Building the Next Silicon Valley

STRATEGY AND ACTIONS
JOINT VENTURE: SILICON VALLEY NETWORK is a regional, non-partisan voice and a civic catalyst for solutions to problems that impact all sectors of the community. Joint Venture brings together established and emerging leaders from business, labor, government, education, nonprofits, and the broader community to build a sustainable region that competes globally. We work to promote economic prosperity and improve the quality of life in the region, making Silicon Valley a better place to live and work. Joint Venture welcomes your participation in its various activities, which are described in detail at www.jointventure.org

Joint Venture’s REGIONAL ECONOMIC STRATEGIC LEADERSHIP TEAM (RESuLT) consists of representatives from business, government, education, labor, and the community. Over a three-month period, the Regional Economic Strategic Leadership Team focused on the goal of fueling a resurgence in our economy and preserving the region as the global platform for technology innovation, thereby ensuring growth of opportunities for all segments of our communities. The RESuLT Team findings and recommended strategy and actions are included in this report. For more information, please visit www.jointventure.org/nsv.

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Introduction

A regional leadership team, organized by Joint Venture: Silicon Valley Network, has created four strategic, action-based initiatives to rebuild Silicon Valley’s economy, create more jobs, and improve the area’s quality of life.

To underpin these initiatives, the team’s 60 members (see inside front cover), representing education, labor, business, government, and community organizations, developed a new strategy for Silicon Valley’s future. The strategy has three elements:
1) Recognize the new realities of the worldwide economy and their impact on Silicon Valley
2) Pursue new sources of prosperity
3) Strengthen Silicon Valley’s capabilities for innovation and entrepreneurship

The Valley is clearly in a wrenching transition. Since the Internet bubble burst in 2000, more than 190,000 jobs have disappeared, with software, the largest local industry, losing the most jobs.

The four new initiatives are designed to help the region emerge successfully from this transition by:

• Promoting a strong, long-term fiscal foundation for government to invest in people, infrastructure, and quality of life (Fiscal Foundation Initiative)
• Accelerating the convergence of biotechnology, nanotechnology, and information technology (Technology Convergence Initiative)
• Expanding the use of these technologies to improve health, education, and transportation (Smart Valley II Initiative)
• Building relationships among technology leaders in Silicon Valley and other regions of the world for mutual economic benefit (Global Knowledge Networks Initiative)

The initiatives and actions are interrelated and mutually reinforcing.

Russell Hancock, Joint Venture’s president and CEO, says, “While the apparent up-tick in the high-tech industry is encouraging, it doesn’t assure Silicon Valley’s recovery. Our businesses must take the lead. But the Silicon Valley community can help, and that’s what the four initiatives in our report, ‘Building the Next Silicon Valley’ are for.”

Outlining the new economic realities, the report points out, first, that the Valley’s regional prosperity depends on the success of its driving industries—semiconductors, computers, software, and biomedical—serving worldwide markets. Second, other regions in America and around the world are getting better at what Silicon Valley has done in the past. Third, Silicon Valley has to change, create a new comparative advantage, and find new ways to add value. And finally, our driving industries are seeking the best worldwide locations for various business operations, for employing people, and for spreading their operations across many regions.

The report suggests that if Silicon Valley resists change, it could slip into the sort of prolonged economic decline that other regions, such as Detroit (automobiles) and Pittsburgh (steel), have experienced.

Building the next Silicon Valley will require specific actions by business, government, education, labor, and civic leaders working together to implement the team’s four initiatives. Many members of the original 60-member leadership team have volunteered to be active champions to lead each of the four initiatives.

Fiscal Foundation Initiative
The first initiative, to help maintain a world-class community for innovation and entrepreneurship, seeks to rebuild California’s fiscal foundation.
A Bay Area-wide coalition has prepared a list of principles for state officials to consider. The goal is a better life for the next three generations of Californians by enabling world-class education, transportation, environment, healthcare, and public safety capabilities.

The coalition is headed by Robert Parry, president and CEO of the Federal Reserve Bank of San Francisco; Lenny Mendonca, a director of McKinsey and Company and chairman of the Bay Area Economic Forum; Keith Kennedy, former chair of Joint Venture; and Mike Nevens, retired director of McKinsey and Company’s global technology practice.

The list of principles includes recommended actions in three major areas:

- **Spending reforms**: Link state spending levels to growth in inflation, personal income, and population. Reserve revenues above spending levels for budget stabilization, one-time infrastructure capital projects, contingencies, and investment. Set performance benchmarks for services.

- **Revenue reforms**: Broaden California’s tax base to reduce volatility. Change the schedule of income tax rates, broaden the base of the sales tax, and move toward value-added taxation. Lower the super-majority vote requirement on tax and bonds to 55 percent.

- **State and local fiscal reforms**: Leave a larger share of revenues where they are raised. Realign revenues and responsibilities between state and local government. Allow cities to keep the one percent share of the sales tax. Give local governments flexibility to implement responsibilities assigned by the state. Return tax and other revenues to local government agencies, where they were originally designed to be used.

Mr. Hancock says, “California’s governor and the legislature’s leaders should build the state’s new fiscal foundation on sound principles and then translate them into new legislation and appropriate administrative actions. We must change the way our state raises revenue, controls expenditures, and shares with local government the cost of services for our citizens. Our leadership team will engage allies in the public and private sectors to endorse and work for adoption of the principles in Sacramento. Getting a solid fiscal foundation will provide an attractive climate for business prosperity, job creation, and support for improvements in our quality of life.”

**Technology Convergence Initiative**

To help speed the merger of biotechnology, nanotechnology, and information technology and create new sources of prosperity for the Valley, the second initiative will promote new partnerships and licensing agreements among companies, institutions, and investors and among leaders of business, private and public research institutes, universities, and venture capital firms. The target is to stimulate up to 15 of these new technology companies within the year. The initiative also will include a technology convergence conference to promote these convergence opportunities.

Leading this effort will be Gary Hooper, vice president of business development, Genencor International; Rose Jacobs Gibson, president, San Mateo County Board of Supervisors; Robert Miller, vice chancellor of research, University of California, Santa Cruz; and Srinivas Rao, vice president of technology, Solectron Corporation.
Smart Valley II Initiative
A third initiative to broaden the use of technology in the everyday lives of Silicon Valley residents will begin with partners in education to improve student learning and move to a wireless campus. In health, the initiative will look at how IT software and hardware can improve patient care and cut costs. Smart Valley II also will explore how information and broadband technology can streamline government operations.

The leaders of Smart Valley II are Eric Benhamou, chairman of 3Com, Palm, Inc., Palm Source; William Miller, professor emeritus of Stanford Business School; Todd Bradley, president and CEO of Palm Solutions Group; Leslie Vadasz, director emeritus of Intel Corporation; Gay Krause, director, Center for Innovation, Foothill College; Magda Escobar, executive director, Plugged In; and Dr. Harry J. Saal, member, Technical Committee.

Global Knowledge Networks Initiative
Finally, to help Silicon Valley prosper as other regions in the world prosper, the Global Knowledge Networks initiative will help give this region better access to global partners, customers, investors, and innovators.

In fall 2003, this initiative is launching a series of events aimed at building a new network of networks among the Valley’s technology and business organizations with ties to Asia and Europe. Next spring, Joint Venture and the Stanford Project on Regions of Innovation and Entrepreneurship (SPRIE) will sponsor an international conference to promote global business, government, and university partnerships. This initiative is led by Jim Sha, managing partner, Spring Creek Investments; Marguerite Gong Hancock, associate director, SPRIE, Stanford University; and Raj Desai, executive director, TiE, Silicon Valley.

“Joint Venture will continue to be a catalyst for community-wide leadership and action as the Valley struggles to regain its economic footing and provide opportunities for its residents,” Mr. Hancock says. Even in this time of uncertainty, it is important to remember that we have been here before. Silicon Valley moved from a defense economy to integrated circuits in the 1960s, to microprocessors and personal computers in the 1970s and 1980s, and then again to the Internet in the 1990s. The enduring flexibility and dynamism of our people, businesses, and institutions have enabled the Valley to move forward. Once again the Valley must reinvent itself.
I. Making the Case: Why a New Regional Strategy Is Essential

The Need for a New Strategy

Silicon Valley is clearly in a wrenching transition. Since the bursting of the Internet bubble in 2000, our region has lost over 190,000 jobs, and most troubling, our region has lost employment in every driving industry except biomedical and health services. The most jobs lost have been in software, our largest industry.

The future of Silicon Valley has become uncertain. Some observers believe that the Valley has passed its prime, that information technology has reached an age of maturity and will experience slower growth in the future. Others see the current economic downturn as a temporary correction due to the highly cyclical nature of information-technology (IT) spending. Some claim that the seeds of the next economy are already incubating in the Valley. What is clear is that Silicon Valley’s role in the global economy is changing—and the region needs a new economic strategy.

To emerge from this transition successfully, we must understand how the global economy and our role in it are changing. We must understand our comparative advantages, including our complementarities with other global regions, and work hard to preserve and strengthen them. Most important, we must resist complacency. We cannot assume that our region will just rebound naturally, or that what worked in the past will work in the future. We must work together in new ways to support our existing industries as they redefine themselves and help whole new industries emerge. We must all make the personal commitment to help create the Next Silicon Valley.

In 2002, Joint Venture: Silicon Valley launched a year-long process called “The Next Silicon Valley,” which involved community meetings, focus groups, and research to examine the causes of the Valley’s downturn and how the region could rebuild its economy. Building on this work and the 2003 Index of Silicon Valley, Joint Venture assembled the Regional Economic Strategy Leadership Team (RESuLTS) to review trends, discuss implications, chart a new strategy, and organize for action.

From this effort, a new three-pronged strategy emerged. Silicon Valley must:

- Recognize the new realities of the global economy
- Pursue new sources of prosperity in the global marketplace
- Strengthen our regional habitat for innovation and entrepreneurship

The following sections describe why each of these elements is important to launching the Next Silicon Valley.

Silicon Valley Must Recognize the New Realities of the Global Economy

Our regional prosperity depends on the success of our driving industries serving global markets.

Despite the recent downturn, our region has established concentrations or “clusters” of firms in four driving industry sectors—semiconductors, computers, software, and biomedical. An industry cluster is a geographic concentration of interdependent firms in related industries, and includes a significant number of companies that sell their products and services outside the region. Together, these industries are the primary sources of exports and wealth creation within our economy.
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Why are clusters important? High-value, outward-oriented industry clusters drive the local economy. In particular, they create jobs for residents and drive employment growth in business support industries such as finance, insurance, and real estate, and in population-serving industries such as retail and food services. They also generate revenues for public services that support the quality of life of the region.

In addition, industry clusters can be a catalyst for innovation as firms compete and collaborate within the cluster, and a source of entrepreneurship as talented people move from firm to firm or start their own new firms. In these ways, clusters can provide a positive ripple effect on both economies and communities.

Silicon Valley’s clusters are dynamic. We can expect our clusters to continue to change. We can also expect the emergence of new industries that may someday help drive the Valley’s economy.

Recent history illustrates how our industry clusters have shifted. From 1992 to 2001, two shifts took place. First, the share of total employment declined in hardware industry clusters while growing substantially in software. Second, the Valley’s biomedical cluster has grown, even as employment in other clusters has declined.

The global economy is undergoing fundamental change, which is strongly impacting our driving industries. Over the last decade, Silicon Valley became more strongly intertwined with the global economy and workforce:

Silicon Valley depends on the global economy for its prosperity. According to a recent Pacific Council on International Policy study on globalization and the San Francisco Bay Area, Silicon Valley’s technology products accounted for most of the Bay Area’s 9.5 percent annual growth in volume in trade during the 1990s. Between 1995 and 1999, growth in foreign trade added more than 100,000 jobs to the Bay Area. In terms of export value, the Bay Area and Seattle vied for the number-one spot in the nation in the 1990s. Our export-oriented industries also tend to be industries with the highest value-added per worker, driving productivity in the Valley to the highest in the nation, which translates into high wages.

Silicon Valley benefits enormously from global immigration. More than 34 percent of our population in 2000 was born outside the United States compared to
23 percent in 1990. According to recent studies by Annalee Saxenian for the Public Policy Institute of California, one-third of the Silicon Valley’s total scientific and engineering workforce are immigrants, with 74 percent either Chinese or Indian. Over half of immigrant professionals are involved in founding or starting a company. Among regions of the nation, Silicon Valley has the third highest proportion of foreign-born residents, behind only Miami and Los Angeles. The “changing face” of Silicon Valley has been a critical source of innovation and entrepreneurship for the region.

The global knowledge economy is growing, with more regional economies participating and more regional markets expanding. China has become the number-one supplier of high-technology goods to the United States. Over 90 percent of personal computers are now manufactured in Taiwan. Over 990 companies in Bangalore, India generated $2.0 billion in software exports in 2001-2002. In addition, regional markets, especially those in Asia, are growing. For example, by 2010, it is estimated that 46 percent of the semiconductor market will be in Asia.

Technology firms are exporting fewer goods and outsourcing more work, but also selling services globally. Technology goods exports from the United States declined by 26 percent between 2000 and 2002. Exports from the San Francisco Customs District declined from $58 billion in 2000 to $35 billion in 2002. A recent survey of information technology firms conducted by the Information Technology Association of America found that 12 percent outsource IT work. An additional 15 percent say they will be moving jobs offshore in the next twelve months. Sixty-seven percent of respondents already outsourcing IT work overseas say that jobs likely to move offshore are programming or software engineering positions, followed by network design and web development jobs. Business process outsourcing has grown 60 percent annually in the last three years in India alone. At the same time, a trade surplus in high-tech services now more than offsets the deficit in merchandise trade. In 2001, U.S. cross-border exports of information technology services totaled $10.9 billion, while imports totaled $3.0 billion, yielding a surplus of $7.9 billion, according to the U.S. International Trade Commission.

During the economic slowdown in the Valley, some immigrants are returning home. Because of the strong transnational networks that have been building between Silicon Valley and native countries, non-U.S.-born professionals have been establishing business operations in their home countries. A “brain circulation” is linking Silicon Valley to the urban centers in those countries. For example, there is now evidence that an estimated 2,000 H-1B visa holders, who came from India to work in the Bay Area during the bubble, returned to India in 2001. In addition, in a recent survey by Annalee Saxenian for the Public Policy Institute of California, 76 percent of Indian and 73 percent of Chinese immigrants reported that they would consider starting businesses in their native countries.

What do these trends mean? Other regions are getting better and better at what we have done well in the past, from basic production and distribution to more advanced research and design across our driving industries. To survive globally, our driving industries must collaborate globally. They must seek out the best locations for various business operations, work with local partners, and stay close to global customers. By necessity, they must employ people and spread their operations across many regions, not just in Silicon Valley. In the new global economy, companies, business functions, and talent are widely distributed across many regions worldwide.

Each major Valley industry—semiconductors, computers, software, biomedical—is already expanding its supply chain through global partnerships. The Valley’s strongest comparative advantages are innovation and entrepreneurship in the early stages of industry supply chains—incubation, research, design, and prototype production. Some other regions are also innovators in these early stages, while some are better suited for latter stages, like commodity production and distribution. In either case, the Valley needs
global partners to succeed—to help fuel our region’s innovation and entrepreneurship, and to create supply chains that can competitively serve global markets.

At the most basic level, individual firms are developing complementarities across business functions. Business functions can be broken down into four general categories (see figure to right):

- Headquarters
- Research & Development
- Production
- Sales/Marketing and Distribution

Firms make decisions about where to locate different business functions based on factors such as cost, business risk, proximity to talent, and market access. These factors vary by region across the global economy. As a result, business functions are seldom co-located in any one region. In fact, global firms compete effectively by connecting the best of what each region has to offer, locating business functions where they provide the best combination of cost, quality, and other advantages.

An example of distributed business functions from the computer industry is the Hewlett-Packard Inkjet Printer sold into the European market. Business functions are connected across at least six regions located on three continents, depending on different requirements.

Beyond individual firms and business functions, complementarities can be found industry-to-industry and region-to-region across the global economy. Complementarity is a global reality, one that can be beneficial for those regions that “collaborate to compete”—that is, every region must seek out complementarities that improve its own ability to compete in the global marketplace.

Whether it’s a single firm distributing its business functions, two or more firms developing joint ventures, or different industries developing partnerships, collaborations across regions can produce more competitive firms, industries, and regions. The nature of these collaborations will vary widely because:

- **Global regions** offer different kinds of competencies and networks important to firms (e.g., different combinations of skilled people, capital, technology).
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• Firms require a different mix of regional competencies for different business functions and for different kinds of products and services (e.g., the needs of a software firm in R&D are very different from those of a semiconductor firm in production).

• Industries have different sets of requirements or “value chains,” each requiring a different mix of competencies (e.g., the biomedical industry operates differently from the computer industry).

The reasons why a firm chooses a region for a specific business function involves a complex number of factors depending on its life cycle and the specific requirements of its industry. A recent survey by the U.S. Department of Commerce found that firms generally choose to operate in the U.S. because of our:

1) Scientific talent pool and university system
2) Entrepreneurial business climate with relatively easy access to capital
3) Access to the world’s largest market
4) Intellectual property rights

This survey also found that firms generally choose to operate in other parts of the world because of:

1) Lower costs
2) Increasing talent base (e.g., China is now graduating more physical science and engineering students than the U.S. every year)
3) Access to growing markets, especially in Asia
4) Increasing foreign investments in research, transportation, and telecommunications infrastructures
5) Proximity to offshore production (e.g., service jobs need to be close to production)

With all this complexity, there is one certainty: complementarity among regions is a dynamic process because of continuous innovation and entrepreneurship, which, in turn, stimulates the restructuring of firms, industries, and regions. In the new global economy, firms are constantly making decisions about where to locate based on a number of factors. Regions need to understand and then maximize their own unique advantages while recognizing that firms have increasing choices and competitive requirements that must be met through a global distribution of operations. Through global partnerships, several regions can benefit from complementarities.

While this shift means that some business functions and jobs are better suited to other regions, it does not mean that globalization must be a “one-way street.” In fact, the Valley should tap global sources of talent, capital, and technology to renew its own habitat for innovation and entrepreneurship—to help our industries create new products, services, and businesses that provide jobs throughout the region. Our region benefits from the inflow of talent and technology through its extensive global knowledge networks.

Intel offers an example of how complementary regional relationships can lead to mutually beneficial outcomes. As the figure on the next page shows, Intel has distributed its business functions within the western United States in a way that has created competitive advantage for the company while increasing the average wages in each region in which it operates. While Intel engages in design and testing activities in California and Oregon, it has production activities in Arizona and New Mexico. The high wages of the semiconductor industry relative to the regional wage has raised the standard of living in each region.

While the Valley has succeeded in becoming a major global region in the past decades, its place in the
The global economy is now changing for industries, as a result of greater technology product competition, and for people, because of increased competition for talent from other global regions. We are now competing for both low-skilled and higher-skilled work, and we will need to replace both with high-skilled, high-wage opportunities to grow our standard of living. These long-term structural changes, combined with a major cyclical downturn in the IT industry following the bursting of the Internet bubble, have raised fundamental questions about the future of the Valley. In today’s global economy, innovative industries search worldwide for the best locations in which to create high value, specialized products, and services. Individual firms will locate different business functions in several regions, depending on their specific requirements. Regions need to understand the new realities of the global economy and learn how to connect their unique regional competencies—people, capital, technology—to create comparative advantage and earn a high standard of living.

Silicon Valley must change because comparative advantage is dynamic. Comparative advantage is always changing as a result of changes in markets, technologies, and talent in different regions. Different regions have different comparative advantages in the global economy—and those advantages shift as regions make strategic investments in education, R&D, and other infrastructure. As a result, Silicon Valley must renew its comparative advantage, or risk the consequences. The Valley’s driving industries must keep renewing themselves through innovation and entrepreneurship, finding new ways to add value if we expect to preserve and improve our standard of living. The alternative is to resist change, and slip into a prolonged economic decline like other regions that once dominated driving industries—such as Detroit with automobiles or Pittsburgh with steel.

Silicon Valley Must Pursue New Sources of Prosperity in the Global Marketplace

Silicon Valley can extend its leadership in the global economy, but its role must change. No longer is the region the dominant source of global innovation, but one of many sources of innovation dispersed globally. No longer is Silicon Valley the primary location of all corporate functions, as many manufacturing and service industries disperse to other regions. Rather, the Valley plays an increasingly specialized role in a global supply chain across all our driving industries. We cannot “go it alone” but must draw on global talent, technology, and capital through mutually beneficial partnerships with many regions worldwide.

While we are one of many nodes in a growing network of regional economies, we also have unique assets that remain extremely valuable in the global economy—our talent, technology, and capital. While other regions are growing their assets, we remain on the cutting edge of research, design, and production—the early stages of global industry supply chains. While our firms must have jobs in many regions in order to compete, companies and institutions based outside Silicon Valley can create jobs and make investments in our region. While today’s global economy does not mean an inevitable one-way flow of jobs out of
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Silicon Valley, it does mean that we must work to make globalization a two-way street.

While we cannot change these new global realities, redefining our role does not necessarily mean reducing our role in the global economy. Rather, it means pursuing new sources of prosperity within the context of new competitive realities. In fact, the rest of the world needs a strong and vital Silicon Valley just as much as our region needs growing global markets and capable international partners.

Silicon Valley can be the leader in finding, accessing, and integrating the best of what each global region has to offer to serve growing global markets—and in the process, grow jobs and prosperity in the Valley and other regions. In this way, Silicon Valley plays a unique leadership role in leveraging the power of a network rather than managing a hierarchy of regions worldwide.

Silicon Valley’s global talent is a key asset for this new role. The Valley’s international population provides a unique advantage by giving us a better understanding of changing global markets and endowing us with a greater ability to tap into expanding global knowledge networks. The continuous flow of global talent into and out of Silicon Valley is a renewable source of market information, innovative ideas, and specialized skills that gives the region a significant edge.

Silicon Valley’s habitat for innovation and entrepreneurship is the core of our comparative advantage. Together with our global talent, our dual ability to generate technology and business-model innovations, and to turn promising ideas into viable products and companies, sets us apart from other regions. Our openness, flexibility, and traditional emphasis on seeking higher value-added will be critical to our future success.

Thus, through innovation and entrepreneurship, Silicon Valley must redefine its role in the global economy, adding new sources of prosperity for the region. These sources could include:
1) The convergence of bio, nano, and information technologies
2) New applications of information technology
3) New global interface services

Convergence of Bio, Nano, and Information Technologies

The Valley and broader Bay Area is already one of the world’s great centers of bio and information technologies, but is only beginning to benefit from the potentially powerful combination of these two technologies and the emerging applications of nanotechnology. Growing opportunities for new products, companies, and jobs could come from such areas as bio-informatics (e.g., processing of large amounts of complex biological data in product development), bio-materials (e.g., new applications for manufacturing and agriculture), and bio-chips (e.g., a convergence of microelectronics and molecular biology that can help diagnose illnesses).

New Applications of Information Technology

Despite the much publicized dotcom crash, the Valley continues to have a strong foundation in information technology from which to launch a new wave of applications—including new uses of Wi-Fi networking technology that enable ubiquitous Internet connectivity. New business applications to improve productivity as well as new social applications to improve quality of life (e.g., education, health) could spawn new companies and create new jobs in existing Silicon Valley companies.

Global Support Services

Along with the new reality of globally dispersed business functions comes the new opportunity for Silicon Valley to play a unique “interface” role, offering specialized services...
expertise to business operations worldwide. While some business functions are better suited to other regions, Silicon Valley can add value at each stage of the global supply chains in our driving industries. We can excel at high-end research, engineering, design, prototype production, and global brand marketing, but can also provide production, marketing, logistics, and sales support as we interface with the growing number of regions playing a role in our driving industries. In fact, our global talent base makes the Valley well-suited for this new role. In this way, we can succeed as other regions succeed, making globalization “a two-way street.”

Rather than view today’s global economy as a “zero sum” game (i.e., other regions gain at Silicon Valley’s expense), we must make globalization a “positive sum” result, based on mutually beneficial relationships across regions. To remain a global leader, the Valley must draw on global talent, technology, and capital through global partnerships while staying on the cutting edge of research, design, and production, with capable global partners filling out industry supply chains.

Cisco Systems’ e-supply chain strategy illustrates how one company has distributed and networked business functions using state-of-the-art information technologies:

• An enterprise system that integrates contract manufacturers, distributors, logistics partners, development engineers, service engineers, sales representatives, and customers into a single information system enables business partners to manage much of Cisco’s supply chain.

• Information sharing in real time allows the entire supply chain to operate from the same demand signal. This means that any change in one node of the network is immediately transmitted throughout the network.

• Cisco’s contract manufacturing partners ship directly to customers. Today, suppliers directly fulfill 55 percent of the company’s customer orders.

• Rapid new product introductions, reduce the number of iterations required during prototype development. Automation and better connectivity have also reduced time-to-market by three months.

All our leading industries have already begun to adapt to the realities of the global economy, building creative partnerships across global regions:

• **The semiconductor industry** began to develop global partnerships in the 1970s and 1980s. Despite the highly cyclical nature of this industry, the Valley has continued to build on its strengths in sophisticated semiconductor equipment manufacturing, high-speed microprocessors, and “fabless” design, while creating linkages with chip foundries in Asia. The logic and memory chip commodity segment of the semiconductor industry is increasingly distributed across global regions.

• **The computer industry** began outsourcing the production of personal computers and other commodity products to Asia in the 1990s, while still focusing on innovative products, including wireless systems and services, telecommunications infrastructure, and data storage. The majority of personal computer commodity production is now concentrated in Asia, especially in Taiwan.

• **The software industry** is now facing consolidation in some segments, such as enterprise software, and is increasing outsourcing production activities to Asia, while continuing to develop new applications for e-commerce and Internet-based services. Software outsourcing to India and China is increasing as a part of global supply chains, with Silicon Valley firms involved in design, engineering, and marketing.

• **The biomedical industry** is an emerging industry with a strong R&D element. Partnerships are beginning to develop, primarily within the United States, as large pharmaceutical firms acquire smaller bio firms. Mergers have already joined bio firms in the Bay Area, Boston, and San Diego. As the biomedical industry matures, more global partnerships with Asia and Europe are likely. For example, 15 California biomedical firms recently produced over $400 million in partnerships with European firms.
In addition, application of new technologies—applying nanotechnology to biomedical and information technologies, for example—will create new opportunities for the Valley in the coming years.

As each industry moves into higher-volume, commodity production, it makes economic sense to move these activities to other regions for cost advantages. At the earlier stages of research, design, and prototype production, innovation is more important than cost—and a good fit for Silicon Valley. At later stages of commodity production, cost becomes more important—and less of a fit for Silicon Valley.

However, this shift does not mean the end of manufacturing in Silicon Valley. Today, innovative manufacturing encompasses the entire supply chain—from research and design through production and distribution—in every industry, whether semiconductors, computers, software, biomedical, or nanotechnology. In short, manufacturing is a process, not an industry.

Silicon Valley can be a leader in innovative manufacturing processes and support services as well as in research and development services. Creative front-end design and prototype development linked to engineering can remain strengths of the Valley, as can providing support services to other regions that are providing the routine production, technical support, and regional marketing close to customers in those regions.

*The future of manufacturing in Silicon Valley is less about large factories, and more about smaller, customized production operations and growing production support services delivered to partners globally.* The region can also play an important role in the marketing and distribution of products and services globally, as Applied Materials has done (see above right).

Thus, the Valley must stay on the cutting edge of research, design, and production (especially engineering and prototype production) in emerging industries, such as biomedical and new applications of nanotechnologies. Our region has advantages in these industries, given our university research base and concentration of early-stage firms. The Valley must also continue to add value and develop new applications in existing areas, such as information technology, through innovation and entrepreneurship. And, it must be a source of support services in production, marketing, and other fields, that can be delivered to partners in regions worldwide.

In the future, the Valley does not have to “give up” on our current industries but, rather, transform what we do within and across these industries, and how we use innovation and entrepreneurship to create new industries. The Next Silicon Valley will emerge if we have a strong regional habitat for research, design, and prototype production, and expanding two-way partnerships with global regions (see figure below).
While the core competencies of the Valley continue to stem from the concentration of talent and intellectual capital in the research and design of new products based on the global flow of talent and ideas, it is important to remember that the real Silicon Valley advantages are innovation and entrepreneurship themselves rather than a particular industry or technology.

Silicon Valley Must Strengthen its Habitat for Innovation and Entrepreneurship

To play this new leadership role, Silicon Valley must raise its expectations and performance. To find new ways of adding value in the global economy and to play a new kind of leadership role with other regions, we must strive to be a world-class community in all respects—from education to infrastructure to quality of life. Our flexible, fertile environment for innovation and entrepreneurship must not be taken for granted, but continuously improved through investments in skills and infrastructure.

The challenge is clear: the Valley must provide one of the world’s best habitats, where people, capital, and technology come together to fuel innovation and entrepreneurship. What comprises our regional habitat? As originators of the term, the authors of The Silicon Valley Edge (Stanford Business Books, 2000, p. 3) have observed that:

Like a natural habitat for flora and fauna, the habitat of Silicon Valley is one in which all the resources high-tech entrepreneurial firms need to survive and thrive have grown organically over time. Silicon Valley’s habitat includes people, firms, and institutions—their networks and modes of interaction. And, like a natural habitat, it is marked by complex, dynamic, interdependent relationships.

More specifically, they list ten features crucial to Silicon Valley’s habitat (ibid., pp.6-13):

• **Favorable rules of the game**—The American system is more favorable to new business ventures than the systems of other countries.
• **Knowledge intensity**—The Valley is a cauldron of ideas for new products, services, markets, and business models.
• **Open business environment**—Individuals and companies are open to win-win exchanges of knowledge and alliances.
• **Results-oriented meritocracy**—Large numbers of immigrant entrepreneurs have succeeded in the region, as has a diverse workforce based on ability and imagination.
• **A specialized business infrastructure**—There is a strong array of support services for new businesses, including venture capitalists and bankers, lawyers, headhunters, accountants, consultants, and others.
• **A high-quality and mobile workforce**—The Valley is a magnet for talent, including entrepreneurs, whose ranks are continuously replenished, bringing in new perspectives, stimulating innovations, and launching new firms.
• **Universities and research institutes that interact with industry**—Ideas and knowledge pass in two directions in a variety of ways.
• **Collaborations among business, government, and nonprofit organizations**—Working relationships among companies, governments, associations, and others provide the means to address key issues and community needs.
• **High quality of life**—The natural, cultural, historical, and intellectual qualities of the region have been major attractions for talent and companies.

It is important to remember that what has set Silicon Valley apart “are not the technologies discovered here, but the companies created in the region that develop, market, and exploit these technologies. In other words, the Silicon Valley story is predominantly one of the development of technology and its market applications by firms—especially start-ups” (ibid., p. 3).

The past success of Silicon Valley can be attributed to a strong “habitat” that encourages both innovation and entrepreneurship. Some regions have excelled at innovation or entrepreneurship, but none can match the Valley’s record for transforming technological innovations through entrepreneurship into commercially successful businesses and products. On the one hand, regions ranging from Japan to Pittsburgh have excelled at innovation, but have not been as strong in...
entrepreneurship. On the other hand, regions ranging from Hong Kong to Phoenix have had a history of entrepreneurship, but without strong records of innovation.

In contrast, Silicon Valley has been a strong incubator of new companies based on the commercialization of innovative ideas. According to a recent Public Policy Institute of California study of Silicon Valley industry dynamics, the region created over 29,000 new firms in its driving industry clusters during the decade of the 1990s. This dynamic, entrepreneurial environment represented a “white hot cauldron” of enterprising activity. The sheer number of firms created indicates the special nature of the Valley as a dynamic incubator. It is important to note that a significant portion of the 340,000 net job gains between 1992 and 2001 was the result of new business formation and expansion. The majority of economic activity occurs within the rapidly churning “incubator” of births and deaths, growth, and moving inside the box rather than moving in and moving out (see figure below).

In calculating a rate of vitality (jobs created by new firms + jobs lost by dead firms/total jobs), technology firms in Silicon Valley had a vitality rate of 14.2 percent. In calculating a rate of mobility (jobs offered by in-moving firms + jobs taken by out-moving firms/total employment), technology firms had a mobility rate of 0.8 percent. Thus, compared to firm birth and death, firm relocation had almost a negligible effect on the labor market.

Globalization plays an important role in this “churning” of firms in the Valley. Firms commercialize new ideas, adopt new technologies, and develop initial products that quickly become commodities in the global marketplace in the fast-paced “creative destruction” process described by Joseph Schumpeter in his book *Capitalism, Socialism and Democracy* (New York: Harper, 1975) [orig. pub. 1942], (pp.82-85).

What this means is that renewing the Valley’s habitat for innovation and entrepreneurship is essential for growing regional value-added as well as for creating new firms and jobs in the face of new global realities. To create jobs, the Valley needs to continue to be an incubator of innovation and entrepreneurship. To be a strong player in today’s global economy, the Valley must remain on the cutting edge of innovation and continue to be a strong generator of new firms that commercialize new ideas.

Habitats are dynamic and regions can (and do) improve them over time (e.g., Bangalore, India). Regions can also neglect their habitats and lose their comparative advantage. While Silicon Valley has excelled at both innovation and entrepreneurship for many years, the future of our regional habitat is not guaranteed; it requires continuing attention, reinvestment, and adaptation. Renewing our strength—our regional habitat for innovation and entrepreneurship—must be our top priority.

To renew this strength, Silicon Valley will need to focus on key “competencies” that provide the foundation of our comparative advantage in the global economy. Our most important competencies are people, capital, and technology (see figure next page).

However, even more important than these individual competencies, is our region’s ability to connect and leverage them to fuel innovation and entrepreneurship, which, in turn, produces economic prosperity and rising standards of living.

These competencies are built and connected through a web of local and regional institutions, policies, and practices—from university research to local government permitting processes to business financing to education and training of specialized workers. It is
these competencies and their web of connections that comprise the regional habitat for innovation and entrepreneurship.

The habitat includes practices that shape the environment for quality of life, that enable people to interact easily with others both inside and outside the region, and that address the changing needs of firms—such as housing, transportation, land use, and information infrastructure.

The habitat also includes actions focused on specific clusters (e.g., preparing people in a particular technical field, encouraging the convergence of industries and technologies across clusters like biomedical and information technology), or on those with broader impacts (e.g., improving housing affordability, advocating for greater federal research funding, or meeting the needs of fledgling entrepreneurial firms).

It is through these kinds of regional and local actions that the regional habitat (and the comparative advantage of Silicon Valley in the global economy) is either nurtured or undercut. Thus, the challenge facing the Valley is to determine what actions will strengthen and connect our competencies (people, capital, and technology) to produce desired regional outcomes (innovation and entrepreneurship that will lead to regional prosperity and an excellent quality of life for residents across the Valley).

Regional and local institutions, policies, and practices must continually adapt to changing global conditions to ensure that people, capital, and technology are connected in ways that create dynamic comparative advantage through innovation and entrepreneurship. This is how Silicon Valley, like all regions, must purposefully adapt to earn its place in the global economy and, in the process, produce regional prosperity and an excellent quality of life that is broadly inclusive of people who live in the Valley.
II. Taking Action: Four Initiatives for the Future

Rationale for Action

The “Next Silicon Valley” will be the product of dynamic innovation, entrepreneurship, and relationships with other global regions, helping us step up to a new leadership role in the global economy. The region’s changing role in the global economy requires a new strategy—and specific actions—by business, government, education, and civic leaders to build the Next Silicon Valley. Since the economic downturn began in 2001, many leaders have been either in denial or waiting for a turnaround—but now is the time to act.

We must act, but action comes with challenges:
- We can create new sources of prosperity—but only if we creatively connect our existing assets to spawn new products, firms, and jobs.
- We can maintain a world-class habitat for innovation and entrepreneurship—but only if we strengthen our long-term infrastructure, skill base, and quality of life.
- We can prosper even as other regions prosper—but only if we build mutually beneficial relationships with other global regions.

To meet these challenges, Joint Venture is launching four initiatives for the future: Smart Valley II; Technology Convergence; Fiscal Foundation; and Global Knowledge Networks. These initiatives are to be catalysts—specific projects to help accelerate the region’s transition to the Next Silicon Valley. Each initiative has a team of committed champions and an identified long-term goal, as well as immediate actions to begin implementation.

Actions to Create New Sources of Prosperity

We can create new sources of prosperity—but only if we creatively connect our existing assets to spawn new products, firms, and jobs. We must recognize that our current assets include large concentrations of both information technology and biotechnology companies, as well as the world’s largest concentration of university research in the emerging field of nanotechnology. Stimulating innovation and entrepreneurship, linking our assets in new ways, promoting dialogue, and demonstrating how these technologies can be applied in new ways are the critical areas for Silicon Valley to demonstrate its special role in today’s global economy.

To capitalize on this opportunity, Joint Venture is launching two initiatives:

**Smart Valley II**

To help create new sources of prosperity, this initiative will expand the use of information technology to improve quality of life in areas such as health, education, and transportation. New applications to serve global markets will be prototyped in Silicon Valley, creating both social and economic benefits for the region. In the 1990s, Smart Valley was a successful regional initiative that helped introduce information technology to the economy and community. Smart Valley II will promote intelligent deployment of information technology to improve people’s lives. Initial projects are being developed with partners in education to improve student learning, and in health to improve patient care. The team driving this initiative is led by Eric Benhamou of 3Com, Palm, Inc., and Palm Source, and William Miller of Stanford University.

**Technology Convergence**

To help create new sources of prosperity, this initiative will accelerate the convergence of bio, nano, and information technologies, stimulating new start-ups and maintaining Silicon Valley’s cutting edge in intellectual capital in these areas. To begin, a technology-convergence conference will be held to promote new partnerships and licensing agreements among companies, institutions, and investors. The team driving this initiative is led by Gary Hooper of Genencor International.
II. TAKING ACTION: FOUR INITIATIVES FOR THE FUTURE

Actions to Maintain a World-Class Habitat for Innovation and Entrepreneurship

We can maintain a world-class habitat for innovation and entrepreneurship—but only if we strengthen our long-term infrastructure, skill base, and quality of life. To succeed, we need the skills and infrastructure required to stay on the cutting edge of innovation and the quality of life that attracts and retains talent. We need the intellectual capital essential for remaining a leader in the global network of regions. In fact, our challenge is greater than that of most regions: to remain at the cutting edge, especially in the early stages of industry supply chains, and to leverage the best of what other regions have to offer, we must have a particularly well-educated and entrepreneurial population and a high-quality infrastructure. A strong fiscal foundation is required to support this kind of habitat—and ensure the successful launch of the Next Silicon Valley.

We are clearly not operating at a world-class level in key areas such as education, housing, and transportation. These are important elements to maintaining the productivity of our region. We need a highly educated and flexible workforce that can afford to live here and we need a transportation system that gets people to work efficiently and reduces the cost of doing business. The region also needs regulatory and tax systems that provide the right incentives for investment and that reduce unnecessary costs of doing business. The recent budget crisis in California, and its adverse impacts on our local cities and counties, compromises our ability to meet these basic criteria for success at the highest levels of the global economy.

To address this need, Joint Venture is launching an initiative that will connect the interests of our region with the broader Bay Area and with other regions across California:

Fiscal Foundation

To help maintain a world-class habitat for innovation and entrepreneurship, this initiative will promote a strong, long-term fiscal foundation for investment in people, infrastructure, and quality of life, including the ability to prepare residents for the transition to new economic opportunities. To begin, a Bay Area-wide coalition is developing specific principles regarding long-term fiscal reform in California, which will be used to advocate for changes in state policy. The team driving this initiative is led by Robert Parry of the Federal Reserve Bank of San Francisco, Lenny Mendonca of McKinsey and Company, Keith Kennedy, and Mike Nevens.

Actions to Build Mutually Beneficial Relationships with Other Global Regions

We can prosper even as other regions prosper—but only if we build mutually beneficial relationships with other global regions. Some global regions will do things that we used to do, especially in production and distribution because of cost advantages as products become commodities. Some global regions will also, increasingly, do things that we have been doing well, such as research and design, as they increase their own talent and research capacities. Other regions are seeking to emulate our success, including investing in research and development, education, and infrastructure. In fact, the National Science Foundation reports that the United States accounted for 44 percent of total R&D among Organization for Economic Co-operation and Development (OECD) nations in 2001 compared to 70 percent in 1970.

We must understand Silicon Valley’s changing place in today’s global economy, rather than holding on to the past. We cannot “go it alone” or try to be the center of global innovation. We must stay on the cutting edge of innovation and entrepreneurship, especially in the high end of the value chain (e.g., research and design) across all of our industries (semiconductors,
computers, software, and biomedical) while connecting to other global businesses through partnerships that strengthen our supply chains worldwide. We must also learn to leverage the connections our residents have to other regions to prosper from emerging global knowledge networks.

Global Knowledge Networks
To help Silicon Valley prosper as other global regions prosper, this initiative builds relationships among technology leaders in Silicon Valley and other global regions for mutual economic benefit, giving our region better access to global customers, investors, and innovators. To begin, Joint Venture and the Stanford Project on Regions of Innovation and Entrepreneurship (SPRIE) will sponsor an international event to promote global business, government, and university partnerships. The team driving this initiative is led by Jim Sha of Spring Creek Investments and Monte Jade, Raj Desai of TIE Silicon Valley, and Marguerite Gong Hancock of SPRIE.

These four actions are interrelated and mutually reinforcing. By creating strong global alliances, we can stay on the cutting edge of research and design and remain competitive in bringing products to the global marketplace for all our industries. These partnerships will help us draw in new people and investment in key technology areas, which will supplement our existing strengths in bio and information technologies, and help lead to a new burst of innovation and entrepreneurship—and jobs. At the same time, we can leverage our current strength in information technology to create a “test bed” for the next generation of applications, improving the quality of our own habitat (a benefit, in and of itself), and then expanding to the global marketplace, which will, in turn, help grow prosperity and jobs in Silicon Valley. Strengthening the fiscal foundation supporting these changes is an investment that is critical for Silicon Valley’s successful future.

Making the Transition to the Next Silicon Valley
The Next Silicon Valley will be an incubator where ideas are commercialized and new companies grow to create new products and services. Its edge will be its habitat for innovation and entrepreneurship. It will compete on the basis of innovation, not simply cost. Through global partnerships, its firms will participate in global supply chains that will succeed in the era of the new global business model.

During an earlier period of economic downturn, the economist John Maynard Keynes said:

We are suffering just now from a bad attack of economic pessimism. It is common to hear people say that the epoch of enormous economic progress which characterized the last century is over; that the rapid improvement in the standard of living is now going to slow down; that a decline in prosperity is more likely than an improvement in the decade which lies ahead of us. I believe that this is a widely mistaken interpretation of what is happening to us. We are suffering not from the rheumatics of old age but from the growing pains of over-rapid changes, from the painfulness of readjustment between one economic period and another.

For Silicon Valley, the opportunity today is to accelerate our transition to our next “economic period.” With these four initiatives, Joint Venture hopes to work with others to move along that important process. For each of these initiatives, a leadership team is in place, a long-term goal has been identified, and initial actions are underway. The action plans will continue to evolve, subject to continuous improvement, as the initiatives move into implementation. Joint Venture is committed to reporting our progress on each of these initiatives to the Silicon Valley community in the months ahead.
Even in this time of uncertainty, it is important to remember that we have been here before. The region has weathered such periods in the past, as it moved from a defense economy to integrated circuits in the 1960s, from integrated circuits to microprocessors and personal computers in the 1970s and 1980s, and then again into the Internet age in the 1990s. The enduring flexibility and dynamism of the Valley’s people, firms, and institutions have enabled the region to move forward. Now we need to understand the changing role of the Valley in today’s global economy. We need to reassess and reaffirm our region’s competitive strengths and assets. With that understanding, we can build mutually beneficial relationships with other global regions and strengthen our region’s habitat for innovation and entrepreneurship. This will require an unprecedented commitment to collaboration across industries and sectors within the Valley and globally across regions. Once again, the Valley must reinvent itself.

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The Next Silicon Valley Initiative is working to: (1) shape a framework for understanding and communicating what is happening in the Valley’s economy; (2) develop a process for engaging leaders in a regional discussion of our opportunities and choices for the next wave of innovation; (3) chart a strategy; and (4) organize for action to address the new realities of today’s economy. The goal is to stimulate creative thinking about resource requirements and encourage regional leaders to collaborate on finding solutions that enable individuals, businesses, and communities in Silicon Valley to benefit from the next wave.

In December 2001, the Next Silicon Valley Leadership Group issued its first white paper, “The Next Silicon Valley: Riding the Waves of Innovation”. The paper provided a model for analyzing waves of innovation and communicating their impact on the local economy. It also identified the need to shape a resilient region and called for a commitment to social and technological innovation.

In June 2002, the Next Silicon Valley Leadership Team released a second white paper, “Preparing for the Next Silicon Valley: Opportunities and Choices”. The paper identified the economic opportunities and risks associated with the evolving convergence of biotechnology, nanotechnology, and information technology. Regional leaders have a choice in how they collaborate in meeting the challenges presented by this convergence. While the economic and strategic opportunities of this convergence are huge, so are the potential risks of missing it—if the Valley is underprepared. The purpose of this second paper was to stimulate discussion and action in preparing for the next wave of social and technological innovation.

In March 2003, Joint Venture organized the Regional Economic Strategic Leadership Team (RESuLTS) to review these trends, discuss implications, chart a new strategy, and organize for action. “Building the Next Silicon Valley: Strategy and Actions” is the product of that work. This third paper outlines a new strategy that (1) recognizes the new realities of the global economy, (2) pursues new sources of prosperity in the global marketplace, and (3) strengthens our regional habitat for innovation and entrepreneurship. To jumpstart this strategy, the paper recommends that Joint Venture launch four initiatives for the future—tangible projects with champions in place and initial actions identified for implementation.

Contributors
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