

# TEXAS

## —BUSINESS—♦—REVIEW—

Bureau of Business Research • McCombs School of Business • The University of Texas at Austin

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### Regaining Ground

#### Business Development and the SBIR Program in Texas

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The Small Business Innovation Research Program (SBIR) is a \$2 billion federal set-aside for small, technology-oriented business development. SBIR funding helps young firms bring their products to market. Texas, despite a richly deserved and growing reputation as a technology hub for business start-ups, lags behind many other states in the rate of participation in this vast program. This article examines the reasons for this and explores some ways to bolster the state economy by promoting entrepreneurship through greater participation in the SBIR program.

#### SBIR Defined

A congressionally-mandated budget set-aside, the SBIR Program was established in 1982 under the Small Business Innovation Development Act. It is intended to increase the participation of small businesses in federal research and development. Each participating government agency (those that spend more than \$100 million annually on external contracts and grants for R&D) must reserve 2.5 percent of its external R&D budget for competitively selected SBIR awards to small businesses. In government fiscal year (GFY) 2004, the SBIR set-aside pool is approximately \$2 billion. A sister program, the Small Business Technology Transfer (STTR) Program, was added in 1992. STTR differs from SBIR only in the required involvement in the project of a research institution, such as a

university. Universities may be included in SBIR projects, but only in a consulting or subcontracting role. For purposes of this discussion, the two programs will be considered together.

The SBIR Program taps into the innovativeness and creativity of the small business community to help meet government R&D objectives. In return, these small companies have the opportunity to develop technologies, products, and services that they can then commercialize through sales either in the private sector or back to the government. Projects are styled as grants or contracts from a government agency for work on a specific project, problem, or program of that agency, and applicants must meet only four requirements for eligibility (see sidebar, page 2). The awards are modest: typically about \$850,000, available over two to three years, for work on first, the feasibility of the entrepreneur's idea to the government's problem and second, prototype development. The intellectual property created during the project belongs to the entrepreneur. That means that the small business retains all patent rights, but the government retains the right to use any resulting products without paying royalties.

#### Funding Phases

The twelve participating SBIR agencies (see sidebar, page 3) select the technical topics—that is, problems or problem areas for which they are seeking solutions—for

To be eligible for SBIR participation, a small business must:

1. Be U.S.-located and -owned (at least 51 percent) and independently operated
2. Employ no more than 500 workers
3. Use an employee of the small business (or of the university for an STTR) as the principal researcher
4. Be organized for making a profit

their solicitations, publish the topics on their websites, and provide guidelines for proposal content and submission. Small businesses search for a match with their capabilities and prepare proposals that show the feasibility of solving the government problems with innovative applications of their technology.

The agencies review, rate, and rank the proposals according to four criteria: degree of originality, technical merit, credibility of the proposing team, and future market potential.

On average, one proposal out of every seven is awarded.<sup>1</sup> In the initial project stage (Phase I), agencies issue the awards in the form of a grant or contract, typically around \$100,000 for periods between six and twelve months. Phase I awardees complete the work on the feasibility study, provide reports, and, upon invitation, submit a proposal for Phase II (the “proof of concept” stage). On average, one in three of these proposals is funded. These awards are much larger, usually for around \$750,000 for a period of up to two additional years. Finally comes Phase III, commercialization. At this stage, the technology is packaged for “end use,” either by the government or the private sector. No SBIR set-aside funding is available, but agencies that do deploy technology (e.g., Department of Defense and NASA) offer a variety of ways to help their Phase III companies bring their technologies to market.

### The Multiplier Effect

Ann Eskesen, director of the Innovation Development Institute and one of the country’s leading authorities on the SBIR Program, estimates a significant award multiplier effect: for each SBIR dollar awarded to a company, five to seven dollars of economic benefit accrue to the economy of the state in which the company is located. Under this scenario, the \$135 million awarded to Texas companies over the period 2000-2002 produced an impact of just under \$1 billion on the Texas economy. At the same time, California saw a comparable SBIR economic impact of \$5.4 billion, and Massachusetts, \$3.8 billion.

The high-paying jobs created by the companies that win these awards provide

the basis for this economic multiplier. Each high-tech job created by an SBIR awardee has the potential to generate a half-dozen additional jobs directly supporting the primary high-tech employee. This, in turn, produces both demand for high-dollar equipment and instrumentation (thus supporting jobs at the companies that make and sell the equipment) and orders for materials and supplies consumed in the projects.

Consider also that several small businesses, as a group, can have an economic impact with more staying power than a single large company. The diversity of the mix of small businesses is less volatile to a local economy than the economic change that a single large business can cause with a decision that significantly affects the workforce of a community. Further, that large-company employer also typically has more lower- than higher-paying jobs.

### Texas and SBIR

Over the more than twenty years of the SBIR Program, 622 Texas companies have won a total of 2,166 SBIR awards, totaling \$547 million. Compare this, over the same period of time, to California (2,937 companies and 12,743 awards) and Massachusetts (1,234 companies and 8,649 awards). Obviously, Texas lags far behind other technology centers and, in fact, now ranks sixth overall in the total number of SBIR-awarded companies and number of SBIR awards, behind California, Massachusetts, Maryland, New York, and Virginia.<sup>2</sup>

The Department of Defense (DoD) and the National Institutes of Health (NIH) have funded most of the Texas SBIR awards. This is not surprising as these two agencies together control approximately 75 percent of all the SBIR money available. The figure below shows the distribution of the awards to Texas companies by agency.

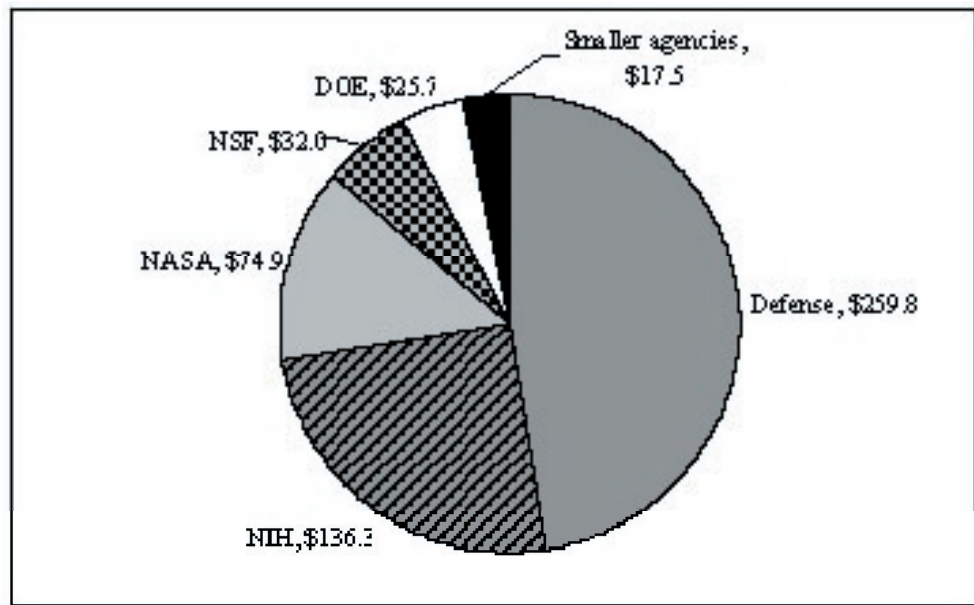
### Losing Ground

Not only is Texas falling behind in number of SBIR awards, it now also follows states it once topped in total awarded SBIR dollar amounts. According to records kept by the Small Business Administration, which administers the SBIR Program

The twelve SBIR participating agencies for GFY 2004 are:

1. *Department of Agriculture*
2. *Department of Commerce*
3. *Department of Defense*
4. *Department of Education*
5. *Department of Energy*
6. *Department of Health and Human Services*
7. *Department of Homeland Security*
8. *Department of Housing and Urban Development*
9. *Department of Transportation*
10. *Environmental Protection Agency*
11. *NASA*
12. *National Science Foundation*

**SBIR Awards to Texas by Agency**  
(millions of \$)



**Source:** Innovation Development Institute, Swampscott, MA, copyright 2003, all rights reserved. Data are for 1983-2003 (partial).

on a national level, Texas ranks eighth among states in the total amount of recent SBIR dollars awarded. The table on page 4 shows the state rankings for the combined totals of the years 2000 through 2002, the last year for which complete data has been tabulated. Clearly, California and Massachusetts continue to dominate the picture.

Why do California and Massachusetts excel in the acquisition of SBIR funding while Texas trails so far behind some smaller states? One important reason is the lack of awareness of the potential economic benefits of SBIR Program on the part of both the large industrial base and the entrepreneurial community. With the focus almost entirely on the outreach effort to draw new participants into the SBIR Program, the state offers little in the way of the encouragement, support, and support necessary to move Phase I award winners along to Phases II and III or to seek multiple awards to build a portfolio of technology solutions.

In fact, of the 622 Texas companies that have won SBIR awards since its incep-

tion, 45 percent never progressed beyond a Phase I project. Another 28 percent received awards for both Phases I and II for a single project. In the past twenty-one years, then, only about 100 Texas companies have stayed with the program.<sup>3</sup>

### Prototypes for Texas?

At present there is no statewide Texas organization chartered with promoting SBIR participation with a focus on bringing technology to an end use. In the mid-1980s, the Texas Department of Economic Development housed an SBIR liaison office, but it was closed in the early 1990s due to budget cuts. Small Business Development Centers (SBDC), which operate through university affiliations in Dallas, Houston, Lubbock, and San Antonio, direct several independent and informally coordinated SBIR outreach efforts. These SBDC centers offer forums and seminars, but because of inadequate budgets and funding, these efforts result in only a limited local or, at best, regional impact. Although

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### State Rankings According to Total SBIR Award Dollars (GFY 2000-2002)

State	Total SBIR awards	
	millions\$	number
California	773.1	3,013
Massachusetts	546.8	2,084
Virginia	221.1	835
Maryland	184.8	715
Colorado	183.5	744
Ohio	154.9	576
New York	143.3	572
Texas	135.0	577
Pennsylvania	129.7	523
New Jersey	110.7	428

**Source:** Innovation Development Institute, Swampscott, MA, copyright 2003, all rights reserved.

they provide proposal support, most of these centers lack hands-on experience with either administering SBIR projects or running a high-tech business, and they are ill-equipped to provide Phase II or commercialization guidance.

Following the SBA's introduction of the program for Federal and State Technology (FAST) grants for SBIR support, the four Texas SBDCs pooled resources and won \$100,000 grants for the state in 2001 and in 2002. Unfortunately, the \$25,000 portion for each center was not enough to make much of an impact. The SBA did not offer FAST funding in the most recent fiscal year, but has just announced its resumption for 2004.

Contrast the lack of statewide SBIR coordination in Texas with Virginia's experience, for example. As an agency of the Commonwealth of Virginia, the Center for Innovative Technology (CIT) is administered by a board of directors appointed by the governor. In keeping with its mission to "accelerate Virginia's next generation of technology and technology companies," CIT maintains an aggressive program for SBIR awareness and education. The center

sponsors well-publicized annual statewide SBIR conferences that attract hundreds of Virginia companies to hear presentations from SBIR program managers and others. The accompanying expo draws a wide variety of both large and small businesses, governmental entities at all levels, and universities to display and provide information of interest to entrepreneurs.

Well funded, CIT attracts many grants and matching fund bequests to supplement the Commonwealth funding and maintains regional offices, and an experienced staff of advisors, which conduct very effective entrepreneurial support activities aimed at all three SBIR phases.

The top rankings of California and Massachusetts may be explained in part by their cultures of entrepreneurship. The entire culture of Silicon Valley in California and of the Route 128 corridor in Massachusetts promotes the development of small high-tech businesses. This gives small businesses the resources, the atmosphere, and the support necessary for enthusiastic pursuit of SBIR awards. Potential Phase II and Phase III partners are plentiful. Texas companies simply do not enjoy anything comparable.

The permeability of the university culture in California and Massachusetts also contributes to SBIR success. Consider Stanford and MIT as the primary examples. Academic information regarding technology flows freely in and out, and entrepreneurial activity by faculty is accepted, even encouraged. In addition, as private institutions, these universities are not encumbered by "public funds" issues, that is, using taxpayer dollars for the support of private enterprise. In fact, they set the political standard for all university entrepreneurial behavior for those states. Businesses are comfortable in turning to the universities for support, and vice versa. The net result is the opening of vast resources for SBIR participation and support.

The dominant higher education and research institutions in Texas, the University of Texas and Texas A&M, are both publicly funded. Although the privately supported Rice University promotes entrepreneurial activities by its faculty, it



is too small to have wide-ranging impact. The state-chartered University of Houston has obtained a large number of SBIR and STTR subcontracts, most from NASA, and the University of Texas at Dallas has been similarly supportive of biotechnology-related subcontracts. Even combined, however, these efforts are not enough to define an academic culture of entrepreneurship even close to that of California or Massachusetts.

## Changing National Priorities

The SBIR Program continues to evolve as the nation's priorities change. For example:

- The National Science Foundation recently announced a special section of SBIR awards for security technologies that require the convergence of at least two of the following three technologies: nanotechnology, biotechnology, and information technology (both hardware and software).

- The EPA recently named three special topic areas: Hazardous Waste Minimization, Pollution Prevention, and Arid Climate Environmental Concerns.

- The Department of Defense announced two extra solicitation periods in this fiscal year.

- The Department of Homeland Security added a new solicitation (not previously scheduled) for May 2004.

- President Bush recently signed an Executive Order requiring all agency SBIR Program managers to "give high priority within [SBIR] programs to manufacturing-related research and development."

Texas can benefit from these new priorities. With its well-established and rapidly growing nanotechnology, biotechnology, information technology, environmental management, defense and security, and basic manufacturing sectors, the state is positioned to take advantage of the opportunities SBIR provides. Obviously, more support is needed to bolster companies' Phase II and Phase III efforts.

This is where support organizations come in. By channeling a portion of their

outreach to companies that have already won Phase I awards, these organizations could facilitate the transition from research and development to production, furthering Phase II and III efforts by initiating and supporting communication with larger entities and with financing sources.

Awareness of the need for such efforts is growing. In January of this year, Congresswoman Eddie Bernice Johnson, 30th Congressional District, convened a field hearing of the Research Subcommittee of the House Science Committee in Dallas to explore why firms in that area have won so few SBIR awards in recent years. Although the hearing prompted more questions than answers, the panel members represented business, government, and educational interests—that is, a cross-section of the groups that will need to coalesce around the goal of improving the state's sluggish SBIR award performance. These interests must work together in a formal effort to support entrepreneurial growth and foster a competitive advantage for Texas businesses by helping them convert concepts into products.

## Notes

1. [www.SBIRcoach.com](http://www.SBIRcoach.com)
2. Data based on information provided by the Innovation Development Institute, Swampscott, MA, in December 2003.
3. Of the \$547 million SBIR funds awarded to Texas companies since the beginning of the program in 1982, 30 percent has gone to only 1 percent (or six) of the awarded companies. The so-called Big Six have so dominated the SBIR history in Texas as to be responsible for one-third of all the SBIR awards ever won in the state. ♦

"SBIR bets on the ideas of innovative small tech firms, often in emerging areas because there is less established competition in new areas. Small firms go after the gold ring of breakthroughs with considerable passion and are willing to work long and hard to achieve it. Federal economic policy ought to recognize the value of this and why this initial government financing at the idea stage is so critical to innovation."

— Roland Tibbetts

*SBIR Program Manager, National Science Foundation, 1976-1996, and universally recognized "founder" of the SBIR Program*

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**SBIR Dollars to Texas Firms  
 1983-2003 (partial)**

<b>Dollar range</b>	<b>Number of firms</b>	<b>Percentage of firms</b>	<b>Total \$ (millions)</b>	<b>Percentage of \$</b>
More than \$10 million	6	1	\$160	29
\$5-10 million	10	2	\$76	14
\$2-5 million	32	5	\$92	17
\$1-2 million	58	9	\$82	15
\$500,000-\$1 million	129	21	\$91	17
\$101,000-499,000	106	17	\$25	5
\$100,000 or less	281	45	\$18	3
<b>Total</b>	<b>622</b>		<b>\$544</b>	

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