

# Sonoma County Local Economic Report

## *Technology Industry 2002*



Developed by the Economic Development Board in partnership with the following groups:

Sonoma County Workforce Investment Board  
North Bay Technology Roundtable

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The Economic Development Board (EDB), in partnership with the Workforce Investment Board and the North Bay Technology Roundtable, is pleased to bring you the next report in the *Sonoma County Local Economic Report Series*.

In this issue, *Technology Industry 2002*, you will find important information regarding current trends in the local technology industry, including the following highlights:

- Good potential for increased profitability in electronic and medical equipment
- Local innovation continuing to soften impact of the current recession
- Moderate resurgence of venture capital investment in local firms
- Telecom industry still struggling with excess long-haul capacity and high debt

This report offers two unique perspectives. First, Dr. Steven G. Cochrane, Director of Regional Services at Economy.com, has provided comprehensive analysis on the strengths and weaknesses, recent performance, and upcoming trends for the technology industry in Sonoma County.

In addition, the report includes results from a recent survey of local technology companies conducted by the Economic Development Board. This survey, conducted in Spring 2002, offers a brief overview of current industry trends from the perspectives of local employers, including subjects such as Sonoma County's economic competitiveness, workforce availability, and the status of educational programs for technology fields.

As always, please feel free to offer feedback on ways to improve the reports released under this series. You can contact Brian Kelsey, Research Director at the EDB at (707) 565-6456 or [bkelsey@sonoma-county.org](mailto:bkelsey@sonoma-county.org).

Thank you again for your interest in Sonoma County's economy and the Economic Development Board's research efforts.

Yours sincerely,

Ben Stone

# Technology Industries - Sonoma County

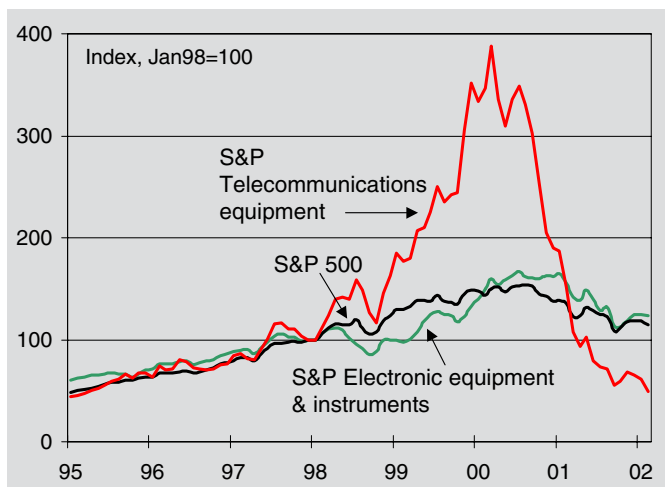
**Recent Trends.** Technology manufacturing currently is the weakest component of Sonoma County's economy. Employment in local industries that manufacture high-tech instruments and optical equipment, for example, has fallen by nearly 2,000 over the past year to under 9,000 workers, erasing all of the gains seen during the economy's surge in 2000. Moreover, there is no clear sign yet that these cutbacks are abating. While much smaller in size, payrolls in other communications equipment, electronics and computer-related equipment have fallen on the order of 10% over the past year.

The importance of these industries for the county's overall economy cannot be overstated. Excluding the net loss of roughly 2,600 tech-related jobs over the past year, the county's total employment base would be expanding today. Moreover, wages paid in the tech industries are slightly more than double the average wage paid across all industries in the county. Thus, the multiplier impact upon local retail, housing and service industry markets is substantial.

**Macro Drivers.** Although conditions remain weak in Sonoma County's tech-related industries, the macroeconomy has made the turn from recession to recovery. U.S. employment expanded in April for the first time in nearly a year and industrial production is picking up, largely due to a reining in of manufacturers inventories, stable consumer spending and some renewed business investment spending.

Despite the recent improvement in the U.S. economy, demand for electronics and computer equipment will be slow to turn around and demand for telecommunications equipment will be among the last to see any improvement in orders and shipments. Telecom equipment makers will see a turnaround only when the telecom services industry stabilizes. The recovery in telecom services will lag other industries because the industry is still struggling with excess long-haul capacity and high debt levels. Moreover, consumer spending on telecom services is down on a year-to-year basis for the first time since the last recession in 1990.

Some recent improvements in corporate profits do generate some nascent optimism for the industry, however. Corporate profits appear to be finally benefiting from



significant corporate cost cutting and successful efforts to maintain productivity growth. Labor and other business costs are flat at best, suggesting that profit margins are expanding once again despite businesses' difficulty in raising prices for their wares. Once profit growth is on a sustained upward path, business spending on enterprise telecom equipment such as internal networks will improve. This may be the first segment of the telecom equipment industry to improve as the economic recovery takes hold.

**Industry Drivers.** Shipments of communications equipment, which averaged 17% annual growth from 1996 to 2000, plummeted back near 1996 levels by the end of last year. Telecom firms raised and speculatively spent billions of dollars on network infrastructure throughout the late 1990s, driven by what proved to be overzealous forecasts of demand for bandwidth. Now those telecom companies that have not already liquidated because of heavy debt loads are desperately slashing capital spending outlays to conserve cash. As a result, a return to aggressive infrastructure spending is still far off.

Nevertheless, the sharp fall in shipments of communications gear experienced over 2001 is easing. Over the last few months, both orders and shipments have remained more or less stable. New orders have yet to surpass current delivery levels however.

Telecom equipment makers have successfully trimmed a great deal of unwanted inventory. Equipment makers have slashed inventories by about \$4.5 billion over the last year in response to the abrupt decline in demand; as a result, the industry's inventory-to-sales ratio has improved over the last six months.

Drivers are more solid for other tech industries. With manufacturing in the early stage of recovery, demand for precision controls will rebound later in the second half of this year. Equipment related to semiconductor manufacturing should see improved demand by the end of this year. Demand for chips in domestic and Asian markets is already beginning to improve.

Medical instrumentation will continue to witness slow but consistent growth as medical research and treatment continue to expand. This industry is generally non-cyclical, although as evidenced by recent payroll cuts at Sonoma's Medtronic AVE, the industry has not escaped completely from the profit squeeze prevalent across most industries today.

**Pricing.** Telecom equipment prices have firmed over the last few months but are down slightly on a year-over-year basis. With fewer buyers in the market and tremendous excess capacity, equipment makers will struggle in the near term to raise prices significantly. Commoditization of tech equipment also helps dampen firms' control of prices.

Technological innovation does counter commoditization creep, however, and continuing research and development spending, particularly among some of Sonoma County's start-up firms, helps to boost prices for new products. Firm pricing among technology innovators helped some to weather the recent economic downturn.

The strong dollar further keeps domestic prices in check. Many tech, telecom and medical equipment products are imported into the U.S. from Canada, Mexico and the United Kingdom. The dollar's value relative to these large trading partners, particularly Canada, remains quite high, putting downward pressure on domestic equipment prices.

Since January, however, the dollar has slipped in value slightly versus sterling and the Canadian dollar. Should the U.S. dollar fall significantly further it could help support domestic prices as imports become more expensive.

**Operating Expenses.** The county's tech-related firms have pared operating expenses largely through layoffs that have taken place over the past year. The industry's

## Technology Industries - Sonoma County

employment peak was in the early months of 2001, and while there have been signs of some stability this year, April employment still was down slightly from the previous two months, indicating that cost cutting remains a priority. Moreover, when Sonoma County's tech firms do begin hiring again, the severe wage pressures of the late 1990s that resulted from the investment bubble at the time will be a thing of the past.

Among the county's smaller tech firms, high R&D spending will remain a large burden and, thus, many will continue to rely on venture capital investments to keep them afloat. And like all other firms in the area, the rising cost of healthcare and workers' compensation premiums as well as electric power will weigh additionally on the bottom line.

**Profitability.** The slump in profitability for Sonoma's tech industries is likely at its worst right now, with good potential for a near-term rise for electronic and medical equipment. Profits for telecom equipment makers, however, may not improve until the end of this year or early next.

Spending on computer and electronic equipment already has improved from late last year, and spending on software has remained stalwart. With operating expenses already trimmed, improved orders and cash flow should move right to the bottom line.

Spending on telecom equipment, however, has not improved yet and may not until the end of the year, so their reduced operating expenses may not pay off for at least another six months. Further weighing on telecom equipment makers' profits is the weak financial condition of some of their customers that received direct industry financing. Indicative of the industry's weak profit picture is a 95% decline in reported earnings for this year's first quarter over one year ago by Advanced Fibre Communications, one of the county's largest tech employers.

Profitability of medical equipment firms is stable and the outlook is boosted by the generally increasing demand for medical services and supplies among the aging baby boomers. This could be dampened only by the ability of government and private medical insurers to negotiate minimal price increases for such equipment in coming years.

**Long-Term Outlook.** Although near-term prospects are moderate at best, expansion will continue over the long term.

Technological advances, continued easing of regulatory telecommunications barriers and demands for data, Internet, and wireless services all bolster the county's tech industry long-term outlook. Overall, telecom investment will eventually return to more sustainable levels, with growth tied more closely to carriers' cash flows. In the meantime, some areas of telecom equipment will continue to offer healthy growth, namely metropolitan and wireless network equipment.

While it will take years to overcome the current overinvestment in long-haul infrastructure, significant bottlenecks persist in many metro areas. Upgrading local infrastructure will not only fuel direct demand for local network equipment, but will also help absorb long-haul capacity, as local upgrades allow more customers to use broadband capabilities and thus long-haul bandwidth. Moreover, as carriers become more cost conscious, they will spend more on equipment and software that enables them to boost revenues using existing networks.

Wireless carriers are planning to add more high-speed data functionality to their services but will have to significantly upgrade their networks to do so. Ongoing improvements and additions in the wireless services industry will stimulate demand for wireless networking equipment.

A critical long-term advantage for Sonoma County's tech industry is that it is an innovative industry, not a producer of commodity products. Indeed, a moderate amount of venture capital and other outside funding has returned to Sonoma County firms since late last year. Examples of VC recipients include Turin Networks, Valo, Gluon Networks and Next Level Communications. Further, Turin's products are finding markets outside of traditional telecom applications and toward cable broadband services for which technology will evolve as demand increases. The value of VC placements in the area is about one-tenth of its peak two years ago, but at least there is some renewed interest which should help drive further innovation and new products.

**Upside Risks.** If local providers can connect more homes and small businesses with broadband services, and consumers embrace new technologies, demand for equipment will increase. The recent surge in long-haul fiber-optic bandwidth comes when

many households and small businesses do not have the connectivity or applications to use it. Also, greater customer access to high-speed last mile connections would accelerate the absorption of long-haul capacity and eventually prompt further investment in long-haul networks. Moreover, consumer adoption of high-speed wireless data services would prompt further investment in wireless phone and network equipment.

Further upside potential would arise with a quicker and stronger recovery in overall business profits than projected; this would spur a sharp rebound due to pent-up demand for IT equipment.

Additionally, foreign markets may look increasingly lucrative for a broad range of tech industries because of two factors. First, the global economy will improve on the heels of the U.S. economic recovery. Second, should this be accompanied by a substantial fall in the value of the dollar, Sonoma County's tech products will be less expensive to foreign buyers.

Expansion of tech-based curricula at Sonoma State University provides further upside potential for the County in providing the personnel needed for the industry. Already, SSU has created a master's program in computer and engineering science, funded in part by JDS Uniphase. Broader plans are in the works to create a future bioinformatics program. A more skilled local workforce would support the expansion of the county's tech-based industries.

**Downside Risks.** The primary downside risk for the telecom industry is a worsening contraction in demand from service companies due to weak financial conditions and a weaker than expected economic recovery, leading to soft spending on capital equipment.

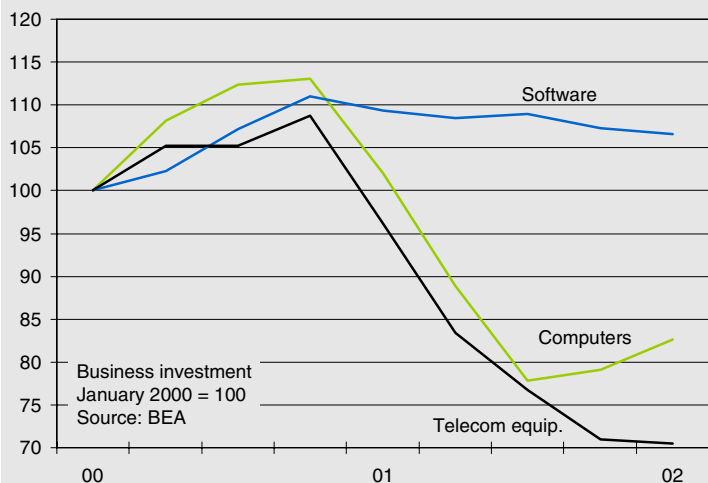
Consumers' and businesses' appetites for emerging technologies will ultimately drive developments in the equipment industry. If final customers are not willing to pay for enhanced services, however, investment in equipment would suffer.

The significant pace of mergers among service providers in the industry represents another downside risk to equipment manufacturers. If only a handful of service providers are purchasing equipment, they would enjoy more bargaining power over prices.

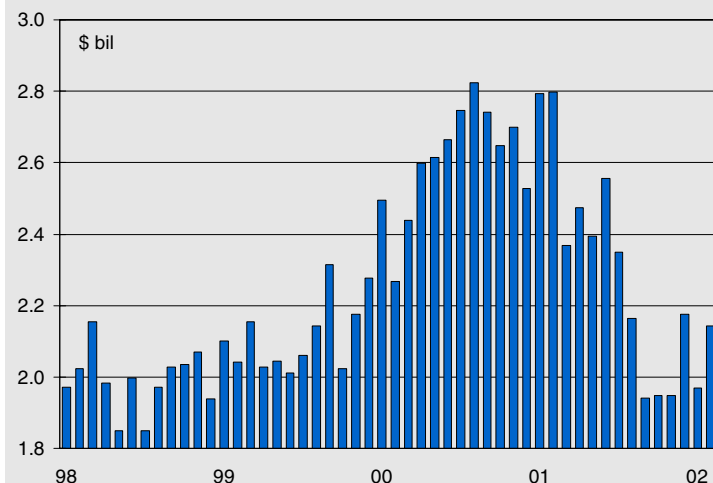
*Steven G. Cochrane  
May 2002*

# Technology Industries - Sonoma County

**U.S. Capital Spending Improving, Except for Telecom Equipment**



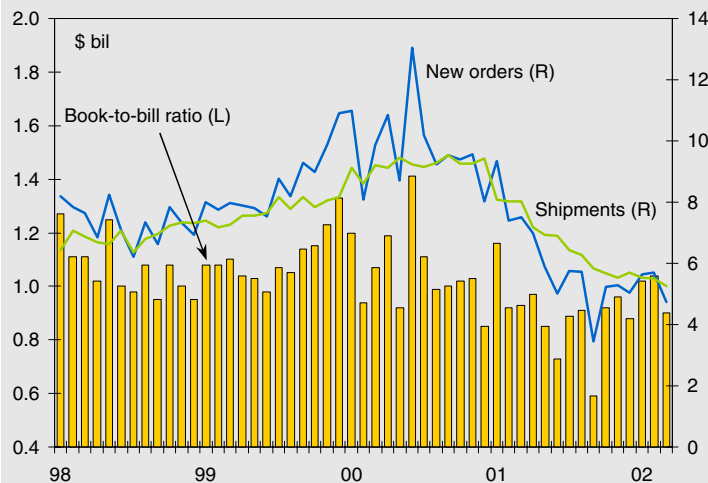
**U.S. Export Markets for Telecom Equipment Still Weak**



A rebound in Sonoma County's high-tech manufacturing industries will not occur until capital spending firms substantially. While nationwide spending on software has been quite steady, spending on computer and telecom equipment remains well below pre-recession levels. Spending on computer equipment has improved in recent months as equipment bought during the year leading up to Y2K is nearing the end of its useful life. But telecom service providers have more excess inventory on hand than any other industry group so their capital purchases will be the last to improve.

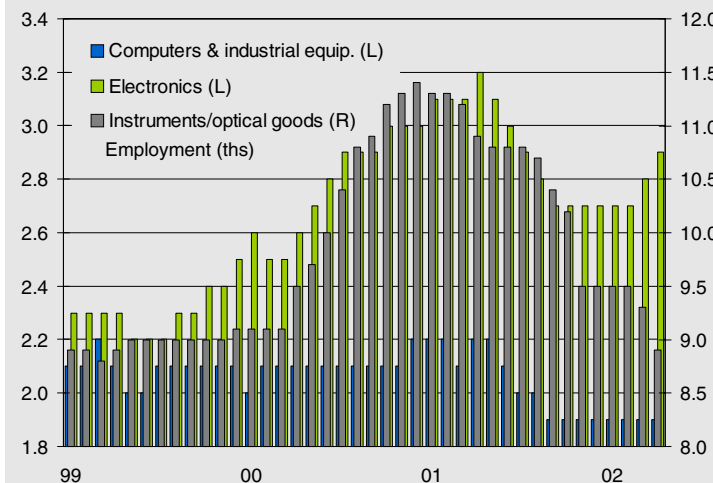
Foreign markets will do little in the near term to boost telecom equipment orders. While exports rose by nearly half during the 2000-2001 boom period, they have now lost all of this gain. Foreign markets offer good potential longer term as infrastructure improvements are made. But near term potential is limited. For example, Europe's slow growth—the euro-zone economy grew by less than 1% annualized during this year's first quarter—will hinder the pace of new investment in all types of technology products. Only a weakening dollar may provide some support for U.S. exports.

**U.S. Telecom Equipment Orders Low, but Nearly Back in Balance**



While telecom equipment orders are weak, at least orders and shipments are back in balance. New orders have fallen a whopping 64% from their peak in 2000. Shipments were running well above orders for most of last year, creating a book-to-bill ratio well below the 1.0 equilibrium point. With the ratio now back near 1.0, any increase in orders should result in new production rather than inventory reduction, providing some stimulus for new products, and new innovation, for which Sonoma's tech industries excel.

**Sonoma County Tech Employment Down by Over 10%**



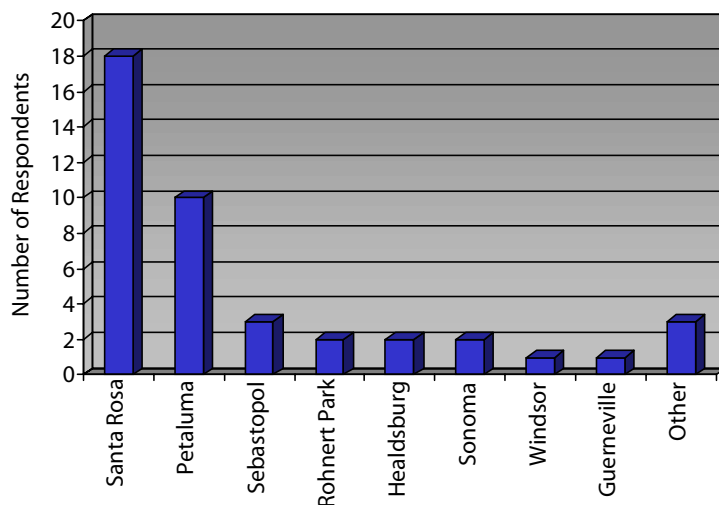
The largest component of Sonoma County's tech sector, instruments and optical goods is still shrinking. Its pattern of employment clearly followed the boom and bust cycle of the broader telecom industry that is its market. The smaller electronics industry also pared payrolls rapidly, but there is some sign of a turnaround over the past two months. Indeed, demand for electronic equipment and components nationwide has stabilized and should see some turnaround in the second half of this year. Telecom's rebound, however, will not be evident until next year.

# Technology Survey Results

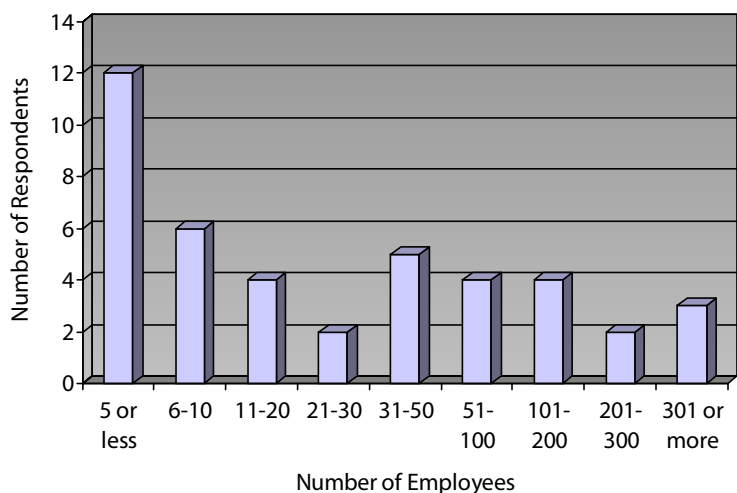
## Background

In April 2002, the North Bay Technology Roundtable (NBTR) and the Economic Development Board (EDB) distributed a survey to a sample of local technology companies in an attempt to gather economic and employment data on the industry. A total of 42 companies, ranging from local service providers to telecommunications equipment manufacturers, responded to the survey during April - May 2002. While arguably not a large enough sample to draw definitive conclusions about the entire industry, which comprises nearly 400 companies and 7,500 employees in Sonoma County,\* the survey results found in this report do offer an informative snapshot of many of the important trends and issues facing local employers.

**Geographical Distribution of Survey Respondents**



**Employment Levels at Responding Firms**



## Survey Respondents

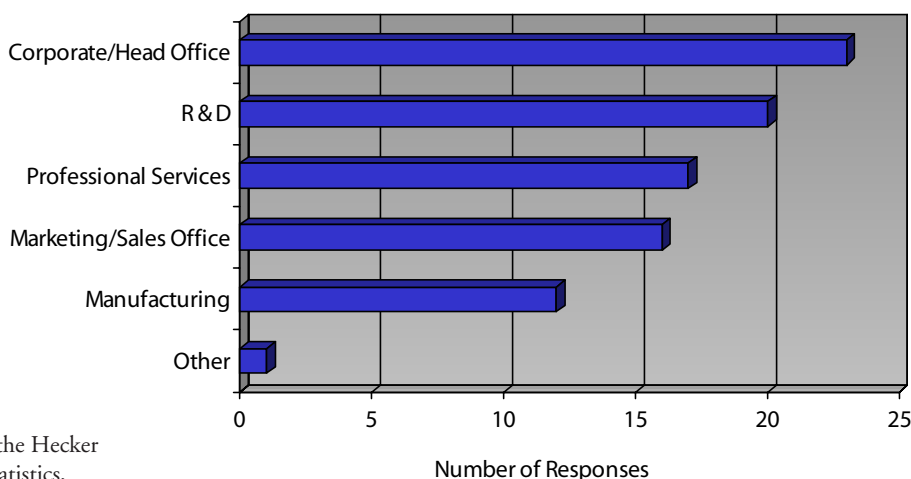
Survey respondents represented a diverse sample of local technology companies in both size and location. As the graph found above shows, at least one company responded from almost every city in Sonoma County, including a few firms located in unincorporated West County.

The adjacent graph shows the employment distribution of responding firms. Based on Sonoma County's significant population of small and home-based businesses, the relatively strong response rate from firms with five or less employees is not surprising. However, at least two companies in every size category from the survey lends a measure of sample diversity.

## Operations

The average number of employees at a local technology company is 19, as reflected in the distribution of survey respondents. In addition, according to survey results, operations at local technology firms are centered around corporate/head office and research and development functions. With a significant number of research-oriented startups in *Telecom Valley*, as well as many small and home-based businesses, the survey appears to accurately capture the nature of local business operations.

**Business Operations of Responding Firms**



\* Companies are defined by SIC codes and grouped according to the Hecker Definition of "high-technology" employment (Bureau of Labor Statistics, *Monthly Labor Review*, June 1999).

## Business in Sonoma County

According to survey respondents, Sonoma County remains an attractive location for technology companies. Indeed, as the adjacent graph indicates, 88% of survey respondents rated Sonoma County as "high" or "fair" regarding the region's potential for attracting and retaining technology industries.

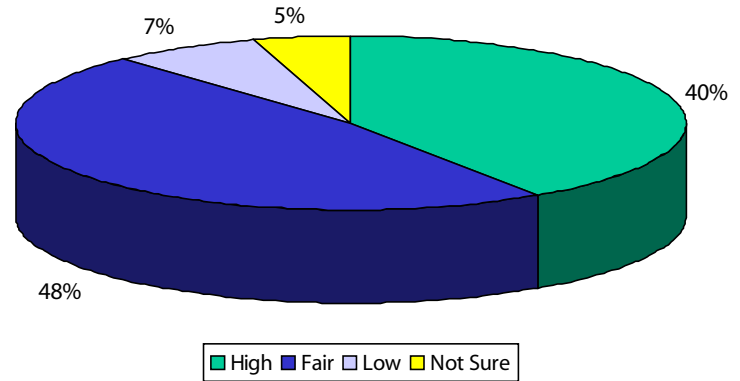
Sonoma County's economic competitiveness is based on many factors, including some of the advantages discussed in the following section. However, for technology companies, several other factors also warrant consideration. Access and availability of venture capital, for example, largely determines the success of startup firms, and an existing pool of company founders in the field can provide invaluable leadership. Sonoma County is fortunate in both respects. Indeed, despite the recent market deterioration, local telecom startups have raised more than \$130 million in venture funds since the beginning of 2002.\*

Survey respondents cited a number of advantages to a Sonoma County location, with "quality of life" and "skilled labor availability" receiving the highest number of responses.

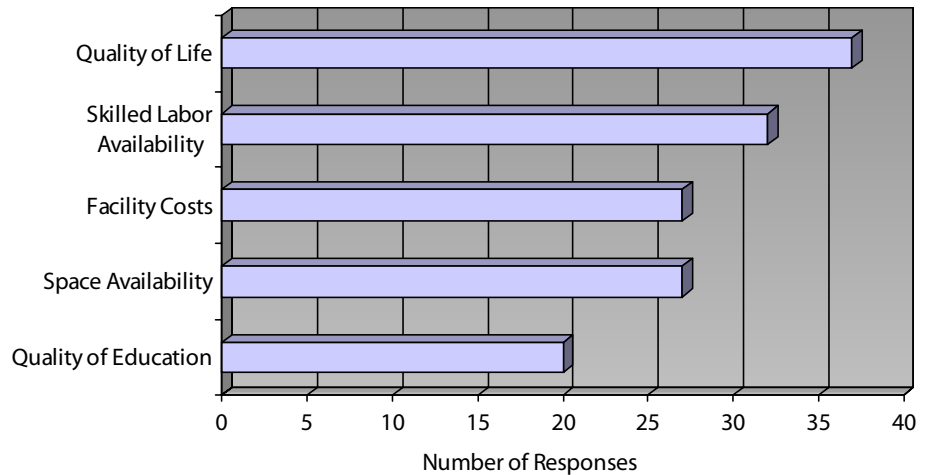
While quality of life and relatively low facility costs are often mentioned in discussions of Sonoma County's favorable business climate, especially in contrast to Silicon Valley, survey results regarding skilled labor availability and quality of education raise interesting points. The wave of layoffs over the past year has most likely increased the pool of available skilled labor in Sonoma County, but to what extent? And, of equal importance, will people currently experiencing job separations still be in Sonoma County when significant job creation in the technology sector returns? In any case, the net migration of skilled technology workers resulting from recent layoffs will be an important factor in the future development of the local industry.

Survey respondents also highlighted a number of detractors from Sonoma County's business climate, including, of course, housing costs and traffic. In addition, survey results found quality of education and commercial rental rates among the list of both advantages and disadvantages, yielding conflicting accounts from an aggregate standpoint. However, according to survey results, prohibitive rental costs for small firms might be a contributing factor.

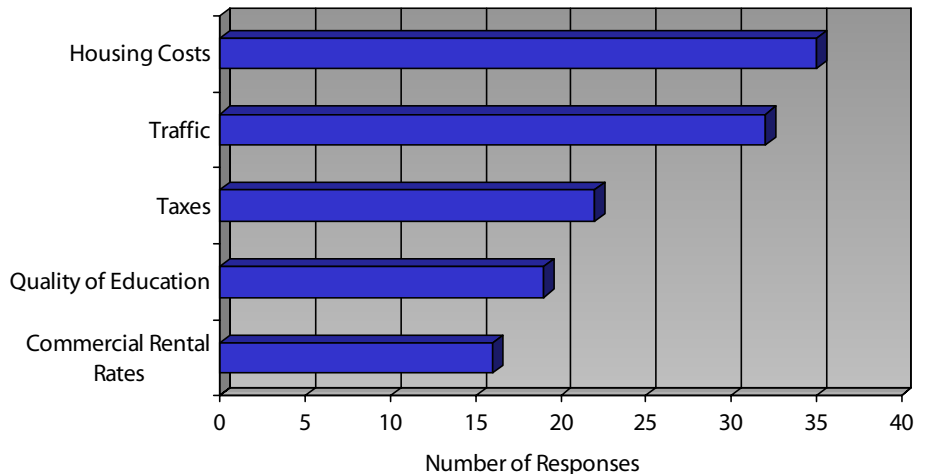
### How would you rate Sonoma County's potential for attracting and retaining technology industries?



### Advantages of Locating in Sonoma County



### Disadvantages of Locating in Sonoma County



\* *The Press Democrat*

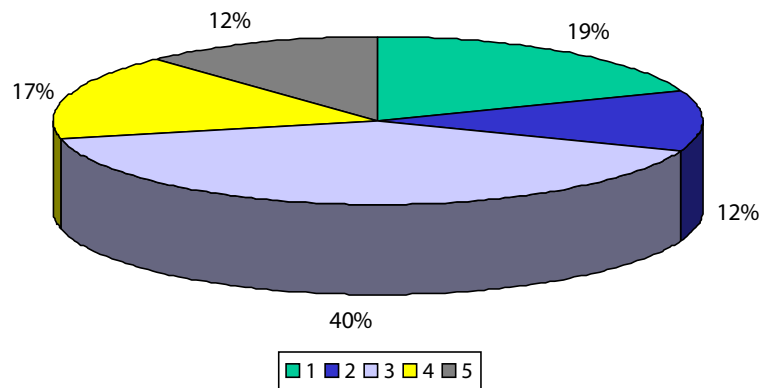
## Workforce

The whirlwind business cycle of the past four years in the local technology sector has profoundly affected workforce demand and availability. While not accounting for recent layoffs, local employment in the technology-related fields of Electronic Equipment and Instruments & Related Products registered growth rates of 26.1% and 20.5% during 1998-2001, respectively. As often pointed out, technology companies are indeed driving employment growth in Sonoma County.

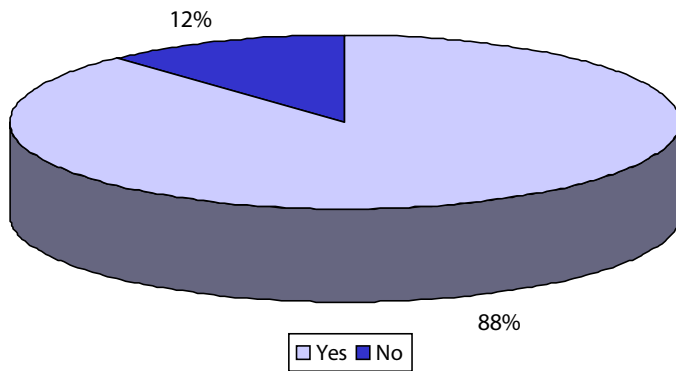
However, the survey results indicate that local employers have mixed impressions regarding the availability of skilled employees in Sonoma County. In fact, as illustrated in the adjacent graph, 69% of survey respondents rated their search for skilled employees as "somewhat difficult" to "very difficult". Survey respondents also reported that experienced scientists, engineers, and research specialists are the most difficult employees to find.

### How difficult is it for your firm to find skilled employees?

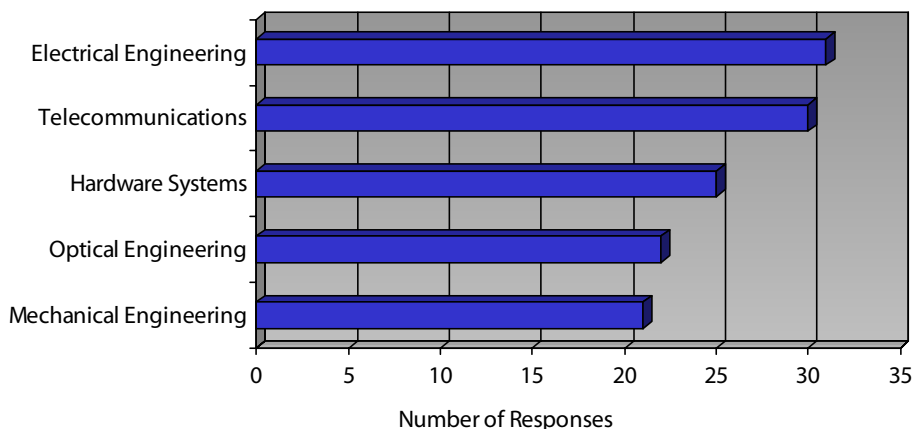
(1=Not a problem > 5=Very difficult)



### Do you think the North Bay needs a bachelor's program in engineering to fulfill local employment demands?



### Most Important Fields for Engineering Education in the North Bay



## Education

An important step toward remedying the lack of skilled employees in the above-mentioned technology fields is improving the availability and quality of local education programs. Many programs are already offered or currently in development, including the Master's Program in Computer and Engineering Science at Sonoma State University and the Telecom Certification program at the Santa Rosa Junior College Tech Academy.

However, according to survey results, local employers would support the creation of additional programs. More specific, 88% of survey respondents indicated a need for a B.S. program in engineering to meet employment demand at local companies. In addition, survey respondents singled out Electrical Engineering, Telecommunications, and Hardware Systems as the most important fields for the creation of a B.S. program.

From an economic development standpoint, the availability of local education options in industry fields characterized by significant job growth rates, such as engineering for the local technology sector, is extremely valuable. Indeed, as employers have noted, additional programs at the undergraduate level might keep talented students in Sonoma County, as well as provide companies with an important source for employee-based training.

## Employer Impact

Survey respondents provided additional support for the creation of an undergraduate program in engineering by estimating the potential enrollment from local firms. Indeed, as the adjacent graph shows, 53% of survey respondents reported that they would expect at least one employee from their companies to enroll in a B.S. program focused on engineering. In fact, based only on information gathered from the survey, a local B.S. program could potentially expect an enrollment of almost 70 employees from responding companies.\* By comparison, 47% of survey respondents did not foresee any enrollment from their companies.

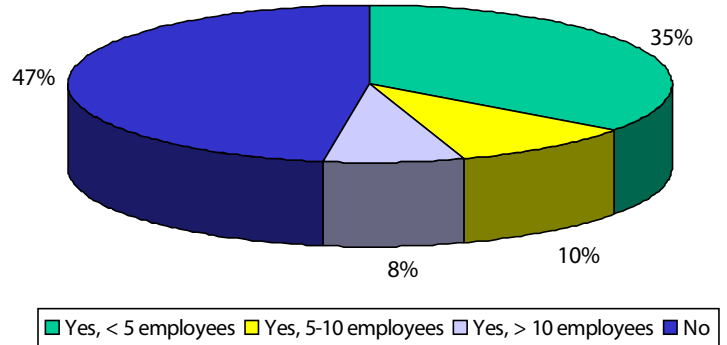
In addition, survey findings also captured a glance at the potential impact of a local B.S. program on the employee retention rates at technology firms. Regarding education options for their employees' children, 79% of survey respondents reported that an engineering program would have an "extensive" or "positive" impact on employee retention rates. By comparison, 19% of survey respondents suggested that it would have no impact at all.

## Reducing Commutes

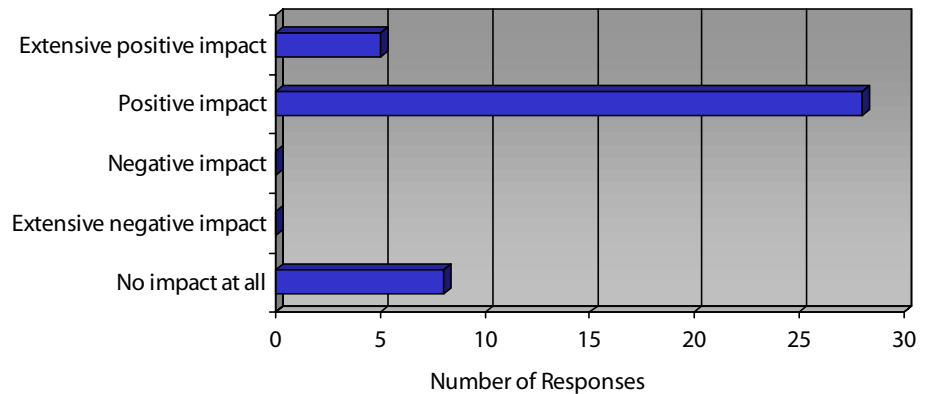
As traffic continues to present a challenge to this region's lauded quality of life, programs such as the ones highlighted in the graph found below--staggered work schedules, telecommuting, and ride shares--will be critical to maintaining a healthy business climate in Sonoma County. More than 80% of survey respondents have established at least one program to reduce employee commute times, and several companies have instituted every type of program listed on the chart.

Finally, survey respondents were also asked about steps toward reducing impact on the environment. Only two companies out of the 42 responding firms reported no substantial efforts. Programs highlighted in the survey responses ranged from basic recycling and conservation efforts to comprehensive impact reduction programs established at the corporate level.

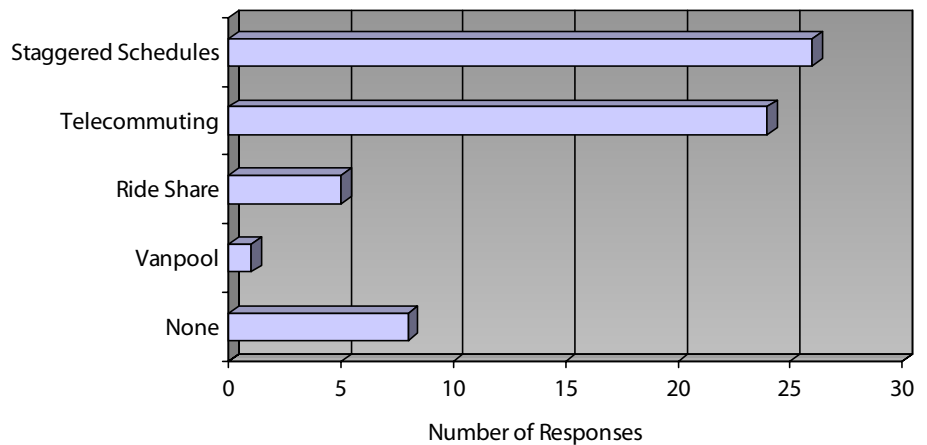
### Do you foresee any of your employees enrolling in an Engineering B.S. program?



### To what extent do you think businesses' employee retention rate would be impacted by the availability of a local engineering program for their employees' children?



### Company Programs to Reduce Commute Times



\* Calculated using minimum value from answer range (e.g., 5 if answered 5-10 employees expected to enroll)