



Sonoma County Annual
High-Tech Sector Report
Spring 2001

Sonoma County Economic Development Board



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INTRODUCTION



The Sonoma County Economic Development Board is pleased to offer the 2001 High-Tech Report. This report represents the EDB's second annual quantitative analysis of the County's high-technology industry.

As background, in 1993, the EDB produced its first report on the region's nascent high-tech sector. Entitled *High-Tech: A New Harvest in Sonoma County*, this report found 151 high-tech companies located in Sonoma County. Within this group, two major industries essentially dominated the high-tech playing field: computer software and hardware.

Times have changed.

Today, Sonoma County's high-tech sector displays a healthy diversification of industries, including computer software and hardware, telecommunications, optical networking equipment, testing and measurement technologies, biotechnology, and high-speed access solutions. Indeed, with innovative products and services ranging from optical switches to human resources management software, more than 400 high-tech companies in Sonoma County have positioned this region at the forefront of the modern Information Economy.

Undeniably, the presence of a vibrant high-tech sector in Sonoma County has made several positive impacts on the local economy: more jobs, higher wages, relatively "clean" industrial practices, and a higher tax base. In fact, strong job growth at local technology firms has largely accounted for the County's unemployment rate hovering between 2-3% over the past two years.

On the other hand, growing industries present significant challenges. Several issues including a limited housing supply, limited natural resources, and increased traffic are significant considerations in the context of maintaining Sonoma County's quality of life.

Several industry groups, public/private partnerships, and other entities have made significant progress toward addressing these important considerations. In Summer 1999, at the direction of the Sonoma County Board of Supervisors, the Economic Development Board put together a panel of high-tech CEOs, trade group presidents, and senior educators, now called the North Bay Technology Roundtable (www.nbtr.org), as recommended in the 1999 high-tech report, *High-Tech: Sonoma County at a Crossroads*.

INTRODUCTION

The North Bay Technology Roundtable has succeeded along a number of fronts during the past year, most notably, drawing awareness to the benefits of telecommuting, and increasing cooperation between companies and local schools.

In addition, the NBTR raised significant support for the new Computer and Engineering Science masters program at Sonoma State University, as well as the Santa Rosa Junior College Technology Academy in Petaluma. Through strong connections between private industry and public educational institutions, we can help ensure that Sonoma County residents fully participate in the world of high technology.

For these reasons and many others, the Economic Development Board is privileged to offer the following information as a factual illustration of the high-tech sector in Sonoma County. While information for this report is largely drawn from EDB surveys, analysis, and other activities, we owe special thanks to Steve Cochrane of Economy.com and Cathe Rutherford at the Employment Development Department for performing the economic research.

Thank you for your interest in the exciting world of high technology in Sonoma County.

Sincerely,

Ben Stone

Sonoma County Economy: A Snapshot

Sonoma County has experienced strong economic growth across many variables--real output, total employment, and per capita income--over the past decade. The year 2000 was no exception. Consider the following highlights:*

\$17 billion in Gross Metro Product

Sonoma County's 2000 GMP of \$17 billion, an 11.1% increase from 1999, comprised nearly 1.3% of California's total output for the year. While the current, nationwide economic slowdown might reduce Sonoma County's GMP growth rate in 2001, forecasts nevertheless project relatively significant annual increases around 6% through 2004.

3.4% employment growth

Sonoma County's workforce grew to more than 185,500 members in 2000. Again, the recent economic slowdown, combined with a tight labor market, might dampen job growth rates in 2001. However, Sonoma County employment growth outpaced both California (3%) and the United States (2.1%) in 2000. In fact, the County's 2.6% unemployment rate currently ranks fifth lowest among all California counties (January 2001).

\$35,100 in per capita income

Per capita income in Sonoma County surpassed \$35,000 in 2000, a 6% increase from 1999. In comparison, U.S. per capita income was \$30,100 in 2000. Economic forecasts project an estimated \$2,000 increase yearly through 2003 for Sonoma County workers.

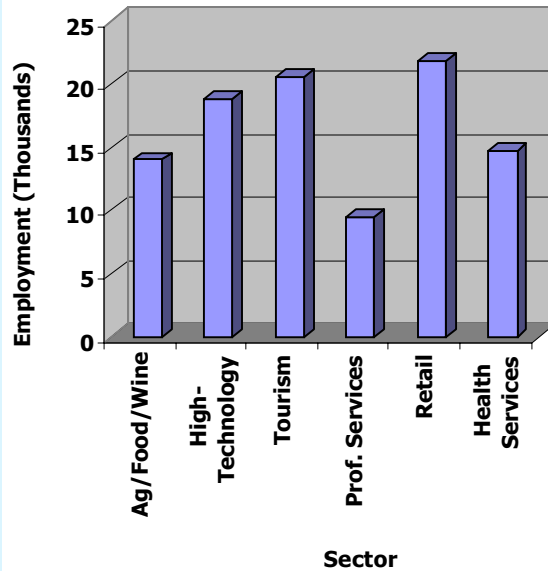
Healthy Balance Among Sectors

While the slowing pace of the national economy is adversely affecting many single or dual sector local economies across the country, Sonoma County is largely avoiding the sharpest declines. With five key industrial sectors--agriculture, health care, retail, technology, and tourism--the County's economic welfare does not exclusively rely on the performance of one particular sector. Indeed, as the following charts illustrate, Sonoma County's economy displays a healthy balance among sectors in both employment and output.

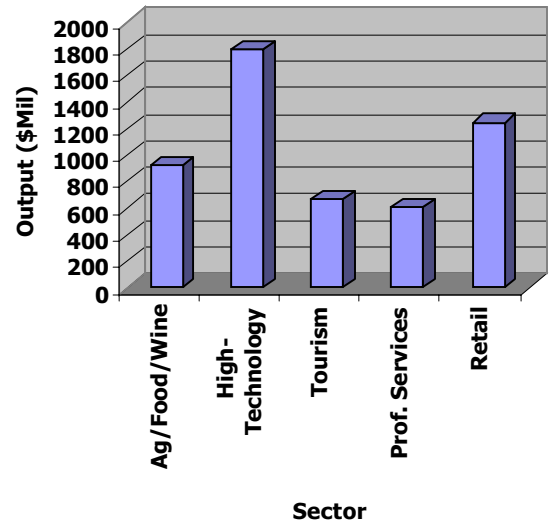
* Source: Economy.com

EXECUTIVE SUMMARY

Sonoma County Employment (2000)



Sonoma County GMP (2000)



Source: Economy.com / EDD

“ Sonoma County employment levels are continuing to rise. We have not seen a decline.”

Cathe Rutherford
CA Employment Dev. Dpt.

The Press Democrat
February 24, 2001

High-Tech Sector Overview

With 412 companies and almost 19,000 employees, Sonoma County’s high-tech sector experienced another year of rapid growth in 2000. Indeed, the high-tech sector now ranks as the County’s third largest employer, behind retail and tourism.

*High-Tech Highlights (2000)**

- **412 high-tech companies located in Sonoma County**
- **18,800 employees**
- **\$1.8 billion in real output****
- **\$52,490 average wage**

A quick comparison with 1999 figures for a few of the above categories provides a salient illustration of the high-tech sector’s robust growth rates over the past year:

- 16.8% increase in total employment at high-tech firms
- 17.5% increase in real output
- 4.4% productivity growth (output per worker)

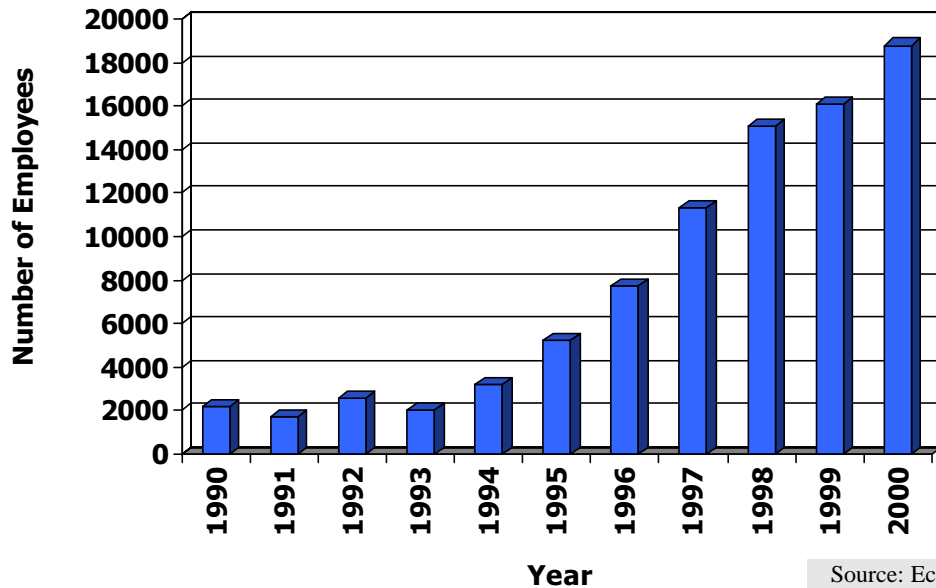
*See methodology section for data explanation.

** Output reflects the value added to goods and services that are produced in Sonoma County.

INDUSTRIAL EVOLUTION

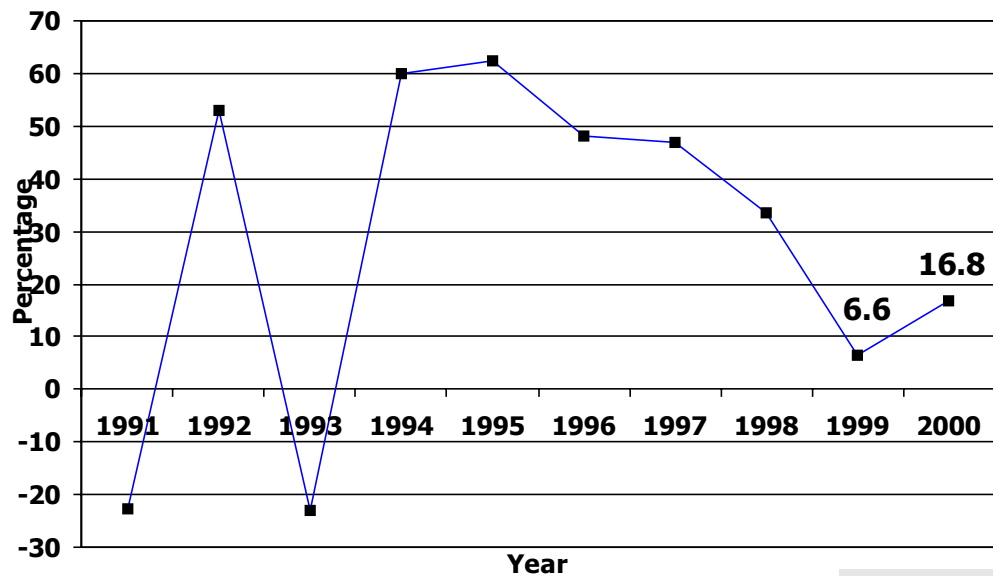
10 Year Overview

High-Tech Employment



As the above chart illustrates, high-tech employment in Sonoma County has dramatically increased since 1994. The local industry boasted a 16.8% growth rate in total employment for 2000.

Employment Growth Rates

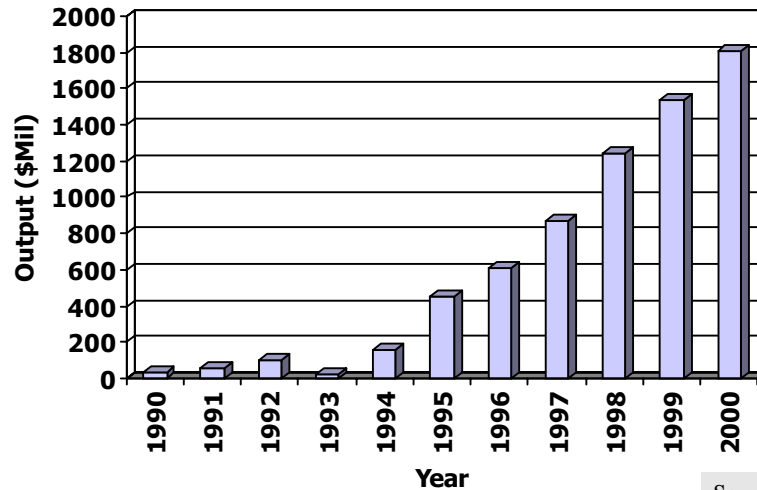


As the graph shows, the 1994-1998 period displayed particularly robust growth rates in total employment at an average of 50% annually in Sonoma County. While growth rates have recently declined to more sustainable levels, total employment in the high-tech industry is still clearly expanding.

INDUSTRIAL EVOLUTION

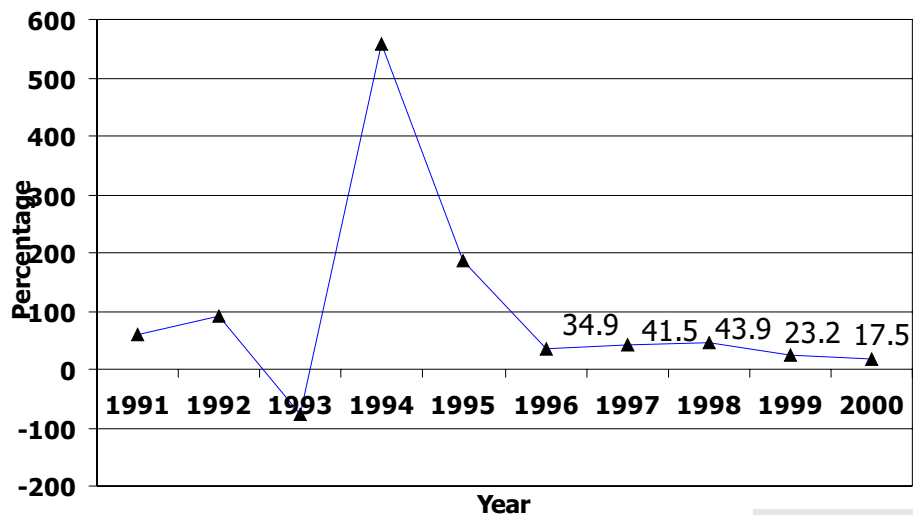
10 Year Overview

High-Tech Real Output



Source: Economy.com

Real Output Growth Rates



Source: Economy.com

As expected, the pattern of real output growth in Sonoma County's high-tech industry mostly reflects the employment growth trendline after 1991. In 2000, the high-tech sector amassed \$1.8 billion in real output, a \$269 million, or 17.5%, increase from 1999.

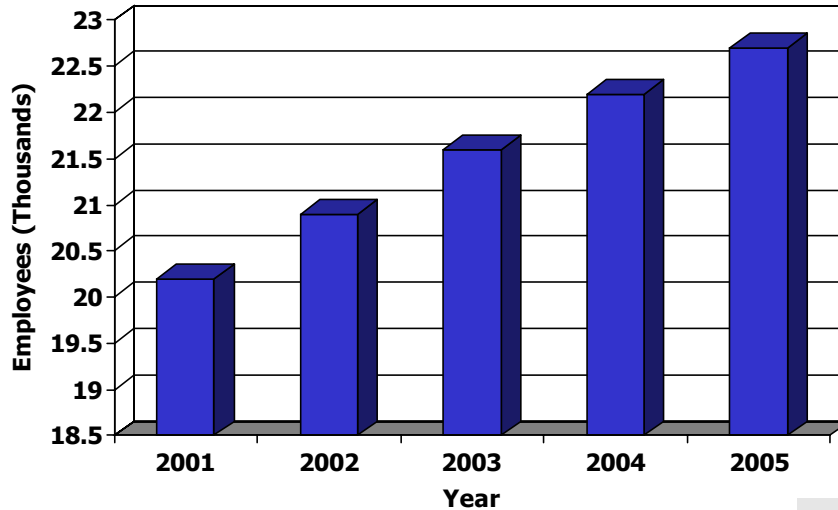
In contrast to the volatile growth pattern between 1993-1998, high-tech industry expansion in Sonoma County has relatively stabilized over the past two years. Nonetheless, 14% employment growth and 18% real output growth in 2000 represent significant increases. By contrast, retail and tourism, the two largest employment sectors in Sonoma County, demonstrated roughly 2% employment growth and an average of nearly 5% real output growth during the same time period.*

*Economy.com

INDUSTRIAL EVOLUTION

Looking Ahead: 2001-2005

Projected High-Tech Employment

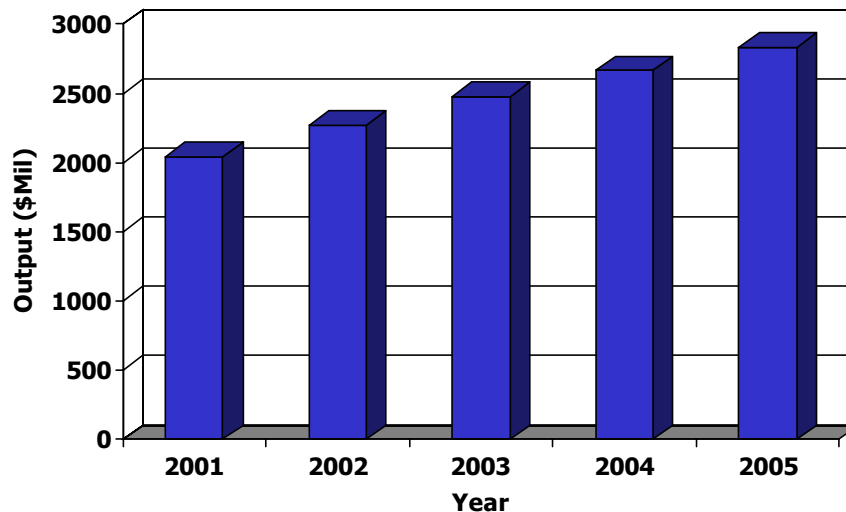


Growth Rates

2001	7.4%
2002	3.5%
2003	3.3%
2004	2.8%
2005	2.3%

Source: Economy.com

High-Tech Real Output



Growth Rates

2001	12.9%
2002	11.2%
2003	9%
2004	7.8%
2005	6.5%

Source: Economy.com

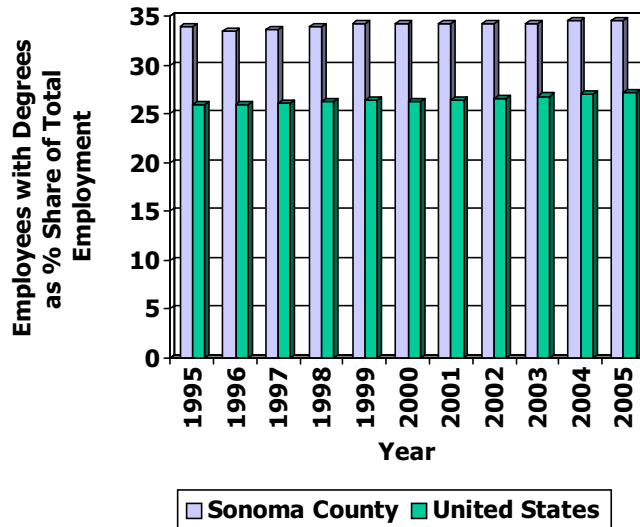
According to Economy.com projections, high-tech employment will surpass 20,000 workers in 2001, and real output will exceed \$2 billion.

Double-digit growth rates for real output during the 2001-2002 period suggest that this region's high-tech companies will continue to largely avoid a precipitous slowdown in sales. In fact, for example, according to the *North Bay Business Journal*, Alcatel shipped 636,800 DSL modems in the fourth quarter of 2000, grabbing a leading 34.9% share of the worldwide market (March 5, 2001).

WORKFORCE DEVELOPMENT

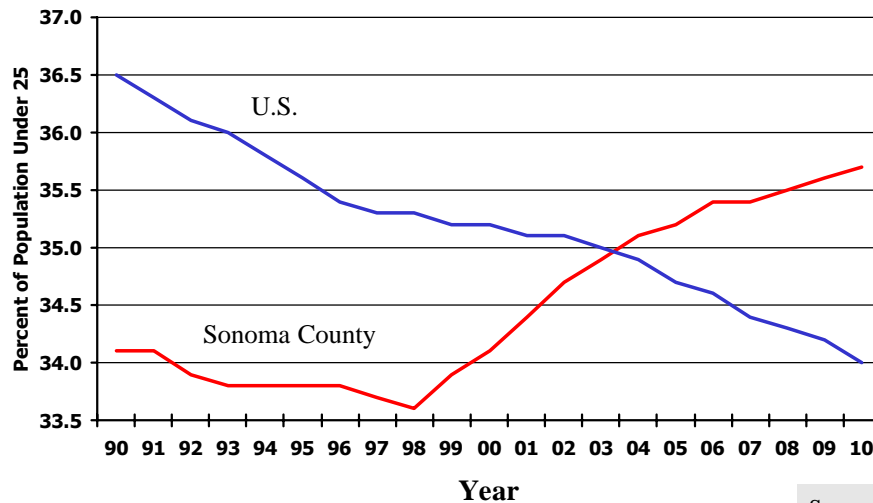
Sonoma County Workforce: Education & Demographics

Workforce with College Degree



Source: Economy.com

Sonoma County's Younger Population



Source: Economy.com

As the first chart above illustrates, Sonoma County's workforce possesses a relatively high degree of educational attainment when compared with the entire United States. In 2000, more than 34% of the County's 185,000 workers held some form of higher education degree.*

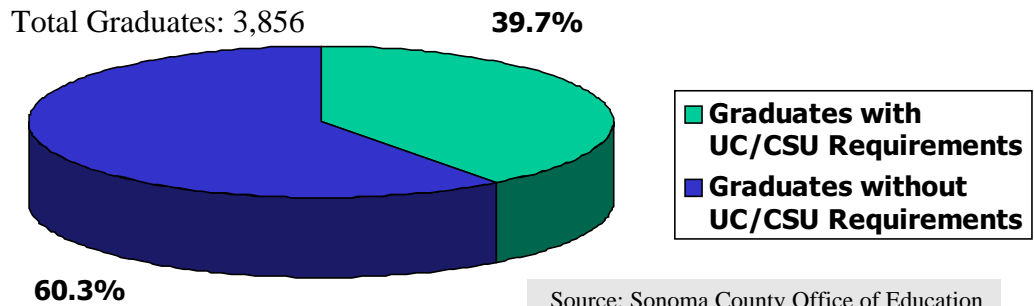
In addition, the local working population is growing younger. Sonoma County's population under the age of 25 comprised over 34% of the County's total population in 2000.

*Numbers reflect employment by occupation in industries where undergraduate/graduate level degrees are commonly required.

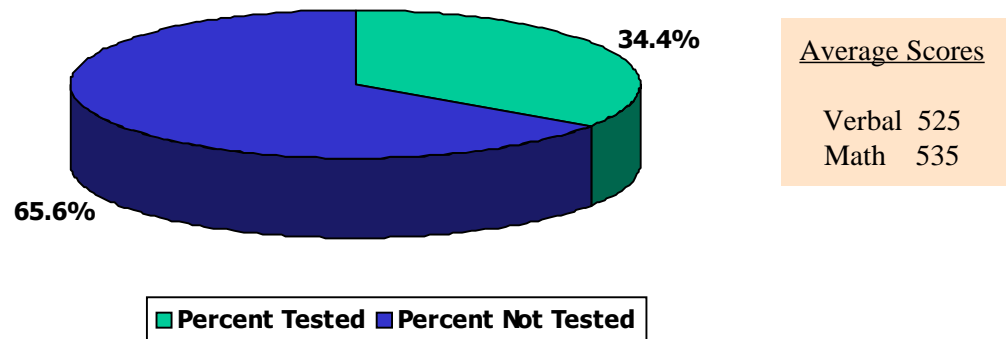
WORKFORCE DEVELOPMENT

The Upcoming Workforce: High School & College Graduates

Sonoma County Public High School Graduates 1999-2000



Sonoma County Public School Students & the SAT (2000)



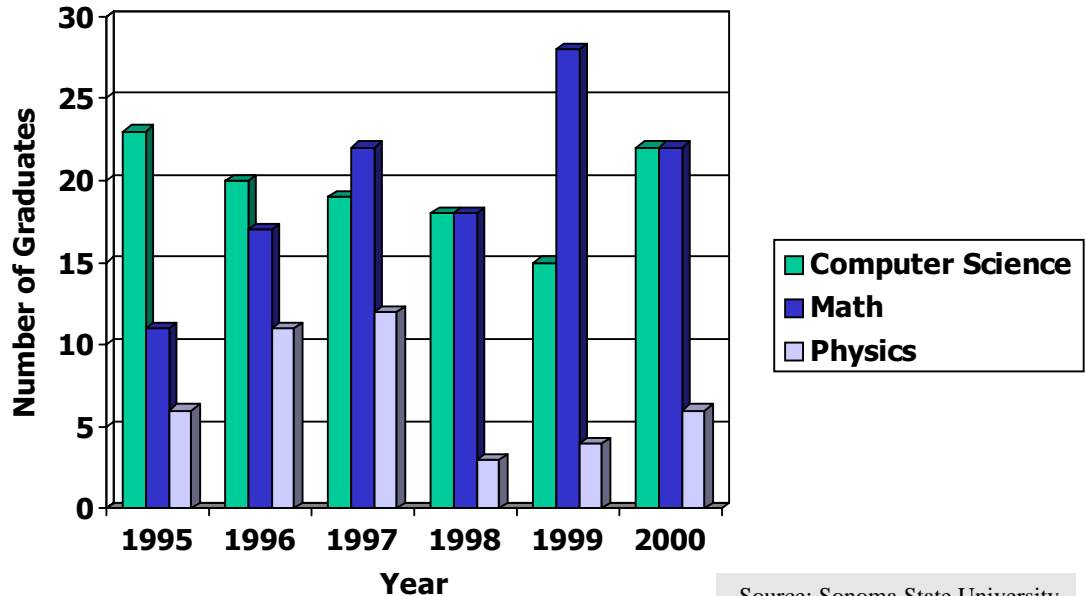
According to the Sonoma County Office of Education, nearly 40% of Sonoma County public high school students graduated with the necessary requirements for entrance into the UC/CSU system in 2000, roughly the same percentage as 1998 and 1999. In addition, 34.4% of public school students took the SAT in 2000, about the same as last year (34.3%).

*Santa Rosa Junior College does not require SAT scores for admittance.

WORKFORCE DEVELOPMENT

The Upcoming Workforce: High School & College Graduates

Number of Graduates from SSU in Selected Majors



“Education is a critical factor in a community’s health and vitality, and [the SSU MS-CES] will make significant contributions to the educational opportunities available in Sonoma County.”

Michael Hatfield
CEO, Calix Networks
Telecom Valley 2001
October 2, 2000

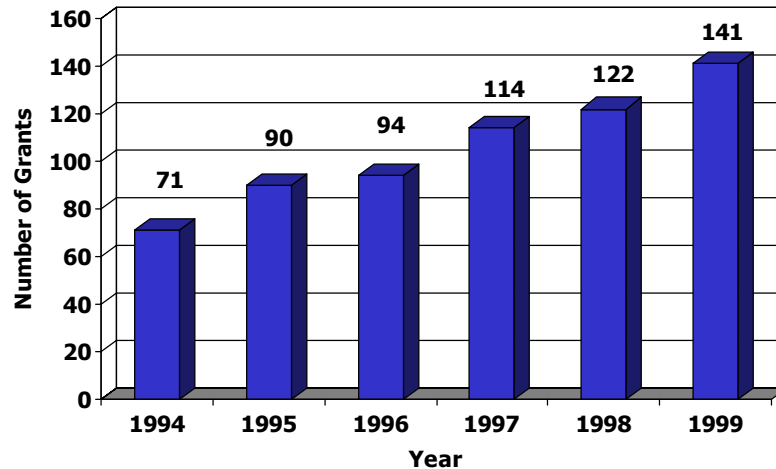
Access to high-quality educational and training opportunities in technology-related fields, of course, represents an important consideration for Sonoma County’s high-tech companies.

In fact, several local high-tech CEOs last year contributed more than \$6 million toward the establishment of a masters program in engineering at Sonoma State University. The new Master of Science degree in Computer and Engineering Science will begin offering classes in Fall 2001.*

With 238 students currently enrolled in the SSU Computer Science Department, and the Santa Rosa Junior College Engineering Transfer Program at or near full capacity, strong demand for technology-related programs should warrant consideration of establishing new opportunities in Sonoma County for students and company employees alike.

* For a more complete list of local, technology-related educational opportunities, please visit the North Bay Technology Roundtable website: www.nbtr.org

U.S. Utility Patent Grants in Sonoma County

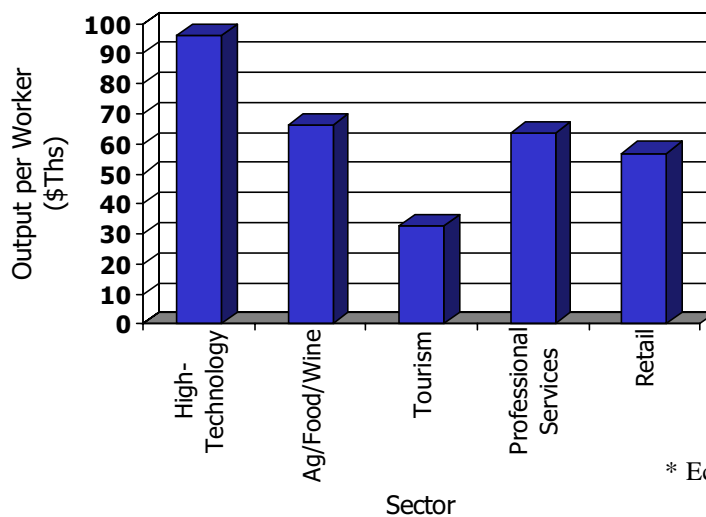


Source: USPTO Website (www.uspto.gov)

The latest available data from the United States Patent and Trademark Office (USPTO) shows that Sonoma County residents successfully registered 141 utility patents in 1999, a 16% increase from the previous year. Most technology products fall under the utility patent, or “patent for invention,” category, including semiconductor device manufacturing, optics, digital processing systems, and many others.

In comparison, the USPTO awarded 5,664 utility patents to Santa Clara County residents and 16,774 to California residents overall during the same time period.

Productivity (2000)*



Innovation has allowed the high-tech industry to achieve the highest productivity rate of any Sonoma County economic sector.

* Economy.com



Venture Capital Deals & Dollars in Sonoma County (2000)

	2000				
Sonoma County	1Q	2Q	3Q	4Q	Total
Number of Deals	3	6	3	2	14
Amount Raised (in M)	\$52.20	\$117.23	\$74.00	\$49.60	\$293.03

The following companies raised venture capital financing in 2000:

Calix
 Cierra Photonics
 Gluon Networks
 Illuminations
 Invisible Worlds
 Mahi Networks
 Mitra Life
 PhotoTablet
 SpectraSwitch
 Turin Networks
 Verticom
 Westwave Communications

* Source: VentureOne

Initial Public Offerings

No high-tech companies in Sonoma County filed for IPOs in 2000. By contrast, two companies--Next Level Communications and TrueTime--offered IPOs in 1999.*

* EDB's 2000 High-Tech Report.

TELECOM VALLEY

“Telecom Valley offers the quality of life and positive environment that truly creative people enjoy.”

Clifford Rudolph
CEO, ATG
Telecom Valley 2001
October 2, 2000

In describing the fairly rapid emergence of Sonoma County’s telecommunications industry, or *Telecom Valley*, many people will effortlessly throw around the term “critical mass.” However, the rise of *Telecom Valley* depended on a myriad--and largely self-evident--set of factors: proximity to Silicon Valley and San Francisco; access to a major interstate, established industry sectors; relatively cheap living costs; a beautiful natural environment; and, perhaps most important, a collection of pioneering minds in the still-nascent telecom industry.

Indeed, with industry pioneers such as Optical Coating Laboratory, Inc. (1951), Digital Telephone Systems (1969), Hewlett-Packard (1972), Microsource, Inc. (1980), and Pacific Bell forming the “roots” of *Telecom Valley*, Sonoma County’s recent share of the national spotlight in high-technology should surprise few people.*

In fact, nearly 40 telecom companies called *Telecom Valley* home in 2000. From Sonoma County’s largest private employer, Agilent, to industry start-ups such as Calix Networks, Mahi Networks, and Cierra Photonics, this region’s telecom sector is clearly prepared to remain at the top of the list regarding prominent high-tech industry clusters around the nation.

*Telecom Valley (2000)**

Advanced Fibre Communications	Lucent Technologies	TrueTime
Advanced TelCom Group	Mahi Networks	Turin Networks
Agilent Technologies	Mariposa Technology	Verticom
Alcatel USA	Microsource	Western Multiplex
American Communications Tech. Int’l.	Network Photonics	WestwaveCommunications
Baja Systems	Next Level Communications	Willhart Technologies
Broadlink Communications	Nextel Communications	Zhone Technologies
Calix Networks	Nokia	
CHAT Communications	OCLI/JDS Uniphase	
Cierra Photonics	Pacific Bell	
Cisco Systems	Quantum Shift	
Coactive Networks	Sonoma Photonics	
DBS Industries	Spectraswitch	
Gluon Networks	SRC Cables	
Intellisys	Terawave Communications	
Kabiro Technologies	Texas Instruments	

* Information found in *North Bay Business Journal* publication, “Telecom Valley, 2001”

TELECOM VALLEY

North Bay Business Journal

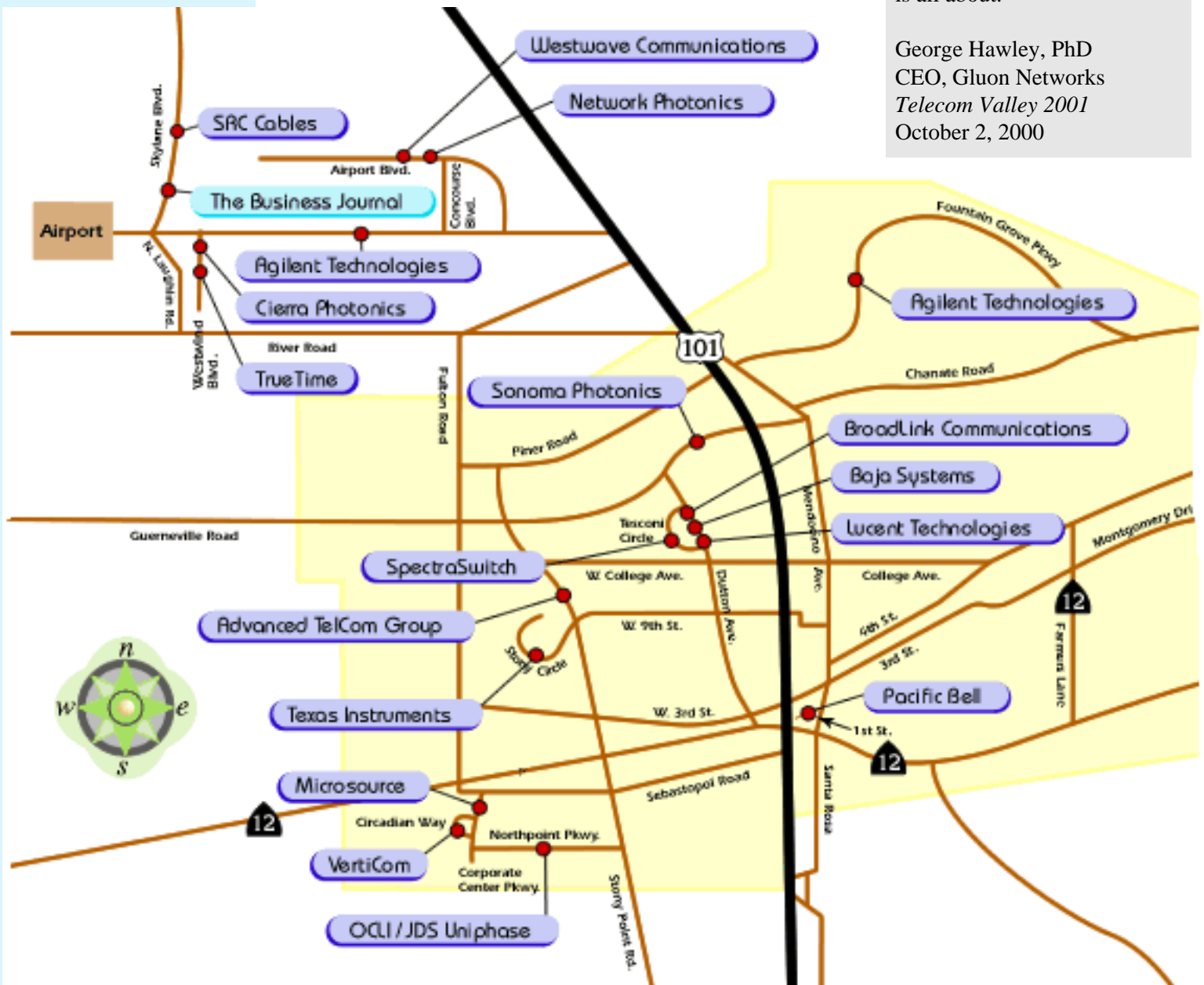
SERVING SONOMA, NAPA, AND MARIN COUNTIES

northbaybusinessjournal.com

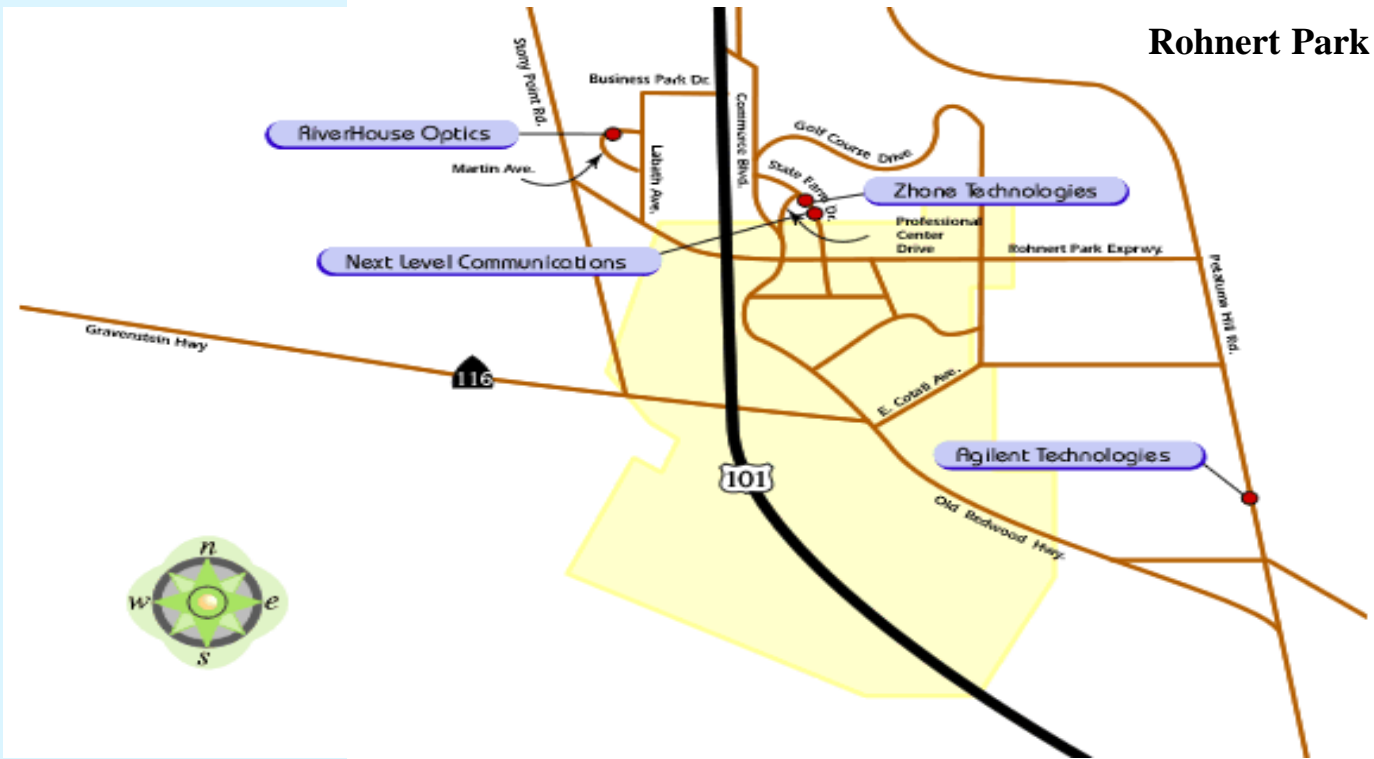
Santa Rosa

“You’ve got this World Wide Web, with all this data and imagery and information on it, and your connection is a simple telephone line based on ‘ancient’ technology! Put in optical fibers, and it will blow away the constriction between you and the content. That’s what Telecom Valley is all about.

George Hawley, PhD
CEO, Gluon Networks
Telecom Valley 2001
October 2, 2000



TELECOM VALLEY



Background

In the Economic Development Board's 1999 High-Tech Report, *High Tech: Sonoma County at a Crossroads*, a key recommendation involved the establishment of an "umbrella" organization comprised of local high-tech company leaders, educators, and technology trade group representatives. At the direction of the Sonoma County Board of Supervisors, this organization, the North Bay Technology Roundtable, assumed responsibility for the following charges:

- Improve the high-tech business climate in Sonoma County
- Act as a conduit of information between the local high-tech community and Sonoma County's residents, businesses, and governments
- Speak as one informed voice on behalf of the local high-tech community
- Raise awareness of high technology among local residents

Mission Statement

To develop and sustain the North Bay Region as a recognized center in technology-driven industries, while fostering a supportive business environment and enhancing local quality of life.

The North Bay Technology Roundtable will work to create private/public partnerships to facilitate:

- The creation of public policy and an infrastructure that is conducive to the growth and development of technology business
- The development of systemic relationships and programs with all levels of education to support the technology industry
- Greater accessibility to sources of capital
- An attractive professional environment to recruit and retain a qualified workforce
- Quality of life solutions with regard to issues such as transportation and connectivity

NORTH BAY TECHNOLOGY ROUNDTABLE

Accomplishments & Current Projects

www.nbtr.org

In 2000, the North Bay Technology Roundtable made significant progress toward fulfilling the organization's primary objectives of participation in education, industry support and community involvement. From increasing cooperation with local schools to promoting telecommuting as a healthy and sustainable business practice, NBTR companies developed a number of important initiatives that will benefit the high-tech industry, as well as the entire local community.

• **Vision Statement**

The NBTR developed and released a Vision Statement that outlines the organization's "vision" for the local high-tech industry. Focusing on several key issues--education, transportation, environment, housing, and community involvement--the Vision Statement highlights the various ways the high-tech community contributes to the North Bay's quality of life.

• **Workforce Gap Analysis**

This report, completed in April 2001, represents a comprehensive study of local high-tech workforce issues. Through surveys with high-tech company representatives, educational leaders, and students, the report, conducted and written by Public Works, Inc., analyzes the "gap" between demand for--and availability of--local high-tech workers.

• **Telecommuting Promotion**

The NBTR supports telecommuting as a healthy and sustainable business practice. From reduced commutes on Highway 101 to increased worker productivity, telecommuting offers businesses a number of significant competitive advantages. In 2000, the NBTR hosted two workshops that presented the basic idea of telecommuting, as well as addressed managerial issues, potential pitfalls, and other topics.

Other Activities

In Summer 2000, several local teachers joined the ranks of NBTR companies as part of Sonoma County School-to-Career Partnership's "Summer Fellowship Program for Teachers." Through on-the-job experience, teachers learned a wide variety of technology skills, and, consequently, they will be more aptly suited for communicating these skills and experiences to students during the school year.

For information on all current NBTR projects, please visit www.nbtr.org.

NORTH BAY TECHNOLOGY ROUNDTABLE

*The North Bay
Technology Roundtable
works to create and
support public/private
partnerships that
address important
quality of life issues in
the North Bay.*

NBTR Participants

Education

Empire College
Santa Rosa Junior College
Sonoma County Office of Education
Sonoma State University

Industry

Advanced Fibre Communications
Advanced TelCom Group
Alcatel
Broadlink
Calix
Cisco Systems
Computer Associates International
DataFlow
KLH Consulting
KnowledgePoint
Mahi Networks
Microsource
Motion Analysis
Nokia
OCLI
Rheodyne
Schurter
SpectraSwitch
TrueTime
Turin Networks
Westwave
Xandex

Trade Associations

North Bay Angels
North Bay Multimedia Association
SofTECH

METHODOLOGY

The majority of economic research contained in this report derives from several Economy.com studies and publications, including *Tool Kit for 2001: The Economic Outlook for Sonoma County*, a report presented at the Business Environmental Alliance's (BEA) "Straight to the Bottom Line Conference" in November 2000. Dr. Steven G. Cochrane is the Director of Regional Services at Economy.com, Inc. For additional information about this publication, please visit the BEA website: www.sonoma-county.org/bea.

For other economic reports, including the *2001 Business Confidence Report*, please visit the Economic Development Board website: www.sonoma-county.org/develop/econdev/index.htm.

In addition, Economy.com performed an analysis of the Sonoma County high-tech sector for the EDB in Fall 2000.

Economy.com used the following industry categories to measure the performance of Sonoma County's high-tech sector: industrial machinery, equipment and goods (SIC35), electrical and electronic equipment (SIC36), instruments (SIC38), optical goods (SICs 381, 382, 384, 385), and computer and data processing services (SIC737).

In addition, regarding statistical methodology, Economy.com used estimated industry multipliers to determine local employment, output, and income figures for the various sectors. In determining local statistics, Economy.com weighted these industry multipliers for the State of California by the size of the component industries in Sonoma County. Thus, the economic data in this report does not represent exact figures for Sonoma County, only estimates relative to the statewide economy.

The State of California Employment Development Department provided the number of high-tech firms in the County, based on the above SIC codes. EDD also provided the employment statistics for the health care industry. For additional EDD information, please visit www.edd.ca.gov.

The Bureau of Labor Statistics provided the average high-tech wage. This figure represents only computer and mathematical occupations in Sonoma County. For additional occupational categories, visit <http://stats.bls.gov>.

Patty Bernstein, Public Information Secretary at the Sonoma County Office of Education, kindly provided the educational statistics.

Finally, different research methodologies will, of course, yield different information. The Economic Development Board is continually updating its research parameters. Thus, figures for the high-tech industry in the *2001 High-Tech Sector Report* might vary from information in reports from previous years.

Acknowledgements

The Economic Development Board expresses thanks to Economy.com, the California State Employment Development Department, and the Sonoma County Office of Education, for the invaluable research behind this project, as well as their continuing commitment to Sonoma County's economic vitality.

In addition, we would like to express our gratitude to the local high-tech community at large. Without the presence of strongly civic-minded high-tech CEOs and employees in Sonoma County, many programs that benefit all residents in this region would not be possible.

We would also like to thank Mr. Michael Troy, former CEO of KnowledgePoint and Chair of the NBTR, for his leadership and commitment to the organization during the past two years.

Brian J. Kelsey, a Public Policy Management Intern during 2000-01 at the Economic Development Board, developed this report. Brian reviewed previous reports and suggested a number of ways to enhance and improve this report. Brian evidenced initiative, dedication, and constant excellence in preparing this report.

Ben Stone