



## Testimony

Before the Committee on Small Business,  
U.S. Senate

For Release on Delivery  
Expected at 10:00 a.m.  
Thursday, June 21, 2001

# FEDERAL RESEARCH AND DEVELOPMENT

## Contributions to and Results of the Small Business Technology Transfer Program

Statement of Jim Wells, Director  
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G A O

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Mr. Chairman and Members of the Committee:

We are pleased to be here today to discuss our review of the Small Business Technology Transfer (STTR) Program.<sup>1</sup> Research and development (R&D) is vital to the long-term health of industry and the national economy. The nation's research institutions—universities and colleges, federal laboratories, and nonprofit research centers—have impressive scientific capacity but often have limited capability to translate research results into marketable technologies. On the other hand, small businesses have a well-earned reputation for bringing new ideas to the marketplace but often lack the resources to carry out extensive R&D. In an effort to join the ideas and resources of the research institutions with the commercialization experience of small businesses, the Congress authorized the STTR Pilot Program in 1992 and reauthorized it in fiscal year 1997. The STTR program is closely modeled on the Small Business Innovation Research (SBIR) Program. Since the first grants became available in 1994, the STTR program has awarded approximately \$300 million to small businesses and research institutions to foster R&D. The program is scheduled to expire in September 2001.

In preparation for the review and potential reauthorization of the STTR program, we obtained information from companies participating in the program. In particular, we focused on the companies' views concerning (1) the contributions made by the companies and the research institutions; (2) the results of the R&D; and (3) options for the future relationship between the STTR program and the SBIR program. In conducting our work, we surveyed all 166 companies that had received STTR awards for further idea development in fiscal years 1995 through 1997, the first 3 years when such awards were made. We chose to analyze these early years because studies by experts on technology development have concluded that 5 to 9 years are needed for a company to progress from a concept to a commercial product. Our results are based on responses from companies for 102 projects. We did not independently verify the information that they provided.

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<sup>1</sup>*Federal Research and Development: Contributions to and Results of the Small Business Technology Transfer Program* (GAO-01-766R, June 4, 2001).

In summary, the companies reported that both they and the research institutions made considerable contributions to the R&D, such as knowledge and/or expertise essential to the project. They also created new partnerships that were effective in achieving technical objectives. However, the companies reported that they played a substantially greater role than the research institutions in originating the key ideas for the R&D. The companies further reported a variety of results from the R&D, including the sales of products, processes, or services; the receipt of additional developmental funding beyond the original STTR funding; and patents granted. Finally, when asked for their view of the STTR program in relation to the SBIR program, about half of the companies expressed a preference for maintaining the current separation of the STTR and SBIR programs.

## **Background**

Five agencies participate in the STTR program: the Department of Defense, the Department of Energy, the Department of Health and Human Services' National Institutes of Health, the National Aeronautics and Space Administration, and the National Science Foundation. Each agency manages its own program, while the Small Business Administration plays a central administrative role, issuing policy directives and annual reports for the program. Each agency having an external R&D budget in excess of \$1 billion annually must set aside not less than 0.15 percent of that budget for the program.

As you know, the 1992 legislation authorizing the program established a three-phase structure for it. The first phase, not to exceed 1 year, is designed to determine the scientific, technical, and commercial merit and feasibility of a proposed idea. The second phase, which begins upon successful completion of phase I and is not to exceed 2 years, is designed to further develop the idea. The statute established \$100,000 and \$500,000 as the general funding limits for phases I and II, respectively. The third phase, in general, is expected to result in commercialization or further continuation of R&D. However, no STTR funding is provided for phase III. Additional developmental funding for phase III can include private sector funds and federal, non-STTR funds.

The STTR program is closely modeled on the SBIR program, which was established in 1982. Their key difference is that under the STTR program, a small business must partner with a nonprofit research institution. While this partnership is permitted under the SBIR program, it is not mandatory. This special STTR requirement reflects the fact that STTR was envisioned primarily as a technology transfer program, in which promising concepts originating in the nonprofit research community would move toward commercialization with the assistance of small businesses.

### **Company Views on Contributions Made by the Companies and Research Institutions**

For the 102 projects that we reviewed, the companies reported that both they and the research institutions contributed significantly to the R&D. For example, the companies believed that both parties contributed significantly to the knowledge and/or expertise essential to the project. Furthermore, they generally believed that both parties contributed significantly in constructing or testing prototypes and in providing special equipment or facilities.

The companies also reported that they and the research institutions were effective in creating new partnerships to conduct the R&D. At the time that they received the phase I award, 70 percent of the companies reported that they did not have a formal working relationship with the research institution. In addition, about half of the awards went to companies whose employees had not previously worked with the specific researcher(s) associated with the award. Moreover, the companies viewed the partnerships favorably. For about 90 percent of the awards, the companies reported that negotiations involving intellectual property rights and business transactions were very fair or generally fair. Also, for about 90 percent of the awards, the companies reported that the partnerships were very effective or generally effective in achieving technical objectives.

However, the companies reported that they played a substantially greater role than the research institutions in originating the key ideas for the R&D. In their view, they

originated, or were primarily responsible for originating, the key ideas in 72 percent of the projects. The companies reported that research institutions originated, or were primarily responsible for originating, the key ideas in 19 percent of the projects and that both the companies and the research institutions contributed equally to the key ideas in 5 percent of the projects.

### **Company-Reported R&D Results**

The companies reported a variety of results from the R&D. Of the 69 projects active in phase III, 51 had sold a product, process, or service; obtained additional developmental funding; or both. As of April 2001, the companies reported about \$132 million in total sales. About two-thirds of the projects with reported sales achieved their first sale in 1999 or 2000 and projected about \$900 million in additional sales by December 31, 2005.

Companies reported receiving about \$53 million in additional developmental funding. About \$22 million (or about 41 percent) of this funding originated from federal sources. The remaining \$31 million was provided by companies receiving the awards (\$10 million); other private companies (about \$12 million); venture capitalists and private investors (about \$5 million); and research institutions, state institutions, and others (about \$4 million).

The companies also reported obtaining 41 patents for the core technologies associated with their projects and the creation of 12 spin-off companies. However, they also reported discontinuing 27 projects. When asked to identify factors that had a great role in the decision to discontinue a project, companies most frequently cited insufficient additional funding for further technical development.

Companies with active projects in phase III also reported a variety of ongoing discussions or finalized agreements with other companies in the United States and in foreign countries. For example, for almost half of these active projects, companies reported ongoing discussions for licensing agreements, and for about one-fifth, companies reported finalized agreements. Companies also reported that about 70

percent of their active projects were associated with ongoing negotiations for joint venture agreements and marketing and distribution agreements.

### **Company Views on Options for the Future Relationship Between the STTR and SBIR Programs**

Most of the companies responding to our survey expressed a preference for maintaining the current separation of the STTR and SBIR programs. In our survey, we asked the 97 companies who had also won SBIR awards to choose among four options for the future of the STTR program in relation to the SBIR program. The results were as follows: (1) companies associated with 47 percent of the STTR projects preferred preserving the current separation of the STTR program from the SBIR program, (2) those associated with 33 percent of the projects favored subsuming the STTR program under the SBIR program with a portion of funds reserved for STTR-type partnerships, (3) companies involved with 19 percent chose subsuming the STTR program under the SBIR program with no funds reserved for STTR-type partnerships, and (4) companies involved with 1 percent supported eliminating the program.

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Mr. Chairman, this concludes my prepared statement. I would be happy to respond to any questions you or the Members of the Committee may have.

### **GAO Contact and Staff Acknowledgments**

For future contacts regarding this testimony, please call Jim Wells at (202) 512-3841. Robin Nazzaro, Dennis Carroll, Vondalee Hunt, and Lynn Musser also made key contributions to this testimony.

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