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FEDERAL RESEARCH

Lessons Learned From the Pilot Technology Access Program



**Resources, Community, and
Economic Development Division**

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Congressional Committees

Public Law 102-140 required the U.S. General Accounting Office (GAO) to issue two reports on the Pilot Technology Access Program (TAPP), which was to establish special technology assistance centers to deliver counseling, training, and research assistance to small businesses. Our first report,¹ issued in March 1994, discussed the program's implementation and progress after the first 2 years. Shortly after the issuance of our first report, the Congress decided not to fund TAPP beyond fiscal year 1995, its fourth year.

This second and final report on TAPP discusses the status of the TAPP centers in the fourth and final year of federal funding as well as our observations on lessons learned during the pilot. We believe these observations could be beneficial if the Congress reconsiders such a program in the future. Details on our objectives, scope, and methodology; a summary of federal funding for TAPP; a discussion of evaluation concerns raised in our interim report; and detailed descriptions of each of the TAPP centers are included as appendixes to this report.

Results in Brief

The Pilot Technology Access Program is in its final year of federal funding and five of the six original centers remain in the program. The sixth has continued on its own, although on a reduced scale, since the program's second year. While each of the centers planned to continue its program beyond fiscal year 1995, each was not sure how it would be organized, what levels of services it would provide, or how it would be funded.

In 1994, the five centers still in the pilot program served 1,840 "client" companies, of which 59 percent were manufacturers and 66 percent were businesses just getting started. The services provided to these companies were evenly divided between technical and nontechnical information and included such assistance as patent searches, literature searches, assistance in identifying potential markets, and counseling by experts in specific technical areas. While the impact of the pilot program is unknown, clients responding to "satisfaction surveys" in the program's final year appeared to be pleased with both the operations of the centers and the services provided. Similarly, officials within the centers were pleased with

¹Federal Research: Interim Report on the Pilot Technology Access Program (GAO/RCED-94-75, Mar. 7, 1994).

the way their programs had developed and provided examples of individual projects they believed had produced favorable results. Federal funding for the TAPP centers totaled \$3,537,000 for the 4 years the program was in existence.

Because the pilot program is not being funded past fiscal year 1995, we identified no issues that need resolving currently. However, we have made some observations on issues, or “lessons learned,” that may be useful if the Congress decides to pursue such a program in the future. These observations include (1) adding more specificity to the goals and objectives of the program; (2) determining whether a separate and distinct federal program is even necessary and, if so, what type of organization is best suited to manage it; and (3) deciding how the program should be funded, including a look at whether it could operate at least partially on a fee-for-service basis.

Background

TAPP was established originally by section 232 of the Small Business Administration Reauthorization and Amendments Act of 1990 (P.L. 101-574). In October 1991, Congress repealed the earlier authorization in section 609 of Public Law 102-140 and replaced it with the current program. Intended from the start to be a pilot program, the law authorized funding for 4 years, not to exceed \$5 million a year. In mid-1994, the Congress decided that it would not reauthorize TAPP beyond fiscal year 1995.

TAPP was modeled after Minnesota Project Outreach, a state program that provided small businesses with access to computerized databases and technical experts. Services for Project Outreach were provided under contract by Teltech Resource Network Corporation (Teltech), a Minnesota-based, national supplier of technical and business knowledge. The Minnesota program was regarded as a success in providing user-friendly services to small businesses that would not otherwise have the means or the ability to obtain needed technical information. Its success provided the stimulus for the TAPP legislation.

The law made three agencies responsible for administering TAPP. The Small Business Administration (SBA) was authorized to make grants to competing Small Business Development Centers (SBDC), which had to obtain matching contributions at least equal to the awards. SBA was to coordinate with the National Institute of Standards and Technology (NIST) and the National Technical Information Service in establishing and

managing the program. According to NIST officials, only SBA and NIST took an active role in program administration because the National Technical Information Service is an agency whose primary role is to collect and disseminate scientific, technical, engineering, and business-related information generated by other federal agencies and foreign sources. In early 1991, NIST and SBA signed a memorandum of understanding that resulted in NIST's implementing TAPP on behalf of and in close cooperation with SBA.

SBA administers TAPP through its Office of Small Business Development Centers, which is responsible for setting policies, developing new approaches, monitoring compliance, and improving operations for the SBDCs. NIST manages and monitors TAPP through its Manufacturing Extension Partnership (MEP), a network of organizations to help American manufacturers increase their competitiveness nationally and internationally through ongoing technological deployment.

The SBDCs, which provide counseling and training to existing and prospective small businesses, were chosen as the local level through which TAPP services would be provided. As of July 1994, there were SBDCs and subcenters at 750 geographically dispersed locations nationwide, as well as Puerto Rico and the Virgin Islands. Counselors at the SBDCs are knowledgeable in the needs of small businesses and are experienced in working with them.

The first TAPP grants were made for fiscal year 1992 and went to SBDCs in Maryland, Missouri, Oregon, Pennsylvania, Texas, and Wisconsin. Oregon dropped out of TAPP after fiscal year 1993 when it was not able to obtain matching funds; however, it has continued to operate without federal funding on a reduced scale. The remaining five centers continued to receive TAPP funds through fiscal year 1995. As shown in appendix II, federal grants to the six TAPP centers for the 4 years of the program totaled \$3,537,000.

While the centers have differed somewhat in the way they chose to deliver services, the basic model for each center is the same. First, the center offers its clients access to a variety of on-line databases. These databases cover technical areas such as product development, patents, and manufacturing processes as well as nontechnical areas, such as market research and vendor listings. Secondly, the center links the clients with experts who can provide specific assistance. Typically, services are provided for free or at a nominal charge and may be augmented by other

SBDC programs and services. Appendixes IV through IX describe each of the current and former TAPP centers.

In our first report on TAPP, we raised concerns about the evaluation methodology for measuring the program's impact. Although NIST subsequently identified a strategy to address these concerns, this issue is now moot because the program will not be funded past fiscal year 1995. (See app. III.)

Although Fully Operational in Its Fourth and Final Year, TAPP's Impact Is Unknown

In our first report, we noted that TAPP had started slowly and that some of the centers, while making progress, were not operating in accordance with the statements of work in their proposals. This is no longer the case. In the program's fourth and final year, each of the five centers still in the program is fully operational. While the centers differ in some important respects, in many ways they have become more nearly alike in the types of services offered and the methods of delivering them.

SBA and NIST have not evaluated the impact on small business productivity and innovation either nationwide or within the individual states where TAPP centers were located. According to the limited responses to client satisfaction surveys, however, the businesses that used TAPP services were pleased with the services they received. Also, TAPP center officials were pleased with the way their individual programs had developed and provided examples of projects that had been successful.

At the time of our review, each of the TAPP centers planned to continue its program beyond fiscal year 1995. However, most officials within the centers were uncertain about how they would be organized, what services they would provide, or where they would obtain funding.

Most Clients Are Manufacturers, While Services Are a Mix of Technical and Nontechnical

Currently, the TAPP centers primarily serve clients with a need for new technology, many of whom are just getting started in business. Overall, the five TAPP centers still in the pilot program served approximately 1,840 clients in fiscal year 1994, ranging from 230 in Missouri to 445 in Wisconsin. According to Nexus Associates, a NIST consultant, 59 percent were manufacturers, 21 percent were service companies, 14 percent were wholesale and retail companies, and 7 percent represented other segments of the small business community. Forty percent of the clients had not yet established a business, and another 26 percent were involved in new

ventures. While there were some “repeat” clients, 89 percent undertook only one project during the period.

The five centers responded to 2,843 information requests during fiscal year 1994, ranging from 283 in Missouri to 847 in Pennsylvania. According to Nexus Associates and as shown in table 1, these projects were evenly divided between technical and nontechnical information, although there were differences among the centers.² A more detailed breakdown of the services showed an emphasis on product or process information and market research.

Table 1: Comparison of Technical and Nontechnical Projects by Five TAPP Centers, Fiscal Year 1994

Type of service	Percent
Technical	
Product and/or process	33
Patent and/or regulatory	13
Other	4
Subtotal	50
Nontechnical	
Market research	32
Management and/or vendor	10
Trademark and/or copyright	7
Other	1
Subtotal	50
Total	100

Source: Nexus Associates.

Database searches, rather than the use of technical experts, represent the primary type of service provided by the TAPP centers. As shown in table 2, for example, 65 percent of the projects in fiscal year 1994 were for literature searches. Only 9 percent of the projects were for expert and/or technical counseling.

²Nexus aggregated data may vary slightly from data on individual centers in appendixes. The data in the appendixes were obtained directly from the centers and their reports to NIST, while some Nexus data were drawn directly from the centers' automated systems at a later date.

Table 2: Comparison of Projects by Type of Service Provided by Five TAPP Centers, Fiscal Year 1994

Type of service^a	Percent
Literature search	65
Intellectual property search	13
Expert and/or technical counseling	9
Vendor search	6
Expert search	4
Other services	1
Total^b	98

^aA significant number of projects in Pennsylvania and Wisconsin were not categorized according to the type of service provided.

^bDoes not equal 100 percent because of rounding.

Source: Nexus Associates.

Those Clients Responding to Surveys Appear Satisfied With Both Centers and Services

The impact TAPP has had on business productivity and innovation cannot be measured because there are no substantive data. Moreover, because NIST cancelled its plans for evaluating the program's impact after funding was discontinued, no such determination will likely be made. NIST continues to collect data on client satisfaction; however, the surveys are of limited value because of the low response rate. For example, in fiscal year 1994 the response rate of the clients surveyed ranged from a low of 9 percent in Pennsylvania to a high of 46 percent in Wisconsin.

According to an analysis by Nexus Associates, those clients that did respond to the satisfaction survey for fiscal year 1994 indicated a high degree of satisfaction with TAPP services. The vast majority of those responding ranked the services they received as "good" to "excellent" and would recommend TAPP to other companies. Similarly, more than 90 percent of the respondents said that their requests for assistance received prompt attention. More than 80 percent said that the representatives who assisted them possessed the necessary skills. The overwhelming majority of the clients rated as "good" to "excellent" the helpfulness of the representatives and the relevance, currentness, and conciseness of the information received.

The estimated value of the services provided varied widely among the centers and their clients. The median value, according to the clients' estimates in their survey responses, ranged from \$101 to \$150 among the

centers; however, 19 percent of the clients responding to the survey placed a value of more than \$500 on the services they received. Those clients valuing the services at more than \$500 tended to (1) be new businesses, (2) focus on expert searches rather than vendor searches, and (3) request market research information rather than management or vendor information.

Two-thirds of the clients responding said that they were unlikely to have been able to obtain the information they received without TAPP. However, the level of satisfaction depended on the type of information requested. For example, while the majority of companies receiving patent information believed they could have received the information elsewhere, the majority of companies receiving management or vendor information believed it was unlikely they could have found this information elsewhere.

TAPP Center Officials Are Pleased With Their Progress

Officials at the five centers still participating in TAPP told us they were satisfied with the programs they had developed and believed that they were providing valuable services to their client businesses. While they could provide no statistics on the overall impact, they did provide examples of projects perceived as successful, such as the following:

- An environmental services company in Missouri feared it was infringing on an existing U.S. patent for monitoring gasoline contamination of groundwater around service stations and storage tanks. As part of an overall action plan, the TAPP center conducted a search of the technology that predated the patent. The company resolved the issue and was able to continue to market its services to test for leaks from storage tanks. TAPP center personnel also referred the company to other SBDC personnel who were able to assist it in preparing three Small Business Innovation Research project proposals to SBA.
- A Wisconsin manufacturer risked losing a major customer because the liquid crystal displays it was making were breaking too easily. Through a literature search by the TAPP center, the manufacturer identified a number of new databases and obtained information that it subsequently incorporated into its product improvement process. The company believes that the information helped it save an amount worth approximately \$2 million over a 2-year period.
- A Maryland software company specializing in adaptive network systems wanted to expand into markets beyond the airline industry it originally had targeted. The TAPP center performed a literature search for firms that were purchasing or producing financial yield predictive software. The company

was then able to identify and begin to market its products to two financial services companies that had advertised in trade journals their need to obtain revenue management tools.

According to TAPP center officials, there was a learning curve associated with developing their individual programs. They provided the following examples of some of the factors with which they had to deal:

- Technology must be “pulled by” rather than “pushed upon” the clients. Unlike large corporations, small business owners typically have limited budgets, time, and expertise. Technology is of little benefit to them in the abstract and must have practical applications that can be adapted to the marketplace. Thus, technology is best integrated when a center can provide assistance throughout the various stages of a product’s development or delivery.
- Promotion is essential because small business owners may not know that they need or can use the technology available. The centers must promote their services through such methods as advertisements in trade publications and seminars.
- A center’s services must be integrated into those of the SBDC. One of the challenges facing the TAPP centers has been internal promotion (i.e., getting other SBDC staff—whose focus has been toward business planning—to see the advantages of TAPP’s technical assistance services so that they can encourage small business owners to use them).

Because officials at each of the five TAPP centers still in the program believed their services were a valuable addition to the types of assistance the SBDCs provide, they said they planned to continue them after federal funding ends in fiscal year 1995. Because they did not know whether or how they would replace the federal funds, however, they were not certain how their programs would be organized or whether they would be able to provide the same level of services.

Lessons Learned Under TAPP Could Be Useful in Designing Future Programs

While federal funding for TAPP will be discontinued after fiscal year 1995, the interest in programs providing technical assistance to small businesses continues. Thus, it is possible that the Congress may reconsider the need for similar types of federal programs in the future. If so, the lessons learned under the pilot program could be useful. From analyzing 4 years of TAPP funding and operations, we believe the following questions need to be considered prior to funding any future program:

-
- What are the program’s specific objectives?
 - Is a separate and distinct federal program necessary to achieve these objectives?
 - How should the program be financed?

Objectives Need to Be Clear and Specific

While the authorizing legislation stated an ultimate goal for TAPP—increasing the innovativeness and competitiveness of small businesses through improved technology—it did not specify what level of increase was desired or how results could be measured. The law did say that the purpose of the program was “increasing access by small businesses to on-line databases that provide technical and business information, and access to technical experts, in a wide range of technologies...” However, it did not define these terms nor did it specify which, if any, segments of the small business community were to be targeted.

From the beginning, NIST and the SBDCs differed on the objectives and scope of TAPP. As noted in our earlier report, NIST was concerned that the services provided had too much of a marketing, rather than a technical, orientation and that many TAPP clients were small, local, retail businesses rather than technical or manufacturing concerns. NIST officials had hoped that, while there was no such requirement in the law, eventually 50 percent of the information provided by TAPP centers would be technical in nature.

Taking a broader view of technology in the context of TAPP, SBDC officials said that an underlying objective always must be the continued viability of the firms seeking assistance. These officials maintain that it is important not just to disseminate pure technology but also to encourage all businesses to take advantage of whatever technical information is available. This may mean using TAPP databases to obtain marketing information heretofore unavailable to them.

The issue seems to have resolved itself within the current program. Projects during fiscal year 1994 were evenly divided between technical and nontechnical information, according to Nexus Associates. NIST officials said they were pleased with the progress the centers had made toward giving TAPP a more technical focus.

A Separate Federal Program May Not Be Necessary

TAPP was not a new idea; technology assistance programs for small businesses have been available for some time. For example, both the Missouri and Pennsylvania SBDCs already had limited programs that were similar to TAPP in place when they received TAPP grants. Other states, such as New Mexico and North Carolina, have developed “technical” SBDCs on their own to promote and enhance technology transfer. Minnesota’s Project Outreach, which was the model for TAPP, has never received federal funding. Teltech is a private company that has provided technical services under contract to other organizations—including Project Outreach and TAPP centers—on a fee-for-service basis.

Generally, the SBDCs appear to agree that they should offer technical assistance to their clients and have begun to establish programs. In a 1991 survey of 56 state SBDC directors conducted by the Association of Small Business Development Centers, 42 directors (75 percent) said they were providing “client-assisted access to databases.” About 60 percent of the SBDCs were providing this service themselves, while the rest were referring their clients to some other organization on an informal or contractual relationship.

Eighty-eight percent of the SBDC directors responding to the survey said they were assisting clients in identifying experts who could respond to technical questions. However, only 23 percent of the SBDCs were providing this service on their own; the remainder referred clients to other organizations on an informal or contractual relationship.

The survey respondents also noted that they had made a long-term commitment to technical assistance programs. Thirty-three states or areas planned to expand their technology transfer and/or development services, including enhanced access to technical databases. Thirty-six states made capital available for research and development, new product development, and access to technology.

Technology assistance is also being provided to small businesses under federally sponsored programs other than those administered by the SBDCs. One example is the Manufacturing Technology Centers (MTC) NIST helped establish as a part of its MEP network. MTCs are regionally located and managed centers for transferring manufacturing technology to small and mid-sized manufacturing companies. MTCs use a wide variety of technology sources, including commercial firms, federal research and development laboratories, universities, and other research-oriented organizations. MTCs differ from the current TAPP centers in that they are regional in nature,

focus solely on pure technology, serve only manufacturers, and work with the same clients on an ongoing basis. However, an MTC can provide the same services to a manufacturing client that a TAPP center can provide. In fact, Minnesota's Project Outreach, which was the model for TAPP, is now a part of an MTC in the state.

Funding Options May Be Available

Federal appropriations for the TAPP program over its 4 years totaled \$3.5 million—far less than the \$20 million authorized. As shown in appendix II, none of the centers received more than \$200,000 in any one year. Actual budgets were larger, of course, because the law required matching funds.

SBDC officials agreed with our observation that the TAPP funding allowed them to create and operate dedicated technology-assistance programs that might not have been possible otherwise. One advantage was that the funding covered the start-up costs of the centers. During the first 2 years of the program, there was a considerable learning curve as the centers established their programs, developed a service mix, and promoted themselves to potential users. Another advantage was that the funding allowed the centers to provide services at little or no cost to prospective clients. The SBDC officials believed that this gave the centers the capability to offer a wider range of services and to serve more businesses.

The TAPP law envisioned technology-assistance centers within the SBDCs that eventually would be at least partially self-sustaining. For example, the law gave as one of the selection criteria “the ability of the applicant to continue providing technology access after the termination of this pilot program.” The law also encouraged the TAPP centers to try to obtain funds from other federal and nonfederal sources. In practice, most of the support came from the TAPP funding itself, the SBDCs, the states, or the educational institutions with which the centers were affiliated.

One option for funding a technology-assistance program is for the program to charge businesses a fee for the services they use. This is one reason the Oregon center has been able to operate after TAPP funding ended. During the program's first 2 years, the Oregon center received a total of \$325,000 in TAPP funds plus matching state funds. Since the end of fiscal year 1993, however, the center has relied on donations and client fees to operate. Currently, clients are charged \$30 an hour plus on-line expenses. According to Oregon center officials, clients pay an average of

approximately \$114 per search. During the TAPP years, client fees averaged about \$10 per search.

In 1994, fees totaled about \$7,500, or 19 percent, of the Oregon center's budget of \$40,000. Its director believed that, in some ways, the center improved after it began to be self-supporting because clients took them more seriously and were more cautious about the services they requested when they had to pay for them. At the same time, the Oregon center has had to scale down its operations now that it no longer receives federal grants and matching state funds.

While Minnesota's Project Outreach receives the bulk of its funding from state appropriations, it also charges a fee for services. For example, "client companies," which can access services directly, must pay an annual fee based on sales as well as a fee for certain services. An expert consultation, literature search, or vendor search costs a client company \$35 per use. There is no annual fee for "public access users," who can obtain services through remote terminals across the state. However, there is a higher charge for services, such as \$50 for a consultation, an interactive literature search, or a vendor search. In some cases, such as gaining access to certain information on the University of Minnesota's databases, there is no charge to either type of user.

The five TAPP centers still receiving federal grants in fiscal year 1995 had not generated any significant revenues by charging fees for services. Generally, the services were either offered to clients for free or for a fee well below what they would have cost if purchased from a private vendor. This was intentional because the centers used their free and low-cost services to attract clients who might benefit from their technical assistance. While some centers were considering fee-for-service arrangements as one possibility for funding services after the end of TAPP funding, they had not yet finalized any plans.

Conclusions

In its fourth and final year of funding, TAPP is fully operational in the five states still participating in the program. Each of the five states as well as Oregon—which dropped out of the program after fiscal year 1993—plan to continue on some level. However, the states are not certain how the centers will be organized, what services will be provided, or where funding will be obtained.

NIST officials are no longer concerned that the TAPP centers are focusing on marketing rather than technical services. Data from fiscal year 1994 indicate that about half the services being provided were of a technical nature, which is the ratio NIST envisioned at the program's inception. Moreover, 59 percent of the users were manufacturing companies. Generally, both the users and the SBDCs were pleased with the services being provided and the results achieved.

Because the Congress has decided not to extend TAPP funding past fiscal year 1995, we identified no issues that need to be addressed on the current program. If the Congress decides to fund a program similar to TAPP in the future, it may wish to consider some of the lessons learned, or issues that emerged during the pilot program. These include (1) adding more specificity to the objectives and goals of the program; (2) determining whether a separate and distinct federal program is needed and, if so, what type of organization is best suited to manage it; and (3) deciding how the program should be funded, including charging user fees for the services provided.

Agency Comments and Our Evaluation

A draft of this report was sent to both SBA and the Department of Commerce for comment. In its written comments, SBA generally concurred with the findings and conclusions in our draft report. (See app. X.) Commerce, whose comments are included in appendix XI, said that the report (1) contained information which incorrectly characterized TAPP, MEP, and the role of NIST in implementing TAPP and (2) did not provide an adequate context from which to determine the lessons learned from TAPP and how those lessons fit into an overall concept of technical assistance. Specific issues related to Commerce's two concerns are discussed below.

Commerce disagreed first with our characterization of the emphasis NIST placed on the technical orientation of the TAPP centers. For example, Commerce disagreed with our use of the term "scientific information" in describing the types of services NIST wanted to emphasize under TAPP and asked that we use the broader description "technology and technical information." Commerce also said that NIST officials had never set a 50-percent goal for such services but rather had sought a "balance" in technical and nontechnical services compared to marketing services.

We agree with Commerce's clarification that NIST wanted a technical, and not just scientific, orientation for TAPP and have revised our report accordingly. We disagree, however, that NIST did not set a 50-percent goal

for such services, as NIST and TAPP center officials discussed this goal with us during our work on both the interim and current reports.

Secondly, Commerce believed the report mischaracterized NIST's evaluation efforts regarding TAPP. For example, Commerce disagreed that NIST had "cancelled" its evaluation plans, as we had noted in our report. Instead, Commerce asserted that NIST had revised its evaluation methodology. Commerce also said the report improperly characterized Nexus Associates as a NIST consultant on TAPP when Nexus actually was a subcontractor to the University of Houston's SBDC.

Commerce also believed that the report did not elaborate sufficiently on the problems associated with evaluating TAPP. Commerce pointed out that there are no models that could be used to establish a clear correlation between the information provided by a TAPP center and increased productivity and innovation as well as other positive economic indicators. According to Commerce, the key determinant is not the information provided but what is done with that information. Developing proper models would require follow-up over a period of years with clients who are willing to share continuing and potentially sensitive feedback on how the information is being used and what changes it has generated in the clients' operations. Furthermore, Commerce said that we had previously agreed to fund and develop a survey that met our impact evaluation needs, as well as those of NIST and the TAPP centers.

We disagree with Commerce's assertion that NIST did not cancel its evaluation plans for TAPP. The discussion of this issue in our report focused on the evaluation of program impact. While NIST has continued to evaluate the program by collecting data from client surveys, we do not believe that these surveys address program impact. We have clarified this issue in our report. We also disagree that we mischaracterized the role of Nexus Associates. While Nexus was funded through the University of Houston's SBDC, it performed analyses of programwide information, was referred to as a TAPP evaluation consultant by NIST officials, and presented its analyses to NIST.

We agree with Commerce's comments on the problems inherent in evaluating TAPP. We made this point in the interim report when we stated that "the data needed to evaluate the effectiveness of the program are not yet available and may not be available for some time." We also stressed this point in November 1994 correspondence with the congressional committees when we agreed that the focus of this report should be on the

lessons learned from TAPP. Contrary to Commerce's comments, we did not agree to fund and develop the survey instrument.

As a third concern, Commerce said that the report needed to provide a better context for how the lessons learned under TAPP fit into the overall concept of technical assistance. Commerce believed that the most important question that we raised in considering future needs is whether a separate and distinct federal program, such as TAPP, is necessary. Commerce said that the types of services provided by TAPP are not "stand-alone" services and that they must be considered within the broader context of services available under MEP. While we agree with Commerce on this point, such an analysis was beyond the scope of this report.

Finally Commerce questioned the report's characterization of MEP. Commerce noted that MEP supports American manufacturers nationally and internationally through ongoing technological deployment, not through technological development as stated in the report. Similarly, Commerce believed the report did not go far enough when it said that an MTC can provide the same types of services to manufacturers that a TAPP center could provide to SBDC clients. Commerce said that MEP's manufacturing extension center organizations, of which the MTC is one type, actually can provide more such services.

We agree with Commerce's comments on the role of MEP and revised the report to say that MEP supports manufacturers through technological deployment. Also, we do not question that MEP may be able to provide more services to its clients than a TAPP center. We made no revisions to the report, however, as our point was to show that there are other organizations providing the same types of services as TAPP, rather than to compare the quality or quantity of the services provided.

We conducted our work between August 1994 and June 1995 in accordance with generally accepted governmental auditing standards. We are sending copies of this report to the appropriate congressional

committees; the Secretary of Commerce; the Administrator of SBA; and the Director, Office of Management and Budget. Major contributors to this report are listed in appendix XII. Please contact me at (202) 512-3841 if you or your staff have any questions.

A handwritten signature in black ink, appearing to read "Victor S. Rezendes". The signature is fluid and cursive, with the first name being the most prominent.

Victor S. Rezendes
Director, Energy and
Science Issues

List of Committees

The Honorable Christopher S. Bond
Chairman

The Honorable Dale L. Bumpers
Ranking Minority Member
Committee on Small Business
United States Senate

The Honorable Larry Pressler
Chairman

The Honorable Ernest F. Hollings
Ranking Minority Member
Committee on Commerce, Science,
and Transportation
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The Honorable Jan Meyers
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The Honorable John J. LaFalce
Ranking Minority Member
Committee on Small Business
House of Representatives

The Honorable Robert S. Walker
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The Honorable George E. Brown, Jr.
Ranking Minority Member
Committee on Science
House of Representatives

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Abbreviations

BIAS	Pennsylvania Business Intelligence Access System
BIC	Business Information Center
BFTC	Ben Franklin Technology Center
CLIS	College of Library and Information Services
GAO	U.S. General Accounting Office
MEP	Manufacturing Extension Partnership
MOTAP	Missouri Technology Access Program
MTC	Manufacturing Technology Center
NASA	National Aeronautics and Space Administration
NIST	National Institute of Standards and Technology
OIC	Oregon Innovation Center
PENNTAP	Pennsylvania Technical Assistance Program
SBA	Small Business Administration
SBDC	Small Business Development Center
TAP/Texas	Texas Technology Access Program
TAPP	Pilot Technology Access Program
Teltech	Teltech Resource Network Corporation
TEN	Technology Expert Network
TENIS	Technology Expert Network Information System
TPDC	Texas Product Development Center
WisTAP	Wisconsin Technology Access Program

Objectives, Scope, and Methodology

Public Law 102-140, enacted October 28, 1991, required GAO to issue two reports on the Pilot Technology Access Program (TAPP). The first, or interim, report was to discuss the program's implementation and progress. We issued our first report on March 7, 1994. The second report was to determine the program's effectiveness and impact on improving small business productivity and innovation.

Prior to our beginning work on the second report, we learned that the Congress did not intend to fund TAPP beyond fiscal year 1995. Therefore, we met with the authorizing committees to determine what work was needed to meet the legislative mandate and to provide the Congress with information it might be able to use on similar programs in the future. We agreed to report on the experiences of and lessons learned by the TAPP centers during the pilot program.

To carry out our objectives, we first met with the federal officials responsible for the management and the oversight of the program. These consisted of officials within (1) the Office of Small Business Development Centers (SBDC) in the Small Business Administration (SBA) and (2) the Manufacturing Extension Partnership (MEP) of the National Institute of Standards and Technology (NIST). We reviewed pertinent documents maintained by these agencies, including reports filed by the individual TAPP centers. We also reviewed materials prepared by a NIST contractor, Nexus Associates.

We visited each of the five TAPP centers still in the program in fiscal years 1994 and 1995. These centers were located in SBDCs in Maryland, Missouri, Pennsylvania, Texas, and Wisconsin. We also visited the center in Oregon, which dropped out of TAPP after fiscal year 1993. At each location, we reviewed budgets, reports, and other materials and talked with key officials within the TAPP center and the SBDC. We also met with clients to obtain their perspectives on the TAPP services they had received.

For comparison purposes, we visited Project Outreach in Minnesota, which was the model for TAPP; a technical SBDC in North Carolina; and a Manufacturing Technology Center in South Carolina. At each of these locations, we obtained an overview of the organization and services, met with key officials, and reviewed background documentation. We also talked with other persons who had background information on the technology needs of small businesses. These included the Association of Small Business Development Centers and two national associations that deal with small business issues.

Appendix I
Objectives, Scope, and Methodology

We asked both SBA and the Department of Commerce to provide comments on a draft of this report. SBA's written comments are included in appendix X, and Commerce's written comments are included in appendix XI. We incorporated their comments where appropriate. Also, we discussed the information included in the appendixes about each TAPP center with appropriate center officials.

Summary of Federal TAPP Funding

State	Fiscal year				Total
	1992	1993	1994	1995	
Maryland	\$50,400	\$50,000	\$170,000	\$140,000	\$410,400
Missouri	200,000	190,400	170,000	140,000	700,400
Pennsylvania	200,000	190,400	170,000	140,000	700,400
Texas	200,000	190,400	170,000	140,000	700,400
Wisconsin	200,000	190,400	170,000	140,000	700,400
Oregon	200,000	125,000	0	0	325,000
Total	\$1,050,400	\$936,600	\$850,000	\$700,000	\$3,537,000

Source: NIST.

Evaluation Issues Raised in Interim Report

The law authorizing TAPP required GAO to issue two reports on the program. The first, or “interim,” report was to address the implementation and progress of the program. A “final” report was to evaluate the effectiveness of the program in improving small business productivity and innovation.

On March 7, 1994, we issued our first report on TAPP entitled Federal Research: Interim Report on the Pilot Technology Access Program (GAO/RCED-94-75). In this report, we discussed the implementation of the six centers that had been established and concluded that it was too early to determine their impact on small businesses within their states. However, we did raise concerns about the evaluation methodology NIST had developed to measure such effects and the difficulties inherent in trying to link the information being provided with improving productivity.

NIST had not attempted to develop an evaluation plan during the program’s first year, when the centers were in the process of getting established. In March 1993, during the second year, NIST asked the centers to conduct a postcard survey similar to one used by the Maryland center. This survey asked clients using TAPP services (1) if they had received the information they needed, (2) if they had used the information for making business decisions, (3) what type of information was most useful, (4) if they would use the program in the absence of a subsidy, and (5) what prices they would consider paying for TAPP services. However, this attempt at evaluation had little effect because (1) only 60 clients were surveyed in Maryland and only 47 responded; (2) only three other centers conducted surveys; and (3) the other surveys did not ask the same questions, making comparisons among the centers impossible.

As a part of the fiscal year 1994 proposal process, NIST encouraged the centers to develop a standard client evaluation methodology. This would include three survey questionnaires of clients. The first would be a questionnaire on client satisfaction that would be distributed to clients immediately after a service was provided. The second questionnaire would ask about the impact of the service 6 months later. The third would ask clients how the service had affected the client’s competitive position in the market place a year after receiving the service.

In our first report, we raised questions about the reliability of the data that would be obtained through the use of these questionnaires. We said that the questions were not clear or precise, did not make a connection between program impact and increased productivity, and failed to ask basic questions regarding client satisfaction with the program. We

concluded that we had little confidence the questionnaires in their current form could be used to measure a center's effectiveness, particularly considering the anticipated low response rate.

In response to our first report, the Secretary of Commerce informed us in May 1994 that NIST planned to change its approach with the evaluation questionnaires. The changes would consist of (1) improving the initial client-satisfaction questionnaire; (2) eliminating the other two questionnaires to reduce the burden on TAPP clients; (3) replacing the two questionnaires that were dropped with a new survey instrument that better suited the requirements of GAO, NIST, and the TAPP centers; and (4) developing an analytic report of the data already being generated by the program. TAPP funds would be used to hire a consultant to develop the analytic report.

After learning that TAPP was not going to be funded past fiscal year 1995, NIST officials decided against pursuing most of the evaluation plans it had set out. Instead, the TAPP centers were instructed to use only the initial client-satisfaction questionnaire. Also, NIST provided the University of Houston with funding for a contract with Nexus Associates, Inc., to develop an analytic report using data the program generated. Nexus Associates already has prepared a presentation using statistics from reports the centers submitted and the results of the client evaluation survey for fiscal year 1994. In addition, NIST plans to have Nexus Associates critique the other two questionnaires originally intended to provide NIST with information it could use to plan evaluations of future programs.

Description of TAPP Center in Maryland

The Maryland Technology Expert Network (TEN) is a part of the Manufacturing and Technology SBDC located at and affiliated with the University of Maryland in College Park. TEN offers small business clients both on-line and off-line services in the form of literature searches, intellectual property searches, expert consultations, and document delivery. These services are used to complement other services offered these same clients by the SBDC.

While TEN has been a TAPP participant from the beginning, it has evolved over the years into its current configuration. For the first 3 years, services were provided by Teltech Resource Network Corporation (Teltech) under an exclusive contract. This contract was not continued in fiscal year 1995 because SBDC officials believed they could provide the necessary services in-house at a lesser cost and because they were seeking ways to become self-sustaining after the end of TAPP funding. Instead, the SBDC has contracted with the University of Maryland's College of Library and Information Services (CLIS), which provides essentially the same database services at a reduced cost. More than 90 databases in a variety of subjects are accessible through the university's library system. The SBDC also has access to experts associated with the university as well as external contacts.

TEN focuses on serving small manufacturing firms, technology companies, and technology-related service companies, such as systems integrators and environmental service companies. TEN informs potential clients of its services through (1) personal contact with SBDC clients; (2) newsletters of various trade organizations and state economic development agencies; (3) targeted mailings; and (4) training events, seminars, workshops, and conferences.

TEN has two key personnel that are responsible for its operations. The SBDC State Director provides program oversight while other SBDC staff inform clients of TEN services through their own counseling activities. Clients can access the center through any one of 28 locations throughout the state.

TEN personnel have developed the TEN Information System (TENIS), an automated management information system to gather and report evaluation data; process client-tracking statistics; and produce monthly reports on clients by access site, counselor, and date. TENIS is also used to control client invoice information to ensure timely collection of fees.

TEN personnel are primarily intermediaries between the client and the database vendor. Upon receipt of a client's request for a database search, the request is entered into TENIS and forwarded to the vendor. The vendor conducts the search and sends the results to TEN, which delivers them to the client. Search results are typically given in conjunction with business consulting services.

Maryland was not among the original states selected for TAPP in fiscal year 1992, the program's first year. Upon review, NIST and SBA determined that Maryland would be a good site for the program because of a large concentration of high-tech companies and several government research and development locations in the state. Maryland was added to the program at a reduced level of federal funding—\$50,400 compared to \$200,000 for each of the other centers. TEN subsequently received \$50,000 in fiscal year 1993, \$170,000 in fiscal year 1994, and \$140,000 in fiscal year 1995. TEN has received matching funds from the state, resulting in total state and federal funding of \$887,754 over the life of the program.

To supplement the funds available for its services, TEN has implemented a client fee structure. Initial searches are free, but the next four searches each require a \$25 fee for remote literature, patent, and vendor searches and a \$50 fee for expert consultations and literature searches. Clients are charged the market rate for the sixth and subsequent searches.

As shown in table IV.1, TEN served many segments of the small business community during fiscal year 1994. The 336 clients served represent an increase of 65 percent over fiscal year 1993. The greatest areas of concentration were in the service and manufacturing segments, which accounted for 82 percent of the clients served.

Appendix IV
Description of TAPP Center in Maryland

**Table IV.1: Maryland TEN Clients,
 Fiscal Years 1993 and 1994**

Industry	Number of clients		Percent of total	
	1993	1994	1993	1994
Agriculture	0	1	0	0.3
Construction	2	0	1.0	0
Manufacturing	53	90	26.0	26.8
Retail	39	46	19.1	13.7
Service	104	186	51.0	55.4
Wholesale	6	7	2.9	2.1
Other	0	6	0	1.8
Total^a	204	336	100.0	100.1

^aTotal may not equal 100 percent because of rounding.

Source: Maryland Manufacturing and Technology SBDC.

As shown in table IV.2, TEN responded to a total of 627 requests for database information during fiscal year 1994, an increase of 84 percent over 1993. Forty-one percent of these requests were of a technical nature.

Appendix IV
Description of TAPP Center in Maryland

Table IV.2: Maryland TEN Information Requests, Fiscal Years 1993 and 1994

Information requested	Number of information requests		Percent of total	
	1993	1994	1993	1994
Technical				
Legal (patents and/or regulations)	7	20	2.1	3.2
Process modification	24	67	7.1	10.7
Product modification	42	72	12.4	11.5
Other	34	95	10.0	15.2
Subtotal	107	254	31.6	40.6
Nontechnical				
Legal	1	4	0.3	0.6
Management	37	53	10.9	8.5
Marketing	177	299	52.1	47.7
Vendor	11	4	3.2	0.6
Other	7	13	2.1	2.1
Subtotal	233	373	68.6	59.5
Total^a	340	627	100.2	100.1

^aTotal may not equal 100 percent because of rounding.

Source: Maryland Manufacturing and Technology SBDC.

TEN currently attempts to measure client satisfaction and program impact through a survey mailed to the client after a service has been provided. This survey requests information on the quality of customer service, the quality of information received, the accessibility of information outside of TEN, the dollar value of information received, and the type of information most critical to the client. The response rate for the fiscal year 1994 survey was 39 percent. Client responses were generally positive. In summary, users found the information from TEN to be very helpful, relevant, and current. Thirty-one percent rated the value of the information at \$500 or more and 96 percent said they would recommend the services to others.

TEN uses client interviews as another form of data collection. The interviews are conducted some months after a client's use of TEN to determine its valuation of the economic impact of TEN service. Although few interviews have been conducted to date, TEN plans to begin client interviews on a larger scale in the third quarter of 1995.

SBDC officials were pleased with the performance of TEN and planned to continue the program after the termination of TAPP funding. By using services available through CLIS, TEN is transitioning to a state-sponsored program by providing services with instate resources and some combination of state funding, user fees, and corporate sponsorships. The total amount budgeted for the fiscal year 1995 CLIS contract is \$63,636. This figure includes \$40,295 to cover such fixed costs as salaries, equipment, and on-line subscriptions; and \$23,341 to cover such variable costs as supplies, telecommunications, expert consultations, and on-line searches.

According to SBDC officials, the new arrangement will have limitations. First, CLIS does not have a well-established and extensive database of technical experts from which to pull resumes. Thus, while TEN can identify experts through CLIS, its database is not as extensive as with Teltech. With time, TEN hopes to develop its own database of experts. Second, interactive searches are not as accessible by staff in the field as they were with Teltech. Interactive searches are now only conducted through the Manufacturing and Technology SBDC in College Park and to a lesser extent in Baltimore.

Description of TAPP Center in Missouri

The Missouri Technology Access Program (MOTAP) is a part of the Missouri SBDC and is affiliated with the University of Missouri in Columbia, the University of Missouri in Rolla, and Central Missouri State University in Warrensburg. MOTAP offers small business clients both information services and technical assistance in the form of literature searches, patent searches, expert consultations, and document delivery. These services complement other services the SBDC offers to other clients.

MOTAP is a coordinated effort between staff located at the three university campuses. The Missouri SBDC, located on the Columbia campus, houses the marketing component of MOTAP. The Technology Search Center in Rolla and the Center for Small Business Technology and Development in Warrensburg house the technical search capabilities. The Missouri SBDC State Director in Columbia provides management oversight for MOTAP.

MOTAP targets the manufacturing community. MOTAP informs potential clients of its services through (1) training events, (2) seminars aimed at the manufacturing community, (3) relationships with network partners who inform their clients about MOTAP, and (4) newsletters and targeted mailings. MOTAP also markets the program internally to SBDC counselors to inform them of its services.

The Missouri SBDC offered its clients on-line database searches and access to technical experts prior to federal TAPP funding. With TAPP funding, the SBDC hired two additional persons—one to conduct marketing database searches and one to provide technical assistance. TAPP funds increased the capabilities of existing SBDC functions and added the capability to provide marketing assistance.

Six people participate or are involved in the MOTAP marketing information search function in Columbia. A marketing specialist devotes 75 percent of his time to MO TAP and is supported by two research associates who devote 33 and 25 percent of their time to the program respectively. Three other persons handle programming and administrative functions.

Nine people perform the technical support function in Rolla and Warrensburg. Included are a technical project manager and a technology transfer coordinator who devote 76 and 25 percent of their time to the program, respectively. The remainder of the staff includes university faculty, a consulting engineer, and administrative support personnel.

Other SBDC staff also provide assistance by informing clients of MOTAP services through their own counseling activities. Clients may access MOTAP through any one of 12 regional SBDC locations, 17 university extension locations, or 2 special service centers.

The methods by which MOTAP services are provided may vary depending on the circumstances. Information services range from single answers to specific questions to lengthy “information counseling” projects that provide clients with information on a broad topic or opportunity. Such projects can involve multiple database searches, extensive data processing, and compiling reports. Technical assistance also varies from one-time answers to in-depth analyses of processes or problems by technical experts, student teams, field engineers, etc.

MOTAP staff at the three campus locations must coordinate their efforts to provide a complete package of marketing and technical services to their clients. For example, if the staff in Rolla performed database searches for market and patent information, this could lead to follow-on services provided by the staff in Warrensburg who provide assistance in developing prototypes, identifying manufacturing facilities, patenting advice, licensing contacts, and other technical services at no cost or on a cost-recovery basis.

MOTAP has been a part of TAPP since it began in fiscal year 1992 and has received \$700,400 over the life of the program. This includes \$200,000 in fiscal year 1992, \$190,400 in fiscal year 1993, \$170,000 in fiscal year 1994, and \$140,000 in fiscal year 1995. MOTAP has received matching funds from the state for each of these years, resulting in a total state and federal funding of \$1,419,130 over the life of the program. MOTAP also has collected a total of \$24,242 in client fees.

As shown in table V.1, MOTAP served many segments of the small business community during fiscal years 1993 and 1994. The 230 clients served represents a decrease of 9 percent from fiscal year 1993. The greatest area of concentration was in the manufacturing segment, which accounted for 64 percent of the clients served in fiscal year 1994.

Appendix V
Description of TAPP Center in Missouri

Table V.1: MOTAP Clients, Fiscal Years 1993 and 1994

Industry	Number of clients		Percent of total	
	1993	1994	1993	1994
Agriculture	5	3	2.0	1.3
Construction	6	5	2.4	2.2
Manufacturing	171	147	67.6	63.9
Retail	21	20	8.3	8.7
Service	40	41	15.8	17.8
Wholesale	10	10	4.0	4.3
Other	0	4	0	1.7
Total^a	253	230	100.1	99.9

^aTotal may not equal 100 percent because of rounding.

Source: Missouri SBDC.

As shown in table V.2, MOTAP processed a total of 283 information requests during fiscal year 1994, a decrease of 34 percent from fiscal year 1993. Fifty-five percent of these requests were of a technical nature.

Table V.2: MOTAP Information Requests, Fiscal Years 1993 and 1994

Information requested	Number of information requests		Percent of total	
	1993	1994	1993	1994
Technical				
Legal (patents and/or regulations)	174	68	40.6	24.0
Process development	38	19	8.9	6.7
Product development	70	68	16.3	24.0
Other	0	1	0	0.4
Subtotal	282	156	65.8	55.1
Nontechnical				
Legal	25	26	5.8	9.2
Management	13	8	3.0	2.8
Marketing	102	91	23.8	32.2
Vendor	7	2	1.6	0.7
Other	0	0	0	0
Subtotal	147	127	34.2	44.9
Total	429	283	100.0	100.0

Source: Missouri SBDC.

Although unsure why the number of clients served and requests answered declined in 1994 from the previous year, the state marketing specialist speculated that the floods Missouri experienced during July of 1993 reduced requests. Following the floods, many small businesses in Missouri may have been more concerned with repairing flood damage and related business slow downs than with identifying new business opportunities.

MOTAP uses several methods to measure the effectiveness of its services, including client surveys, seminar evaluations, and comments received from clients following visits to its business sites. MOTAP applies information received from these efforts to adapt its services, communications, and management practices.

MOTAP sends each client a satisfaction survey the quarter following the client's MOTAP project. The survey asks questions concerning the quality of MOTAP services, the perceived value of its information, and the likelihood of obtaining similar information outside of MOTAP.

The response rate for fiscal year 1994 was 29 percent. Client responses were generally positive. In summary, users found the information MOTAP provided to be helpful, current, concise, relevant, and of overall good quality. More than half of the respondents rated the financial value of the information higher than \$150. Forty-three percent of the respondents, however, felt their chances were at least "somewhat likely" that they could have obtained the information outside of MOTAP.

MOTAP experienced difficulties in evaluating the impact of its services because many respondents answered survey questions in a form that could not be tabulated. One reason is that respondents often provided descriptions of the ways they used the TAPP information but could not express its impact on their businesses in percentage or monetary terms. Another reason is the typical response rate on MOTAP questionnaires was approximately 25 percent. According to MOTAP officials, a rate this low does not allow a projection of the total program impact with any statistical confidence. Third, respondents often confused information obtained through the MOTAP program with information obtained through other SBDC services—which is understandable because MOTAP services are primarily delivered through SBDC counselors.

The Missouri SBDC is updating its survey techniques to minimize the problems with evaluating its services. For example, the Missouri SBDC is

developing an exit interview for clients so that the interviewer may ask follow-up questions that will help interpret the responses.

Although planning to offer its clients MOTAP services after federal funding ends in 1995, the Missouri SBDC is not sure how the services will be funded or provided. According to SBDC officials, on-line database searching and expert services have been an integral part of the package of services offered by the SBDC. The SBDC will most likely downsize the center and save only the most critical parts.

Description of TAPP Center in Pennsylvania

The Pennsylvania Business Intelligence Access System (BIAS) is a part of the Pennsylvania SBDC network and is affiliated with the University of Pennsylvania in Philadelphia. BIAS offers small business clients both on-line and off-line services in the form of literature searches, patent searches, expert consultations, and market analyses. These services are used to complement other services the SBDC offers these same clients.

According to the Pennsylvania SBDC State Director, the primary emphasis of the BIAS program is education, also one of the main goals of TAPP. He said many of the BIAS presentations to clients are not sales presentations, but workshops with clear educational goals. In addition to providing on-line services, SBDC consultants explain and often demonstrate technology to clients.

BIAS is implemented by the Ben Franklin Technology Center (BFTC), a small business incubator facility. The Pennsylvania SBDC contracted with the Business Information Center (BIC) of the BFTC to manage the BIAS program. The Pennsylvania SBDC State Director provides management oversight for BIAS. BIC is responsible for managing the research process and training both the SBDC consultants and the public. BIC also administers the contract with the database vendors—Telebase and Knowledge Express. Other vendors BIC can access include Batorlink, Internet, and Community of Science. These vendors provide access to more than 3,000 databases of business and technical information, including resumes of university experts from major research universities.

BIAS is the only TAPP center that did not contract with Teltech for the first year of the program. Because BIAS has access to the Pennsylvania Technical Assistance Program (PENNTAP), a network of experts, it elected not to contract with Teltech. For the second year of the program, BIAS decided to experiment with Teltech to attract more of its clients to request expert searches. However, because demand for expert searches remained low, BIAS did not renew the Teltech contract for the third year.

BIAS focuses on the manufacturing and technology sectors—particularly the advanced materials, biotechnology, and computer hardware and software development industries. BIAS also targets firms adversely affected by reductions in defense procurements, seventy percent of which are in manufacturing and technology-based industries. BIAS informs potential clients of its services through (1) personal contact with SBDC clients; (2) mailings and briefings to various trade organizations; (3) mailings to

potential clients; (4) news media and on-line networks; and (5) seminars, workshops, and conferences attended by SBDC clients.

Six months prior to federal TAPP funding, the BIC began providing on-line database searches to BFTC clients at a rate of \$75 an hour plus expenses. TAPP funding enabled the SBDC to subscribe to services provided by the BIC and offer them to SBDC clients at a subsidized rate. BIAS charges its clients 70 percent of on-line expenses exceeding \$75.

Under the management of the SBDC assistant state director, two professional information specialists at BIC devote 50 percent of their time to the center. Other SBDC staff also provide assistance by informing other clients of BIAS services through their own consulting activities. BIAS can be accessed through any one of the 16 university-affiliated SBDCs or 70 community outreach offices.

In contrast to other TAPP centers, Pennsylvania SBDC consultants are the main providers of BIAS services. After receiving training from the BIC's senior information specialist, these consultants perform most of the database searches for SBDC clients. BIC information specialists support the SBDC consultants and provide assistance for particularly difficult search projects. According to SBDC officials, this arrangement makes the service more accessible to clients, expands the SBDC's searching capacity, and strengthens the consultants' database searching skills.

Clients needing expert consultations are referred to PENNTAP, an in-state network of technical consultants. When using PENNTAP, clients are referred to technical experts by the PENNTAP regional staff person. These people identify the appropriate network expert and facilitate the consultation. Other experts can be identified using electronic databases.

BIAS has been in TAPP from the beginning and has received \$700,400 in federal funding. This included \$200,000 in fiscal year 1992, \$190,400 in fiscal year 1993, \$170,000 in fiscal year 1994, and \$140,000 in fiscal year 1995. BIAS has received matching funds from the state for each of these years.

As shown in table VI.1, BIAS served many segments of the small business community during fiscal years 1993 and 1994. The 427 clients served represent an increase of 45 percent over fiscal year 1993. The greatest areas of concentration were in the manufacturing and service segments, which accounted for 70 percent of the clients served.

Appendix VI
Description of TAPP Center in Pennsylvania

Table VI.1: Pennsylvania BIAS Clients, Fiscal Years 1993 and 1994

Industry	Number of clients		Percent of total	
	1993	1994	1993	1994
Construction	5	4	1.7	0.9
Manufacturing	99	148	33.7	34.7
Retail	33	56	11.2	13.1
Service	107	150	36.4	35.1
Wholesale	30	37	10.2	8.7
Other	20	32	6.8	7.5
Total	294	427	100.0	100.0

Source: Pennsylvania SBDC.

As shown in table VI.2, BIAS responded to a total of 847 information requests during fiscal year 1994, an increase of 112 percent over fiscal year 1993. Only 18 percent of these information requests were of a technical nature.

Table VI.2: Pennsylvania BIAS Information Requests, Fiscal Years 1993 and 1994

Information requested	Number of information requests		Percent of total	
	1993	1994	1993	1994
Technical				
Legal	8	35	2.0	4.1
Process development	13	13	3.2	1.5
Product development	32	71	8.0	8.4
Other	12	30	3.0	3.5
Subtotal	65	149	16.2	17.5
Nontechnical				
Legal	5	49	1.2	5.8
Management and/or planning	54	122	13.5	14.4
Marketing	198	404	49.5	47.7
Vendor	3	26	0.8	3.1
Other	75	97	18.8	11.5
Subtotal	335	698	83.8	82.5
Total	400	847	100.0	100.0

Source: Pennsylvania SBDC.

BIAS uses a brief mail survey to measure client satisfaction. The survey asks how BIAS information was used in the business, the financial value of the information, the likelihood of obtaining similar information outside of BIAS, and which type of information was most useful.

Although the response rate for the fiscal year 1994 evaluations was nine percent, the clients' responses were generally positive. In summary, clients found the information from BIAS to be concise and current and would recommend that other businesses contact BIAS. Forty-five percent valued the information at more than \$100. However, 49 percent indicated their chances of obtaining similar information elsewhere was at least "somewhat likely."

Focus groups were also used to obtain input from clients and consultants concerning needs for on-line information. The information gained during the focus group sessions is used to inform BIAS staff of how to tailor the program to meet the needs of both clients and consultants.

The SBDC plans to offer its clients BIAS services after federal TAPP funding ends in 1995. According to SBDC officials, BIAS services will be further incorporated into the SBDC's basic operations while continuing to use BIC for many BIAS functions. SBDC officials believe that their arrangement with the BIC has been effective and will need only minor modifications in the future. Sources of funding being investigated include the state, other federal sources, and the private sector.

Description of TAPP Center in Texas

The Texas Technology Access Program (TAP/Texas) is a part of the Texas Product Development Center (TPDC), a specialty center of the University of Houston SBDC. TAP/Texas offers small business clients both on-line and off-line services in the form of literature searches, patent searches, expert searches, and document delivery. TAP/Texas is managed by the Director of the TPDC with general oversight from the SBDC Director of the Houston Region.

The TPDC and the SBDC are two of five functional areas under the University of Houston Institute for Enterprise Excellence. The other three functional areas are the Texas Manufacturing Assistance Center Gulf Coast, the Texas Information Procurement Service, and the International Trade Center. These five functions coordinate efforts to provide a full range of consulting services to small business clients.

Clients of any of the five functional areas have access through TAP/Texas to more than one thousand databases through vendors like Knowledge Express, Dialog, Teltech, and Lexis/Nexis. Special in-state database resources are also available. These include the Mid-Continent Technology Transfer Center at Texas A&M University, TEXAS-ONE/Texas Marketplace, and the Texas Innovation Network System. These sources offer access to databases of the National Aeronautics and Space Administration (NASA) and federal laboratories, electronic bulletin boards containing directories of Texas companies, and access to technical experts and research facilities in Texas.

TAP/Texas targets small manufacturers and technology-oriented service companies throughout Texas. TAP/Texas informs potential clients of its services through (1) personal contact with clients; (2) direct mail to targeted industries and trade associations; (3) participation in trade shows and conferences, including demonstrations of on-line capabilities; and (4) classroom workshops.

The TPDC Director and one consultant at the TPDC work full time in the program while four additional staff provide support on a part-time basis. SBDC staff also provide assistance by informing clients of TAP/Texas services through counseling. TAP/Texas can be accessed through any one of 56 SBDC locations across the state.

The methods by which TAP/Texas services are provided may vary depending on the situation. For example, the information specialist may conduct database searches independently after receiving a search request

Appendix VII
Description of TAPP Center in Texas

or interactively with the client guiding the search. Depending on the information requirements and time frames, the SBDC consultant and client may access databases directly from a remote location without the assistance of the information specialist.

TAP/Texas has been a part of TAPP since it began in fiscal year 1992 and has received federal funds totaling \$720,500 over the life of the program. This includes TAPP funding of \$200,000 in fiscal year 1992, \$190,400 in fiscal year 1993, \$170,000 in fiscal year 1994, and \$140,000 in fiscal year 1995. TAP/Texas also has received additional funds from the state, resulting in a total state and federal funding of \$1,618,813 over the life of the program.

To supplement funds available for on-line searches, TAP/Texas implemented a client fee structure in fiscal year 1994. Initial searches are free, but additional searches require a client co-payment. Fees collected for 114 co-payment searches total \$2,744.

As shown in table VII.1, TAP/Texas served many segments of the small business community during fiscal years 1993 and 1994. The 402 clients served in fiscal year 1994 represent an increase of 76 percent over the previous fiscal year. The greatest areas of concentration were in the manufacturing and service segments, which accounted for 63 percent of the clients served in fiscal year 1994.

Table VII.1: Tap/Texas Clients, Fiscal Years 1993 and 1994

Industry	Number of clients		Percent of total	
	1993	1994	1993	1994
Agriculture	6	16	2.6	4.0
Construction	1	6	0.4	1.5
Manufacturing	145	166	63.6	41.3
Retail	4	48	1.8	11.9
Service	47	87	20.6	21.6
Wholesale	7	26	3.1	6.5
Other	18	53	7.9	13.2
Total	228	402	100.0	100.0

Source: TPDC.

As shown in table VII.2, TAP/Texas responded to a total of 445 information requests during fiscal year 1994, an increase of 83 percent over the

Appendix VII
Description of TAPP Center in Texas

previous fiscal year. Thirty-three percent of these information requests were of a technical nature.

Table VII.2: Tap/Texas Information Requests, Fiscal Years 1993 and 1994

Information requested	Number of information requests		Percent of total	
	1993	1994	1993	1994
Technical				
Legal (patents and/or regulations)	44	63	18.1	14.2
Process modification	41	10	16.9	2.3
Product modification	66	39	27.2	8.8
Other	6	32	2.5	7.2
Subtotal	157	144	64.7	32.5
Nontechnical				
Legal	5	86	2.1	19.3
Management	6	10	2.5	2.2
Marketing	60	130	24.7	29.2
Vendor	15	75	6.2	16.9
Other	0	0	0	0
Subtotal	86	301	35.5	67.6
Total^a	243	445	100.2	100.1

^aTotal may not equal 100 percent because of rounding.

Source: TPDC.

To measure client satisfaction, TAP/Texas uses a brief mail survey, which is distributed to clients immediately after the first data search is provided. The survey asks clients to evaluate the quality of customer service, the quality of data received from the searches, the accessibility of data outside of TAP/Texas, the value of the data received, and the type of data most critical for their needs. A follow-up letter is sent to nonrespondents after 30 days to increase the response rate.

The response rate for the fiscal year 1994 client surveys was 32 percent. Client responses were generally positive. In summary, clients have found the information provided by TAP/Texas to be helpful, relevant, and of overall good quality. Fifty percent of the clients valued the information provided at more than \$100. Forty-three percent of the respondents,

however, felt their chances were at least “somewhat likely” that they would have obtained the information elsewhere.

Focus groups are also used to obtain input from clients concerning on-line information needs. The information gained during the focus group sessions is used to inform TAP/Texas staff of how to tailor the services to meet the needs of both clients and consultants.

The TPDC plans to offer its clients TAP/Texas services after federal funding ends in 1995, although officials are not sure how the program will be funded or what level of services will be available. On-line database searching is, and has been, an integral part of the package of services offered by the Institute for Enterprise Excellence. Depending on the future level of funding, however, the TPDC may have to reduce or even discontinue technology access services.

Description of TAPP Center in Wisconsin

The Wisconsin Technology Access Program (WisTAP) is a part of the Wisconsin SBDC and is affiliated with the University of Wisconsin. WisTAP helps small manufacturers and technology companies solve both technical and business management problems through technical counseling, on-line literature searches, and patent searches. These services are used to complement business management services offered these same clients by the SBDC.

WisTAP is a decentralized program implemented through ten SBDCs located across the state. The central office in Whitewater coordinates the efforts of the other SBDCs while also providing counseling, assisting with the development of marketing plans, coordinating all remote literature searches, monitoring the activity level for each center, and offering support or shifting resources as needed. The WisTAP central office is staffed by a half-time Director and a half-time research specialist. The Wisconsin SBDC State Director provides management oversight for WisTAP.

WisTAP targets small manufacturers and technology-based businesses. WisTAP has developed “marketing partners,” including various trade associations, state agencies, and regional and national technology transfer organizations, to leverage the marketing dollars available. Marketing partners provide mailing lists, underwrite mailings and promotional events, and assist with publications.

WisTAP uses information provided by the marketing partners to assist them in targeted marketing efforts. For example, the Wisconsin Manufacturers and Commerce Association provided each SBDC with a database of its members. This database of over 8,500 manufacturers can be sorted by geographic area, type of company, and number of employees. The SBDC offices are able to use this information to reach small manufacturers in their area.

The Wisconsin SBDC did not offer its clients technical counseling and on-line database searches prior to federal TAPP funding. WisTAP has added a new dimension to an SBDC by allowing it to broaden its focus to include technology access issues.

Counselors at ten SBDC offices across the state and the Wisconsin Innovation Service Center are the primary deliverers of WisTAP services. Rather than locate database experts in a central location, WisTAP attempts to train all SBDC counselors at the various sites on database access. This organizational structure was developed in late 1993 to encourage “one

stop” service delivery for WisTAP clients. By delivering WisTAP services through an SBDC counselor, clients may obtain the more traditional SBDC services (e.g., market analysis and management planning) in conjunction with technology access services.

Teltech was the primary vendor for on-line services and access to technical experts during the first year of the program. Although WisTAP has been generally satisfied with the services offered by Teltech, the relative cost of its services has prompted WisTAP to identify alternative sources of information. Teltech is now a complement to WisTAP services rather than its primary provider.

WisTAP has collaborative arrangements with a variety of sources of technical assistance and vendors. Examples include University-Industry Relations and Wisconsin Techsearch at the University of Wisconsin-Madison and the Office of Industrial Research and Technology Transfer at the University of Wisconsin-Milwaukee. These sources, among others, provide access to technical counseling by university faculty, database search and document delivery services, and other consulting services.

Like the Wisconsin SBDC, WisTAP does not charge fees for its services. The Wisconsin SBDC does charge fees for training; however, none of these are credited to the WisTAP account.

WisTAP has been a part of TAPP since it began in fiscal year 1992 and has received \$700,400 in federal funds over the life of the program. This includes \$200,000 in fiscal year 1992, \$190,400 in fiscal year 1993, \$170,000 in fiscal year 1994, and \$140,000 in fiscal year 1995. WisTAP has received matching funds from the University of Wisconsin-Extension for each of these years, resulting in a total state and federal funding of \$1,411,100 over the life of the program.

As shown in table VIII.1, WisTAP served many segments of the small business community during fiscal years 1993 and 1994. The 445 clients served represents an increase of 16 percent from fiscal year 1993. The greatest area of concentration was in the manufacturing segment, which accounted for 71 percent of the clients served in fiscal year 1994.

Appendix VIII
Description of TAPP Center in Wisconsin

Table VIII.1: WisTAP Clients, Fiscal Years 1993 and 1994

Industry	Number of clients		Percent of total	
	1993	1994	1993	1994
Agriculture	1	9	0.3	2.0
Construction	7	10	1.8	2.2
Manufacturing	300	317	78.5	71.2
Retail	14	12	3.7	2.7
Service	51	88	13.4	19.8
Wholesale	9	9	2.4	2.0
Other	0	0	0	0
Total^a	382	445	100.1	99.9

^aTotal may not equal 100 percent because of rounding.

Source: WisTAP.

As shown in table VIII.2, WisTAP processed a total of 641 information requests during fiscal year 1994, a decrease of 39 percent from fiscal year 1993. Seventy-three percent of these requests were of a technical nature.

Appendix VIII
Description of TAPP Center in Wisconsin

Table VIII.2: WisTAP Information Requests, Fiscal Years 1993 and 1994

Information requested	Number of information requests		Percent of total	
	1993	1994	1993	1994
Technical				
Legal (patents and/or regulations)	183	108	17.5	16.8
Process development	76	82	7.3	12.8
Product development	280	279	26.8	43.5
Other	7	0	0.7	0
Subtotal	546	469	52.3	73.1
Nontechnical				
Legal	15	6	1.4	0.9
Management	7	8	0.7	1.2
Marketing	408	158	39.1	24.6
Vendor	68	0	6.5	0
Other	0	0	0	0
Subtotal	498	172	47.7	26.7
Total^a	1,044	641	100.0	99.8

^aTotal may not equal 100 percent because of rounding.

Source: WisTAP.

WisTAP attributes the decline in information requests to two factors. First, WisTAP changed its reporting practices from 1993 to 1994. The 1993 figures represent projects. A solution to a project may require several database interactions, thus having an inflationary effect on the 1993 figures. Secondly, a database vendor offered unlimited and free usage for the first quarter of fiscal year 1993. According to WisTAP officials, WisTAP increased their use of the service for its clients during this period.

WisTAP uses a client satisfaction survey to measure the effectiveness of its services. Each quarter, WisTAP mails the survey to clients that had received services during the previous quarter. The survey asks questions concerning the quality of the services, the perceived value of the information, and the likelihood of obtaining similar information elsewhere.

The response rate for the fiscal year 1994 client satisfaction survey was 46 percent. Eighty-eight percent of the respondents rated the overall quality of the information provided as good to excellent. Sixty-four percent rated their ability to access the information without WisTAP from somewhat

Appendix VIII
Description of TAPP Center in Wisconsin

unlikely to extremely unlikely. Sixty-two percent rated the financial value of the information received at more than \$100.

The Wisconsin SBDC plans to offer its clients WisTAP services after federal funding ends in 1995; however, the level of service will probably be cut in half. To prepare for the end of federal funding for TAPP, the Wisconsin SBDC has been focusing on developing relationships with new and existing network partners. For example, WisTAP has developed relationships with the staff of several University of Wisconsin technical and engineering departments. SBDC officials hope that, as more network partners gain experience working with small businesses, technical information will be accessible independent of WisTAP.

Description of TAPP Center in Oregon

The Oregon SBDC participated in TAPP during fiscal years 1992 and 1993. Through a contract agreement with the Oregon Innovation Center (OIC), the SBDC offered small business clients both on-line and off-line services in the form of literature searches, patent searches, expert consultations, and document location. Because of the loss of matching state funds for fiscal year 1994, the Oregon SBDC dropped out of TAPP. The OIC, however, has continued to provide TAPP-like services in the absence of state and federal financial support.

The current program is managed and operated by the OIC, which assists businesses in accessing technical information. The OIC continues to offer TAPP-like services to its own clients and clients referred to them by the SBDCs, government agencies, and industry associations.

The OIC serves primarily small manufacturers and technology-oriented service companies. OIC services are not limited to Oregon businesses; however, the majority of OIC clients are located in Oregon. When part of TAPP, the OIC informed potential clients of its services through SBDC marketing efforts, including seminars, pamphlets, and media publications. Now that the OIC is no longer directly affiliated with the SBDC, all marketing efforts have been eliminated because of funding constraints. The OIC relies entirely on word-of-mouth to attract new clients.

One information specialist at the OIC devotes three-fourths time to the program. Staff of the SBDCs, state economic development agencies, and industry associations also assist by informing clients of OIC services through their own counseling activities. Because the OIC no longer participates in TAPP, it receives fewer referrals from the SBDCs. However, the clients that contact the OIC are more likely to represent technology-oriented industries, according to OIC officials.

The OIC provides a range of business services including the development of marketing plans and information research. OIC clients have access to hundreds of on-line and off-line databases, including Dialog, Data-Star, CompuServe, Orbit, NASA, and the Federal Register. At the beginning of the program, OIC also provided access to Teltech. However, because of high costs and low demand to access Teltech experts, the OIC did not renew Teltech's contract in July 1993.

The OIC serves its clients primarily through remote database searches. Upon receipt of a request, the information specialist conducts the search and sends the results to the client. OIC staff rarely meet face-to-face with

the client. Nearly all services are provided via telephone, facsimile machine, or computer. According to an OIC information specialist, the OIC has also developed the ability to conduct real-time, screen-to-screen searching. Also, client access is offered through a menu-driven bulletin board system.

The OIC received \$325,000 in federal funding during the 2 years it was in the program. This included \$200,000 in fiscal year 1992 and \$125,000 in fiscal year 1993. The OIC also received state matching funds for each of these years, resulting in a total state and federal funding of \$650,000 over the life of the program. The OIC has not received any state or federal funding since the end of fiscal year 1993.

In the spring of 1996, the OIC will occupy a new facility to be constructed as a joint project with the Central Oregon Community College. This project will be funded by the OIC's state economic development appropriation that was committed in 1992. The OIC currently relies on donations and client fees to operate. According to OIC officials, client fees averaged \$114 per search during 1994. During the TAPP years, clients were charged only about \$10 per search although the total cost of the searches averaged \$161.

As shown in table IX.1, the OIC's client base was dominated by manufacturing and service concerns in fiscal years 1993 and 1994. In 1994, service and manufacturing businesses accounted for 73 percent of the clients served overall. Because of increased client fees and the elimination of marketing outreach efforts, the number of clients served declined sharply—from 191 to 33—between 1993 and 1994.

Appendix IX
Description of TAPP Center in Oregon

Table IX.1: OIC Clients, Fiscal Years 1993 and 1994

Industry	Number of clients		Percent of total	
	1993	1994 ^a	1993	1994
Agriculture	5	0	2.6	0
Construction	1	0	0.5	0
Manufacturing	70	12	36.6	36.4
Retail	12	1	6.3	3.0
Service	84	12	44.0	36.4
Wholesale	7	3	3.7	9.1
Other	12	5	6.3	15.2
Total^b	191	33	100.0	100.1

^aOregon did not participate in TAPP in fiscal year 1994. Because of changes in record-keeping systems, the figures shown represent calendar year 1994. The OIC served 19 other clients during the first quarter of fiscal year 1994.

^bTotal may not equal 100 percent because of rounding.

Source: OIC.

As shown in table IX.2, the OIC responded to a total of 99 information requests during fiscal year 1994—the first year in which the OIC did not participate in TAPP. This figure represents a decrease of 79 percent from fiscal year 1993. Twenty-three percent of these projects were of a technical nature.

Appendix IX
Description of TAPP Center in Oregon

Table IX.2: OIC Information Requests, Fiscal Years 1993 and 1994

Information requested	Number of information requests		Percent of total	
	1993	1994 ^a	1993	1994
Technical				
Legal (patents and/or regulations)	24	5	5.2	5.1
Process improvement	37	4	8.0	4.0
Product modification	48	13	10.3	13.1
Other	10	1	2.2	1.0
Subtotal	119	23	25.6	23.2
Nontechnical				
Legal	15	0	3.2	0
Management	17	5	3.7	5.1
Marketing	283	60	60.9	60.6
Vendor	22	1	4.7	1.0
Other	9	10	1.9	10.1
Subtotal	346	76	74.4	76.8
Total	465	99	100.0	100.0

^aOregon did not participate in TAPP in fiscal year 1994. Due to changes in record-keeping systems, the figures shown represent calendar year 1994.

Source: OIC.

During fiscal year 1993, the OIC conducted three focus group sessions in various locations to determine the informational needs of small businesses. Questions were asked to determine what types of information were the most difficult for small businesses to obtain, what sources small businesses typically use to obtain information, and what improvements they would suggest to provide them with business information. A recurring response from the participants was that marketing information was a primary concern and difficult to obtain. The OIC used the focus group results to gain a better understanding of the information needs of businesses.

The OIC plans to continue providing TAPP-like services on a cost-recovery basis as it has been since the end of fiscal year 1993. The OIC hopes to supplement its budget through corporate donations. MCI Telecommunications Corporation, for example, recently donated \$10,000 to the OIC. OIC officials said that a self-sufficient program has some

Appendix IX
Description of TAPP Center in Oregon

advantages. One of these is that because a client makes a larger investment, it is more serious about its request for assistance. Also, the OIC has been able to provide services beyond the small business community, which has both expanded services and generated more funds.

Comments From the Small Business Administration



U.S. SMALL BUSINESS ADMINISTRATION
WASHINGTON, D.C. 20416

OFFICE OF THE ADMINISTRATOR

AUG 10 1995

Mr. Victor R. Rezendes
Director, Energy and Science Issues
United States General Accounting Office
Washington, D.C. 20548

Dear Mr. Rezendes:

We have reviewed the General Accounting Office (GAO) draft report "FEDERAL RESEARCH: Lessons Learned From the Pilot Technology Access Program" (GAO/RCED-95-212, Code 307724), dated July 6, 1995, and generally concur with the findings and conclusions of the draft report.

We agree with your conclusion that if the Congress decides to fund a Technology Access Program, special considerations should be given to: (1) Adding more specificity to the objectives and goals of the program; (2) determining whether a separate and distinct Federal program is needed and, if so, what type of organization is best suited to manage it; and (3) deciding how the program should be funded, including charging user fees for the services provided. In spite of the relatively low response rate in some states, we are pleased with the client perceptions of the assistance provided from the pilot program and would look forward to participating in a future program of providing this type of technology assistance to small businesses. We are encouraged that the five centers included in the pilot program intend to continue to provide this type of assistance after the pilot program, and the Federal funding, end this year.

If we can be of further assistance regarding this pilot program, please contact Ms. Johnnie L. Albertson, Associate Administrator for Small Business Development Centers at (202) 205-6766.

Sincerely,

A handwritten signature in black ink, appearing to read "Philip Lader".

Philip Lader
Administrator

printed on recycled paper

Comments From the Department of Commerce



THE SECRETARY OF COMMERCE
Washington, D.C. 20230

JUL 21 1995

Mr. Victor S. Rezendez
Director, Energy and Science Issues
Resources, Community, and Economic
Development Division
General Accounting Office
Washington, DC 20548

Dear Mr. Rezendez:

Enclosed are the Department of Commerce's comments on the General Accounting Office's (GAO) draft report, *FEDERAL RESEARCH: Lessons Learned from the Pilot Technology Access Program*.

We note that there are some disagreements by the Department with the description of the program and the Department's role in implementing it. We also note that GAO has not allowed us the usual 30 days to respond to the substance of the report.

If your staff requires additional information about the Department's response to your report, they may contact Dr. David C. Cranmer of the Manufacturing Extension Partnership at 301-975-5753.

Sincerely,

A handwritten signature in black ink that reads "Ronald H. Brown".

Ronald H. Brown

Enclosure

cc: Charles A. Bowsher

U.S. Department of Commerce
Comments on GAO Draft Report Entitled
FEDERAL RESEARCH: Lessons Learned From
the Pilot Technology Access Program

GAO/RCED-95-212

July 11, 1995

Appendix XI
Comments From the Department of
Commerce

U.S. Department of Commerce Comments on the General Accounting Office (GAO)
Draft Report "Federal Research: Lessons Learned From the Pilot Technology
Access Program"

The GAO draft report contains a number of inaccuracies and omissions which incorrectly characterize TAPP and the NIST role in implementing the program, as well as mischaracterizing the MEP. The draft report also fails to provide adequate context from which to determine the lessons learned from the program and how those lessons fit into an overall concept of technical assistance.

1. The draft report does not make sufficiently clear the fact that the TAPP centers provide primarily access to information services nor NIST's expectations for which types of information are provided. The provision of other types of technical assistance by the host SBDCs or other service providers was limited by the degree of integration of the information service with other services.

The character of the program is inadequately described due to a failure to define the term "technical assistance" as it is used in the Pilot Technology Access Program. While Public Law 102-140 indicates that the TAPP centers will deliver counseling, training, and research assistance to small businesses, the centers have concentrated on providing access to technical and non-technical information to the small businesses through a host SBDC, with lesser emphasis on training and counseling. The extent of services provided to any given client depended on how well the TAPP center programs were integrated into the host SBDCs or other sources of assistance. Provision of additional counseling or assistance based on the information acquired typically depended on the abilities of the SBDC counselors or programs.

The draft report (p. 12 and 17) indicates that NIST thought the services provided were too focussed on marketing information, and not enough on scientific information. This categorization is not correct. The original intent was to provide information on technology or information of a technical orientation. Provision of information on technology and its applications applies to all small businesses, while scientific information would apply to a much smaller population. The statements that NIST officials hoped that eventually 50% of the information provided by TAPP centers would be technical or scientific in nature are not correct. We asked only for a balance between technical and non-technical information. The appropriate balance within a TAPP center depends on the clients and the clients' information needs.

2. The draft report does not properly characterize the NIST role in evaluation of the TAPP program and its impacts.

The interim report by GAO, "Federal Research: Interim Report on the Pilot Technology Access Program", GAO/RCED-94-75, March 1994, referred to in the

**Appendix XI
Comments From the Department of
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current draft report, expressed GAO's earlier concerns on the evaluation methodology. At that time, NIST officials disagreed with the conclusions drawn by the GAO study team but also took action to address those concerns. The current draft report also indicates that NIST took action, but that the evaluation issue is moot since TAPP will not be funded beyond fiscal year 1995. The draft report (p. 8 and Appendix III) indicates that NIST cancelled its plans for evaluating the impact of TAPP after funding was discontinued. This statement is incorrect. NIST has continued to carry out an evaluation task under the program. The elimination of two of the original three surveys from the evaluation plans was done with the full cognizance and agreement of the original GAO study team, as well as the House Small Business Committee. Our understanding was that GAO would fund and develop a survey instrument that met the impact evaluation needs of GAO, NIST and the TAPP centers, while NIST would work to continue to improve the client satisfaction survey and develop an analytic report on the data being generated by the TAPP centers. Given the new GAO survey, all parties agreed that elimination of two of the initial three surveys was desirable to minimize the reporting burden on the client companies. To the best of our knowledge, the GAO has not developed the impact survey instrument nor is it available for deployment to the TAPP centers or their clients. Reference to the GAO survey is made in a letter from Chairman LaFalce to the Comptroller General, dated March 4, 1994.

The draft report (pp. 5 and 8) also indicates that the impact of the program on productivity or innovation could not be estimated because of the limited scope and duration of TAPP. These statements are insufficient since they do not elaborate on the true scope of the problem. The impact cannot be readily estimated because there are no reliable models or methods available which demonstrate a clear, direct linkage between the information provided by a TAPP center and productivity gains, increased innovation or other economic indicators, nor could they be developed within the resources available in the program. The key determinant in developing such an evaluation is not what information is provided, but what the recipient does with that information. Depending on the information received and the decisions made by the company on the basis of that information, the time to recognize an impact and an ability to quantitatively determine an impact could take anywhere from one week up. Development and validation of such an impact model would require much more extensive follow-up over a period of years to properly assess the impact of the program. It would require that the client companies be willing to provide information on a continuing basis, some of it potentially sensitive, and make a continuing judgements on how the information they received from a TAPP center affected their operations. This would include determining what information was obtained, how it was used, and what difference it made in a client's operations compared to how the company would have behaved in the absence of such information.

The draft report refers to Nexus Associates as a NIST consultant (p. 6). Under the TAPP program, they are a subcontractor to the University of Houston SBDC to

carry out the evaluation task.

3. The draft report does not provide adequate context for the lessons learned and how they fit into an overall concept of technical assistance.

The provision of access to information services by the TAPP centers presupposes that the recipient/requestor of the information will act appropriately on that information to incorporate it into their operations. The TAPP centers have created an essentially stand-alone information service, which in the absence of other decision support services, may or may not be adequate to meet a company's needs. Experiences within MEP demonstrate that provision of the information alone is not sufficient, recipients frequently need additional assistance in assessing and acting on that information, especially when it is technical information.

The draft report (p. 12) indicates several questions to be considered prior to funding additional TAPP-type programs. These are essential questions to be asked, but in our opinion, the key question is the second one listed - "Is a separate and distinct federal program necessary to achieve these objectives?" From our experiences in MEP, the type of information services provided by TAPP centers are not stand-alone services, they must be incorporated/integrated into a wider set of decision support services so that smaller businesses can properly act on the information.

It is our understanding that manufacturing extension services in the U.S. are being studied by the International Trade, Finance and Competitiveness Directorate of GAO. The senior evaluator is Amy Finkelstein of the Los Angeles Regional Office. Additional contextual information may be available from that source, as well as from numerous other studies of industrial extension services, both in the U.S. and abroad. All of these studies should be considered when evaluating the lessons learned from programs such as TAPP.

4. The draft report does not properly characterize the Manufacturing Extension Partnership, the services its affiliates provide to smaller manufacturers, and how they compare to TAPP center services.

The draft report describes the MEP as a network of organizations (manufacturing extension centers, not MTCs) which support American manufacturers through ongoing technology development. This statement is incorrect. The MEP supports American manufacturers through ongoing technology deployment. The focus is on helping smaller manufacturers identify and implement appropriate technology in their operations. The implementation of appropriate technology and the effective utilization of it requires that the manufacturers be prepared to undertake a full range of change in their operations including the purchase and installation of equipment, changes in manufacturing processes and layouts, changes in business and management practices (including accounting and finance practices), training of their workforces in the use of that technology, and identification of markets for the

**Appendix XI
Comments From the Department of
Commerce**

resulting new and/or improved products. The requirements of the manufacturers in turn means that the manufacturing extension centers must also be prepared to assist their clients in all of these areas, as well as help the company evaluate the economic impact of the changes. The methods of delivering all those types of services vary from center to center, but all of them depend on the use of outside service providers (partners) to ensure that the client firms get the assistance they need to make the best use of the technology. The manufacturing extension centers thus can provide not only the services that a TAPP center can provide to a manufacturing client, but can provide more services than can a TAPP center. (pp. 4 and 15)

Again, it is our understanding that manufacturing extension services in the U.S. are being studied by the International Trade, Finance and Competitiveness Directorate of GAO. It may be that a more complete comparison between the two types of centers can be obtained from that source.

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