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Developing High-Technology Communities: San Diego

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Purpose

The San Diego metropolitan area formerly depended heavily on one source of employment — military and defense contracting — that was controlled by employers based outside the region. Unlike many single-industry cities, however, San Diego was able to diversify and become a leader in several high-technology fields after its once-dominant employment source contracted sharply. Moreover, the city achieved its success without large infusions of federal or state funding. Because San Diego's success has been the envy of many other cities, this study was undertaken both to analyze how the economy there adapted so well and to provide lessons for other localities.

Scope and Methodology

Innovation Associates used a variety of techniques to document the change in San Diego's employment base, to show the diversity of its present-day economy, and to understand how mutually reinforcing interactions among university leaders and researchers, entrepreneurs, suppliers of capital, and local government officials have created an atmosphere that spawned a large number of new high-tech businesses. These businesses are grouped in a number of "industry clusters" as defined by the San Diego Association of Governments (SANDAG).

The report traces the transformation of the local economy from the 1980s to 1998, using such data as: employment by sector and industry cluster; number of firms; local, state, and national comparisons of unemployment rates, per-capita personal income, and retail sales; regional imports, exports, and cross-border manufacturing; and comparisons with other metropolitan areas for patent grants, Small Business Innovation Research awards, and venture capital investments. The data come from both public sources and special tabulations from numerous federal and state agencies, SANDAG, and private companies.

The contractor interviewed more than 30 government, university, non-profit, and corporate leaders. The report includes extensive details from an interview with University of California President Richard Atkinson, who served from 1980 to 1995 as chancellor of the University of California at San Diego (UCSD). In addition, there are profiles of key organizations and companies. Lessons for other communities are distilled into 16 findings.

Highlights

San Diego in the late 1980s and early 1990s was hard hit by defense cutbacks that caused severe economic dislocations for the local work force, particularly in aerospace and supplier industries. Less than 10 years later, all of the lost jobs have been replaced, mainly by new jobs in business services, high-technology clusters, and tourism. From 1990 to 1998, high-tech clusters added over 46,000 new jobs to the region. Jobs in biotechnology and pharmaceuticals

doubled, as did employment in software and computer services, while communications jobs grew by over one-half.

Small firms created nearly all these jobs. Except for a few major companies — such as Qualcomm, which started in San Diego in 1985 — the terms "technology firms" and "small firms" have become synonymous in the San Diego region.

The success of the region's ability to create and expand high-tech businesses is due to multiple factors, including a rich research and development (R&D) base, active university promotion of science and technology to local businesses, availability of a skilled work force, an involved business community, and public support.

The technology growth was not the result of a master strategic plan, and the region's business, academic, and public sectors did not initially act in unison. A failed bid in the 1980s to attract major national R&D centers taught San Diego about the importance of community cohesiveness.

The San Diego Regional Economic Development Corporation (EDC) took the lead in promoting greater community participation by private-sector leaders and involvement of the academic community to reduce the region's dependence on defense contracting. The EDC's efforts resulted in better networking among business leaders, a closer working relationship between UCSD and the business community, and improved communication among the public, academic, and private sectors. These efforts ultimately strengthened the region's environment for technology development.

San Diego's defense industries provided the base for spin-offs in fields such as wireless communications and computer and software services. Two of the largest homegrown technology firms — Science Applications International Corp. and Qualcomm — started by serving the defense industry but have since diversified. The rich R&D base left by the downsized defense firms provided fertile ground for new technology growth aimed at meeting the demands of emerging commercial markets. San Diego's world-renowned research institutions — the Scripps Research Institute and the Salk Institute for Biological Studies — also fostered growth in medical services, biotechnology, and medical device industries.

The development and growing prestige of UCSD was particularly important in promoting the development of high-tech firms in the region. UCSD not only trained many of the engineers and scientists who later took positions with new and growing high-tech firms, but also provided a valuable science and technology base for these firms. According to UCSD, most of the high-tech firms in the region were based on technology developed at the university or founded by its faculty or graduates. Programs at San Diego State University and San Diego City College also helped deepen the work force's entrepreneurial and technical skills.

A number of local organizations, each of which is profiled in the report, added a key element in developing a supportive environment for high-tech industries. One ingredient of the region's success has been the inclusive, cooperative spirit of these industry organizations.

Conclusions

San Diego's future as a technology community looks promising. Rapidly growing technology industries have pushed the unemployment rate below the national average and have set the stage for future growth. The legacy of UCSD's former chancellor, who created a nationally recognized research university, and the commitment of business leaders to build a technology region, should continue to provide a healthy environment for new technology-driven growth.

The high cost of living, transportation, and other issues may slow growth somewhat. Moreover, improvements in primary and secondary education, particularly for a growing minority population, will be essential to ensure a supply of skilled workers for technology industries. But in the near future San Diego's economy shows every sign of remaining healthy and growing, as it continues to diversify and as technology clusters in emerging markets continue to expand.

Ordering Information

The full text of this report, along with summaries of other studies performed under contract to the U.S. Small Business Administration's Office of Advocacy, is available on the Internet at *www.sba.gov/advo/research*. Printed copies are available from:

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