



GLOBALIZATION IN THE SAN FRANCISCO BAY AREA:

*Trying to Stay at the
Head of the Class*

S. L. Bachman

JANUARY 2003



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Pacific Council on International Policy
Los Angeles, CA 90089-0035
Tel: (213) 740-4296
Fax: (213) 740-9498/9993
E-Mail: pcip@usc.edu
Website: www.pacificcouncil.org

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EXECUTIVE SUMMARY

Globalization has helped the Bay Area reemerge as a leading actor on the world stage, and its challenge now is to stay there. This is no easy task because the Bay Area's recent success—driven by global demand for its high-tech products—has overburdened its infrastructure and threatened its famed quality of life and thus its competitive edge. This report examines the forces that have led to the region's success and examines what needs to be done to ensure that this success continues. Among the findings:

Regional action is needed to secure the Bay Area's global economic leadership, particularly in high-technology industries.

Regional action has succeeded in protecting the Bay Area's environment, particularly the San Francisco Bay itself, but more regional efforts are needed to improve transportation bottlenecks, housing shortages, and other byproducts of rapid economic growth. These problems cut across many jurisdictions and can only be tackled if the region's local governments and private sector work together. The Bay Area's bid for the 2012 Summer Olympic Games failed, but reviving the bid might serve as a potential catalyst for promoting regional thinking.

The Bay Area's trade infrastructure requires major upgrades.

Inefficient Oakland and San Francisco airports and marine ports are losing business to their rivals, particularly those in Southern California. Some freight forwarders truck shipments to Los Angeles to avoid congestion and delays in the Bay Area. San Francisco's airport still has only one runway. Oakland's important marine container port suffers from a lack of several international trade services available elsewhere on the West Coast, and is less automated and efficient than ports in Asia.

The Bay Area must be vigilant against policies that could endanger its ability to attract the immigrants who have played such an important role in globalization by linking the innovation and money of Silicon Valley back to their homelands.

Silicon Valley, located at the southern end of the Bay Area, has drawn many of the world's best and brightest, particularly engineers and other technology experts, from developing countries such as India and China. These immigrants are playing a uniquely important role in global development because of the money, business, and know-how they channel back to their homelands. Even less-skilled immigrants play a role internationally by remitting money to their countries of origin. Despite legitimate concerns about homeland security after September 11, it is important that Bay Area universities and businesses continue to attract the well-educated, entrepreneurial foreigners who account for much of the region's success.

For all the importance of Silicon Valley's high-tech companies, the Bay Area's engagement in the global economy is broader than generally realized. This breadth offers it some protection against a downturn in any one industry.

Many of the Bay Area's most important companies, from Hewlett-Packard to Oracle to Intel, are clearly products of Silicon Valley. But many other important players in the region represent a wide range of industries—oil (ChevronTexaco), finance (Wells Fargo and VISA International), engineering (Bechtel), and apparel (Levi Strauss and The Gap)—thus ensuring that the region is likely to flourish in the global economy despite periodic setbacks to one or another sector.

PREFACE

Sarah Bachman's paper on the San Francisco Bay Area is the fourth in the Pacific Council's project, "Mapping the Local Implications of Globalization," which examines five city-regions in the western United States. Earlier papers were *San Diego, Baja California and Globalization: Coming from Behind* by Richard Feinberg and Gretchen Schuck; *Mapping Globalization Along the Wasatch Front* by Earl Fry; and *Boeing and Beyond: Seattle in the Global Economy* by Fred Morris. An overview report by Gregory F. Treverton, Pacific Council senior fellow and director of the Mapping project, is upcoming. In early 2003, we will also publish two in-depth analyses on themes related to this project: one on immigration, and the other on infrastructure for international trade.

Here, Bachman describes a Bay Area region that has become a leading actor on the world stage, in large part because of the huge global markets for its high-tech products and the entrepreneurial verve of the immigrant communities that have thrived in Silicon Valley. Yet this success has overburdened the Bay Area's infrastructure and threatened its famed quality of life. Bachman argues that only greater regional cooperation can solve these problems, thereby maintaining the Bay Area's competitive edge in the global economy.

The Pacific Council expresses its appreciation to the Ford Foundation, which had the vision to fund this project; to project director Gregory F. Treverton; and to fellow participants in this project—Richard Feinberg, Earl Fry, Fred Morris, and Xandra Kayden. Comments on this paper or the project are welcome and can be directed to the project director at gregt@rand.org.

Ian O. Lesser
Vice President, Director of Studies
December 2002

I. INTRODUCTION: THE BAY AREA IN THE GLOBAL ECONOMY

In some respects, the San Francisco Bay Area has been riding a wave of globalization since the 1850s, when the Gold Rush attracted thousands of would-be millionaires from around the world. Even after the miners had exhausted the gold and silver of the Sierra Nevada Mountains, San Francisco remained the urban center and economic capital of the West Coast of North America.

The early and mid-20th century saw Los Angeles surpass San Francisco in importance as a port and a center of population and manufacturing. Yet by the final decades of the century the Bay Area had regained its economic vitality as high-tech companies—particularly those in Silicon Valley—turned the region into the most export-intensive in the country on a per-capita basis. Immigration has been a key factor in Silicon Valley’s success, bringing technology-minded entrepreneurs who established successful local companies and then created economic ties to their home countries. Other immigrants with less education filled low-wage service jobs and started small businesses, contributing to international economic development by remitting money to their home countries.

The Bay Area’s reemergence has been marked by relatively high productivity, even in the face of the high-tech recession that began in early 2000.¹ The region has accumulated a record of entrepreneurialism and reinvention that has repeatedly allowed it to recover from the economic setbacks of the past 30 years by bringing new ideas to market. The most recent of these waves of reinvention started in 1994 with the commercialization of the Internet.² A new wave may be starting with the amalgamation of bio-, nano- and information technologies.

As a result, the Bay Area and especially Silicon Valley have been cited widely as international exemplars of a high-tech, high-productivity, knowledge-driven regional economy. In the 1990s, visitors from all over the world flocked to the Bay Area-Silicon Valley to try to parse the secret of the region’s extraordinary productivity. To be sure, the region’s position at the center of the New Economy resulted in its being among those hit hardest when the “dot.com” bubble burst in Spring 2000. Sales at Silicon Valley companies slumped and thousands of workers were laid off.

Nevertheless, the Bay Area still retains an advantage in productivity and business creativity over other urban areas of the United States. Venture capital investment has fallen—but was still far above its 1996 level. Economic fundamentals remain strong. The economy is diversified. The regional workforce remains highly educated, and the area’s universities, research labs, colleges, and other institutions of higher education continue to produce new entrants into the local workforce.

Within the nine counties of the Bay Area, civic groups generally agree that regional action is needed if the Bay Area is to maintain its leadership as a global center of high-tech and knowledge industries. Regional action includes tackling the problems of transportation, housing, and environment that have arisen from the region’s failure to manage the consequences of economic growth, much of it driven by the forces of globalization.

One of the most visible regional groupings is Joint Venture, Silicon Valley Network, or JVSV (formerly known as Joint Venture, Silicon Valley), which was founded during the recession of the early 1990s as a public-private organization to address specific problems of urban governance. Although many of the problems that JVSV tackled were related to business, others concerned local social services (for instance, primary schooling) in the community at large.

Whether groups like JVSV can be more effective in moving beyond planning to implementation remains to be seen, as does the question of whether consensus can be achieved absent a crisis worse than the high-tech collapse at the turn of this century. What form of regional government, or public-private partnership, provides the most appropriate model for future action is also in question, both in the Bay Area and in similar metropolitan regions.

II. THE BAY AREA DEFINED

The standard definition of the San Francisco Bay Area is the nine-county region that encompasses the waters of greater San Francisco Bay, which has shaped the region's history and continues to shape its economy.

Greater San Francisco Bay includes San Francisco Bay to the south, San Pablo Bay to the north, and Suisun Bay to the northeast. The San Francisco Bay-San Joaquin estuary is the West Coast's largest estuary.³

The estuary, including the greater bay, is one environmental unit. Politics and government, however, divide the estuary into smaller jurisdictions. For planning purposes, the greater bay is governed by the nine counties that surround it. They comprise the local council of governments (the Association of Bay Area Governments, or ABAG). The council's jurisdiction ends at the eastern edge of those counties, which leaves out almost all the rivers that make up the bulk of the estuary system.

The nine-county region is neither the only definition of the Bay Area nor always the most useful, but it has two distinct advantages. One is that it coincides with the geographic expanse of the greater bay. The other is that, despite the larger environmental unit (the estuary), and smaller subunits (cities and special purpose districts), this nine-county area is the statistical entity by which the world usually judges the Bay Area.

The nine counties—San Francisco, Marin, Solano, Sonoma, Napa, Contra Costa, Alameda, Santa Clara, and San Mateo—are home to a population of 8.26 million in a 7,000- square-mile area.⁴ The Bay Area is the fourth largest metropolitan area in the country, after New York, Los Angeles, and Chicago.⁵ The Bay Area is the 34th largest metropolitan area in the world, ranking between Bogota, Colombia, and Chennai (Madras), India.⁶

Although the area's cities and suburbs once stood apart, separated by farmland, today urban and suburban development has melded them together. But this physical unity is deceptive: The nine counties include a total of 100 cities, 162 school districts, and nearly 1,000 special districts.⁷ Three cities stand out: San Jose, with almost 900,000 people, is the country's 11th largest; San Francisco is 13th; and Oakland is 42nd.

The counties can be further divided into four sub-regions: San Francisco; the North Bay; the East Bay; and the South Bay-Silicon Valley. Although sub-regional divisions are blurring, they



still help shape local governance as well as some of the ways in which Bay Area residents think about economics, work, and politics. The sub-regions have distinctive identities.

San Francisco is the capital of culture, with the largest number of well-established cultural institutions. They include ballet, classical music, art, and the San Francisco Opera, which is regarded by many as one of the top 10 opera houses in the world. The city is also the news media center for all of Northern California and has been the West Coast's financial hub for 150 years.

San Francisco's centrality is fading as other parts of the Bay Area grow. Some of the city's population is moving into the suburbs—and the suburbs of former suburbs—and Silicon Valley is spreading and transforming other nearby parts of the Bay Area.

The South Bay, now the Bay Area's population and economic center, is closely identified with the high-tech knowledge industries that earned it the nickname Silicon Valley. It is also developing a new hybrid: information technology linked to bioscience.

The East Bay is a mixture of heavy industry (oil refineries, Oakland's container port); knowledge industries (software, biotech) developed around universities and scientific laboratories; and suburban offices, housing, and service industries. A bioscience cluster has developed around the University of California, Berkeley.

The North Bay is still mostly rural, known for bedroom communities and wine production. Yet the North Bay's expanding urban areas have become a new center of the telecommunications industry. It is known, unsurprisingly, as Telecom Valley (see Table 1).

The Bay Area's super-region includes counties outside the Bay Area that house a growing proportion of Bay Area workers who commute to their jobs. This extraregional workforce accounts for 5 percent of the total Bay Area workforce,⁸ 18 percent for Silicon Valley.⁹ Although these counties differ significantly from the Bay Area counties in economics, politics, and demographics (the super-region counties are poorer, more rural, less populous, and politically more conservative than the central region), they are critical to the Bay Area's role in the global economy, as well as the Bay Area's response to pressures emanating from globalization. In fact, of the six or seven additional counties usually counted in the super-region, one—Santa Cruz County, on Santa Clara County's southwest border—houses a concentration of high-tech development that is often included in statistical and other definitions of Silicon Valley.

Table 1. Regional Overview

CONVENTIONAL NINE-COUNTY REGION										
Sub-Region County	Sub-Region I (San Francisco) San Francisco	Marin	Sub-Region II (North Bay)		Sub-Region III (East Bay)		Sub-Region IV (South Bay)		Nine-County Total or Average as appropriate	
			Sonoma	Napa	Solano	Contra Costa	Alameda	Santa Clara	San Mateo	
Indicators										
Population (2000)	776,733	247,289	458,614	124,279	394,542	948,816	1,443,741	1,682,585	707,161	6,783,760
Land Area										
Square miles	47	520	1,576	754	828	720	738	1,291	449	6,923
Population per sq. mile	16,526.23	475.56	291.00	164.83	476.50	1,317.80	1,956.29	1,303.32	1,574.97	2,676.28
Gross Regional Product (1999)										
(\$ thousands)	40,813,781	6,719,286	8,603,160	2,588,182	4,859,141	19,172,159	36,029,860	74,315,401	24,752,720	217,853,690
per capita GRP (\$ thousands)	53	27	18.75	21	12.32	20	25	44.16	35.00	28
Employment (Dec. 2001)										
Employed Labor Force	419,500	136,300	253,300	63,500	190,400	495,600	724,700	951,000	401,400	3,635,700
Unemployment Rate	5.70%	2.70%	3.30%	4.50%	4.40%	3.60%	5.20%	6.10%	3.40%	4.32%
Median Household Income (1997)	\$47,239	\$62,126	\$46,149	\$46,246	\$47,953	\$57,611	\$48,445	\$63,298	\$59,771	\$53,204
Persons below poverty, %, 1997 estimate	12.60%	7.00%	9.10%	8.80%	11.30%	8.70%	11.80%	9.00%	6.60%	9.43%

BAY AREA SUPER-REGION								
Sub-Region County	Yolo	Super-Region East			San Benito	Super-Region South		Super-Region Total
		San Joaquin	Stanislaus	Merced		Santa Cruz	Monterey	
Indicators								
Population (2000)	168,660	563,598	446,997	210,554	53,234	255,602	401,762	8,884,167
Land Area								
Square miles	1,012	1,399	1,495	1,929	1,389	446	3,322	17,915
Population per sq. mile	166.66	402.86	298.99	109.15	38.33	573.10	120.94	548.29
Gross Regional Product (1999)								
(\$ thousands)	3,741,271	7,684,067	6,041,645	2,306,341	637,840	4,474,507	7,568,214	468,161,265
per capita GRP (\$ thousands)	22.18	13.63	13.51	10.95	11.98	17.50	18.83	17
Employment (Dec. 2001)								
Employed Labor Force	85,900	239,000	182,000	68,900	24,310	129,300	161,100	3,187,653
Unemployment Rate	5.10%	9.70%	10.90%	17.40%	10%	8.30%	14.20%	9.99%
Median Household Income (1997)	\$41,169	\$36,940	\$36,207	\$29,178	\$45,989	\$45,267	\$40,480	\$41,054
Persons below poverty, %, 1997 estimate	16%	18.80%	13.10%	25.40%	11.40%	13.10%	24.10%	16.39%

Sources: Census 2000, California Statistical Abstract, California Dept. of Commerce National Association of Counties, US Bureau of Economic Analysis

III. GLOBAL ENGAGEMENT: YESTERDAY AND TODAY

“The Bay Area’s economy has been strongly linked to the rest of the world since gold was discovered at Sutter’s Mill near Sacramento in 1948.”

Globalization—if defined as the accelerating interconnectedness of economies, people, and ideas—is most often and easily measured in terms of economic activity. By that definition, the Bay Area’s economy has been strongly linked to the rest of the world since gold was discovered at Sutter’s Mill near Sacramento in 1848. The most strategically placed supplier of everything from basic goods to luxuries was the village of Yerba Buena, which mushroomed almost overnight into San Francisco, the Gold Rush’s supply depot, port, fleshpot, and financier. When the easy-to-find gold was mined out a few years later, San Francisco remained the richest, most sophisticated city on the West Coast.

The Central Valley hinterland, as well as some of the land around the bay, continued to produce agricultural products. Their export perpetuated the flow of goods and people through the ports along the bay and the estuary, and helped Oakland and nearby Richmond, located on the bay-shore stretch now known as the East Bay, to grow into major ports. Oakland converted early from bulk cargo to container shipping, and that helped it grow into Northern California’s port for container traffic.¹⁰

By the end of the 19th century, San Francisco had begun developing suburbs in Marin and San Mateo counties. Further south, Santa Clara County remained heavily agricultural until the 1940s, when the military-funded electronics industry took hold, especially around Stanford University (which lies at the county’s northern border). Midway through the 20th century, silicon wafer factories and suburban homes had crowded out the orchards. In 1971, journalist Don Hoefler wrote an article showcasing a new nickname for the region: Silicon Valley. By the 1990s, Silicon Valley-related jobs were spread all through the nine counties, and along east-west arteries heading toward Sacramento, which is developing its own high-tech cluster.

Even the North Bay counties, which were the slowest to develop an urban fringe next to the bay, have gained enough high-tech jobs to acquire the nickname “Telecom Valley.” Some North Bay residents are not particularly happy about this growing high-tech element, having moved north specifically to escape Silicon Valley. And yet, studies of regions in the global economy have shown that knowledge industries reap distinct advantages from clustering close to one another. Telecom Valley was a natural outgrowth of the high-tech industries of Silicon Valley looking for a cheaper place to locate plants and offices, but one that still would be close enough to Silicon Valley to reap the benefits of clustering.

San Francisco’s international links stem from its 19th century status as the West Coast’s urban leader. Japan established its San Francisco consulate in 1872, when Los Angeles, Seattle and Portland barely existed. The 1915 Panama Pacific International Exposition left behind a monument, the Palace of Fine Arts, and a civic association, the Pan American Society of California. By 1945, San Francisco still played enough of a leading role on the West Coast to have its War Memorial Opera House selected as the site of the founding meeting of the United Nations.

Many foreign consulates remained in or near San Francisco long after Northern California’s population was surpassed by Southern California’s. Today, almost 70 countries have consulates in San Francisco and other Bay Area towns. Mexico has established a consulate in San Jose because

of the city's large Mexican population. Countries (e.g. Canada, France, Malaysia, and Japan) and regions (e.g. Northern Ireland) have established commercial offices in Silicon Valley.

More Than Just Silicon Valley

Many analyses of the region look only at statistics from San Francisco or from Santa Clara County, which is often used as a Silicon Valley proxy. But the region includes much more than these limited views show—and it is the very diversity of the region that has allowed it to flourish despite periodic setbacks in one economic sector or another.

By 1999, the Bay Area's gross regional product of \$217 billion (Table 1) qualified the region as the 20th largest economy in the world. The Bay Area's economy is smaller than Belgium's but larger than the economies of Austria, Denmark, and Turkey. Although the South Bay-Silicon Valley sub-region houses the bulk of the Bay Area's jobs and population, the nine counties boast a diversified economy. Essential services, such as the Oakland marine port and the San Francisco and Oakland international airports, are located outside of the area that statisticians consider Silicon Valley. It would be a mistake to look at Silicon Valley in isolation without looking at the Bay Area as a whole.

The biggest companies on the San Francisco Chronicle's list of the 25 largest locally headquartered companies—as measured by total (global) sales—include several decidedly non-high tech companies (see Table 3). Top among them is ChevronTexaco, a giant of the extraction industries that Silicon Valley likes to call Old Economy. Second and third are New Economy companies. They are McKesson Corp., which makes software for “health care supply management” and Hewlett Packard, a high-tech standard-bearer. Holding down fourth place is Safeway Inc., a chain of grocery stores, and in fifth place is Wells Fargo & Co., a bank.

The diversity and dynamism of the Bay Area economy was deep enough to shrug off a rash of high-profile mergers and acquisitions of local firms in the mid-1990s by companies headquartered outside the region. The acquisition of Bank of America by North Carolina-headquartered NationsBank in 1998 was only the most visible. Bank of America had been the nation's third-largest bank, and a San Francisco corporate leader since A. P. Giannini founded it as the Bank of Italy in 1904. Although the loss of Bank of America and other corporate headquarters dealt San Francisco a psychological blow and removed some important corporate leadership, the region itself did not appear to suffer significantly. In fact, Bay Area finance jobs grew annually by about 4.5 percent from 1993 to 1998. One reason was the emergence of online equity trading, pioneered by Charles Schwab, whose eponymous company, located in the city, set the international standard for discount equity trading online. Another was the growing need for financial services

Table 2. Top 15 Employers, Nine-County S.F. Bay Area Through 2002

	# Employees
1 City & County of San Francisco	28,718
2 U.S. Postal Service	~24,600
3 Kaiser Permanente	22,500*
4 University of California at San Francisco	17,000
5 United Airlines	~15,000
6 Santa Clara County	14,360
7 Bank of America	~14,000
8 Contra Costa County	11,780
9 S.F. School Districts	11,290*
10 Federal government (various agencies)	11,265*
11 University of California at Berkeley	11,212
12 PG&E	11,151
13 Stanford University	10,778
14 Hewlett Packard	~10,000
15 Oakland Unified School District	~9,000

SOURCES: Compiled by PCIP and ABAG from Books of Lists, 2000, 2001 (Business Journal), and PCIP reporting.
*2000 or 2001 figure

in Silicon Valley, which is now home to half of the region's banking jobs.¹¹

Companies of Global Significance

A list of the Bay Area's internationally significant companies naturally begins with the largest as ranked by global sales (ChevronTexaco, Wells Fargo) but must also include other companies, such as Bechtel (engineering) and McKesson (pharmaceuticals), which have extensive and influential operations overseas.

Smaller companies would make the list because of their place in international competition for products or ideas. VISA International would claim a place on the list not because of its size but because of the ubiquitous presence of VISA charge cards in the pockets of globe-trotting consumers; the fierce rivalry among VISA and other charge cards in consumer markets internationally; and the growing importance of charge cards and other non-cash options (e.g., debit cards) internationally, especially in developing nations. IDEO, the Palo Alto-based industrial design firm, would win a place because of its ubiquitous, pioneering designs (e.g., the Apple mouse, which was the first mouse for mass consumer use; the first laptop; the Palm handheld; the first stand-up toothpaste tube) and its reputation as one of the world's most creative industrial design firms.¹² Ebay, the online auction site in San Jose, would make the list because it is one of a very few businesses to emerge from the dot.com bust with a viable Internet-based business model.

Levi Strauss and The Gap, two of the world's largest apparel companies and major trend-setters in the business, would also appear on the list. Most of the goods sold under their brand names are manufactured overseas in low-wage developing countries. In addition, Levi Strauss has been a leader in developing socially responsible business practices in such factories. The Gap followed suit—although belatedly, in response to pressure from anti-sweatshop activists.

The Importance of Clustering

High-tech companies such as Intel, Sun, and Oracle would appear on any list of internationally significant firms not only because of their size and influence in the global economy, but also because they are the central players in Silicon Valley's high-tech cluster. The phenomenon of clusters helps explain why the Bay Area has gained in economic importance as the pace of globalization has increased. Not only are some of the largest high-tech companies headquartered in the area, but also the synergistic effect of bunching so many companies and people together has resulted in a kind of group creativity. This regional momentum lends importance not only to the largest companies but also to smaller enterprises that are fast-growing and creative. By 2020, the Bay Area's knowledge-industry clusters are expected to employ nearly one out of every five people in the region.¹³

Table 3. San Francisco Bay Area-Headquartered Public Companies, Ranked by Sales
(bold face indicates high-tech)

	Total Sales (\$ millions)
1. ChevronTexaco Corp	104,409
2. McKesson Corp.	48,419
3. Hewlett-Packard Co.	44,211
4. Safeway Inc.	34,301
5. Wells Fargo & Co.	26,892
6. Intel Corp.	26,539
7. PG&E	22,959
8. Cisco Systems Inc.	18,290
9. Sun Microsystems Inc.	14,059
10. Gap Inc.	13,847
11. Solectron Corp.	13,705
12. Oracle Corp.	10,092
13. Calpine Corp.	7,590
14. Agilent Technologies Inc.	7,257
15. Applied Materials Inc.	5,980

Source: Chronicle 200, compiled by the San Francisco Chronicle, Dec. 2001-Feb., 2002, www.sfgate.com

Some of these clusters may hold the key to economic recovery for the region after the bursting of the dot.com bubble in 2000. Companies in the Bay Area's biotechnology cluster—the world's first such cluster, and still the largest by many measures¹⁴—have proved remarkably resistant to the stock slide that hit much of the rest of the high-tech sector. Futurists such as Doug Henton of Collaborative Economics predict that biotechnology will combine with new engineering technologies and that they in turn will combine with information technology to produce a new wave of innovation and economic growth.

Another boost to the region's economy may come from defense spending in the post-September 11 world. Defense dollars helped Silicon Valley take root, and the region's industry clusters still make products that are keystones in the nation's arsenal. The terrorist attacks of 2001 sparked the Bush administration to ask for an increase in the defense budget for information technology.¹⁵

Why did Silicon Valley develop in the Bay Area and not somewhere else? Explanations in the literature range from the area's entrepreneurial culture and "habitat" for entrepreneurship;¹⁶ to electrical engineering professor Frederick Terman's 1930s efforts to make Stanford University and the area around it into a technology center; to the decision of William Shockley, co-inventor of the transistor, to return to the area after winning the Nobel Prize for physics in 1956.¹⁷ The eight engineers Shockley hired for his new company soon quit and started new ventures nearby. Today's Silicon Valley stalwarts include those companies' descendants: Hewlett-Packard, Agilent, Intel, Advanced Micro Devices, Teledyne, Varian, and venture capital dean Kleiner Perkins Caulfield & Byers.

The formation of a pool of talent and a collection of high-tech businesses attracted more and more entrepreneurs to the area. Local geography helped concentrate these industries in an area small enough to facilitate the sharing of knowledge in person. Stanford lies on a narrow stretch of the Monterey Peninsula, hemmed in between the Santa Cruz Mountains to the west and the waters of San Francisco Bay to the east. People who started businesses there saw each other in after-work bars, at church, and during other social functions. AnnaLee Saxenian, professor of City and Regional Planning at the University of California, Berkeley, and others have identified this sharing of knowledge as key to the region's economic creativity. They found that Silicon Valley's unique creativity derived from exchange of information among firms, flexible networking arrangements, and—crucial for the area's links to the global economy—immigrants and money from abroad.¹⁸ Saxenian and other analysts say that the region possesses a welcoming attitude toward talented and skilled people, no matter what their origin. Immigrants are welcome, especially if they bring technical and entrepreneurial skills.¹⁹

Central to creating and maintaining these high-tech clusters are vibrant universities. Stanford is the prototype of the university that nurtures businesses that use ideas developed in its classrooms and laboratories. People in these firms likewise benefit from proximity to university labs and colleagues. Stanford's success has inspired many institutions in the area to try to spin off businesses in a similar fashion. The most notable outcome is the formation of clusters of bio-tech firms around Emeryville, near UC Berkeley, and around South San Francisco, many of them spin-offs of Genentech, which itself was a spin-off from the medical facilities at the University of California, San Francisco.

IV. MEASURING GLOBALIZATION IN THE BAY AREA

“Measured by trade, the Bay Area is one of the most globalized regions in the country.”

The Bay Area’s three largest cities—San Francisco, Oakland and San Jose—benefited in obvious and easily measured ways from globalization’s increased flows of people and goods, especially high-tech products. These measures include trade (imports and exports), financial flows, and travel.

Other aspects of globalization are far harder to measure statistically. The extent to which Bay Area companies think and act in global terms—by targeting global markets and resorting to global sourcing, for example—is less easy to quantify. Several of the largest Bay Area companies, from ChevronTexaco to Hewlett Packard, have global supply chains and obtain at least half of their revenues from overseas operations. Yet even small compa-

nies think globally. Internet companies, for example, target a market that is inherently global.

Trade

Measured by trade, the Bay Area is one of the most globalized regions in the country. In terms of export value, the Bay Area and Seattle, which is home to heavyweights Microsoft and Boeing, vied for the No. 1 spot in the nation over several years in the 1990s. In 1999, for instance, the Bay Area’s \$28.3 billion in international trade was topped only by Seattle’s \$32.4 billion. Silicon Valley is largely responsible for this success; its high-tech products accounted for most of the 9.5 percent annual growth in the volume of trade recorded by the San Francisco customs district from 1990 to 2000. (It should be noted, however, that the district’s export volume fell by one-quarter in 2001 when the technology bubble burst.)

Increased employment related to trade provides further evidence of the links between the Bay Area and the global economy. From 1995 to 1999, growth in foreign trade was an important reason for the Bay Area’s gain of more than 100,000 jobs.²⁰ Asian countries in particular have consistently been major purchasers of Bay Area exports, particularly high-value technology goods. Judged from a 1993 base,

Table 4.
San Francisco Bay Area Exports by Product Sector, 1999
(\$thousands)

	San Jose	San Francisco	Oakland
Manufactured products	27,612,805	8,439,800	6,157,534
Food Products	109,679	710,578*	425,615*
Tobacco Products	77	—	—
Textile Mill Products	2,859	—	8,982
Apparel	6,229	247,719	10,515
Lumber & Wood Products	5,234	42,498	13,172
Furniture & Fixtures	8,167	154,553**	5,411
Paper Products	32,495	147,937	112,807
Printing & Publishing	114,117	38,606	36,598
Chemical Products	233,327	633,288	503,105***
Refined Petroleum Products	531	—	—
Rubber & Plastic Products	71,701	112,022	67,107
Leather Products	6,767	6,805	2,667
Stone, Clay & Glass Products	43,434	50,325	23,280
Primary Materials	92,739	139,931	112,051
Fabricated Metal Products	75,624	129,838	108,612
Industrial Machinery & Computers	12,003,107	2,148,297	1,967,335
Electric And Electronic Equipment	11,461,179	1,916,598	1,960,473
Transportation Equipment	122,470	1,219,506	217,582
Scientific & Measuring Instruments	3,084,740	543,738	491,750
Misc. Manufactures	50,705	77,191	43,849
Unidentified Manufactures	87,623	30,370	46,713
Nonmanufactured commodities	642,934	685,188	551,960
TOTAL	28,255,739	9,034,987	6,709,494

*Food & Tobacco Products are combined.

**Textiles, Tobacco & Furniture are combined.

*** Chemical & Petroleum Products combined.

Source: International Trade Association, US Department of Commerce
<http://www.ita.doc.gov/td/industry/otea/metro/industry>.

the region's exports increased 75 percent over a five-year period and "recorded the second largest dollar gain nationwide (after Seattle) despite a decline in 1997 and 1998 trade volumes" attributable to the Asian financial crisis.²¹

Not all the trade news has been positive for the Bay Area's job market, however. Importing goods made more efficiently abroad has often resulted in local factory job losses, as in the case of imports of apparel from Mexico or cut flowers from Colombia. Further, when displaced manufacturing workers find new jobs, they are likely to be lower-wage jobs in the service industry.²²

Airports

Globalization increased air cargo shipping, which is expected to grow even further. According to one source, total cargo through the Bay Area's three major international airports is expected to nearly double—from 1.75 million tons in 2001 to 3.2 million tons by 2005—and to triple to 5.5 million tons by 2020, reflecting an annual growth rate of 6.2 percent.²³ These statistics do not count package software exports or services exports, both of which are major Silicon Valley products.

Oakland handles the vast majority of domestic air cargo. San Francisco is the principal handler of international air cargo, including all international mail and almost all perishable goods. (After September 11, San Francisco air traffic dropped dramatically. United Airlines, which has a hub in San Francisco, cut many flights. Business travel and cargo shipments, already down because of the high-tech recession, fell further. One ranking of U.S. airports subsequently dropped San Francisco from fifth busiest to 10th busiest for 2001.²⁴) One study has found that regions with hub air cargo operations such as these generate many more high-tech jobs than regions without hubs.²⁵

But increasing the activity at these airports will require appropriate infrastructure. Today, San Francisco airport's congestion and delays, due in part to the lack of a second runway, are costing it business.

Marine Ports

Six marine ports are located on San Francisco Bay and the estuary that feeds it: Oakland, Redwood City, Richmond, Sacramento, San Francisco, and Stockton. In 2000, the two largest, ranked by approximate annual throughput, were Richmond, the regional oil refining hub (22,827,043 tons),²⁶ and Oakland, the region's main container port (21,418,705 tons).²⁷

In terms of dollar value, the bulk of exports are high-tech products, including manufactured products; industrial machinery and computers; electric and electronic equipment; and scientific and measuring instruments. The high value of high-tech products contributes to the San Jose metropolitan region's relatively high "openness ratio"—or value of merchandise exports per capita.²⁸

Oakland, which handled 1,400,000 TEU²⁹ in 1999, won the Bay Area container port business in part because of the easy rail and highway connections to its site, which at 995 acres is three times larger than Richmond's.³⁰ The port's total international cargo is 62 percent exports, and 38 percent imports—the highest and lowest percentages, respectively, of exports and imports for all large U.S. container ports.³¹

Oakland's recent growth notwithstanding, the port's history is primarily a tale of unfortunate geography and opportunities missed. Its location between Seattle-Tacoma and Los Angeles has put it at a competitive disadvantage in handling imports. Because of the northwest cant of the

west coast of North America, Seattle-Tacoma is a day closer by ship to Tokyo. And since the Sierra Nevada Mountains do not reach Los Angeles, imports shipped to Long Beach for transport east via rail line face a comparatively less formidable and faster journey toward markets in the desert Southwest, the Mountain states, and the Midwest.³²

Although Oakland has continued moderate annual growth of 4-6 percent in container traffic, thanks to local and regional cargo traffic, it has lost potential container cargo trade with Asia to other West Coast ports. The reasons include the relatively high cost of transferring containers from ship to rail cars, and large port warehouse developments in southern California and the Pacific Northwest (and comparatively smaller and older facilities in Oakland). Southern California's huge local market also is an attraction for importers. Delays in dredging the channel leading from the mouth of the San Francisco Bay to Oakland also have cost the port business.³³ In an alarming trend, some importers of department store goods are trucking imports from Southern California to major processing and distribution centers in Northern California—enduring the time and expense involved in land shipping in order to bypass Oakland.

To cope with growing global shipping and air traffic and to compete with other ports, the Port of Oakland has set up a five-year, \$757-million strategic plan for maritime improvements and a \$1.2-billion plan for airport improvements.³⁴ The regional plan of the Metropolitan Transportation Commission, which is the nine-county regional planning organization for roads and transit,³⁵ also contemplates improvements to air and marine ports.³⁶ And yet, as beneficial as port improvements may be to the regional economy, they often face fierce opposition from bay-wide environmental groups or from other local interests.

Ports work together with little friction, according to Ellen Johnck, a longtime activist for regional action in the Bay Area, in part because of Oakland's dominance as the region's container port. The other ports have each established a stable niche. San Francisco, for instance, has kept docks for cruise ships. Limited cargo shipping and ship repair are located in China Basin, on the port's southern edge.³⁷

Financial Flows

Several statistics used for measuring financial flows associated with globalization—remittances, portfolio investment and foreign direct investment (FDI)—are measured at the national and state level, but not at the regional level.³⁸ Extrapolation suggests that the Bay Area captured a large portion of statewide flows, but not a disproportionate share internationally. What is more significant in the Bay Area is alternative financing—venture capital and angel investing—financial flows that set a global example of how to support economic creativity.

Inward flows: Foreign direct investment

Foreign direct investment (FDI) figures at the county level are not immediately available, and so the Bay Area's share cannot be directly computed as a proportion of a global or national total. Cumulative FDI in California has grown dramatically in two decades, from \$20.4 billion in 1981 to \$103 billion in 1998.³⁹

Some 5 percent of the state's total workforce and 9 percent of its manufacturing workforce are employed by U.S. affiliates of foreign enterprises.⁴⁰ By 1998, Japan was the largest foreign investor, providing \$34 billion, or 33 percent, of all foreign investment—primarily in manufac-

turing, especially high-tech ventures. The Netherlands was second with \$14 billion, or 13 percent, and Britain and Canada each had invested \$10 billion.

As the state's economic base shifted in the 1980s away from a concentration on traditional industries, such as manufacturing, construction and real estate, and toward the more diversified mix achieved in the 1990s, foreign investment also shifted. In the past 10 years, new foreign investment has concentrated in wholesale trade and "high technology industries," which the state Department of Commerce defines as telecommunications, pharmaceuticals, computer software, and electronic components.⁴¹ The Bay Area's strength in telecommunications, computer software, and electronic components would suggest that a large portion of this foreign investment went to this region.

Outward flows: Remittances

Like portfolio investment measures, statistics for remittances are not available at the local level. Yet some rough approximations shed light on the monetary links between immigrant communities in the Bay Area and their native countries.

A rough calculation can be made based on national estimates and county populations. Census figures show that the Bay Area's 928,000 Mexicans make up 21 percent of the estimated 4.4 million Mexican migrants in the United States. The concentration of Mexicans from the state of Michoacan in Redwood City, which lies on the San Francisco peninsula roughly halfway between San Francisco city and San Jose, has won it the nickname "Little Michoacan." Other Mexican towns are known to have sent almost their entire adult male populations to such Bay Area towns as Healdsburg in Napa County. If they all remit a share of their earnings from the United States to Mexico (as calculated from 1997 estimates) at the average rate found nationally, then each remit about \$841 per year, for a total of \$780 million.⁴² In 1999, remittances from the Vietnamese, another ethnic group with a substantial presence in the Bay Area, totaled \$1.2 billion via banks and an estimated \$2 billion in cash. While there is a debate about whether these remittances breed dependency and are put to good use, there certainly are cases in which the money is being used to build small factories and develop small farms and livestock.

Remittances from the Bay Area to any one country probably are dwarfed by remittances from Southern California, and in particular, Los Angeles. More significant and unusual, in terms of the global economy, is the extent to which the money and talent of immigrants to the Bay Area have acted as bridges over which information and capital have flowed to immigrants' home countries to start high-tech businesses. As we will discuss later, China, Taiwan and India have been major beneficiaries of this trend.

New financing models: Angel and venture investment

The Bay Area has been a leader in the use of venture capital investment: capital invested in high-risk, relatively new companies in the hope of very high returns. Venture capitalists usually demand at least partial equity ownership and a portion of hands-on management of the enterprise. The Bay Area, and Silicon Valley in particular, has captured more than one-third of venture capital in the United States. When the technology bubble burst, venture capital investment plummeted—but total VC funding for 2001 was still higher than in 1998. Nevertheless, the Bay Area remains the center of venture capital investing. Between the first and second quarters of 2002, venture capital investing fell 5.1 percent in the Bay Area but 11 percent nationally. And not all sectors suffered: Venture capital funding in the life sciences—which includes biotech, medical devices, health care services, and information—rose during the same period.⁴³

“Would-be investors from around the world have flocked to the Bay Area to learn how to nurture their own versions of venture capital funding.”

The fact that Silicon Valley is such an attractive destination for venture capital has created a number of important links between it and the rest of the world. First, would-be investors from around the world have flocked to the Bay Area to learn how to nurture their own versions of venture capital funding. Researchers at Stanford University’s Asia-Pacific Research Center have come from Korea, Japan and China to study venture capital investing.⁴⁴ Venture capital funding has been crucial to the region’s development of Internet-based businesses. Arguably the most successful of these is the Ebay auction site, which in turn has established or merged with other auction sites in Europe and Asia. Second, anecdotal evidence suggests that the hands-on nature of venture capital investing has created new patterns of foreign investment. At least one venture capitalist was so determined to be close to his investment and so reluctant to travel outside of Silicon Valley that he insisted that the principals in a firm in which he had invested move to the Bay Area from Israel.⁴⁵ The region has also seen substantial private “angel” investing. (Angels are wealthy individuals who invest in start-up companies; other venture capital investors are usually businesses or institutions.⁴⁶) Recipients of angel investment money have included immigrants without strong U.S. credit histories, who tend to be shunned by mainstream venture investors.

Silicon Valley venture capital firms also have invested abroad. A number of established firms, including Sequoia Capital, Benchmark Capital, and Accell Partners, announced funds dedicated solely to investments in Europe and Israel in 2001. Other companies simply sent executives abroad to troll for opportunities.⁴⁷ Venture capital executives and professors alike have been tapped by Europeans and Asians for ideas about how to start Silicon Valley-style venture capital investment back home. Venture capital also is beginning to flow the other direction: Foreign investors from countries such as China (China Development Industrial Bank), Japan (Mitsubishi), Taiwan (Acer), and Germany (Bertelsman) also have provided funding for Silicon Valley start-ups.⁴⁸

Communication

Both access to electronic communications and the sheer volume of communications can be used as another indicator of globalization. At the national and international level, communication is measured by number of telephones and amount of long-distance traffic. These measures are unavailable for local jurisdictions.⁴⁹ Silicon Valley’s high levels of literacy, almost universal telephone access, and the importance of high-tech business suggest a high level of computer and telecommunications literacy and usage. It seems safe to assume that the Bay Area is one of the most internationally connected regions in the country—and probably in the world.

The Progressive Policy Institute’s New Economy Index for metro regions, released in April 2001, ranked San Francisco as the top metro area on a combination of five measures representative of high-tech business and computer usage.⁵⁰ The San Francisco region, which for the purposes of the index included Oakland and San Jose as well, had the largest on-line population, broadband telecommunications capacity, and number of commercial Internet domain names. It scored lower on two other measures (computer use in schools and Internet “backbone”).⁵¹

V. IMMIGRATION AND THE SILICON VALLEY SUCCESS STORY

At the end of the 19th century, the Bay Area's population was a hodge-podge of native Americans, Mexicans, Italians, Portuguese, Slavs, French, Scandinavians, Germans, Irish, Jews, Basques, Filipinos, Sikhs, Samoans, Japanese, and Chinese, as well as Americans from poorer, colder parts of the country. The African-American population soared around World War II. Some came during the war to work in Oakland's shipyards, and others returned after the war to settle near the Bay Area bases where they had been stationed.⁵²

The collective face of the Bay Area began changing five years before the 1970 census, when Congress passed the 1965 U.S. Immigration Act. The new law ended decades of policies that had suppressed immigration from Asia, the Pacific Islands, and Latin America. It also lifted a ban on Asian immigrants becoming citizens. Today, the Bay Area has one of the largest percentages of immigrants of any metropolitan region in the country. In San Jose and San Francisco, more than one-third of residents were born outside the United States. People in almost half of all households in Santa Clara County, as well as in San Jose and San Francisco, speak a language other than English.⁵³

In the years that followed, the Bay Area's population became more Asian and more Latino. In the 1970s, wars in Vietnam and Cambodia sent refugees fleeing to the United States. California is now home to two-fifths of the Cambodians and Vietnamese living in the United States. The Bay Area, in particular Santa Clara County, acquired the second-largest concentration of Vietnamese in the country. In the 1980s, civil war and strife in Mexico and Central America sent a wave of political and economic refugees north. Although most settled in Southern California and the Central Valley, significant numbers settled in the Bay Area.

At the same time, Bay Area universities and burgeoning Silicon Valley businesses attracted highly educated immigrants. Notable flows of newcomers came from East and South Asia, some already educated in their home countries and others eager to get graduate degrees in Bay Area universities.

One of the most noticeable changes produced in the Bay Area by the recent influx of immigrants has been the way in which they have strengthened the social networks that tie the Bay Area to other parts of the world. In earlier periods of history, migrating to another country meant cutting off all ties to the motherland. But immigrants today can be in daily contact with their home countries via telephone, e-mail, and electronic news services of all kinds. The ability to maintain these long-distance relationships and even create local ones with other new immigrants settling in the region has played a part in the concentration of knowledge industries in the Bay Area and has boosted the global reach of Silicon Valley industry and entrepreneurship.

Networking

Immigrant entrepreneurs have played an outsized role in building Silicon Valley. Two Public Policy Institute of California studies by AnnaLee Saxenian illustrate this further. A 1999 study showed that Chinese or Indian immigrants headed up 24 percent of Silicon Valley companies and that foreign-owned firms accounted for 14 percent of Silicon Valley's employment.⁵⁴ More recently

“Immigrant entrepreneurs have played an outsized role in building Silicon Valley.”

“What once seemed to be a ‘brain drain’ from poor to rich countries is now better characterized as a complex, multidirectional ‘brain circulation.’”

(2002), Saxenian has found that immigrant entrepreneurs create social and business networks with other immigrant entrepreneurs, and these networks help the newcomers to Silicon Valley bypass established but less-than-welcoming social and business networks. The result has been new products, businesses, and jobs. Previously, scholars studied entrepreneurship and globalization separately. In the old view, entrepreneurs were “small strivers,” whereas globalization was about the work of multinational corporations and nation-states. The new view, Saxenian argues, based on results from a Web-based survey of members of immigrant networking organizations and active community members, should be that globalization also is the work of entrepreneurs circulating between Silicon Valley and the urban centers of Asia. What once seemed to be a “brain drain” from poor to rich countries is now better characterized as a complex, multidirectional “brain circulation.”⁵⁵

“This is very unique to Silicon Valley. You don’t see this happening on a large scale across the U.S.,” Saxenian has said. “Places that were peripheral not so long ago are now closely connected to the world center of technology here.”⁵⁶

Asian entrepreneurs have invested capital raised or accumulated in the United States and set up other operations in their home countries, strengthening or creating cross-border economic, business, and social ties between Silicon Valley and growing high-tech sectors abroad (see box). Of the 600 entrepreneurs in Saxenian’s survey, half had set up subsidiaries, joint ventures, subcontracting, or other operations in their countries of origin.⁵⁷ At a minimum, this investment represents a flow of capital worth millions of dollars.

Highlights of Saxenian study of immigrant ties to homeland business:

- 80 percent of people who responded to the email survey said that they tell colleagues in their home countries about jobs, business opportunities and technology news from Silicon Valley;
- 40 percent had arranged business contracts in their home countries; others advised or consulted for homeland companies;
- 20 percent had invested their own money in start-ups in their home countries;
- Indians said that the top reason for investing in India was the low cost of skilled labor there;
- Chinese professionals said that they established business ties to China in order to sell in the Chinese market;
- The types of businesses that Indian, Chinese, and Taiwanese started in their home countries included software consulting (27 percent), software services (25 percent), research and development (16 percent), marketing and sales (16 percent), hardware design and manufacturing (8 percent), and back-office or remote service (8 percent).⁵⁸

Both professional networking groups and less formal personal contacts have been important for immigrant Indian and Chinese entrepreneurs who have started companies in Silicon Valley. They have used their networks to raise capital, find personnel, and forge business relationships. Asian networking groups started in large part because, as recently as 1990, ambitious East Asian and South Asian immigrants were not winning the job promotions or financial backing they thought they deserved from Silicon Valley's then mostly Caucasian business leadership. A survey of more than 2,000 members of formal professional networks, designed by Saxenian and Rafiq Dossani, a senior research scholar at Stanford University's Asia/Pacific Research Center, and conducted by Dossani, found that members of networking organizations raised money even more successfully through relatives, friends, and other informal networks than they did through formal organizations.

Prominent networking organizations include TiE (The IndUS Entrepreneurs), which has 800 charter members and 8,000 regular members (2,500 in the Bay Area). TiE was founded in 1992 by 20 ethnic Indian Silicon Valley entrepreneurs, who had been invited back to India to talk about how they succeeded in the United States. The organization welcomes members who have roots or an interest in South Asia (India, Pakistan, Bangladesh, Nepal, Bhutan, and Sri Lanka) and Southeast Asia.⁵⁹ TiE members have helped fund start-up companies and incubate ideas, and the group claims that those associated with it have created businesses with over \$200 billion in market value since 1992.⁶⁰ TiE members also have exported the "angel investor" venture capital model to India.⁶¹

The Monte Jade Science and Technology Association was started by Taiwanese immigrant engineers in Silicon Valley in 1990 to "promote cooperation and the mutual flow of technology and investment between Taiwan and the United States."⁶² Monte Jade's main purpose appears to be helping transfer technology to Taiwan, as well as allowing members to build personal networks that might result in business opportunities. In the Chinese community, Hua Yuan Science and Technology Association was started in 1999 as a networking association that, through dinner meetings, seminars, and other activities for members, promotes the "technological, professional and scientific development of the Chinese business community."⁶³ The organization's 700 members are mostly engineers and entrepreneurs.

Other networking groups, formal and informal, exist for people from, or interested in, Ireland, Korea, Vietnam, Iran, and various countries in Europe. Not all networking organizations work the same way or equally well for their members. Some groups, such as the overseas Vietnamese, or Viet Kieu, do not appear to have a formal networking group. Yet between 1996 and 2000 they established 430 companies in Vietnam, with registered capital of 490 billion dong (\$35 million). Ten percent of the companies were in high-tech; it is not clear how many have Silicon Valley ties.⁶⁴

TiE, meanwhile, is finding that Silicon Valley-based members hope to create networks of relationships for a variety of business purposes, whereas India-based members focus more on finding investors for their new business ventures. TiE has launched a new effort to reach out to include more engineers, women, and others who do not have roots in the Indian subcontinent in TiE events and to recruit them as members.

Successful Indian entrepreneurs have become notable philanthropists back home as well. The community's dynamic of business success and growing philanthropic interest is not unique, but it is notable for its size and visibility. The American Indian Foundation, for instance, was started in 2000 and quickly raised \$2 million for earthquake relief in Gujarat. Although the charitable efforts

“The skilled workforce is the region’s ‘ace in the hole’ in the global marketplace.”

of Indian entrepreneurs have focused on India, some also support U.S. charities in the Bay Area and elsewhere. TiE founder Kailash Joshi and his family, for instance, founded Bluegrass Indo-American Civic Society (BIACS), which helps poor, mostly white communities in Kentucky.⁶⁵

H-1B Visas

In the early 1990s, high-tech companies from the Bay Area, working through industry organizations, played a lead role in winning an expansion in Congress’ allocation of H-1B visas for skilled workers. The result was an influx to the United States of highly skilled engineers. An estimated 250,000 holders of the special visa are working around the country. A large portion came from India, but since the tech bubble burst, an estimated 2,000 H-1B visa holders who had been working in the Bay Area returned to India in 2001.⁶⁶ The number of visas issued in 2002 was down sharply from 2001.⁶⁷

H-1B visa holders have not all been happy with the results. Because visa holders are contracted to specific companies, they are reluctant to complain about labor abuses. Some companies have impounded workers’ passports; withheld portions of H-1B contractors’ salaries; or refused to pay overtime. Spouses of H-1B visa holders cannot hold jobs in the United States.

Complaints also have emerged from some American engineers, such as the head of the Institute of Electrical and Electronics Engineers-USA (IEEE-USA), who believe that relatively low-cost H-1B visa holders have bumped American engineers into the unemployment line.⁶⁹ It should be noted, however, that the majority of Indian-born workers in Silicon Valley are not H-1B visa holders. The majority came to the United States for higher education and stayed. The San Francisco Bay-Silicon Valley pattern underlines the importance of the region’s institutions of higher education in attracting and holding a highly skilled workforce. The skilled workforce, as R. Sean Randolph of the Bay Area Economic Forum puts it, is the region’s “ace in the hole” in the global marketplace.

Immigration Problems

Immigration has not been without tensions. These have taken the form of rising numbers of non-English speakers in schools and cases of resentment and fear among non-immigrants. Schools are struggling to cope with English language learners speaking at least 54 languages. Hospitals struggle to diagnose diseases and deliver prescriptions in many languages. Ballots and other publications must be printed in languages other than English, imposing extra costs on local government.

Resentment against immigration spiked during the recession of the early 1990s, resulting in the campaign for a measure (Proposition 187) that would have denied education and health care to undocumented immigrants. By comparison, anti-immigrant incidents were scattered and relatively few in number after the September 11 terrorist attacks. Perhaps the most noteworthy effect of the post-September 11 recovery for immigrants in the Bay Area was a new rule requiring airport security jobs to be held by U.S. citizens. This rule threatened hundreds of non-citizen airport screeners in San Francisco, where 70 percent of about 1,000 screeners were non-citizens, and Oakland, where about 40 percent of 150 screeners were not U.S. citizens. Many had not lived in the United States long enough to apply for residency permits.⁷⁰ The citizenship requirement for screeners did point up, inadvertently, the regional economy’s dependence on immigrants in non-high-tech jobs.

VI. REMAINING GLOBALLY COMPETITIVE: THE REGIONAL RESPONSE

As globalization increases, the Bay Area's biggest challenge will be balancing growth against constraints on growth. Local values protective of the environment must be balanced against the need for infrastructure, transportation, electricity supply, and other basic services for commercial and private life. To strike the balance successfully, a coherent planning process is needed—one that takes local interests into account but does not get bogged down by the fragmentation of political responsibility within the region. In some cases, a process that involves the nine-county region around the Bay Area may be most effective in addressing this challenge. In others, smaller sub-regions or larger super-regions will prove the best units of action.

The larger nine-county Bay Area has dealt well with environmental issues. It has been far less successful, however, with such problems as housing shortages and insufficient transportation, either on its own or as part of a super-region that includes adjacent counties that also are affected. The sub-region of Silicon Valley has successfully fostered economic growth, even outside of its boundaries.

One obstacle to regional action is state law and regulations. "California does little to encourage cooperation among cities and counties on growth issues," said an editorial in the *San Jose Mercury News*. "Indeed, its tax laws and other policies sometimes pit cities against each other, competing for sales taxes and corporate growth at the expense of housing."⁷¹

Globalization and the Environment

Residents of the greater San Francisco Bay area share a sense of common identity, interests, and concerns about the future, largely because they perceive the Bay Area as being a single environmental unit.

Regional efforts to protect the environment go back at least 40 years, when the U.S. Army Corps of Engineers proposed filling in 60 percent of the bay and leaving a navigable channel in the middle.⁷² Gradual filling had reduced wetlands around the bay from 680 square miles in 1850 to 430 in 1960.⁷³

In response to the Army Corps plan, three Berkeley women launched the Save San Francisco Bay movement in 1961.⁷⁴ The movement gained so much support that in 1965 the California state legislature created the San Francisco Bay Conservation and Development Corporation (BCDC) to regulate development inside the bay and along the bay coastline. The 27-member commission comprises appointees from local government and state and federal agencies.⁷⁵

More recently, environmental concerns have spawned other nongovernmental organizations in the Bay Area, including the Silicon Valley Toxics Coalition, which was formed in 1982 when high-tech companies were discovered to have leaked toxic chemicals into the ground water. That discovery shattered the image of high-tech as environmentally clean. Actions to address the environmental damage helped give Silicon Valley a new sense of itself as a region. The Toxics Coalition and other local environmental groups perform an important role as watchdogs over the institutions, formal and informal, that are supposed to safeguard the natural environment. They also raise the alarm over threats.

“A regional approach to maintaining the Bay Area’s international economic competitiveness must try to ensure that environmental preservation is maintained in economic growth plans.”

The regulatory structure embodied by BCDC is strong, as is public awareness of the Bay Area as a single environmental region. Also strong is public concern about keeping the Bay Area environment in good health. Public concern poses something of a paradox when it comes to responding to, and increasing the benefits from, globalization. The Bay Area’s beauty and the salubrious outdoors lifestyle are important lures for knowledge workers, who in turn are critical to the continued growth of the region’s high-tech industries. Yet the need to preserve the bay and its surroundings also restrains many actions necessary to reap the full benefits from globalization. They include the dredging of Oakland harbor (now, finally, under way), the construction of a new runway at San Francisco Airport (still being debated), and construction of highways and other infrastructure.

A regional approach to maintaining the Bay Area’s international economic competitiveness must try to ensure that environmental preservation is maintained in economic growth plans. This can be done, but the balancing act is not easy. Oakland’s dredging plans, for instance, were delayed by environmental objections. When most concerns had been addressed, dredging moved forward. The proposed \$100 million acquisition and restoration of the salt ponds at the southern end of San Francisco Bay, owned by the Minnesota agriculture company Cargill, followed years of activism against development along the bay shore and negotiations to raise the federal, state, and foundation money needed to purchase and restore the ponds.⁷⁶ A narrower view of growth in a globalized economy might have considered the salt ponds only as land that could be filled and paved for industrial or commercial use. And yet, successful restoration of the ponds will improve the health of the bay for generations to come, thus preserving the Bay Area’s quality of life, and thereby, the life-style attraction for knowledge workers. Also, restoration of the ponds might be underwritten by money put up by the San Francisco International Airport in return for the go-ahead to fill 930 acres of the bay for a second runway.⁷⁷ That, in turn, could solve a critical transportation bottleneck for global and domestic flows of goods and people.

Globalization and Economic Development

The bay aside, the idea that the nine counties of the Bay Area form a single economic entity is only about 10 years old, according to University of California at Berkeley globalization scholar Michael Clough. In fact, many people who live in the Bay Area continue to think of the nine-county area in terms of the four sub-regions—San Francisco, the North Bay, East Bay and South Bay (Silicon Valley)—that form it. Yet these boundaries are blurring fast. One bit of evidence: North Bay counties that rarely sent representatives to ABAG meetings in the 1970s are now regularly doing so.

Some existing regional government bodies seem to have been invigorated by the idea that some problems should be tackled regionwide. Apart from ABAG, the Metropolitan Transportation Commission is the most effective. The commission is one model of how Bay Area regional government might operate. The MTC’s strength lies in the power of the purse: It has both a mandate to make transportation plans and, as the administrator of federal and state funds, the mandate to coordinate and finance projects.⁷⁸ The MTC’s weaknesses include a leadership that is mostly appointed by local officials and so is not directly accountable to voters.⁷⁹ At times, according to Rob Elder, former editor and editorial page editor of the *San Jose Mercury News*,

appointees to the MTC board have approved projects mostly for political reasons. Power of the purse is notably missing from other planning entities, such as the Bay Area Alliance for Sustainable Development.

The blurring of regional subdivisions also raises the hope that localized solutions to public policy problems might spread and create regional change. Silicon Valley is the site of one home-grown public policy organization that is trying to spread the word about solutions it has developed to local problems—problems that now are common to all Bay Area counties because of the spread of Silicon Valley-type industry.

Joint Venture Silicon Valley (JVSV), a business-initiated regional body, grew out of the concerns of Silicon Valley leaders that the valley was losing business to Austin, Texas, and other would-be high-tech centers with lower land and labor costs. JVSV focused first on solving a practical problem faced by silicon-chip companies planning to build multiple new plants. The problem was that obtaining building permits was slow, and complicated by a tangle of various and confusing city and municipal requirements for obtaining the permits. In the quick-turnaround world of high-tech industry, speed to market is critical, and the many permitting processes were slowing plant siting and building, reducing the competitiveness of Silicon Valley. After a scandal concerning contamination of groundwater, the Silicon Valley leaders had discovered that each city in the South Bay had a different process for issuing permits that would allow chemicals to be stored below ground without leaking into the groundwater.

Local permit officials, community leaders, businesses, and JVSV, whose vision is “to build a sustainable community collaborating to compete globally,”⁸⁰ worked together on a solution. They piloted in eight cities a plan to streamline the permitting process and put it on-line. The pilot project was successful and now is being replicated in neighboring cities. The new approach would benefit the entire Bay Area if it spreads to all nine counties. Streamlining the permitting process has helped save money for high-tech businesses and kept some in the area. Perhaps more important, the effort involved in streamlining the permitting process has demonstrated that business and government can work together for the benefit of both.

Two factors quickly helped JVSV gain momentum. First was a perception that action was needed, fast: JVSV attempted to rebuild Silicon Valley’s competitiveness during the deep economic recession of the early 1990s, a time when the area seemed to be losing its grip on its position as the nation’s high-tech capital. Second, the group began by tackling a very concrete and specific problem. JVSV has since brought together what it calls “civic entrepreneurs” from Silicon Valley to formulate strategies to promote education, the economy, the environment, health care, and innovation. Among the results are ideas for federal tax reforms that would help U.S. business compete in the global economy.⁸¹ For instance, the report calls for making U.S. corporate tax rates similar to those of its competitors.⁸² JVSV also compiled a Silicon Valley Index, which measures progress and slippage against benchmarks for the economy and society. According to Elder, the index helped focus attention on specific measures of success and failure, and in that respect helped build a sense of Silicon Valley as a region. The index also goes beyond the usual economic statistics to include measures of education achievement, traffic congestion and income disparity, which describe quality of life in the community at large.

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JVSV is one sign of the emergence of new civic leadership south of San Francisco and Oakland. It has raised hopes of more inclusive civic leadership by embracing leaders from non-business fields as well as from the businesses and government sources tapped by other regional bodies. JVSV has also increased regional interest in improved governance. It is among the organizations studied by the California Center for Regional Leadership, a nongovernmental organization started to promote a regional approach to civic problems.⁸³

Although people working on regional issues report improvements in cooperation among the Bay Area’s sub-regions, more effort will be needed to make a substantial difference on the most difficult issues, including housing and education.⁸⁴ The Bay Area Economic Forum, for instance, is a San Francisco-based, business-led organization that operates a series of projects to promote regional action on such issues as trade, energy use, conversion of defense facilities, high-speed water transportation, and the stimulation of multimedia industries. It also produces research about the regional economy. The Economic Development Alliance for Business (EDAB) promotes economic development in the East Bay. The Silicon Valley Manufacturing Group promotes business-supported positions on regional issues, including education and housing, as well as energy and transit issues. It might help if regional organizations included more non-business and non-government representatives. Few of the Bay Area’s other regional and sub-regional organizations have made the effort that JVSV has to include more than one or two sectors of leadership. Finally, regional responses to broader issues have occasionally emerged. As mentioned above, Silicon Valley businesses that wanted to hire foreign engineers lobbied Congress for more H-1B visas through industry groups. Notably, JVSV did not call for the expansion of H-1B visas, despite its huge implications for Silicon Valley.

Globalization and Infrastructure Issues

Employers in the nine ABAG counties draw upon a labor pool that includes people living in at least three counties to the east (San Joaquin, Stanislaus, and Merced), and three more to the south (San Benito, Santa Cruz, and Monterey). This Bay Area super-region covers all 15 counties and a total population of nearly 8.6 million.⁸⁵ While this sprawl has resulted only partly from the regional immersion in the “new economy,” the trend has created problems that could hinder the region’s ability to take full advantage of globalization. Traffic congestion and the high cost of housing are widely believed by business and civic organizations to discourage foreign firms from investing in the region.

As people and businesses move outside of the nine-county area, traffic arteries have become increasingly clogged. Transportation has failed to grow fast enough to match Silicon Valley’s job growth. One-third of Silicon Valley’s freeway mileage received the “worst possible” congestion rating in 2000, according to JVSV’s Silicon Valley index.⁸⁶ The Texas Transportation Institute (TTI) ranks San Francisco-Oakland second after Los Angeles on an index of congested traffic. News reports feature daily backups at the entrances to the Bay Bridge and other traffic chokepoints for cross-bay commuters. On the TTI index, for the year 2000, San Jose was in eighth place.⁸⁷

Housing is a second problem. Since 1992, jobs in Silicon Valley have grown four times faster than housing. To keep pace with the job growth, Silicon Valley housing boomed, with infill

development and middle class home-owners encroaching into such formerly depressed areas as East Palo Alto and downtown Oakland. The housing shortage persisted, however, and when combined with the inflationary effect of large high-tech salaries, it sent Silicon Valley homes shooting to the top of national real-estate price lists. Household incomes increased an average of 6.6 percent annually from 1995 to 2000, but housing prices increased nearly twice as fast at 11.4 percent annually. On an index of housing affordability that compares 20 U.S. cities—including Boston, Los Angeles, Seattle, New York, Austin, Houston, and Boise—the Bay Area ranked lowest.⁸⁸ A growing share of Silicon Valley workers has moved farther and farther away from Santa Clara County. The bay and the mountains around it limit the location of transportation corridors and the location of new housing. The result has been enormous growth in long-distance commuting from as far away as Modesto and even Sacramento in the Central Valley. Depending on traffic, that could mean a commute of up to two hours in each direction.

To address the twin housing and transportation problems, in September 2001 ABAG launched a project to coordinate land-use and transportation planning within the nine-county region, and to a lesser degree, the super-region. The project, called Smart Growth/Transportation for Livable Communities, involves a number of transportation, environmental, and other public and private agencies that deal with urban development. They plan to develop a “preferred land use pattern” for Bay Area planning for the next 20 years.⁸⁹

This initiative, however, shows signs of being slow to bear fruit.⁹⁰ It is a planning process with no regulatory or economic teeth, and so will have to rely heavily on persuasion in an economic and cultural climate that does not favor such a process. Local officials typically are suspicious of regional plans—if they pay attention to them at all.

In sum, the difficulties in effective planning and management of transportation and housing stem from the lack of cohesion among the nine counties, and between them and the super-region. The regulatory structure is not strong, and public awareness of the problems has yet to yield significant consensus about appropriate solutions. ABAG has neither regulatory power nor money with which to implement a nine-county housing plan. Some success in leapfrogging the transportation problem has come in the form of high-speed ferries.⁹¹ But the development of better regionwide highway and transit infrastructure continues to stumble on the local concerns of communities that must raise their share of construction money, find appropriate land, and convince local officials and voters to go along with a regional plan. This is even true with the MTC’s transportation planning, although in other respects the MTC works relatively efficiently. As one writer put it, “the Bay Area has growth problems because no one is in charge.”⁹²

Indeed, it seems that only a crisis demonstrating the need for money, public support, and political will can lead to action on regional transit problems. The story of the Bay Area Rapid Transit System (BART) is an example. Ambitious plans for a regional light-rail system that would circumnavigate the bay began as early as 1947 in discussions among San Francisco, Marin, Alameda, Contra Costa, and San Mateo counties. But conflicting interests among the counties limited the geographical reach of the rail system and delayed its opening until 1972. More recently, similar conflicts delayed the extension of the first tracks linking San Francisco, Oakland, and their immediate suburbs in Contra Costa County to San Francisco Airport. Daily traffic jams on the stretch of highway next to the airport finally tipped the scales, however, and a \$1.5 billion BART extension to the airport is due to open in 2003.

After September 11, efforts to improve security at ports and airports showed some signs of regional cooperation, occasionally led by state and federal government initiatives. Gov. Gray Davis' Office of Emergency Security has convened several meetings of local officials in the Bay Area and elsewhere to try to improve security in a way that disrupts the flow of goods as little as possible.⁹³ Security measures might include, for instance, bar codes on all shipping containers that would allow computers to track their location within shipyards and in transit. Asian ports now use such bar code systems for containers, but Oakland and other West Coast ports do not.

Another possible catalyst for addressing regional issues may be the planning involved in bidding for a future Olympic Games. The region's already clogged transportation system raises practical issues (e.g., how to get athletes from an Olympic Village on the peninsula to locations around the bay) that the bid organizing committee for the 2012 Olympics addressed in a comprehensive way. Planning for how to stage events, house athletes, and transport them and spectators to and from events will be a big task. The coordination required for such a big event could inspire more region-wide thinking on transportation and other issues that will benefit from a regional strategy. Although the Bay Area's bid for the 2012 Summer Olympic Games failed, there is no obvious reason why the Bay Area should not try again.

VII. CONCLUSION: STAYING AT THE HEAD OF THE CLASS

For city-regions, globalization poses policy choices about how to deal with the challenges and opportunities created by more rapid and intense flows of people and goods.

While such choices are often stymied by NIMBY-ism ("not in my backyard"), provincialism, and the reluctance of local political figures to cede power to regional bodies, more people are starting to think regionally. In 2002, California Assembly Speaker Robert Hertzberg appointed a Commission on Regionalism. Regional policy could channel growth in ways compatible with local environmental and social values and with economic goals, but the Bay Area needs to overcome the fragmentation of power and responsibility first. Absent a crisis that could catalyze action, coalition-building will take time.

For the Bay Area, as for other regions, what's needed is leadership. What person or agency might pick up the need for regional approaches to problems and devise a new way to produce results? Would new regional government work best? Or would new partnerships—among existing governmental, private, or public organizations—work best?

An agenda for the region is clearer than the answer to who will take the lead in addressing it:

1. *Develop a Bay Area Globalization Index.* Creating an index, containing both existing and new measurements of globalization, would help the region understand its resources and deficiencies. Original data or proxies should be developed for some statistical measures of globalization—e.g. long-distance telecommunications traffic; remittances to foreign countries; portfolio and foreign direct investment—that are not readily available on the regional level. Some of these globalization indices could become useful policymaking tools. For instance, more information about the

role of immigrants in job creation could help bring greater understanding of their importance to the local economy. That in turn might reduce tensions between immigrants and the communities where they settle.

2. *Develop a regional understanding of international issues that can be used to boost global competitiveness.* The Bay Area Economic Forum and JVSV have set an admirable standard with, for instance, regional indices, education reform efforts, and reports on tax reform. But few regional public policy organizations systematically bring together leaders from the business, government and non-government sectors to look at immigration and other international issues important to the region. Many local universities are starting to fill this void. For instance, Santa Clara University is hosting a nine-month Institute on Globalization in 2002-2003. San Jose State University is developing a bachelor's degree in globalization. A regional understanding of international issues is critical after September 11. Tightened security will mean greater costs for security measures, and slower flows of goods and people. Bay Area universities and companies, whose success depends heavily on attracting foreign talent, will have to deal with more paperwork and other inconveniences to keep track of visa holders. The region's six ports will have to do a better job of inspecting imported cargo. This will be a particular challenge for the Port of Oakland, the region's container shipping center. Airports and airlines will need to spend more money on passenger inspection. Paying for these new security measures will strain scarce resources, requiring an understanding of what is at stake not only on the national level but also at a regional level. The costs of these new security measures might be more bearable if they are shared region-wide.
3. *Strengthen the region-wide consensus on preserving the balance between the region's environmental health and economic productivity.* This consensus is reiterated by most civic groups that are trying to build regional solutions to housing, traffic and other problems. In a rush to ensure that the region remains economically competitive, the need to preserve the local environment must not be overlooked. A clean and sound natural environment can be accommodated in plans for growth. The Bay Area's relatively strong commitment to a clean environment and to protecting its natural resources is integral to its sense of place. It also is integral to the region's attractiveness for knowledge workers. Infrastructure development, such as a new runway at San Francisco airport or the dredging of a deeper channel from the mouth of San Francisco Bay to Oakland's docks, is necessary if the region is not to forgo the opportunities created by the growing flow of goods and people. Yet legitimate environmental concerns must be respected. Nurturing the environmental consensus is slow work, but taking pains to do so will help build wide public support for inevitable sacrifices.
4. *Improve and streamline port services.* Oakland and San Francisco's air and marine ports are losing business because of inefficiency. The airports should come up with a plan to better share the air traffic coming in and out of the Bay Area. A plan should relieve congestion in San Francisco and increase options for air travelers. Oakland's marine port needs to introduce more up-to-date technology for tracking containers to improve efficiency and to incorporate the new technology into an improved security system for tracking containers in transit.
5. *Work as a region to support the knowledge industry infrastructure.* This should include lobbying the federal government for more R&D funding and spending on science. Earmarking budget items for Bay Area universities won't always be possible, but expanding overall R&D spending

will increase the chance that money will flow to the Bay Area's fine universities and research institutions. High-tech companies worked together to convince Congress to increase the number of H-1B visas; they should work together on broader immigration issues as well. September 11 shone a spotlight on the inefficiencies of the Immigration and Naturalization Service. Yet even in a region that depends heavily on a flow of bright foreigners, there is markedly little discussion of how the federal government's immigration services could be made more efficient—albeit in the post-September 11 environment where greater security also is a concern.

6. *Use a Summer Olympics bid as a catalyst for regional thinking and action.* Bidding to host an international showcase-event might focus attention on regional answers to the Bay Area's world-class traffic and housing problems. A bid requires a long-term, region-wide effort. Sports competitions would be scattered around the region. As Berkeley's Michael Clough put it, "If the Olympics do come to the Bay Area, it will require the region to work together in unprecedented ways to plan, build and prepare."⁹⁴ Organizers of the bid for the 2012 Summer Olympics hoped to build an environmentally friendly athletes' village and to make extensive use of group and mass transit.⁹⁵ Even though the 2012 bid failed, a future bid should be considered. In order to live up to environmental and efficiency ideals, and avoid embarrassing glitches, key infrastructure would have to be strengthened. Traffic bottlenecks, for instance, some of which lie between sites where important events could be staged, would have to be addressed more vigorously than they are being addressed today.

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ENDNOTES

(All of the Websites cited below were viewed between September and December 2002).

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- 73 Bay Area Conservation and Development Commission, <http://www.bcdc.ca.gov/allink/allink.htm>.
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- 77 "Salt Pond Purchase: The Bay's new future," editorial, *San Francisco Chronicle*, June 9, 2002.
- 78 "About MTC," Metropolitan Transportation Commission, http://www.mtc.dst.ca.us/about_mtc/about.htm.
- 79 A 19-member panel gives MTC policy direction. Fourteen members are appointed directly by local elected officials. Two members represent regional agencies—the Association of Bay Area Governments and the Bay Conservation and Development Commission. In addition, three nonvoting members have been appointed to represent federal and state transportation agencies and the federal housing department. "About MTC," Metropolitan Transportation Commission, http://www.mtc.dst.ca.us/about_mtc/about.htm.
- 80 *Smart Permit: A Blueprint for Success*, Joint Venture: Silicon Valley Network, November 2001, p. 9.
- 81 All initiatives are outlined on the Joint Venture website, <http://www.jointventure.org>.
- 82 "U.S. International Tax Issues: A Silicon Valley Perspective for Reform" A Report of the Tax Policy Group of Joint Venture: Silicon Valley Network, Spring 2000, p. 5.
- 83 The CCRL "believes that we are likely to be more effective in addressing California's challenges if we work with, not against, its self-organizing systems, and that means working with and in support of regions. See <http://www.calregions.org/newregionism.html>.
- 84 A regional effort, the Joint Aquatic Resources Permit Application of JARPA, exists "to design, and assist public agencies in adopting and implementing, a simplified permit application for development activities in or near Bay Area aquatic environments." This is not quite the same as the regional push to have all cities adopt the same permitting process, which got Joint Venture started, but is related in the idea of simplifying permits to be used by several counties and municipalities. See: <http://www.abag.org/bayarea/sfep/projects/JARPA/JARPA.html>.
- 85 www.bayareamonitor.org/july00/region.htm. Yolo County also is involved in a super-regional transportation-and-housing planning exercise being conducted by the Association of Bay Area Governments.
- 86 Joint Venture, *op.cit.*, p. 25.
- 87 San Jose ranked 15, 2002 Urban Mobility Study, Table 2. "2000 Urban Mobility Conditions - Trip Time Penalty". Data available from http://mobility.tamu.edu/ums/study/mobility_data/.
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- 89 Downloaded from the website of the Metropolitan Transportation Commission, www.mtc.ca.gov.
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Pacific Council on International Policy

Los Angeles, CA 90089-0035

TEL: (213) 740-4296

FAX: (213) 740-9498

E-MAIL: pcip@usc.edu

WEBSITE: www.pacificcouncil.org