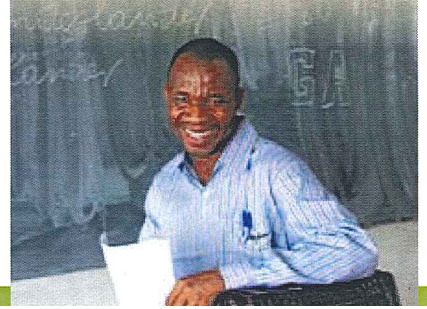
Most Housing Affordable to Working Families Is Located in the North Bay and the Inner East Bay.

THREE-FIFTHS OF all Bay Area residents live in communities that are unaffordable to households earning less than $80,000. Large cities located along the Highway 880 corridor—principally along the eastern and southern shoreline in Oakland, San Leandro, Fremont, and low-cost parts of San Jose—remain relatively affordable. In addition, northern Sonoma and Napa counties and eastern Solano County contain areas with below-average housing costs, but households living in these areas must travel farther to reach regional employment centers and public transit.



Housing + Transportation Costs

ON AN AVERAGE WEEKDAY, the Bay Area transit system serves nearly 10 percent of the Bay Area workforce, ranking it among the most transit-reliant metropolitan areas in the country (Table 4).

As with housing costs, the combined costs of housing plus transportation are lowest in the areas around the Bay where many of the region's jobs are located and public transit has the greatest reach. These areas provide the best opportunities for working households to save on their combined housing and transportation costs.

Bay Area households seeking more affordable housing in the outlying parts of Sonoma, Solano, Napa, and Contra Costa counties are burdened with higher transportation costs associated with these low-density, non-transit-accessible neighborhoods. These communities appear less affordable when the combined costs of housing and transportation are considered.

Combined Costs Highlight the Location Efficiency of the Largest Cities

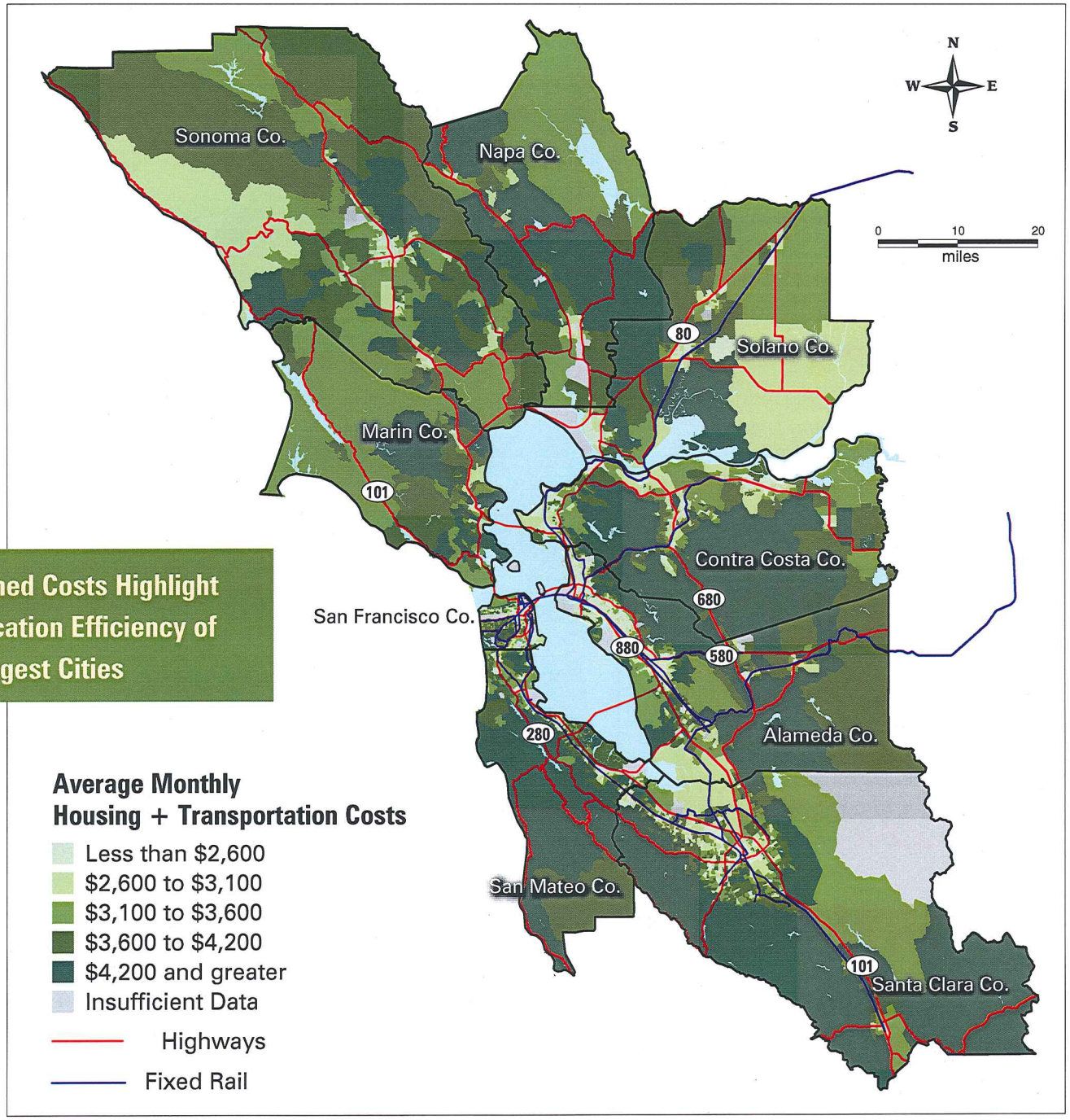


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TABLE 3] **Vehicle Miles Traveled and Emissions per Household Are Associated with Land Use Patterns (2006)**

County Name	Distribution of Households by Land Use Pattern			Average Weekday Daily, per Household	
	Urban	Suburban	Rural	VMT	CO_2 (Pounds)
San Francisco	97%	2%	1%	19.4	20.2
Alameda	47%	51%	4%	33.1	30.8
Santa Clara	34%	61%	5%	35.9	34.4
San Mateo	35%	59%	6%	40.3	36.5
Contra Costa	11%	74%	15%	43.8	42.9
Marin	0%	85%	15%	35.9	35.0
Solano	3%	76%	20%	50.4	49.4
Napa	3%	60%	37%	42.3	42.5
Sonoma	4%	56%	40%	50.1	51.0
Bay Area	36%	54%	10%	36.6	35.4

Note: Table sorted in ascending order by percent rural.

Source: Brazil, H.M., and C.L. Purvis 2009, July. BASSTEGG (Bay Area Simplified Simulation of Travel, Energy and Greenhouse Gases): Sketch Planning Charrette/GIS Models for Predicting Household Vehicle Miles of Travel (VMT) and Greenhouse Gas (CO_2) Emissions. Oakland, CA: Metropolitan Transportation Commission.

TABLE 4] **Nearly One in Ten Bay Area Workers Use Public Transit**

Rank	Metro Area	Share of Workers Using Public Transit
1	New York—Newark—Bridgeport	26.5%
2	Washington—Baltimore—Northern Virginia	11.1%
3	Chicago—Naperville—Michigan City	11.0%
4	San Jose—San Francisco—Oakland	9.5%
5	Atlantic City, NJ	8.6%

Source: 2007 American Community Survey.

Environmental Impact

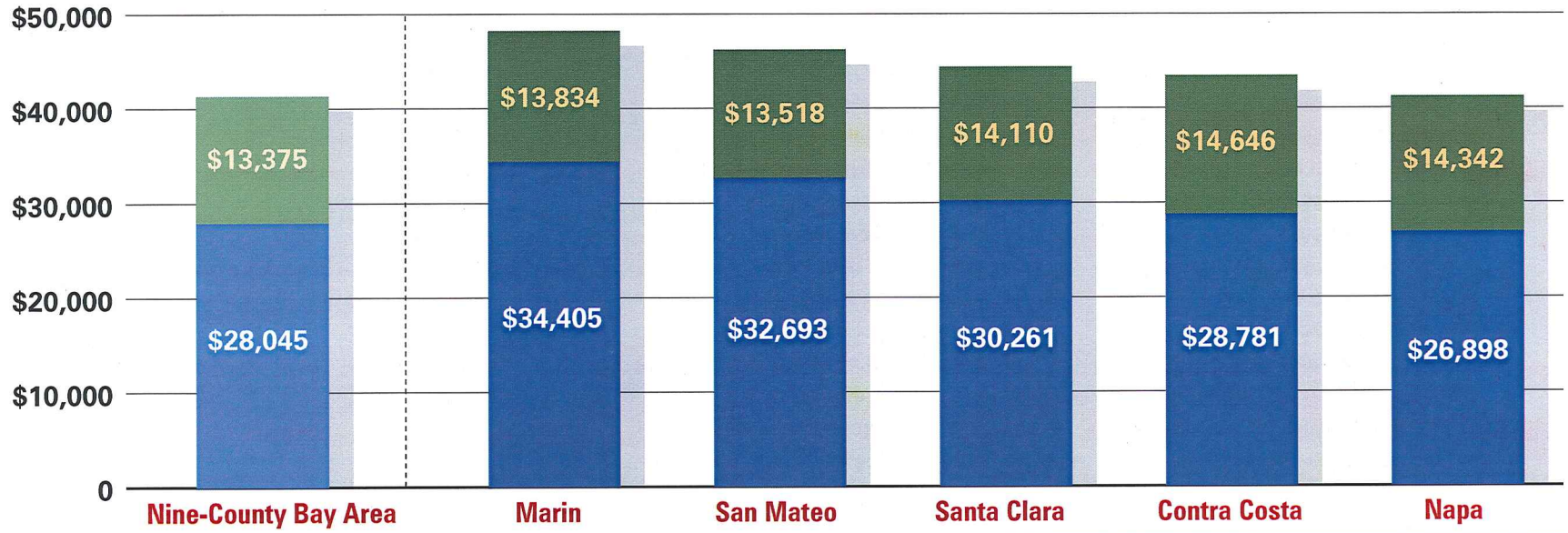
THE UNITED STATES ranks among the top producers of greenhouse gas (GHG) emissions in the world, and due to the historic rise in the amount of car travel in the U.S., the transportation sector is the segment of the economy where GHG emissions have recently increased the most. The successful implementation of GHG emission reduction plans in the transportation sector is particularly important in the Bay Area, where transportation accounts for 40.6 percent of greenhouse gas emissions,[4] compared to 33 percent nationally.[5] With the successful passage of California's Senate Bill 375—legislation that requires metropolitan planning organizations to develop housing and transportation plans to lower GHG emissions—California emerged as a worldwide leader in seeking strategies to reduce GHG emissions.

A recent ULI study, *Growing Cooler*, found that the number of "vehicle miles traveled" (VMT)—a measure of car usage—in compact urban areas with a mix of housing types, access to reliable transit to/from employment centers, and services within walking distance, can be 20 to 40 percent lower than in auto-dependent suburbs.

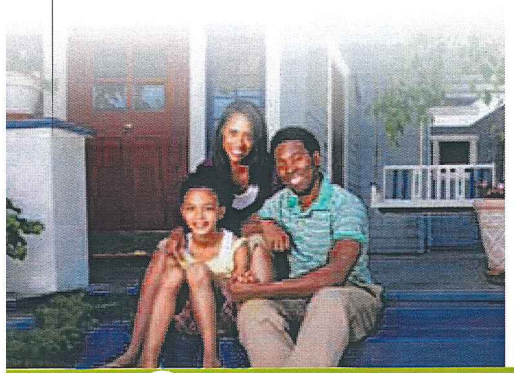
As Table 3 illustrates, densely developed urban counties like San Francisco are estimated to have substantially fewer vehicle miles traveled per household (19.4) and thus lower per-household carbon dioxide emissions (20.2) than do more rural and suburban counties, where these measures can exceed the Bay Area average by a wide margin.

Of significant importance is the fact that compact land use patterns facilitate lower per-capita GHG levels in *both* transportation and building sectors. Multifamily units in an urban setting are often smaller and more thermally efficient than single-family detached homes at the urban edge, reducing energy consumption associated with heating and cooling by up to 50 percent on a per-household basis.[6] Depending on the source of electricity generation for a given metropolitan area, this can yield a comparable reduction in GHG emissions.

Housing + Transportation Costs for Bay Area Counties



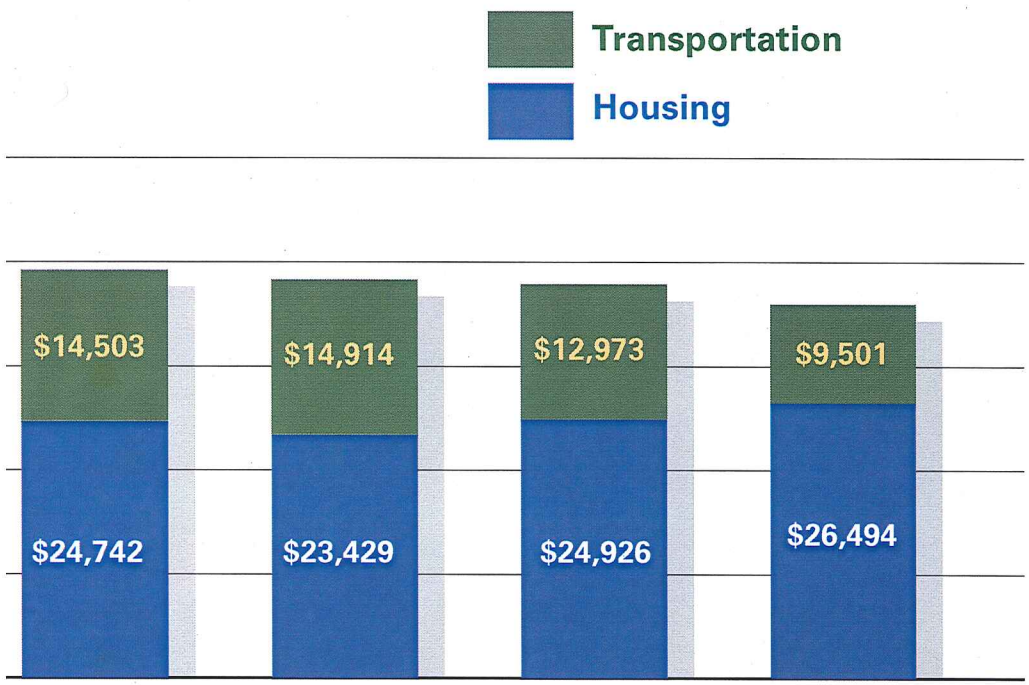
	Nine-County Bay Area	Marin	San Mateo	Santa Clara	Contra Costa	Napa
Average H+T Costs	$41,420	$48,239	$46,212	$44,371	$43,428	$41,240
Average Median Income	$75,103	$84,028	$82,262	$85,314	$78,468	$66,709
Average H+T as % of Median Income	59%	60%	58%	54%	59%	64%



A Nine-County Perspective: Interplay between Median Incomes and Housing + Transportation Costs

HOUSEHOLDS IN THE BAY AREA spend an average of $28,045 per year on housing and $13,375 on transportation. As expected, housing costs are highest in the counties with the highest incomes: Marin, San Mateo, Santa Clara, and Contra Costa. These counties also have mid-to-high transportation costs. As a percentage of income, these combined costs roughly approximate the regional cost burden of 59 percent, with the exception of Santa Clara.

In Napa, Sonoma, and Solano counties to the north, housing costs are below the regional average, but higher transportation costs result in combined costs, as a percent of income, of 61 percent to 66 percent—above the Bay



Sonoma	Solano	Alameda	San Francisco
$39,245	$38,342	$37,899	$35,995
$62,348	$65,291	$68,985	$66,523
66%	61%	61%	58%

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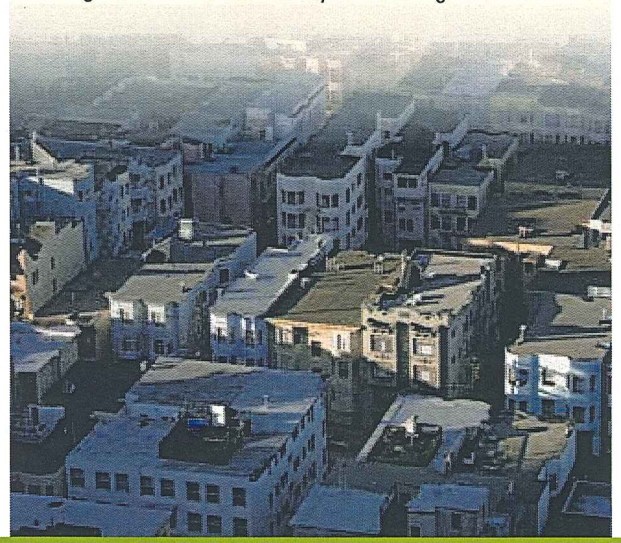
Area average. In a pattern consistent with the "drive until you qualify" phenomenon common to many metropolitan areas, Solano County has both the lowest housing costs and the highest transportation costs in the Bay Area.

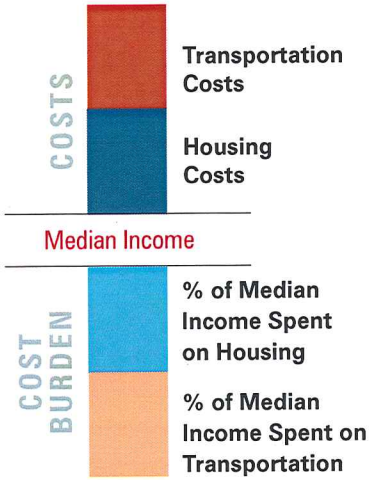
Despite having higher housing costs than two of the counties to the north, combined costs for housing and transportation are lowest in absolute dollar terms in Alameda and San Francisco counties, which can be attributed in part to their "location efficiency" (i.e., their proximity to job clusters and public transit) and consequently low transportation costs. Average annual transportation costs in San Francisco are nearly $3,900 below the regional average.

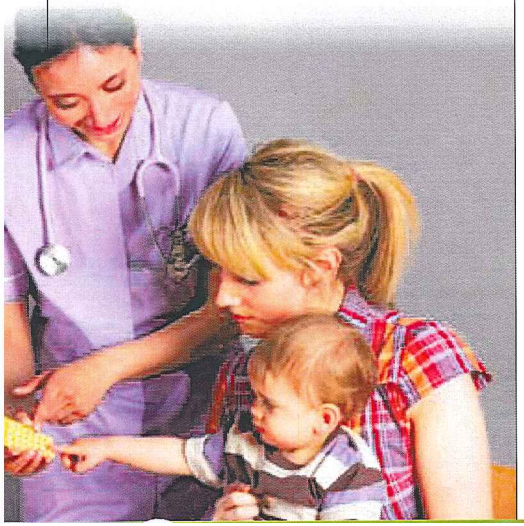
Rental Housing Lowers Overall Housing Costs in San Francisco County

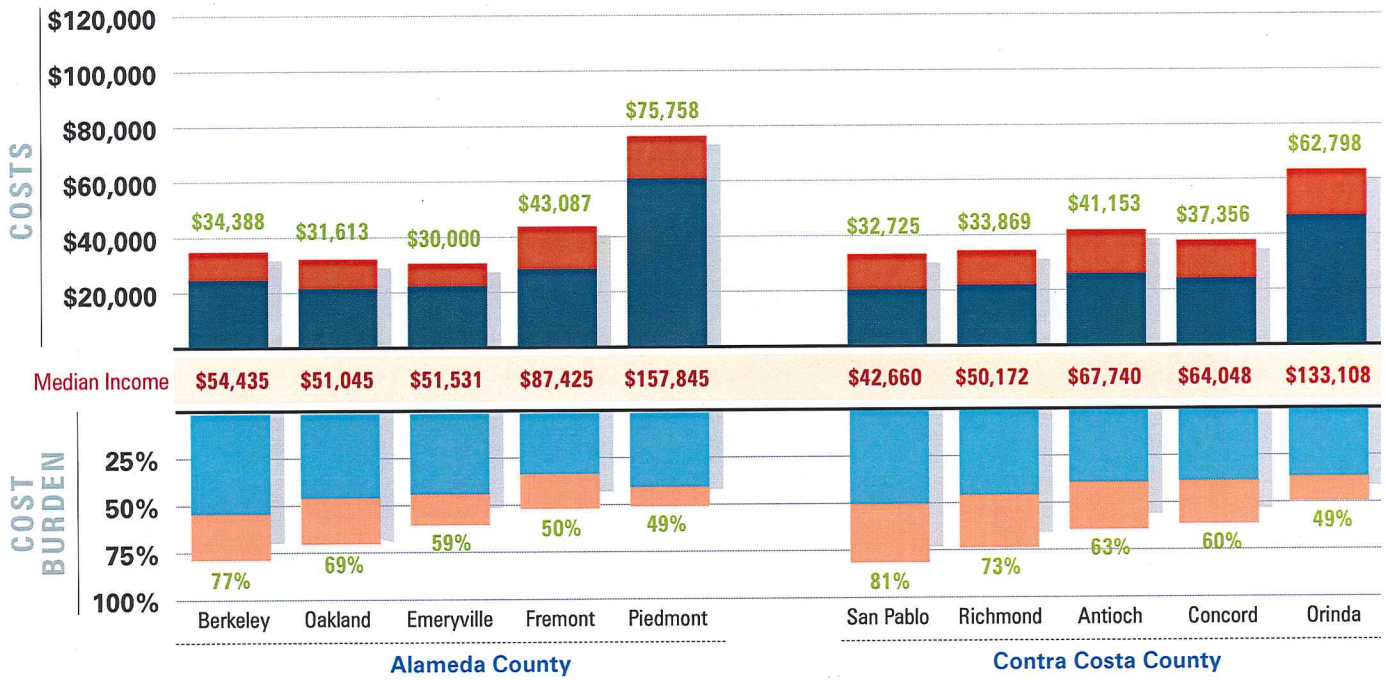
Although San Francisco County is often associated with high housing costs, the data presented in this report suggest that housing is more affordable there than in five other counties in the Bay Area. Since 62 percent of San Franciscans rent their homes, the average housing costs in San Francisco are below the Bay Area average. In comparison, only 37 percent of households in the rest of the Bay Area are renters. Even though rents in San Francisco are high, renting is less expensive than owning a home, and the large number of renters in the county keeps average housing costs lower than the Bay Area average.

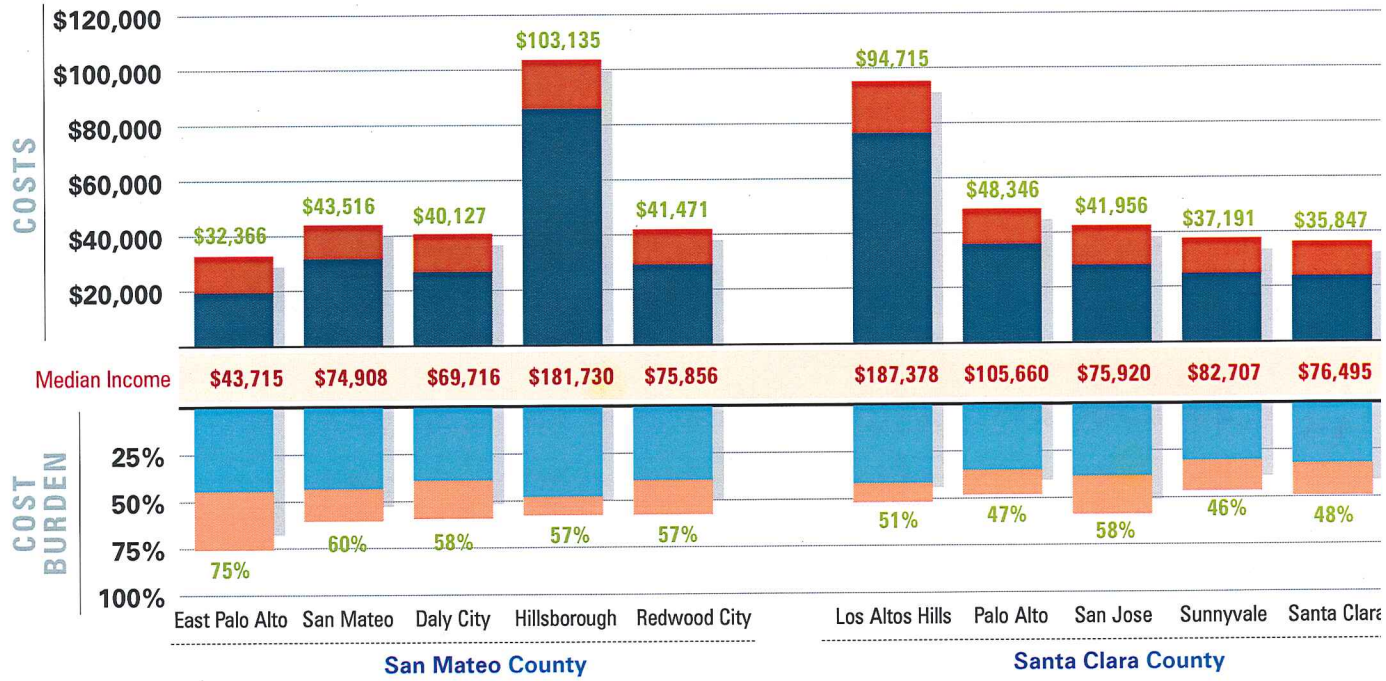


Housing + Transportation Costs for Bay Area Cities









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With average combined costs of housing and transportation consuming over 70 percent of their income, residents of cities such as Berkeley, San Pablo, Richmond, and East Palo Alto are left with little income for food, child-care, and other daily necessities.

IN MOST CASES, the average combined costs of housing and transportation are lower in a county's largest cities relative to the county as a whole or to smaller municipalities in the same county. For example, in Alameda County, the combined costs are far lower in larger cities like Oakland and Berkeley than in a small town like Piedmont with fewer than 4,000 households (see chart).

However, costs that appear relatively affordable may nevertheless consume a large fraction of the residents' incomes. For example, the combined housing and transportation costs in Berkeley ($34,388) are less than half of the costs in Piedmont ($75,758). But because median income in Piedmont exceeds $150,000, housing and transportation costs consume only 49 percent of household income, compared to 77 percent for the typical household in Berkeley.

A Bay Area Working Family's Budget

A Solano County Family

A Solano County firefighter and a waitress with one preschool-age child together earn an estimated $61,034 annually*—84 percent of the Bay Area median income. After taxes,** their monthly income is approximately $4,282.

Average housing and transportation costs in Solano County consume about 63 percent of this family's gross income, which leaves only $1,087 per month to cover other household expenses:

	$4,282
Housing	–$1,952
Transportation	–$1,243
What's left	$1,087

This family of three in Solano County can expect to incur the following basic expenditures:

Child-care	–$713
Food	–$592
Health care	–$315
Miscellaneous	–$321
At month's end	–$854

Spending 63 percent of their income on housing and transportation, this Solano County household is $854 short of covering even their basic essentials like food and healthcare.

* Average salaries for these professions in the Vallejo-Fairfield Metropolitan Statistical Area according to salary.com, as reported in the Center for Housing Policy's *Paycheck to Paycheck 2009*.
** Tax estimates and monthly expenditures with the exception of housing and transportation are based on *The Self-Sufficiency Standard for Solano County, CA 2008*, produced by Insight Center for Community Economic Development.

A Santa Clara County Family

A physical therapist with one infant and one elementary school-age child earns an estimated $85,125 annually*—117 percent of the Bay Area median income. After taxes,**monthly income is approximately $5,405.

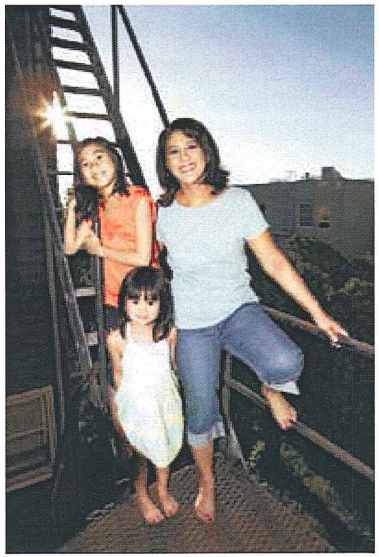
Average housing and transportation costs in Santa Clara County consume about 52 percent of this family's gross income, which leaves $1,707 per month to cover other household expenses:

	$5,405
Housing	–$2,522
Transportation	–$1,176
What's left	$1,707

A family of three in Santa Clara County can expect to incur the following basic expenditures:

Child-care	–$1,388
Food	–$669
Health care	–$276
Miscellaneous	–$389
At month's end	–$1,015

Spending 52 percent of their income on housing and transportation, this Santa Clara household is about $1,015 short of covering even the essentials like childcare and food.



* Average salaries for these professions in the San Jose–Sunnyvale–Santa Clara Metropolitan Statistical Area according to salary.com, as reported in the Center for Housing Policy's *Paycheck to Paycheck 2009*.
** Tax estimates and monthly expenditures with the exception of housing and transportation are based on *The Self-Sufficiency Standard for Santa Clara County, CA 2008*, produced by Insight Center for Community Economic Development.

Reductions in Combined Housing and Transportation Costs are Essential to Help Working Families Meet Their Basic Needs.

TABLE 5] **Transportation Costs are Significantly Lower in Transit-Accessible, Job-Rich Regions Along the Bay**

Region	Includes	Monthly Transportation Costs*	% of Bay Area Median Income
San Francisco	San Francisco City/County	$819	13.5%
Inner East Bay	Coastal Portions of Alameda, Contra Costa, and Solano counties	$1,113	18.4%
Peninsula	San Mateo County	$1,122	18.5%
Silicon Valley	Northern Part of Santa Clara Valley	$1,125	18.6%
Outer East Bay	Eastern Portions of Alameda and Contra Costa counties	$1,238	20.5%
North Bay	Four Northernmost counties of Marin, Napa, Solano, and Sonoma	$1,262	20.9%
South Bay	Outlying Portion of Santa Clara County	$1,317	21.8%

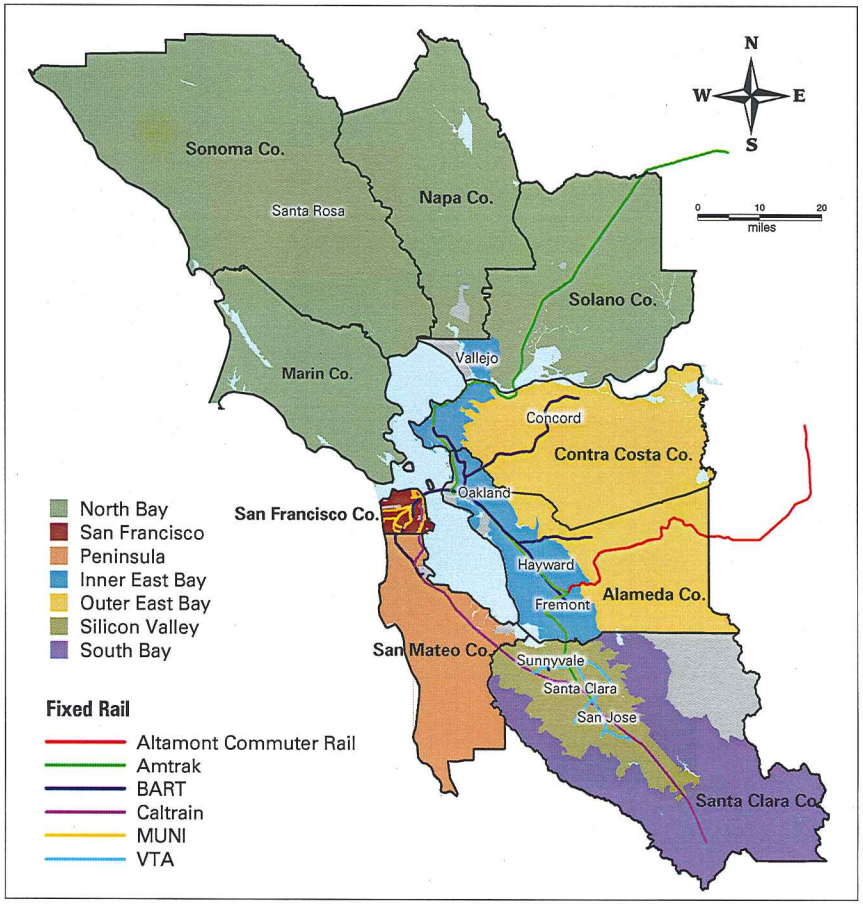
*This Table shows estimated transportation costs for a household with the Bay Area median income.
Source: Center for Neighborhood Technology Calculations.

FOR PURPOSES OF THIS REPORT, the Bay Area has been divided into seven regions—North Bay, San Francisco, Peninsula, Inner East Bay, Outer East Bay, Silicon Valley, and South Bay—based on physical geography, development patterns, and socioeconomic characteristics.[7] The seven regions broadly group together communities that share similar attributes. For example, dense urban communities like Oakland and Berkeley have more in common with one another than they do with Pleasanton, but all three are located in Alameda County. Rather than look at Alameda County as a whole, this section splits the county into the Inner East Bay and the Outer East Bay.

As Table 5 suggests, San Francisco stands out as a particularly location-efficient region, based in large part on its access to public transit, its walkable communities, and its concentration of jobs.[8] Transportation costs are highest in the Outer East Bay, North Bay, and South Bay. In these regions, the typical household must drive farther and more frequently to reach employment centers and services. In addition to the adverse

The Regional Perspective: Transportation Costs

environmental impacts of extensive driving and the "time tax" associated with long-distance commutes and traffic congestion, this level of auto dependence can strain a household budget. Transportation costs in these regions consume an estimated 20 to 22 percent of the monthly income of a median-income household, which can add $5,000 to $6,000 to the annual transportation bill compared to a household living in San Francisco.



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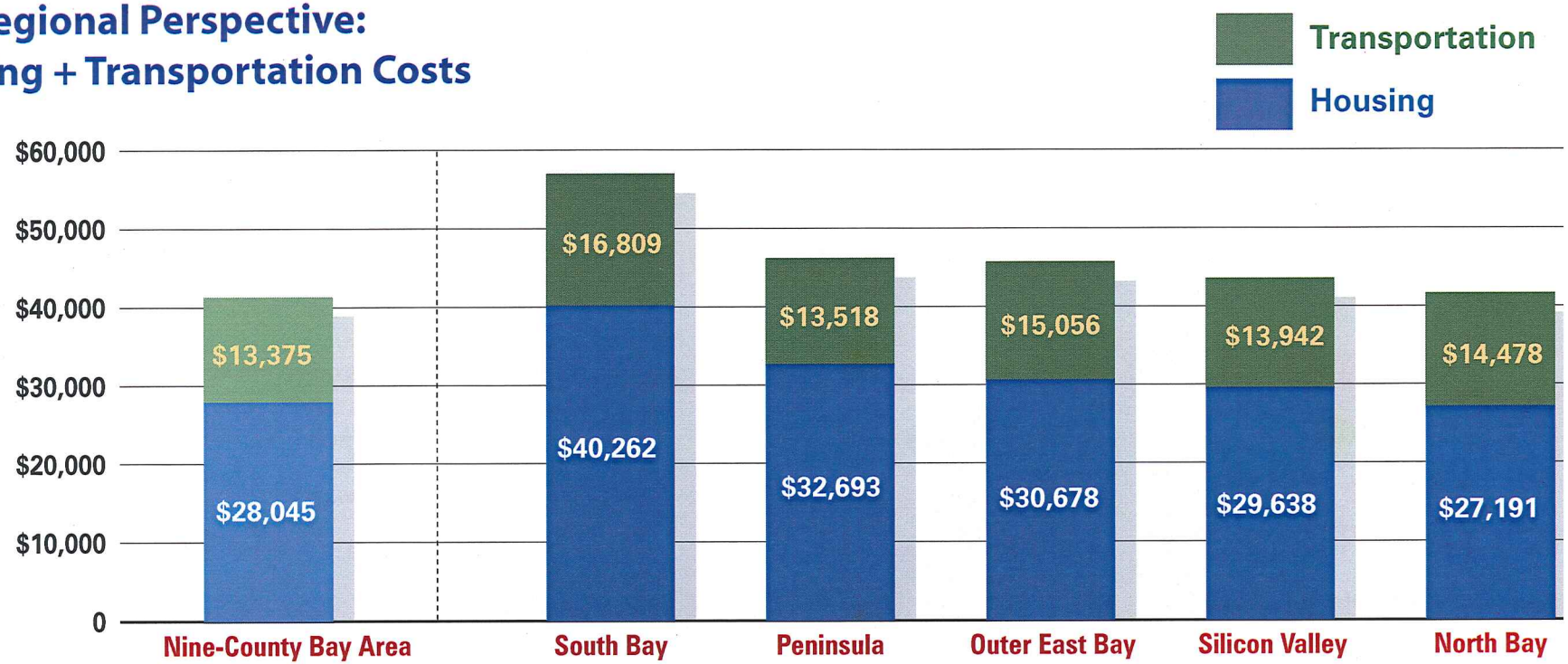
The Regional Perspective: Housing + Transportation Costs

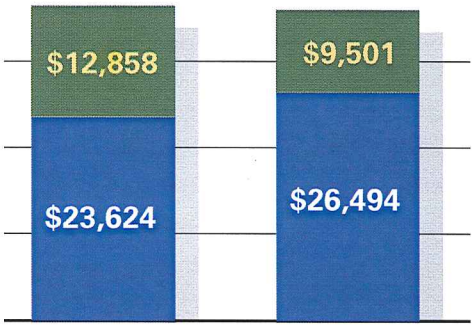


	Nine-County Bay Area	South Bay	Peninsula	Outer East Bay	Silicon Valley	North Bay
Average H+T Costs	$41,420	$57,071	$46,212	$45,735	$43,581	$41,669
Average Median Income	$75,103	$99,107	$82,262	$87,511	$84,456	$69,360
Average H+T as % of Median Income	59%	61%	58%	55%	54%	63%

Regional Variations in Combined Costs and Incomes Are Significant.

ON AVERAGE, a household in the Bay Area spends $41,420 annually on the combined costs of housing and transportation, which is roughly 59 percent of the typical Bay Area household's income. Within the Bay Area, these costs, as well as the incomes of the households who pay them, vary substantially from region to region. At one end of the spectrum is the South Bay, where combined costs are more than one-third higher than the Bay Area average, with housing costs alone exceeding $40,000. South Bay incomes, too, are exceptionally high, helping resi-

On average, a household in the Bay Area spends $41,420 annually on the combined costs of housing and transportation, roughly 59% of the typical Bay Area household's income.



	Inner East Bay	San Francisco
	$36,482	$35,995
	$62,992	$66,523
	63%	58%

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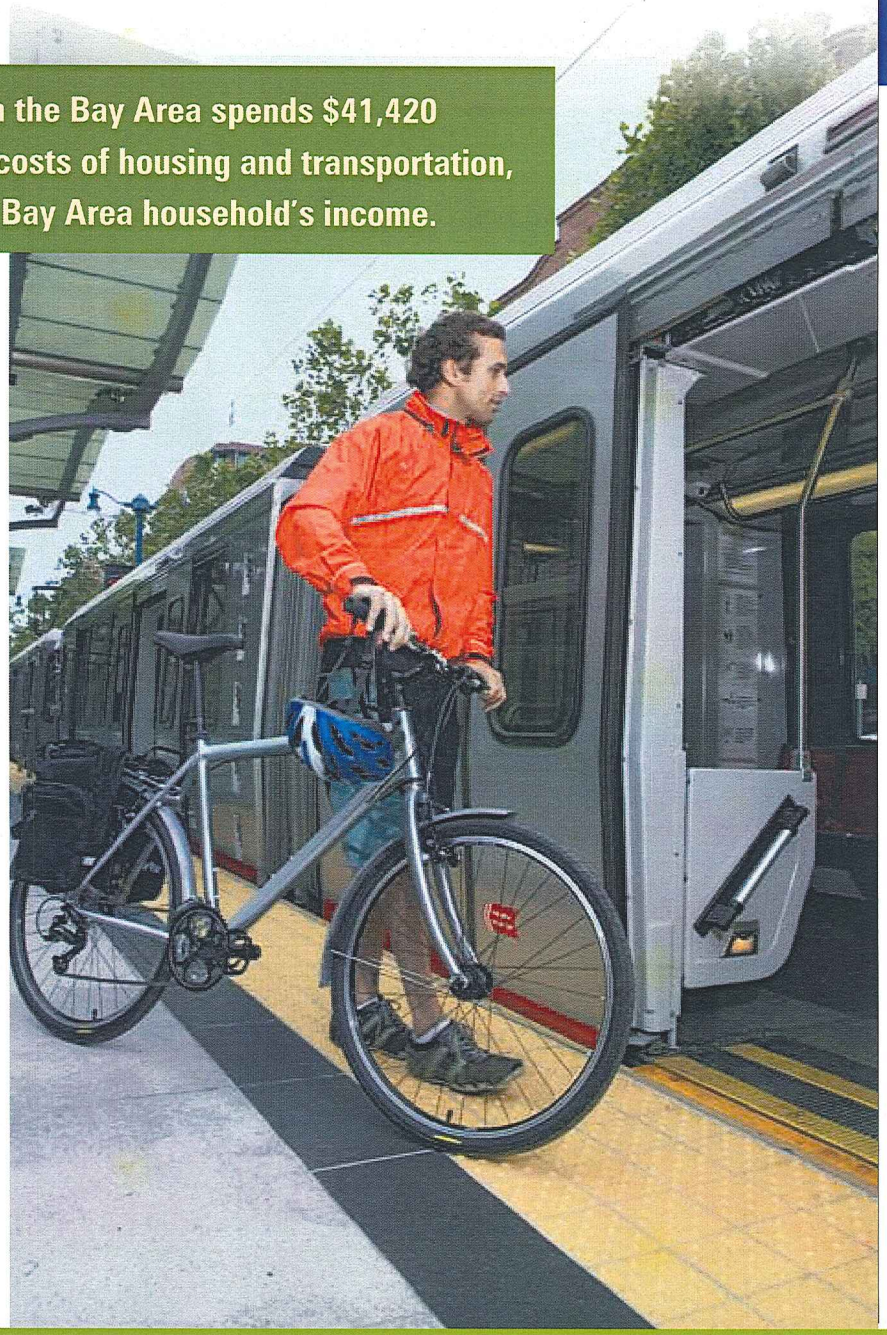
dents to offset the higher costs.

San Francisco and Inner East Bay are the only regions with average combined costs below the nine-county Bay Area average. In San Francisco, access to public transit, employment centers, and a very low rate of auto ownership help produce the lowest transportation costs, equivalent to a savings of more than $7,300 each year compared to the South Bay. In the Inner East Bay, transportation costs are the second lowest among the seven regions, and housing costs are the least expensive. Despite these low costs, Inner East Bay households, on average, spend 63 percent of their income on these combined expenses as a result of their comparably low incomes.

Tied with the Inner East Bay for the highest combined cost burden, North Bay households also spend 63 percent of their income on housing and transportation. Housing costs in the North Bay are comparatively affordable, but the savings are offset by high transportation costs. As a result, the North Bay is the only region with combined costs above the Bay Area average and an average median household income below the Bay Area's.



The Regional Perspective: Housing + Transportation Cost Burdens

ONE-FOURTH OF ALL HOUSEHOLDS in the Bay Area live in neighborhoods where housing and transportation costs account for 65 percent or more of income—a level this report defines as an "extreme housing and transportation cost burden." As shown in Table 6, in most regions, the typical incomes of neighborhoods with extreme housing and transportation cost burdens fall between $39,000 and $53,000, suggesting that such burdens primarily affect low- to moderate-income households. The Peninsula and South Bay are outliers, where the average median incomes of households within burdened neighborhoods are $61,290 and $75,692, respectively.

In the Inner East Bay, North Bay, and South Bay, more than one-third of all households have extreme housing and transportation cost burdens.[9] In absolute dollar terms, housing and transportation costs in the Inner East Bay are relatively low in comparison to those of the other regions, and both expenditures fall below the Bay Area average. The low transportation costs are due at least in part to the fact that the area is well served by mass transit, and many people work in the region. Incomes, however, are also below average, and neighborhoods with extreme housing and transportation cost burdens have an average median household income of less than $40,000—barely half of the Bay Area median. Extreme cost burdens in these neighborhoods are more a function of the residents' low incomes than of their housing and transportation costs.

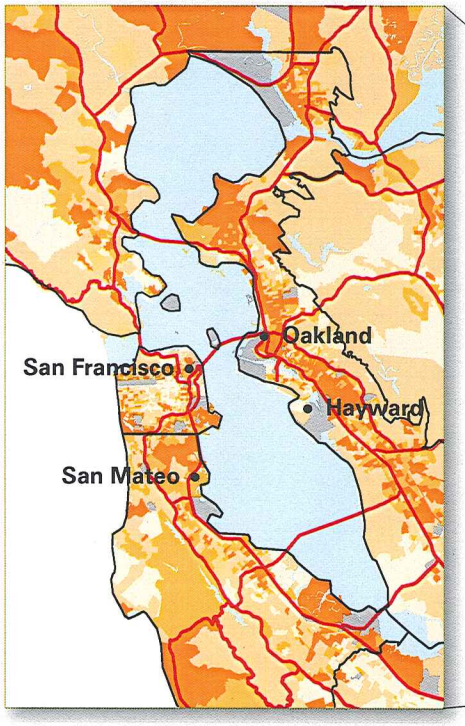
Although the North Bay exhibits a comparable percentage of neighborhoods with extreme cost burdens, similarities with the Inner

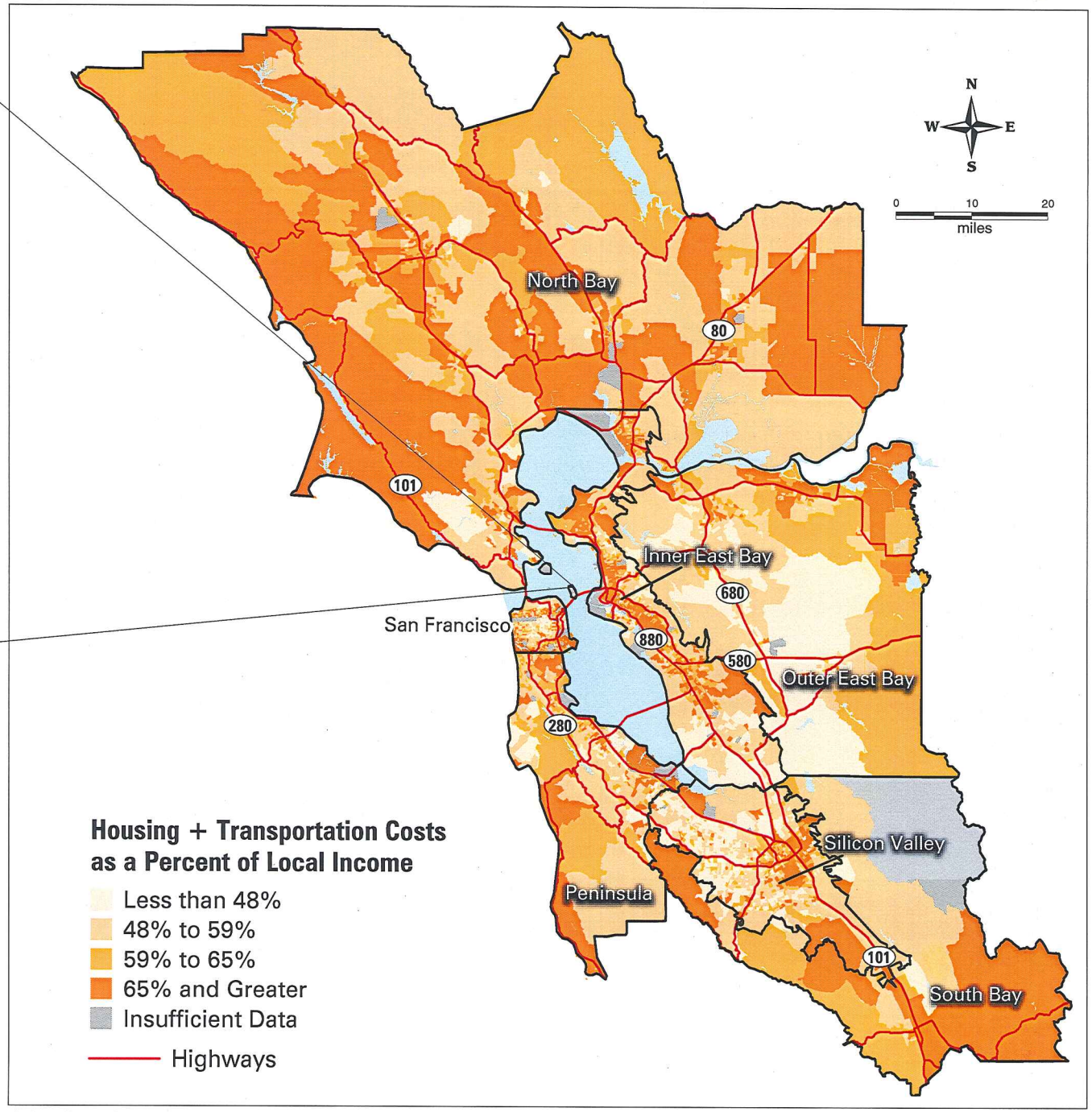
TABLE 6] Many Neighborhoods with Extreme H+T Cost Burdens Are Located in the Inner East Bay and the North Bay

Region	Households in Neighborhoods Where H+T Costs >= 65% of Income	% of Region's Total Households	Average Housing Costs in These Neighborhoods	Average Transportation Costs in These Neighborhoods	Average Median Household Income
Inner East Bay	196,344	34%	$1,595	$936	$39,786
North Bay	143,454	34%	$2,010	$1,106	$50,673
Silicon Valley	83,852	15%	$2,191	$1,090	$52,635
San Francisco	80,028	25%	$2,139	$751	$45,969
Peninsula	47,391	19%	$2,661	$1,071	$61,290
Outer East Bay	45,798	13%	$1,748	$1,091	$44,756
South Bay	11,870	35%	$3,219	$1,269	$75,692
Nine-County Bay Area	608,736	24%			

Source: Center for Neighborhood Technology Calculations.

Combined Costs as a Percent of Income Exceed 65 Percent in Many Neighborhoods throughout the Bay Area.





East Bay end there. Typical monthly transportation costs for these North Bay neighborhoods of $1,106 are the second highest reported in Table 6 and largely offset the comparatively low housing costs in these neighborhoods. Together, the costs of housing and transportation create extreme cost burdens in neighborhoods where the median income is $50,673, or 70 percent of the Bay Area's median income—leaving little funds for these households to spend on basic necessities.

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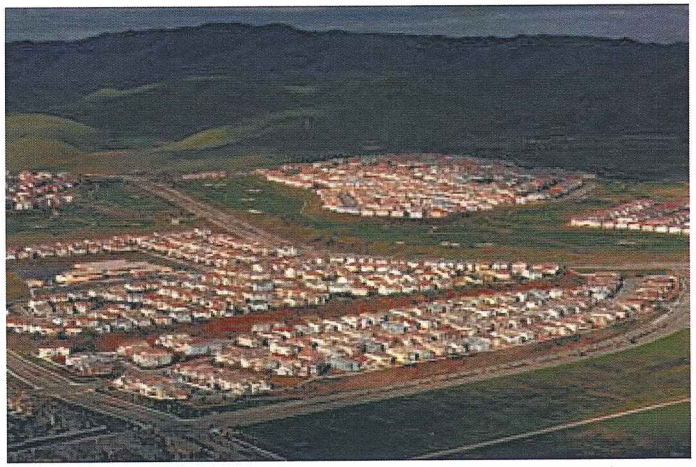
Current and Future Challenges

"We are the first in the nation to tackle land use planning. What this will mean is more environmentally friendly communities, more sustainable developments, less time people spend in their cars, more alternative transportation options, and neighborhoods we can safely and proudly pass on to future generations."

—Governor Arnold Schwarzenegger, September 30, 2008



BY EXAMINING the combined costs of housing and transportation, and the impacts of land use decisions on the environment, this analysis presents a more complete measure of the "cost of place" in the Bay Area. Housing that appears affordable based solely on housing costs may not be truly affordable when it is located far from transit, jobs, and/or services. This underscores the importance of broadening our understanding of housing affordability challenges to also include transportation costs and both the "time tax" and environmental impacts of commuting.

Over the next 25 years, the Bay Area is projected to grow by 1.6 million new residents—a 22 percent increase in population.[10] This is an opportunity to integrate land use, housing, and transportation policies to encourage new residential development in areas that are well served by public transit or near job centers.

PROMISING POLICY DEVELOPMENTS

The Obama administration, the state of California, and the Bay Area have taken a number of constructive steps to encourage new patterns of growth and cleaner modes of travel by facilitating the development of affordable, transit-oriented housing. For example:

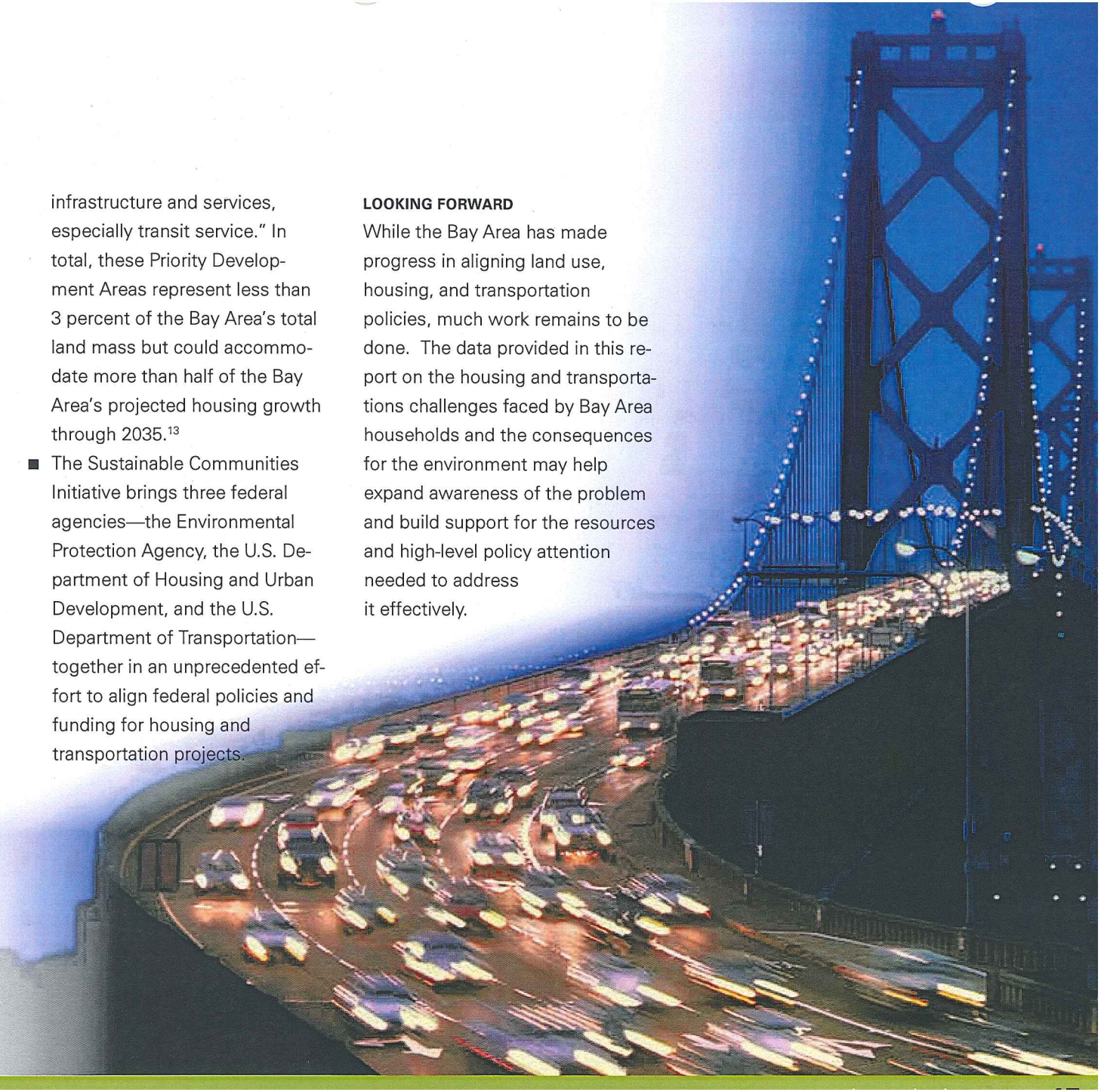
- Through Resolution 3434, the Metropolitan Transportation Commission (MTC) encourages increases in residential density near planned public transit stops. MTC also provides grants to help communities plan for this outcome, as well as funds for small-scale

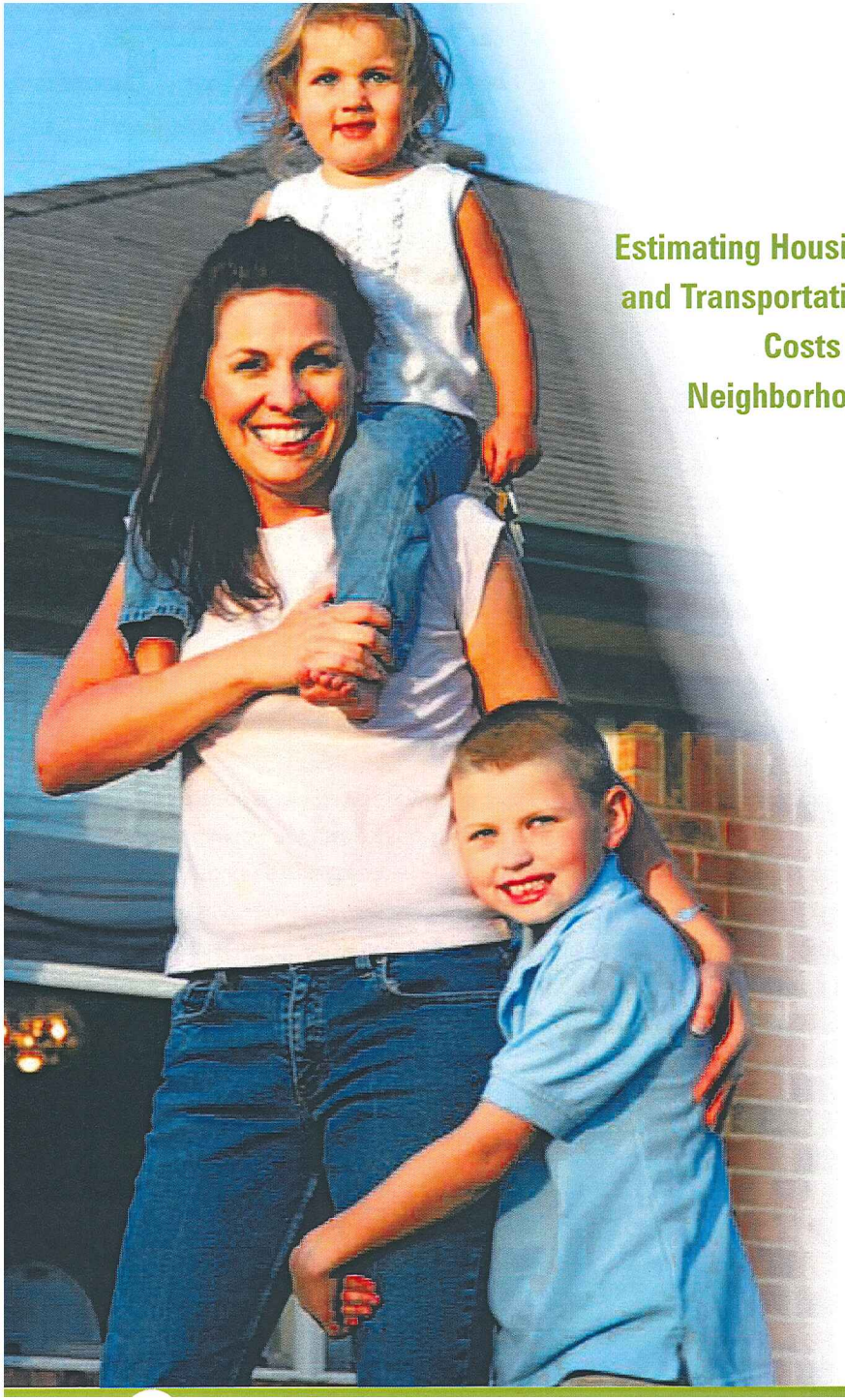
improvements (e.g., pedestrian walkways, bike lanes, streetscape improvements) that help make it feasible.[11]

- Senate Bill 375, passed in 2008, directs MTC to develop coordinated housing, land use, and transportation plans that lower carbon dioxide emissions and favor transit-oriented development.
- Proposition 1C authorized over $1 billion in state housing bonds for the development of transit-oriented housing and infill infrastructure. Roughly half of the housing units planned in the first round of funding will be affordable to households earning 80 percent of the area median income or less.[12]
- A regional joint committee identified approximately 120 areas in 60 Bay Area jurisdictions as either planned or potential Priority Development Areas (PDAs), defined as "locally designated land where future growth can be channeled, at sufficient densities to take advantage of existing infrastructure and services, especially transit service." In total, these Priority Development Areas represent less than 3 percent of the Bay Area's total land mass but could accommodate more than half of the Bay Area's projected housing growth through 2035.[13]
- The Sustainable Communities Initiative brings three federal agencies—the Environmental Protection Agency, the U.S. Department of Housing and Urban Development, and the U.S. Department of Transportation—together in an unprecedented effort to align federal policies and funding for housing and transportation projects.

LOOKING FORWARD

While the Bay Area has made progress in aligning land use, housing, and transportation policies, much work remains to be done. The data provided in this report on the housing and transportations challenges faced by Bay Area households and the consequences for the environment may help expand awareness of the problem and build support for the resources and high-level policy attention needed to address it effectively.





Estimating Housing and Transportation Costs by Neighborhood

Methodology

THE ORIGINAL HOUSING + TRANSPORTATION COST MODEL

The Housing + Transportation (H+T[sm]) Affordability Index was developed by the Center for Neighborhood Technology (CNT) and its collaborative partner, the Center for Transit-Oriented Development (CTOD), with support from the Brookings Institution's Metropolitan Policy Program's Urban Markets Initiative. This cost index has been applied to 52 metro areas in the United States, and is unique in that it measures the joint transportation and housing affordability at a neighborhood level (see www.htaindex.cnt.org).

TRANSPORTATION COSTS

The transportation costs estimated in this model and used in this report are more than the cost of commuting to and from work. They also include trips to and from school, errands, and other travel that is part of the household daily routine. The methods for the cost model draw from peer-reviewed research findings on the factors that drive household transportation costs. The model assumptions, calculations, and methods have been reviewed by practitioners at the Metropolitan Council in Minneapolis-St. Paul, fellows with the Brookings Institution, and academics from the University of Minnesota, Virginia Polytechnic, Temple University, and elsewhere, specializing in transportation modeling, household travel behavior, community indicators, and related topics.

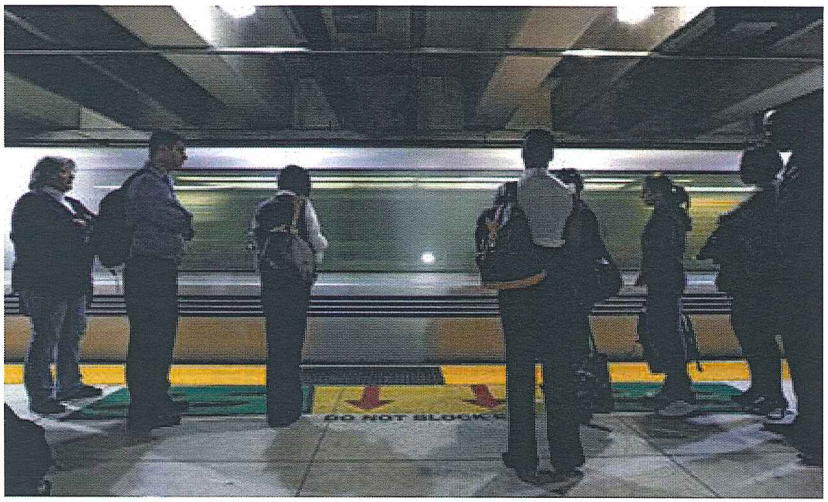
Specifically, the transportation cost model incorporates four neighborhood variables (residential density, average block size, transit connectivity index, and job density) and four household variables (household income, household size, workers per household, and average journey-to-work time) as independent 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 the total transportation costs.

HOUSING COSTS

Housing costs were determined using the census variables 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 (including payments for the first mortgage, second mortgage, home equity loans, and other junior mortgages); real estate taxes; fire, hazard, and flood insurance on the property; utilities (electricity, gas, and water and sewer); and fuels (oil, coal, kerosene, wood, etc.). It also includes, where appropriate, the monthly condominium fees or mobile home costs (installment loan payments, personal property taxes, site rent, registration fees, and license fees).

Gross Rent (GR) is defined as the contract rent plus the estimated average monthly cost of utilities (electricity, gas, water, and sewer) and fuels (oil, coal, kerosene, wood, etc.) if these are paid by the renter (or paid for the renter by someone else). Using gross rent eliminates differentials that result from varying practices with respect to including utilities and



fuels as part of the rental payment. The estimated costs of utilities and fuels are reported on an annual basis but are converted to monthly figures for the tabulations.

The census reports aggregate values for both of these variables as well as the count of owners and renters used to compile the different aggregates. Therefore, to find an average value for SMOC and GR, the aggregate is divided by the number of households making up the aggregate value. For the purposes of this study, 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 therefore excluded.

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

UPDATING THE ORIGINAL MODEL TO 2005—2007

Input data for the original model are primarily composed of 2000 U.S. Decennial Census block group data and values that were created and calculated based on these data. Since the most recent data are for 2000, estimates for 2005—2007 were carried out using a recognized procedure called the "constant-share method," which considered the percent change of variables from 2000 to 2005—2007 within the Public Use Microdata Areas (PUMAs). PUMA data for 2005—2007 were obtained from the American Community Survey (ACS) three-year estimates while 2000 US Census block group data were aggregated to the same PUMA boundaries. Once the percent changes were calculated between the two time periods for each PUMA for each variable, these values were then used as multipliers. Year 2000 values for each block group within each PUMA were multiplied by this percent change to estimate 2005—2007 values at the block group level.

Transportation costs were updated by applying new cost factors to the model's estimates of vehicle miles traveled and automobiles per household. These cost factors were based on the 2006 AAA estimates of costs for owning and operating a vehicle, which are estimated to be $5,569 per auto and 15.1 cents/mile for fuel ($2.41/gallon), maintenance, and tires.

References

[1] 2005–2007 American Community Survey three-year estimates. Data for the Bay Area reflect the San Jose–San Francisco–Oakland Combined Statistical Area.

[2] The federal standard is that housing costs should consume no more than 30 percent of household income. Data are from the 2007 American Community Survey.

[3] Metropolitan Transportation Commission. 2009, June. *Statistical Summary of Bay Area Transit Operators: Fiscal Years 2003–04 through 2007–08.* Oakland, CA: Author.

[4] Source Inventory of Bay Area Greenhouse Gas Emissions, December 2008. Bay Area Air Quality Management.

[5] Condon, Patrick, Duncan Cavens, and Nicole Miller. 2009. *Urban Planning Tools for Climate Change Mitigation.* Cambridge, MA: Lincoln Land Institute.

[6] Energy Information Administration. 2005 *Residential Energy Consumption Survey.* Table US1. Total Energy Consumption, Expenditures, and Intensities, 2005, Part 1: Housing Unit Characteristics and Energy Usage Indicators,

[7] Table 5 estimates the cost of transportation for a household earning the average median income for the Bay Area. This approach ensures that variations in transportation costs among the different regions are due principally to such features of the built environment as access to public transit, residential density, and proximity to employment centers.

[8] These regions were developed because the main drivers of transportation costs—particularly features of the built environment (e.g., public transit rails and routes, residential density, the proximity of employment centers) and socioeconomic characteristics (e.g., household income and composition)—do not always adhere to city or county boundaries.

[9] We focus here on the Inner East Bay and North Bay because they are much larger than the South Bay, and thus contain many more people with extreme cost burdens, and because the comparatively higher income of South Bay residents suggests they are better able to afford other essential costs.

[10] Association of Bay Area Governments. 2008, June. San Francisco *Bay Area Housing Needs Plan, 2007–2014.* Oakland, CA: Author.

[11] Metropolitan Transportation Commission. 2009, April. *Change in Motion: Transportation 2035 Plan for the San Francisco Bay Area.* Oakland, CA: Author.

[12] Sprowls, Sharon. 2009. *Evaluation of First Round Awards Under California's Transit-Oriented Development (TOD) Housing and Infill Infrastructure Grant (IIG) Programs.* San Francisco, CA: Housing California.

[13] Metropolitan Transportation Commission. 2009, April. *Change in Motion: Transportation 2035 Plan for the San Francisco Bay Area.* Oakland, CA: Author.

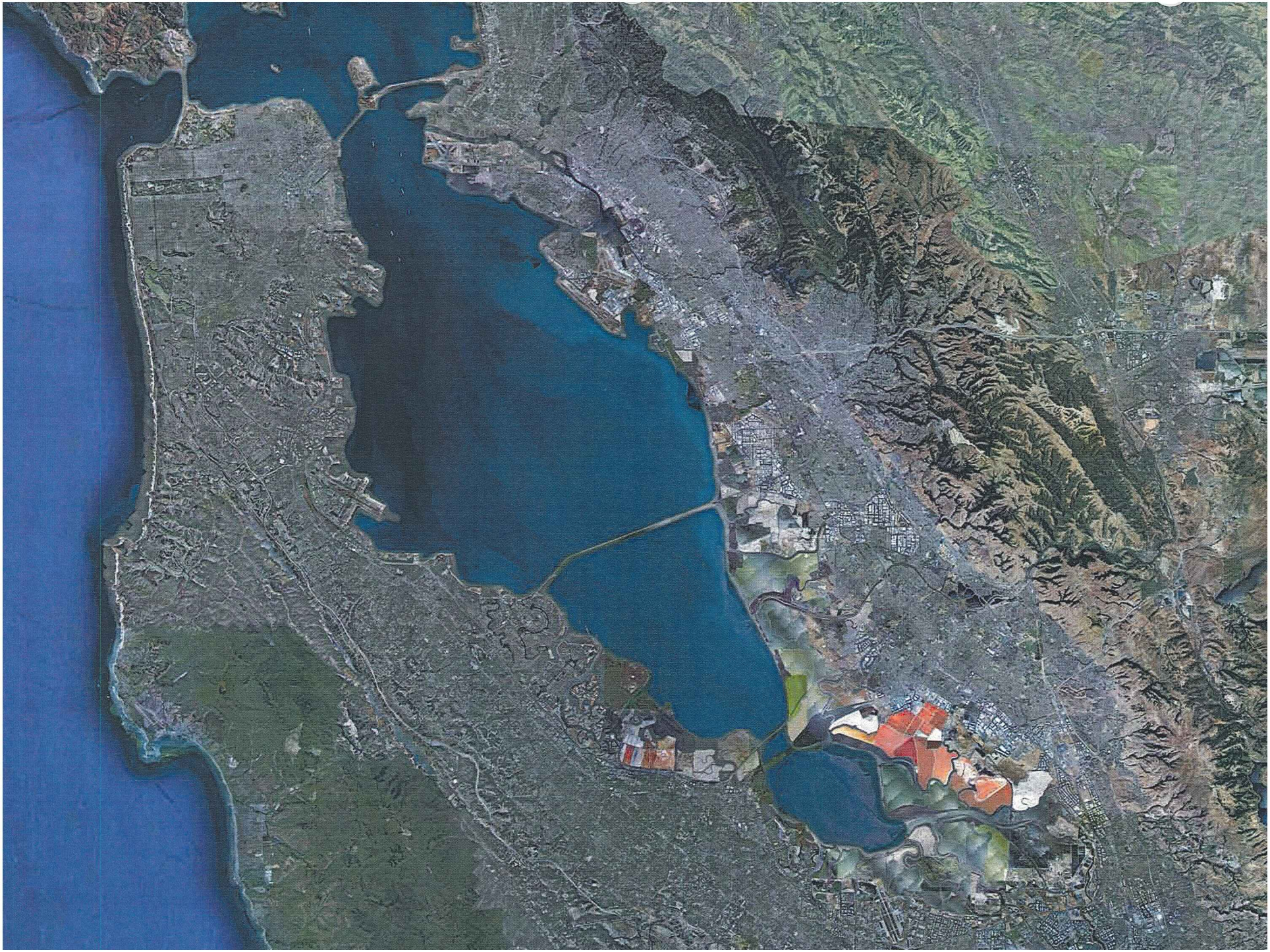
Calculator

What do housing and transportation in the Bay Area cost YOU?

Find out with the Housing and Transportation Cost Calculator.

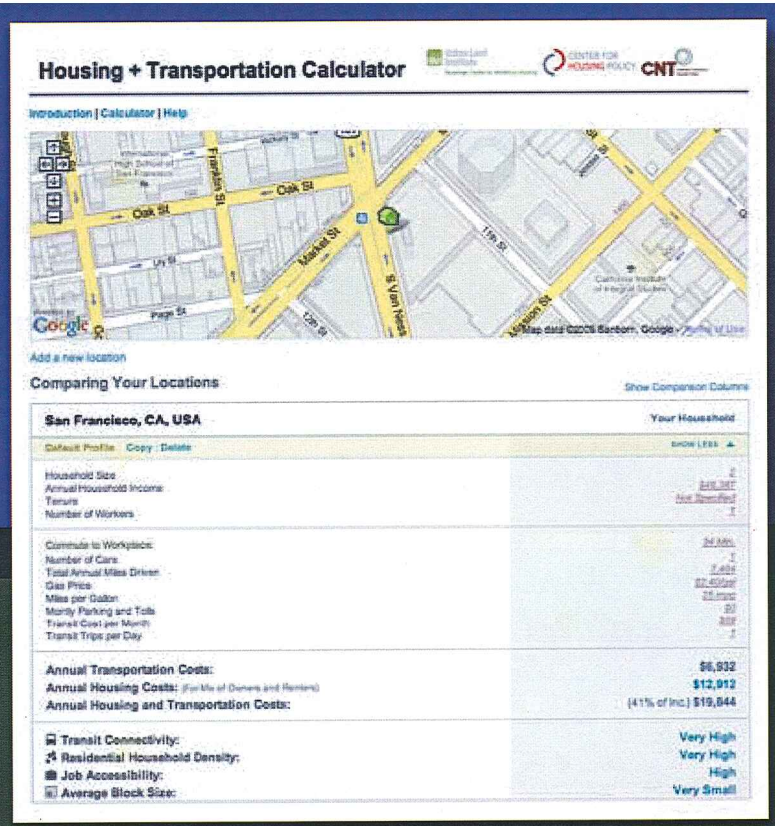
The ULI Terwilliger Center for Workforce Housing is pleased to announce its Housing + Transportation Cost Calculator to the Bay Area to provide consumers with up-to-date cost data to make informed housing decisions based on housing and transportation costs.

To access the calculator, go to www.bayareaburden.org.



ULI Terwilliger Center Housing and Transportation Cost Calculator

www.bayareaburden.org



The Terwilliger Cost Calculator aids individuals, households, planners, government officials and municipalities to understand the true costs of housing and transportation, and how these costs can vary by location within the Bay Area.

Using the fully customizable tool, users can:

- calculate the combined housing and transportation costs using household characteristics and location;
- evaluate the factors that determine housing and transportation costs, and how changes can impact expenses;
- assess the true proportion of income being spent on housing and transportation;
- compare actual household costs with neighborhood and regional averages.

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