REPORT OF THE
JOINT TASK FORCE APPOINTED BY THE
SECRETARY OF TECHNOLOGY AND THE
SECRETARY OF COMMERCE AND TRADE

House Joint Resolution No. 206, 2002
Study: Technology-Based Businesses

TO THE GOVERNOR AND
THE GENERAL ASSEMBLY OF VIRGINIA

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Report of the Joint Task Force Appointed by The Secretary of Technology & The Secretary of Commerce and Trade Commonwealth of Virginia

Developed in Compliance with

House Joint Resolution No. 206, 2002 "Study; Technology-Based Businesses"

Sponsored by Delegate Samuel A. Nixon

Report Submitted by
Thomas P. Weithman, Vice President for IP Transfer & Entrepreneurship
Virginia's Center for Innovative Technology

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Preface

This study fulfills the requirement mandated by House Joint Resolution No. 206, "Study; Technology-Based Businesses," passed in the 2002 Virginia General Assembly. In accordance with the enabling legislation, the Secretary of Technology and the Secretary of Commerce & Trade established a joint Task Force, drawn from membership of the Virginia General Assembly, Virginia-based technology businesses, Virginia-based investors, and Virginia's institutions of higher education. The membership of this Task Force is included as Attachment "A" to this submission. In order to best examine the role and efficacy of Virginia's entrepreneurial support initiatives, the Task Force undertook and completed a four (4) phase plan or work:

Phase 1: Survey of Virginia's Asset Base In this phase the Working Group provided the Task Force with a "snapshot" briefing of the Commonwealth's intellectual resource base, technology business communities, and public and private sector infrastructure, and policies supportive of technology entrepreneurship.

Phase 2: Identification of Regional Challenges to Entrepreneurship In this phase, the Working Group assisted the Task Force in refining its view of the unique challenges to technology entrepreneurship posed in each of the Commonwealth's major technology regions by convening region-specific focus groups composed of entrepreneurs, tech transfer personnel, investors and professional services firms.

Phase 3: Best Practices Assessment In this phase, the Task Force benefited from a survey of other states's "best practice" approaches to R&D investment, technology transfer, business incubation, early stage capital formation, provision of business support services, infrastructure development, and policy development in support of technology entrepreneurs.

Phase 4: Development of Recommendations In this phase, the Task Force will draw together its findings and formulate recommendations for the General Assembly and Governor regarding the development and implementation of a state-wide strategy for technology entrepreneurship.

For the purposes of conducting the administrative and analytical portions of this study, the Task Force drew upon the resources of Virginia's Center for Innovative Technology, Virginia's Department of Commerce & Trade, the National Commission on Entrepreneurship, and the Vermeer Consulting Group of Richmond, Virginia.

At the time of this writing, the Task Force has completed Phases 1-3 of its anticipated plan of work and in so doing has met the requirement of the enabling legislation. Having reviewed the results of the Entrepreneurial Focus Groups and the "Best Practice Assessment" conducted in Phases 2 and 3 of this study, the Task Force has decided to continue discussions in January of 2003 to determine a future course of action and to designate recommendations that may result in further legislative or administrative action.

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HJ206 Task Force Study - Executive Summary

At its initial meeting, the Joint Task Force opted to focus on three (3) specific issues in its "best practices" study of entrepreneurial support programs conducted by other states and regions: Entrepreneurial Networking, Business Assistance Programs, and Early Stage Capital Programs. Among the states considered in the "best practices" examination were Pennsylvania, North Carolina, Maryland, Minnesota, Ohio, Oklahoma, and California.

Key Preliminary Findings

Entrepreneurial Networking The "best practices" assessment affirmed the criticality of networking among entrepreneurs as an essential building block in the development of early stage technology companies. The study suggested that to be most effective, these networks could not be "government-created," but must driven be entrepreneurs and be composed of entrepreneurs. Rather, government could play a role in facilitating or financing the formation of such networks. Internet-based technology offers a number of ways for these networks to work more effectively, providing avenues for "on-line" interaction in the form of discussion groups, listservs, e-mail newsletters, and on-line chat.

Business Assistance Programs The study observes that the states that have been most effective in developing entrepreneurial support programs are those that view entrepreneurs as a unique segment of the economy. Effective program development requires a significant commitment of time and funding. Several states have achieved critical funding mass by amassing funds from several sources – state, federal, and private – in support of their initiatives. Many states have taken a "regionalized" approach to entrepreneurial support, foregoing the creation of "mirror-image" resources in favor of an approach that exploits the unique entrepreneurial strengths and assets of individual state regions.

Early Stage Capital Formation The study indicated that for states to be successful in assisting in early stage capital formation, they must be willing to undertake a long-term commitment. Additionally, states must appreciate the strong business orientation required to successfully participate in pre-seed or see funding endeavors. Specifically, states must incorporate the participation of professional money management in the early stage funding process and be able to provide non-monetary resources -- education, mentoring, and connections – critical to sustaining early stage companies.

Task Force Recommendations

As of this writing, the Task Force has concluded a preliminary assessment of the "best practices" study on the three (3) areas it designated for investigation and has not yet had the opportunity to develop formal recommendations. The Task Force has decided to reconvene in January, 2003 to continue discussion of this subject matter for future legislative or administrative action.

"Best Practice" Research Results
House Joint Resolution No. 206
"Study; Technology-Based Businesses"

Presented to

HJ 206 Task Force

December, 2002

Vermeer Consulting Group
Richmond, Virginia
Marianne Vermeer, Principal
(804)-261-7676

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HJ 206 TASK FORCE RESEARCH RESULTS

I. OVERVIEW AND HISTORY

HJ 206 was passed by the Virginia Legislature during its 2002 session; it called for a "best practice" assessment of state entrepreneurial support initiatives for presentation to the 2003 Session of the Virginia General Assembly. This report is presented to the Task Force overseeing this study as a summary of a research conducted by Vermeer Consulting Group in support of this initiative.

While this initiative was developed by the Virginia House of Representatives, the concept of studying and adapting best practices is not new. In fact, there have been a number of studies done on the issue of state support for entrepreneurial programs, both specific to Virginia and on a national scale. As well, there have been a number of programs and projects within Virginia that have served as models for others around the country. The Commonwealth of Virginia has invested in programs for entrepreneurs through several different state agencies over the years, including the Center for Innovative Technology, the Department of Business Assistance, and the Department of Minority Business Enterprise. As well, there have been a number of private sector initiatives that have focused on providing support for entrepreneurs (some of which are included in this research).

The overall goal of this research, broadly interpreted, is to provide sufficient information to development recommendations for supporting entrepreneurial growth and development, particularly in technology sectors, to spur economic development in Virginia. The desire for economic impact in the number of jobs, the net importation of highly skilled individuals, the growth in the tax base, and the development of sustainable, growing companies that continue to add jobs and economic vitality is laudable. How to get there is less well-defined, though this report will highlight a number of factors that can, in combination, contribute to that goal.

II. PROJECT SCOPE AND METHODOLOGY

Project Scope

While the legislation was written to encompass a variety of initiatives and approaches, the research highlighted here focused on three programmatic categories:

- Entrepreneurial Networks and Networking
- Business Support and Advisory Programs
- Angel and seed venture financing

In each case, the researchers were seeking innovative programs and the common characteristics among those successful programs that gave them the fuel to survive. In each case as well, the intention was to examine what role, if any, state involvement played in the success of each program and how a combination of funding from multiple sources (federal, state, and private) has helped to reach these programs to grow and evolve. The

Other findings of the study mirror what the researchers learned in talking to programs across the US. Some of those findings relevant to this study include the following:

- Informal financial support for start-ups was five times that of domestic venture capital support. Nearly one half of all informal investment is given to family members.
- Venture capital support declined significantly between 2000 and 2001 but informal financial support was more consistent.
- Formal venture capital receives most of the attention from governments as a means for financing new companies. Yet, informal financing is what provides the majority of new companies with resources to get off the ground. Governments may want to consider tracking and supporting these informal financings with carefully designed tax incentives.

GEM also publishes country specific reports each year; while the US report for 2002 is not yet available, the 2002 report looked at venture backed companies and the impact on their regional economies. Venture capital is heavily concentrated geographically in the US, so its immediate economic impact is regional. This impact is measured by GEM as a ratio of venture capital invested in a state against that state's gross state product (GSP). In 2000, Virginia's venture capital investments as a percentage of GSP were approximately 1.2%, putting Virginia in 7th place nationally and reflecting its relative national ranking in securing venture capital overall. [2] The state is home to more than 50 venture capital firms that have more than $3 billion under management.[3]

On this measure, Virginia is showing relative strength nationally. As we all know, however, the concentration of that investment has been in northern Virginia and the ability to encourage and support entrepreneurial ventures across the state has been difficult. It is one goal of this analysis to search for ways to make a state-wide initiative have impact in many regions of the state.

B. State Perspective

Virginia, through its Center for Innovative Technology and in consultation with the National Commission on Entrepreneurship, has analyzed its entrepreneurial development, state resources and support services for entrepreneurs.

A snapshot of Virginia's technology companies and their characteristics:

- 62% of Virginia's technology companies are based in northern Virginia. Distribution for the remainder of the state:
  - Richmond- 12%
  - Hampton Roads- 11%
  - Roanoke-Blacksburg- 5%

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[2] *Global Entrepeneurship Monitor, National Entrepreneurship Assessment: United States of America.* 2001 Executive Report, November, 2001.

[3] Taken from Tom Weithman presentation to HJ 206 Task Force, September 27, 2002.

Charlottesville- 3%
Shenandoah Valley- 3%
Southside- 1%
Far Southwest- 1%

- Fewer than 7% of start-ups receive funding from the SBIR program.
- Less than 1% of Virginia's technology start up companies spin out of the state's universities.
- The state's technology base is heavily weighted in information technology and telecommunications (70% of companies). Advanced manufacturing accounts for 2%; advanced materials, electronics, life sciences, and aerospace each account for 1% and 23% fall into the "other" category.

Resources Available to Entrepreneurs in Virginia : State Supported

Currently, the state supports several programs to provide services to entrepreneurs throughout the Commonwealth. With state budget cuts imposed in October, 2002 (and more anticipated as of December 31, 2002), some of these programs will, by necessity, change. This information is current as of November, 2002: (taken from each agency's web sites and conversations with staff)

STATE AGENCY	PROGRAMS	Locations
Center for Innovative Technology (CIT)	Regional CIT offices	10 locations statewide: Herndon, Charlottesville, Lynchburg, Richmond, Newport News, Portsmouth, Wise, Roanoke, Blacksburg, and Danville
	Entrepreneurship Centers	Old Dominion University, George Mason University, Virginia Tech, William & Mary, Norfolk State, Advantech (Richmond)
	FAST: Federal Research Assistance Financial assistance: Technology Infrastructure Awards, Technology Development Awards, Business Advisory Services Awards.	Through Regional Offices
	A.L. Philpott Manufacturing Extension Partnership	10 locations statewide
Department of Business Assistance	Small Business Development Centers	30 locations statewide (DBA no longer will host program as of 1/1/03; new host not yet selected)
	Business Incubator Support	22 incubators supported through DBA operating grants
	Virginia Small Business Financing Authority	Typical state financing programs: (industrial development bonds, loan guarantee programs)
Department of Minority Business Enterprise	Certification for MBEs Procurement and contract assistance Conferences and training	Office in Richmond, partner organizations throughout the state

Resources Available to Entrepreneurs in Virginia: Private Initiatives

Netpreneur: started by the Morino Institute and Mario Morino, Netpreneur has provided a structure and support system for entrepreneurs in northern Virginia for the past five years. Due to a decision by its founder and benefactor, the organization will formally disband at the end of 2002. Certain programs and features are now taking on new lives under sponsorship and support from other organizations (see further description under "Entrepreneur Networking and Networks", below).

Venture Mentors: Started in northern Virginia, Venture Mentors has added a second group in the Tidewater area. Focusing on providing direct assistance to companies raising capital, Venture Mentors offers coaching and business plan critiques to aspiring entrepreneurs.

Venture Clubs:

- The Charlottesville Venture Group,
- Roanoke-Blacksburg Angel network,
- GMU's Grubstake Breakfast,
- the Private Investors Network,
- The Venture Forum in Richmond,
- Virginia Venture Capital Forum in Tidewater,
- and others

These groups all provide networking opportunities for service providers, entrepreneurs and angel investors. While all of these groups have organized processes for companies to present to an audience, some audiences are more likely to have angel investors than others. In general, at a minimum, these organizations provide a chance for entrepreneurs to test their pitch, make some connections, and better understand how the angel investment game works in their area.

The Venture Forum sponsors an annual event honoring companies in the region who have secured private investment capital for their ventures. The Charlottesville Venture Group sponsors an annual conference each November with the Batten Institute at the University of Virginia that features selected venture presentations and seminars on venture investing.

Technology Councils: There are nine technology councils located throughout the state with over 2,500 company members. By far the largest is the Northern Virginia Technology Council with 1,700 members. These regional efforts focus on regular meetings with speakers and programs targeting technical management staff and companies with a technology focus. While there are networking events, training programs, and legislative efforts, most is focused on the use of technology or technological innovation rather than entrepreneurial training or support.

IV. *PROGRAMS WORTHY OF CONSIDERATION AS MODELS FOR VIRGINIA*

In keeping with the mandate of this study, the following discussion focuses on the three areas the researchers were asked to consider and model programs from each. In each case, there are general observations, three to five models offered as examples of successful programs and concluding observations. The three areas studied were Entrepreneurial Networking, Business Assistance and Support, and Early Stage Financing.

A. Entrepreneurial Networking

Networking is an old concept, re-fashioned for the new economy and increasingly important to entrepreneurs. Nearly all of the organizations studied for this report had some form of networking built into their programmatic structure. Some organizations have used the networking concept as the springboard to other programs and as a way to build community among their members. Others have seen it as necessary as a way to support companies they have helped in other ways (e.g. building networking opportunities for portfolio companies of a financing program). Overall, however, it is clear that this is a critical component of any successful entrepreneurial initiative.

The National Commission on Entrepreneurship published its report, *Building Entrepreneurial Networks,* in December, 2001[4]; this study served as a foundation for research in this programmatic arena, supplemented by interviews and additional notes and observations from the Edward Lowe Foundation. In an interview with Eric Pages, author of the NCOE report, additional information on new initiatives was added. In general, there appears to be more interest in fostering and supporting entrepreneurial networks on a statewide basis, but the history of these efforts is too short at this point to make any conclusions. West Virginia, for example, has just started four networking groups around the state.[5] The following examples are from programs that have significant history and have developed best practices from their experience.

Council for Entrepreneurial Development (CED), Research Triangle Park, NC

History and Networking Programs:
Always held up as a model for how a region can embrace entrepreneurship and serve as a catalyst for growing companies, CED has existed since 1983 . It was started by a group of business people (service providers and others) interested in entrepreneurship and in looking at ways to diversify the agricultural economy of North Carolina. As Monica Doss stated, the key at that time was that there was so little activity and nothing in RTP, so none of those who started the organization saw the other as competition. Their ability to band together and think about what the region needed to do to start the engine was key at the time. CED was very clear in its mission and focus and has remained true to that over nearly 20 years: provide mentoring and networking opportunities for entrepreneurs in the Research Triangle Park region.

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[4] *Building Entrepreneurial Networks,* National Commission on Entrepreneurship, December 2001.
[5] Conversation with Eric Pages, December 2, 2002.

CED's web site now has four pages dedicated to networking events, highlighting 11 groups and events. Ranging from industry specific groups (Biotechnology, Information Technology and Healthcare Technology Forums) peer-based roundtables, executive events, online discussion groups, social events, and annual conferences, these groups and events all create a networking climate. Ms. Doss feels these events are critical to all CED does and that the organization's success in bringing entrepreneurs together with mentors, service providers, and early stage financing all stems from this networking climate. If an angel investor has an opportunity to meet and chat with an entrepreneur at one of these events, then sees that same entrepreneur seeking support through the Capital Connections program, he/she will likely have greater interest in helping that venture through the process or even considering an investment.

Keys to Success and Ability To Replicate:
Ms. Doss believes that the organization's status as a non-profit organization with private funding has been of benefit during recent upheavals with the North Carolina state budget. The organization has only taken state funding for specific projects and intends to remain committed to its private funding base. The tension that presents, however, is evident as CED is approached to bring its services to other communities in North Carolina. While CED recognizes its role as a driver for entrepreneurial development in the state, its funding and constituency base is centered in the RTP area. With the economic downturn, CED has hesitated in taking on additional programs in other regions because of a concern that those economies could not sustain the effort.

While CED does not intend to clone what it does in other cities, the organization does respond when local leaders in a given locality request specific assistance in developing targeted programs. CED has worked with organizations in Asheville, Wilmington, Charlotte and the Piedmont area to date, some under a contract from the NC Department of Commerce. As an example, the Wilmington area has an interest in building deal flow for angel investors who have retired to that area. Helping those investors make connections with ventures from around the states is one way CED can help. At this point, CED is not looking to go outside of North Carolina in extending its programs. Instead of replicating programs, CED is focusing instead on two other considerations:

1) Helping its members recognize that RTP is an economic driver for the rest of the state. The area is a net capital importer, for example, bringing venture investment from outside the state to the region and, by extension, to the state.
2) CED is gathering members from all over the state, including a number of individual investors. CED is filling a need they cannot find elsewhere and the organization is looking for ways to build loose confederations and provide opportunities for programs to connect people from around the state. Two examples are the Venture Conference and the InfoTech Conference, both of which draw on resources from other areas of the state and attract attendees from a large radius.

There are other areas where CED feels it is not possible to reach beyond the RTP area and where replicating programs is not feasible. Mentoring and training both fall in this category. Ms. Doss feels they must remain local events with a local focus.

The glue for all of this activity is a highly creative staff at CED; their ability to bring companies together through CED, who might otherwise consider themselves competitors, is one key to the success they have enjoyed.[6]

Netpreneur, Herndon, VA

History and Networking Programs:
Founded by Mario Morino as an initiative to support entrepreneurs in the new economy, Netpreneur grew over five years to include a number of innovative programs, a creative and engaging email newsletter, and a model for how networks can develop. While the program is now in "sunset" mode, there are a number of lessons to be learned from its development and now its demise.

Netpreneur was unique in that it was funded largely by one benefactor who committed enough financial resources for the organization to have the flexibility to try new ideas, ignore the need for major sponsors, and target its efforts uniquely to entrepreneurs. Some of the networking successes Netpreneur started include the following:

Coffee and DoughNets: an early morning networking event with a program targeted to start-ups, admittance was offered to entrepreneurs first and to service providers only if there was room left. Combining a networking opportunity with educational content was a popular format. Advertising the program as "entrepreneurs only" drew interest from the start-up and emerging company ranks and ensured that the vast majority of those attending were entrepreneurs.

Mindshare: this program brought select service providers together with entrepreneurs for a monthly program of interest to growing companies. Dues were $350 per year and the group was limited to 10 service providers and 50 entrepreneurs. Sample programs included "Meet the Press" and "Building Sales Teams". There was ample opportunity for the exchange of ideas and the ability to help entrepreneurs find unique ways to address some of their business management needs.

Netpreneur News: when Netpreneur began, this was the vehicle that covered what Start-ups and "wannabe" entrepreneurs were doing. It provided a unique communication channel that allowed people to "get the word out"- something that was missing at the time. Netpreneur built the channel to collect and disseminate information on the northern VA entrepreneurial ecosystem. Today, in Greater Washington, there are many email blasts with news about companies, but Netpreneur News was the first and showed others how it could be done.

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[6] Information gleaned from phone interview with Monica Doss, November 27, 2002 and from www.cednc.org.

Netpreneur Calendar: over the years, almost 700 different organizations have submitted events and programs to this community calendar. While Netpreneur has not specifically endorsed the events or their promoters, there has been a screen for accuracy and relevance to entrepreneurs. It has been viewed as a real service and also a central place to see the vibrancy and diversity of the community, which reinforces the place of entrepreneurs and their stakeholders in the northern Virginia economy.

Talk-the-Talk email list: a listserv for entrepreneurs to discuss business opportunities, get advice, find recommendations for solutions to problems within their businesses, or whatever other entrepreneurs could provide. On occasion, the listserv also hosted special guests who took on-line questions and offered advice. Over 600 people have registered for the listserv since its inception.

Keys to Success and Ability to Replicate

One key to Netpreneur's success has been the ability to develop a well-rounded menu of services and events that together provided a "whole" that was greater than the sum of its parts. Mary Macpherson believes that no one program provided the "silver bullet" that made Netpreneur work, but the combination of activities, both online and offline, made the whole organization effective. Netpreneur did not attempt to quantify the impact it had in large part because the organization felt it would be impossible to take complete credit for outcomes. Anecdotally, the feedback has been that people have learned things that helped them build their businesses or that they found partners, mentors, advisors, employees, customers and some found funding.

Obviously, another key success factor was the consistent and reliable source of funding. That reliance on one source, however, proved difficult when the benefactor decided to pursue other philanthropic interests. In the process of considering what to do next, Netpreneur began a process of examining how it could replicate its programs in other parts of the state. The organization began by doing an assessment of four regional economies in Virginia, including an analysis of networking organizations already in place, technology councils, special interest groups, incubators, educational institutions, public-private partnerships, and government supported programs as well as regional economic conditions. While the analysis was not completed, it showed obvious gaps in services and a consistent lack of a central entrepreneurs network in each region.

Netpreneur plans to host a symposium in 2003 to highlight its methods and how Netpreneur worked. The primary focus of the event will be on entrepreneurial networks, their importance to entrepreneur support, how they are built, and their roles in regional economic development and competitiveness. Invitations will go to organizations and leaders who are working to promote entrepreneurship, business incubation, technology transfer, and regional economic development.

Netpreneur is also now looking at the option of licensing some of its program formats and names as one way to spread its experience. Finding ways to connect northern Virginia companies with ventures in other parts of the state remains an interest and offers another opportunity to bring resources Netpreneur has developed to bear on the development of

other networks throughout the state. Using technology inexpensively and creatively is one hallmark of Netpreneur's growth. Taking that knowledge beyond northern Virginia is now an opportunity for the rest of the state.[7]

Ben Franklin Technology Partners of Southeastern Pennsylvania

History and Networking Programs:
Another program with significant history, the Ben Franklin programs in Pennsylvania have existed as public/private partnerships since 1983. While focused on offering early and seed stage financing to ventures initially, the program has grown and evolved to include a number of initiatives aimed at improving the entrepreneurial climate in four regions of the state. (More detailed information on these programs is included in the next section).

In southeastern Pennsylvania, BFTP/SEP has focused its efforts on using existing resources and contacts to support new ventures, offering seed funding and staff support to new networks, and creating linkages between networks by bringing various groups together into new coalitions. Some of these networks serve entrepreneurs directly while others offer resources to BFTP/SEP in managing its programs and investment decisions. Using its portfolio companies as a base, the organization has now extended its reach to include networks focused on specific industry segments and on supporting technology transfer from area universities.

Keys to Success and Ability to Replicate

BFTP/SEP has been patient; after nearly 20 years of supporting entrepreneurs, the fruits of this organization's efforts are now more visible. Through its networks and mentoring activities, the organization has been able to recruit top talent to assist nascent companies. The organization has also been able to adapt to changes in its region; initially the BFTP program focused on working with universities and had a strong technology transfer emphasis. Now, the organization sees entrepreneurs as its primary focus and has re-oriented its programs to support that constituency.

The NCOE report[8] points out that most of the networks that now exist in southeastern Pennsylvania received some of their seed funding and/or initial staff support from BFTP/SEP. Included in the list of "seeded" organizations are the Eastern Technology Council, the Entrepreneurs Forum, the Greater Philadelphia Venture Group, several angel networks, the Southeastern Pennsylvania Export Consortium and the Central Bucks Biotechnology Council. While not replicating with BFTP does, BFTP has made it possible for these networks to form and grow, leading to a large number of networks available to meet the needs of different entrepreneurs.

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[7] Information taken from interviews with Mary Macpherson, September 27 and November 13, 2002 and from www.netpreneur.org.
[8] *Building Entrepreneurial Networks,* NCOE.

The Edward Lowe Foundation

The Edward Lowe Foundation exists to support second stage entrepreneurs (those beyond the start-up stage). Their stated mission is focused on how they can help these entrepreneurs be more successful. As well, they are looking at ways to build capacity with Entrepreneurial Support Organizations (ESOs) so that they can better serve these second stage entrepreneurs. To that end, they have established PeerNet, a membership-based online "experience exchange". The web interface is now complete and the infrastructure in place to support the roll-out of this service. The Foundation is now taking the network to organizations around the country for branding and regional/local affinity development. As part of this strategy, the Foundation identified model ESOs from across the country.

In July, 2002, the Foundation brought together the executive directors of 11 of these model ESOs. The point of the gathering was to look at best practices, to think through how the organizations could help each other, and to determine the need (or not) of a national organization of successful ESOs. Mark Lange of the Foundation was gracious enough to share notes from those conversations. Rather than offering an analysis of that gathering, some quotes and thoughts regarding networking and entrepreneurial networks are copied here[9]:

- " The network is the key to the entrepreneurial ecosystem. It's not the ingredients, it's the recipe. It has to come together organically. The key to the soup is the network that binds all the ingredients together."
- In response to the question of "why are you based in the place you are?" the responses focused on the "presence of a workforce and networks of entrepreneurs."
- Four challenges for ESOs and networks:
    - Sustainability or growing to scale
    - Money: Finding funds to put the organization in place long-term can be a challenge (beyond the initial grant).
    - Enthusiasm: ...How do you get outside stakeholders excited or motivated or supportive of the work?
    - Niche for ESO: What's the place of greatest potential?

CONCLUDING OBSERVATIONS:

From all of these conversations and reviews of other studies, some points were very clear:

Key thoughts and findings from those interviewed:

- There is a need to distinguish between "networking" and "networks". The general perception is that networking is the "meet and greet" event where folks gather to informally exchange business ideas and do " business development." Networks, on the other hand, speak to a bit more formalized system of exchange between members. It implies some form of membership or permission to join and purposeful attempts to develop business alliances and ultimately measurable results

[9] Interview with Mark Lange, Edward Lowe Foundation, November 27, 2002 and from notes from ESO conference of July 30-31, 2002.

for the participants (revenues, improved efficiency, employment, reduced cost). Entrepreneurs tend to gravitate towards "soft" networks where there is real-time information and the group exists to transfer the values of an entrepreneurial culture.

- To be successful, networks need to be composed **of** entrepreneurs **for** entrepreneurs. Mixing in a large dose of service providers or government program staff can sour the effort and leave the entrepreneur with a feeling that the gathering is just a group of people trying to get his/her business.
- There are now attempts to prove that there is a correlation between the number of networks in a given geographic region and that region's economic vitality. Michael Camp of Advanced Research Technology is attempting to do just that by analyzing 394 regions across the US in what is called an entrepreneurial index of economies. This company is itself a spin-off from the Kauffman Foundation in an attempt to take research initially begun at Kauffman and extend it into a model for legislators and policy makers to use in developing entrepreneurial initiatives.
- Networks take time to develop and grow. A key to the ability to survive is the need for infrastructure and a local champion who provides the vision and charisma to bring people together. The development of an effective network is not a one year process; this speaks to the need for vested leadership who will stay for the duration to help the organization evolve to meet the needs of that local entrepreneurial community.
- Government agencies are ill-suited to create or mandate entrepreneurial networks. In fact the NCOE report states explicitly: "Government agencies cannot mandate the creation of entrepreneurial networks; nor can they lead or dominate such organizations. If entrepreneurs view a network as ' just another government program', its prospects for success are limited."
- At the same time, public support of entrepreneurial networks may be appropriate in regions where there is little in place or where geography makes it difficult to make connections. Providing seed funding through a public/private partnership is one way for government agencies to offer support in those situations.
- Key factors for success included the following:
    - Most successful networking groups and networks started small, using a base of committed entrepreneurs to explore ways to support emerging companies and splitting off or branching out as the needs of the entrepreneurial community changed.
    - Find key people: there are movers and shakers in every community who make things happen. Finding these individuals and using their standing in the community to bring others to the network is a key factor for success.
    - Flexibility is a necessity: entrepreneurs change, the entrepreneurial economy changes and the networks and networking events need to change with the environment. Keeping the organization fluid enough to respond to those changes is important.
    - Patience is part of the process; networks take time to develop and those organizing them have to be willing to work at it for several years to see the fruits of their efforts. Two of the programs featured here have histories approaching 20 years. Netpreneur is relatively young in comparison and already is in a very different form.

- While entrepreneurial networks tend to be "soft and fluid", there needs to be some structure to them to sustain their growth. Regular meeting times, administrative support, and relatively consistent expectations about what entrepreneurs can get by attending are part of that "soft structure".
- Technology offers ways to make networks more effective. The programs featured here have used robust web sites, discussion groups, listservs, email newsletters, and online chat as ways to support and encourage networks among their constituencies. The ability to use communications technology efficiently and creatively are hallmarks of these programs.
- Finally, networking is a means to the end: the ability to bring entrepreneurs together through networking events should lead to the development of networks where real impact can take place.

B. Business Assistance Programs

While many states have developed innovative programs to support entrepreneurship, this study focused on five. The researchers then chose to feature one or two specific programs offered in those five states as examples of how concerted state effort can have significant impact in entrepreneurial support and economic development. The five states studied were Ohio, Maryland, Pennsylvania, North Carolina and California.

1. OHIO

Ohio's entrepreneurial support efforts are all centrally supported and administered through the Ohio Department of Development (ODOD). These include all state financing programs, the Small Business Development Centers, incubator support, women's business initiatives, and the Edison programs. Described here as the key model programs are the Edison programs and the new Wright Centers of Innovation.

Thomas Edison Program[10]

Ohio's Thomas Edison Program is an initiative that brings together technology providers and users to create commercial opportunities. The program has two major components: the Edison Technology Incubators and the Edison Technology Centers.

History:

In response to 15 percent unemployment and a $500 million budget deficit from plant closings and layoffs, the Ohio Department of Development established the Thomas Edison Program in 1983 to promote technological innovation, industrial competitiveness and business development.[11] The Edison Technology Centers were set up with the intent to link industry and universities. Communities made proposals to the state based on an existing industrial strength--welding in Columbus or polymers in northeastern Ohio. Although each proposal had to embrace one or more universities, the center needed to be

[10] http://www.odod.state.oh.us/tech/edison/default.htm

[11] National Conference of State Legislatures, The State Role in Effective Technology Transfer, August 1996, http://www.ncsl.org/programs/esnr/96TECH.HTM#OH.

governed by a body in which industry predominated. The Edison Centers were never expected to survive on public money alone.

Structure:
There are seven technology centers and ten incubators. Each of the centers offers its own special capabilities in specific technologies. As companies increasingly are seeking answers to multi-disciplinary needs, the Centers have expanded their outreach through collaborative relationships with fellow Centers. These programs fall under the Ohio Department of Development's Technology Division.

Funding:
Funding comes from the Ohio Department of Development ($25 million), the National Institute of Standards and Technology (NIST) and private industry support. (The NIST funds come to each center directly applying for them and are not administered on a state level.) Private money comes from memberships, venture association events, corporate sponsorships, regional growth partnerships and venture capital groups. Federal funding was very limited early on, however, it has grown over the years to include major support from NIST's Manufacturing Extension Program, which began in the mid-1990s. This funding has been reduced in recent years.[12]

Governor Taft has recently introduced a new technology funding initiative called the "Third Frontier Project," a ten-year, $1.6 billion plan to create high-wage jobs and support the expansion of high growth industries in Ohio. It is expected that the state's investment will leverage non-state support for a total investment of $6 billion over the ten years. (See section on the Wright Centers below for more information).

The Edison Technology Centers
The Edison Technology Centers link industry with academia and government in partnerships to strengthen industrial competitiveness through technological innovation. Each of the Centers offers capabilities in specific technologies including advanced manufacturing, polymers, materials and processes, welding and materials joining, biotechnology, and environmental.

Services:
Companies involved in the Edison Technology Center programs benefit from the following:

- relationships with universities and federal research facilities, providing state of the art basic and applied research technologies;
- a range of technical services including testing, technology analysis and assessment, training, hotlines, business and economic studies, information database retrieval, pilot plant and microfactory assistance and computer modeling;
- networking and services which cover informational needs through frequent seminars, forums and conferences.

[12] Conversation with Jackie Rudolph of the Ohio Department of Development, 11/26/02.

Four of the centers have Manufacturing Small Business Development Centers (M-SBDCs) co-located with the Edison Centers; of these four centers, three also have Procurement Technical Assistance Centers (PTACs) in the same location. There is one additional M-SBDC in Cleveland and while not located within CAMP (Cleveland's Edison Center), there is a strong working relationship between the two programs. The state's universities serve as hosts for these co-located programs in Dayton, Toledo, and Piketon. ODOD finds that a close relationship with the universities is one key factor in the success of these multi-faceted programs. The ability to leverage funds, provide the financial infrastructure to float programs over various budget cycles, and the access to experts across multiple disciplines are all part of the mix. Funding for these specialized programs comes from the US Small Business Administration's Defense Transition program, Ohio General Revenue Funds, and the Defense Logistics Agency (for procurement programs) as well as local matching funds. [13]

The specific Edison centers and their specialized expertise are described briefly below:

CAMP, Inc.-Cleveland[14]

CAMP, Inc. provides manufacturing, engineering, technical management, and other services for manufacturers seeking to become more productive, more competitive and more profitable. With 75 full-time employees, CAMP and its engineers, trainers and experts consult with regional manufacturers to provide practical solutions for virtually every area of manufacturing. Over the past 15 years, CAMP has assisted more than 1,500 regional companies in hands-on manufacturing improvement projects, resulting in an economic impact of more than $410 million. Funding for CAMP comes from the Edison Technology Program, NIST, and private industry support.

Edison BioTechnology Center (EBTC)-Cleveland, Columbus, Cincinnati[15]

EBTC promotes the growth of the Ohio biomedical/biotechnology industry by providing business development services, building collaborations between industry and research institutions and funding research and development. The Centers work closely with Ohio research institutions, new and established companies, and economic development organizations to commercialize research, foster company formation and growth, and promote Ohio life science industry and resources.

EISC, Inc.-Toledo[16]

EISC moves Ohio companies toward excellence through manufacturing modernization. Areas of expertise include advanced imaging, applied coating technologies, food manufacturing technologies, CAD/CAM, rapid prototyping, quality improvement, plant/layout workcell design, environment and waste minimization. Entrepreneurs, start-up companies and manufacturers find practical, cost-effective solutions to their challenges

[13] Conversation with Karen Sha'uri of the Ohio Department of Development, December 10, 2002.
[14] http://www.camp.org/

[15] http://www.ebtc.org/

[16] http://www.eisc.org/

by tapping into EISC's consulting, training and technology development and commercialization services. An M-SBDC is co-located with this Edison Center.

Edison Materials Technology Center (EMTEC)-Kettering[17]
EMTEC provides applied research in materials and processing technologies including metals, ceramics, composites and polymers. Solving industry's most pressing materials and manufacturing process challenges is EMTEC's primary focus. Since 1987, EMTEC has sponsored over $40 million in materials technology projects. EMTEC has funded over $40 million in cooperative R&D projects for industry and has an M-SBDC on-site as well.

Edison Welding Institute (EWI)-Columbus[18]
EWI provides materials joining and engineering expertise to manufacturers throughout the United States. EWI is the largest nonprofit engineering organization in North America dedicated to advancing and applying materials joining technology. EWI 's 160 staff provide materials joining assistance, contract research, consulting services and training to member companies representing more than 3,300 plant locations nationwide.

TechSolve, Inc.-Cincinnati[19]
TechSolve provides assistance to manufacturers and manufacturing-related businesses, specifically in the following disciplines: waste reduction, machining, operations analysis, industrial engineering, energy conservation and computer-aided process planning. TechSolve, was founded as part of a regional effort to improve the competitiveness of manufacturing and related businesses. An M-SBDC is co-located here as is a procurement assistance program. More than 800 major productivity improvement projects with manufacturers who have reported the following ROI:

- $95 million in cost savings
- $600 million in increased sales
- Retention or creation of more than 600 manufacturing jobs
- $22 million in new salary income added to the economy
- More than 16,000 manufacturing employees trained

Ohio's IT Alliance- Dayton[20]
Ohio's IT Alliance provides regional economic development programs designed to support Ohio's extensive information technology industry. It's statewide approach, leveraging six Regional Partner organizations, has become an extensive distribution channel for deploying IT programming consistently across the state.

One new specialized program is located at the Ohio State University Extension Research Station in Piketon. Here, a joint program with the OSU Cooperative Extension Service, the Research Station, the Edison program, the Small Business Development Center, and

[17] http://www.emtec.org/

[18] http://www.ewi.org/

[19] http://www.techsolve.org/

[20] http://www.ohiositalliance.net/

the US Department of Energy has brought a diverse funding base together to develop support for business diversification (also part of the defense transition program) and aquaculture. With training programs, demonstration projects, technology transfer, and technical support to area companies, the hope is to provide specific opportunities for companies transitioning from a defense focus and to support the local agricultural business economy.[21]

Edison Technology Incubators[22]

The Edison Technology Incubators nurture small technology/manufacturing businesses during the start-up stage. The Incubators provide a variety of business development assistance including below-market space, shared office services, and managerial and technical assistance in an environment conducive to new small businesses:

- **Administrative support** to tenant companies, including: rental space, laboratories, "clean rooms," conference rooms, telephone answering, bookkeeping, access to specialized equipment, manufacturing and assembly areas, offices, reception areas, access to copy and fax machines, word processing, and break rooms.
- **Expert business advice:** management teams assist Incubator tenants in areas such as technology and market evaluation, strategic business and financial planning, and capital formation. Each Edison Incubator is guided by a Board of Trustees comprised of successful entrepreneurs, prominent community leaders and representatives from the local academic community.
- **Access to the Edison Technology Centers and local universities**, offering an array of technical resources including access to sophisticated laboratories, specialized equipment and personnel who may provide professional and technical assistance.
- **Funding** -- Through state matching grants and other federal, community, and industry support, rents and fees are at or below market rates; some incubators provide access to separate seed capital funds.

There are 10 incubators:

- Akron Industrial Incubator- Akron
- Bio/Start - Cincinnati
- Center for Technology Commercialization- Toledo
- Mansfield/Richland Incubator- Mansfield
- Youngstown Business Incubator- Youngstown
- Enterprise Development Inc- Cleveland
- Business Technology Center - Columbus
- Hamilton County Resource Center- Cincinatti
- Lewis Incubator for Technology- Strongsville
- The Entrepreneur Center- Dayton

[21] From conversation with Karen Sha'uri of Ohio Department of Development, December 10, 2002
[22] http://www.odod.state.oh.us/tech/edison/tiedincu.htm

Results:
The Edison Program has achieved national and international recognition as a model for state-industry-university partnerships. In the last 3 years, the tenant companies of the Edison Incubators have generated over $160 million in sales revenue, attracted almost $80 million in investment capital, have been awarded 90 SBIR/STTR grants with a value of over $22 million, and have applied for nearly 240 patents with almost 90 issued to-date.

The Edison Centers have contributed to significant increases in sales, profits, and market share of many companies. From 1998 to 2002, the Edison Centers created or retained 6,081 jobs, contributed 76 new businesses, and 316 new product development projects. They have also secured the following[23]:

Federal Investment	$133,021,644
Total Private Investment	$515,779,560
Cost Savings	$1,001,528,045
New Sales	$2,314,343,390
Wages Created or Retained	$1,152,864,000
Total Estimated Economic Impact	$5,117,536,639

Wright Centers of Innovation
In the State of the State address, delivered on February 5, 2002, Governor Taft introduced the "Third Frontier Project," described above. A major component of the Third Frontier Project is the creation of Wright Centers of Innovation.

Wright Centers of Innovation are to be collaborations in which research and new technology development platforms are closely associated with commercialization systems designed to maximize the economic impact in Ohio of the State's research investment. This program is intended to accelerate the pace of technology research in Ohio and enhance the efficiency with which it is commercialized. Collaborations will be structured to advance the skills and resources of Ohio's existing private and public organizations in the core competencies of: bioscience, information technology, power and propulsion, advanced materials, instruments, controls and electronics.

A total of $20 million is available for award through an initial RFP. It is expected that no more than two centers will be funded at a level of $10,000,000 to $20,000,000 for support of a portion of a three-year budget plan.[24] The state's capital budget for fiscal 2003 includes $50 million to build up to four Wright Centers and about six smaller, tech-based capital projects during the next three years. Under the state's preliminary plans, one or two of the Wright Centers will be in the biosciences sector; the others will be in information technology, power and propulsion, polymers and advanced materials, or instruments, controls and electronics. The state's ultimate goal is to have up to two Wright Centers for each of the five technology categories. The centers are to have a statewide focus rather

[23] *Estimated Economic Impact of Edison Centers*, Ohio Department of Development, November 2002.
[24] Wright Centers of Innovation, Ohio Department of Development, 2003 Request for Proposals.

than a regional focus.[25] Funding of operating expenses is expected to come from federal grants. In addition, Ohio is planning a $500 million bond referendum.

The Edison Centers may compete for or be collaborators for Wright funding. However, it is expected that they will ultimately work with universities on commercialization of technologies. [26]

2. PENNSYLVANIA: Ben Franklin Technology Partners (BFTP)

The Ben Franklin Technology Partners help technology companies prosper by providing access to risk capital, business expertise, and third-party resources. Assistance is provided through four regional centers. This summary focuses on the services provided by two of the centers: Ben Franklin Technology Partners of Southeastern Pennsylvania and Innovation Works, the Southwestern office.

History:
The BFTP was established in 1982 to stimulate economic growth through innovation, entrepreneurship and the development and adoption of new technologies. The state of Pennsylvania has consistently funded the program since its inception and is about to embark on its 20th year of operation.

Structure:

Ben Franklin Technology Partners operates on a regional level through four centers strategically located throughout the Commonwealth, with main offices in Pittsburgh, University Park, Bethlehem, and Philadelphia. An independent not-for-profit economic development organization, each center serves specific counties and offers distinct regional activities. Each center is a private, non-profit organization with its own board.

In 2001, the Commonwealth of Pennsylvania passed the Ben Franklin Technology Development Authority Act. The legislation established the Ben Franklin Technology Development Authority (BFTDA) and charged it with coordination of BFTP programs and investments that advance the competitiveness of Commonwealth companies in the global economy.[27] At $54.3 million, the BFTDA is one of the largest single state technology development programs in the nation. A board of directors, made up of public and private sector representatives from the business and technology communities, governs the BFTDA.[28]

Funding:
State funding for the Ben Franklin Technology Partners program is currently $28 million a year. This is divided evenly among the four centers. Each center supplements this funding

[25] Jeff Stacklin, "$50M up for grabs for new tech centers," *Crain's Cleveland Business*, November 18, 2002.
[26] Conversation with Norm Chagnon, Ohio Department of Development, November 26, 2002.
[27] Ben Franklin Technology Partners web site, http:///www.sep.benfranklin.org, November 7, 2002.
[28] http://www.inventpa.com, November 25, 2002.

with federal and foundation grants, though the programs remain heavily reliant on their state funding.

Ben Franklin Technology Partners of Southeastern Pennsylvania (BFTP/SEP)

BFTP/SEP provides capital and expertise in technology, finance and business that helps entrepreneurs and established businesses overcome challenges and plan for growth. The organization fosters dynamic relationships among companies, institutional and private investors, research institutions and the university community.

BFTP/SEP provides "Capital, Coaching, Connections and Community" to commercial for-profit technology based companies.

Capital: BFTP/SEP provides critical seed capital at the earliest stages and growth capital for product development, process improvement and technology commercialization. Financing is provided through mezzanine and guarantee funds. BFTP's Investment Fund provides seed capital for innovative product development leading to commercialization. There are more than 130 technology firms currently active in BFTP/SEP's seed capital portfolio. Cumulative investment amounts of up to $500,000 are available (typically through several funding rounds) to development-stage Pennsylvania companies located in Bucks, Chester, Delaware, Montgomery and Philadelphia counties. Investments are generally made for projects requiring six to twelve months to complete, with first-round funding of up to $100,000. While company applicants may not have a complete management team, prototype or final product, they are expected to have completed significant market research and to have developed at least a preliminary market strategy. Eligible projects may involve development of new scientific findings with near-term commercial potential or the application of technology that is central to satisfying a significant and unmet market need. Projects must include both technical and commercialization activities.[29]

Coaching: One-on-one business assistance is provided through portfolio management and mentoring programs. Through success teams, entrepreneurs work together on their challenges. Staff provide customized technology assessments, competitive analysis and strategic planning.

Connections: Companies benefit from relationships with preferred service providers, partnerships with qualified investors, access to technology development resources, a network of research centers and federal laboratories, Centers of Excellence network, laboratory facilities for product development, and strategic alliances and licensing opportunities.

Community: Ben Franklin's mission extends to the community through several programs: The Minority Vestibule Program, The Enterprise Center, Biotechnician certification

[29] http://www.sep.benfranklin.org

program, and West Oak Lane Charter School Community Internet Center (providing Internet access to the school's students, faculty and families.)[30]

Technology Services:[31]
Supported by the U.S. Economic Development Administration and Pennsylvania Department of Community and Economic Development, Technology Services assists companies in identifying new technologies, developing new products, and implementing product and process improvements.

Market and Competitive Information Services: Ben Franklin Technology Partners of Southeastern Pennsylvania has provided custom business information services to companies and organizations for over 10 years. Employing a wide variety of online resources that are often unknown or cost-prohibitive to persons outside of the research industry, the information specialist at Ben Franklin can assemble critical business information for market assessment and competitive analysis. Services include providing research for the following uses:

- *Market analysis*
- *Competitive intelligence*
- *Strategic alliances*
- *Marketing campaigns*
- *Technical analysis* - Review literature including articles, reports, papers and patents in biotechnology, information technology, engineering and other industries; obtain abstracts/summaries or full text of documents.

Minority Vestibule Program: Promoting the growth of minority-owned technology enterprises within the region is a major focus at BFTP/SEP. The organization is working aggressively to increase to 10% the number of minority technology firms in its Investment Fund portfolio. The Vestibule is an initiative designed to strengthen minority technology firms' readiness for the due diligence process. The Program provides viable candidates with advice and coaching on BFTP/SEP's investment process, feedback on the content and format of their application materials, guidance and pro bono professional consulting services for technological and commercialization due diligence, and information related to funding resources.

The Ben Franklin Innovation Center at The Jefferson Center for Biomedical Research of Thomas Jefferson University in Doylestown, PA (BFIC): The goal of the Innovation Center is to nurture agri- and bio-technology development in the region. In particular, The Center's faculty, scientists and staff and the extensive research facilities are encouraged to be available to commercial enterprises. The availability of these resources, together with opportunities in workforce training has resulted in several successful collaborations.

Centers of Excellence - The Centers of Excellence Service Network is designed to assist companies in addressing near-term technical needs by utilizing the Philadelphia area

[30] http://www.sep.benfranklin.org/who/overview.html

[31] http://www.sep.benfranklin.org/services/services.html

research institutions. The twelve centers provide consulting and use of laboratory facilities for analysis, experimentation, and prototyping.

- *Business Technology Center - West Chester University*
- *Center for Advanced Biomaterials and Tissue Engineering - Drexel University*
- *Center for Advanced Communications - Villanova University*
- *Center for Materials Testing and Processing – University of Pennsylvania*
- *Center for the Plasma Processing of Materials - Drexel University*
- *Center for Recombinant Protein Production and Structure Evaluation - Wistar Institute*
- *CITECH* -- CITECH offers testing and consulting services exclusively to the medical device industry.
- *Fiber Optics and Photonics Manufacturing Engineering Center – Drexel University*
- *Fibrous Materials Research Center - Drexel University*
- *Institute for Environmental Engineering Research - Villanova University*
- *Rapid Product Development Center – DVIRC* -- Established to assist manufacturers to reduce time-to-market from product concept to first production piece
- *The TAPES Center of Excellence - Thomas Jefferson University* -- The Technology Assessment and PharmacoEconomic Services Center (TAPES) assists private sector healthcare companies with pharmaco-economic evaluations, health product technology assessments, drug development efforts, pharmaceutical policies, and clinical outcome and cost-effectiveness evaluations.

FedTap - The Federal Technology Access Program is a regional consortium formed to transfer and commercialize technology from the federal laboratory system to companies in Southeastern Pennsylvania. The FedTAP® initiative provides the following:

- Assessing a company's technical needs and providing strategic recommendations
- Connecting companies with appropriate technology resources
- Facilitating agreements with federal laboratories
- Assisting the formation of CRADAs (Cooperative Research and Development Agreement) and other agreements with laboratories
- Identifying licensing opportunities and application assistance

The New Product Development Forum: The New Product Development (NPD) Forum is a joint effort of Ben Franklin Technology Partners of Southeastern Pennsylvania and the Urban Industry Initiative of the Philadelphia Industrial Development Corporation. The NPD Forum was conceived to stimulate more new product development efforts by growth-oriented Philadelphia companies.

TechScout ®: TechScout® is a customized technology service program instituted to find, assess, acquire and implement specific new cutting edge technologies that support companies' plans for new product development and sustained growth. BFTP/SEP and its

affiliated partners form a virtual network to access new technologies and provide relevant expertise, using resources from federal laboratories, the universities, other synergistic companies, and technology transfer agencies.

Innovation Works[32]

The Innovation Works team specializes in helping seed stage technology ventures by providing them with access to risk capital, business expertise, and third-party resources.

Short History
Originally called the Ben Franklin Partnership for Southwestern Pennsylvania, this organization changed its moniker, and focus in 1999. Still concentrating on the needs of companies in nine southwestern Pennsylvania counties, Innovation Works started fresh in 1999 with an intention to provide early stage financing and support to portfolio companies. The organization continues to add programs and support services as the needs of its companies change. As an example, Innovation Works re-started an angel investor initiative in November, 2002 to provide a source of follow-on funding for its portfolio companies. Its intention is to provide opportunities for its companies locally and to network with other angel groups in the state to expand the opportunities to secure next stage financing.

When a startup receives an investment from Innovation Works, the entrepreneur and the staff conduct an honest assessment of the organization's strengths, weaknesses, opportunities, and threats. This evaluation provides a common starting ground for Innovation Works and the company, and results in a detailed roadmap outlining the critical steps (milestones) the business must take. Each company is then assigned to a professional through the Enterprise Associates program.
Enterprise Associates Program: This program provides guidance and support to help companies identify and address critical business issues. The Enterprise Associate Program is comprised of a team of seasoned business professionals who work directly with portfolio companies to maximize their prospects for commercial success and best position them to attract follow-on investment. Each Enterprise Associate works closely with 4-5 portfolio companies, helping them to identify and prioritize their most pressing business needs and assisting in the development and implementation of plans to address them.

Using this roadmap as a guide, Enterprise Associates meet with portfolio companies on a regular basis to monitor their progress and to help them complete key milestones. As the liaison between Innovation Works and the entrepreneurs, Enterprise Associates also ensure that portfolio companies gain maximum value from the full range of resources available to them.

Innovation Network (INet) matches companies with providers of essential business services, experience, advice, and information. Through its network of professionals, the

[32] Information compiled from http://www.innovationworks.org and from an interview with Bob Strazynski of Innovation Works on November 19, 2002.

INet team pairs entrepreneurs with seasoned business advisors and industry experts who possess a detailed understanding of the company's technology or industry. To ensure continuity, an advisor typically stays with the company in a consultative role throughout its lifecycle with Innovation Works. Industry experts are more likely to be called upon on an as-needed basis to help solve a particular problem or provide advice on a specific issue.

The INet program also matches entrepreneurs with qualified service providers experienced in assisting startup companies. In tandem with Enterprise Associates, the INet team assesses the specific requirements of each portfolio company throughout its development cycle and facilitates introductions to appropriate service providers.

INet also serves an important role by sponsoring programs and events that promote entrepreneurship including tradeshows, business seminars, internships, and venture fairs.

Staffing and Effort: Innovation Works has a staff of 20-25 individuals at any given time, with approximately two-thirds of them devoted to working with portfolio companies and one third focused on bringing in new deals.

Results[33]

The Ben Franklin Technology Partners is a strong statewide system. *A Record of Achievement: The Economic Impact of the Ben Franklin Partnership* by Nexus Associates records the impact of the Ben Franklin Partnership from 1989 to 1996[1]:

- Boosted the Pennsylvania economy by more than $3 billion.
- Made investments which yielded $14 for every $1 of state money.
- Garnered $168 million in additional state tax revenues for Pennsylvania as a direct result of the Ben Franklin program.
- On average, BFTP clients employed five more people in each year following funding than they would have in the absence of the BFTP investment.

In 2001, The Ben Franklin Technology Partners network had the following results:[34]

- Jobs Created or Retained: 1765
- New Tech Companies Assisted: 76
- Products Commercialized & Processes Implemented: 147
- Private Sector Match: $44 Million
- Federal Match: $3.8 Million
- College/University Contribution: $1.7 Million
- Other Resources Leveraged: $3.8 Million

[33] Nexus Associates: *A Record of Achievement: The Economic Impact of the Ben Franklin Partnership,* 1999.

[34] A study is currently being conducted to update these figures for 1996 through 2001. Results will be published in early 2003.

3. MARYLAND: Maryland Technology Development Corporation (TEDCO)

History:
TEDCO was created by the General Assembly to "assist in transferring to the private sector and commercializing the results and products of scientific research and development conducted by colleges and universities; assist in the commercialization of technology developed in the private sector; and foster the commercialization of research and development...to create and sustain businesses throughout all regions of the State." Formal activity of the Corporation began in September 1999, with the hiring of an Executive Director, and full operations began in July 2000. [35]

Structure:

TEDCO is a "body politic and corporate" and is "constituted as a public instrumentality of the State." Governed by a 15-member Board, appointed by the Governor for four year terms with Senate consent, the Board is comprised of leaders in the State's technology community and contains representatives from these sectors: private, university, non-profit, and public.

Funding
TEDCO resources and guidance has focused nearly $10 million on business incubation activities in Maryland, with nearly 70% from non-State sources.

Non-State Funds:	$6,649, 435
TEDCO Funds:	$1,873,500
State Funds:	$1,000,000

Services[36]
TEDCO offers business assistance through several programs, listed here; this report will focus in greater depth on the Business Incubator Assistance Program, highlighted below.

Federal Laboratory Partnership Program: The goal of the Federal Laboratory Partnership Program is to create awareness of technologies available in Maryland Federal Laboratories, improve Maryland companies' technical skills, increase product development and prototyping for early stage product development, and strengthen Maryland's economy. The program allows companies to reduce the cost of technical assistance from Federal Laboratories.

Maryland Technology Transfer Fund: The goal of the Maryland Technology Transfer Fund is to encourage the transfer of technology between Maryland companies and eligible

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[35] TEDCO, *Annual Report on Operations, 2001.* March, 2002.

[36] Sources for this section are from TEDCO's web site, http://www.marylandtedco.org, from TEDCO's 2001 Annual report and from conversation with Heidi Sheppard, Program Manager for Business Incubation Programs on November 27,2002.

federal labs or universities. The MTTF is funded in 2001 by a grant of $460,000 to TEDCO from the Maryland Department of Business and Economic Development. A portion of the funds are reserved for Morgan State University and Johns Hopkins University to develop innovative ways of partnering with industry.

NAVAIR Technology Commercialization Initiative: In collaboration with the Patuxent Partnership, TEDCO has contracted with the Naval Air Warfare Center – Aircraft Division to facilitate transfer of technology being developed by the Navy into the commercial sector.

TEDCO Ventures: (See section on early stage financing for more information) TEDCO was asked to coordinate relationships between Toucan Capital Corp. and DBED (a limited partner in Toucan's fund). Toucan associates meet biweekly with staff members from TEDCO and the DBED Investment Financing Group to review opportunities for investment that involve technology transfer and/or technology development collaborations between Toucan portfolio companies and universities and federal laboratories in Maryland.

University Technology Development Fund: The goal of the University Technology Development Fund is to provide resources to Maryland universities to support pre-commercial research on university intellectual property to increase the likelihood of commercializing that intellectual property.

Maryland Minority Small Business Innovation Research Initiative: The Maryland Minority SBIR Initiative seeks to increase the number of Maryland-based minority and women technology entrepreneurs competing for R&D funding through the SBIR program.

Maryland Technology Partnership for Innovation: MTPI's vision is to facilitate the transformation of knowledge into innovations that will create new wealth and strengthen local economies in Maryland's economically distressed communities, by planning and implementing a model that utilizes technology transfer, business incubation, and education and workforce development to leverage the resources of the federal laboratory system.

NASA Technology Opportunities: As an affiliate, TEDCO identifies NASA-sponsored research, technology, technical expertise and R&D capabilities that match the needs and interests of Maryland businesses.

While all of these services provide support to emerging technology companies in Maryland, the state has been recognized specifically for its incubator program. There are three components to the program: The Business Incubator Assistance Program, the Best Practices Program, and the Incubator Development Fund (also know as the Capital Facilities Program). It is this initiative the researchers felt warranted further analysis:

A. TEDCO's Business Incubator Assistance Program supports the growth of technology companies in Maryland through the development of business incubators and the systems and resources that support them. The program has two parts: 1) improving the

effectiveness of current incubators and 2) assisting in the development of new incubators. TEDCO's role is to provide leadership, research, technical assistance, and seed funding.

Feasibility Study Grant Program

The Feasibility Study Grant Program is designed to assist higher education institutions and local economic development organizations in creating and expanding technology business incubators. TEDCO provides matching grant dollars for winning programs. To qualify for the award the applicant must be a government, government-related or university-related organization located in Maryland. The applicant must be considering the development of a new business incubator that will support technology firms. The feasibility study must be performed by an independent entity. The intent of the program is to determine the need for the incubator, availability of resources, access to management, and methods of incubator governance as well as other factors that can impact the success of a new program.

Nine feasibility studies have been funded with a total commitment of $245,500. As yet, no incubators have been developed from these studies, however, recommendations have been made for their development.

Angels and Eggs Investor Forum: Begun in 2002, Angels and Eggs is a collaborative program between the Howard County Economic Development Authority, the Maryland Business Incubation Association, TEDCO and the University of Maryland Baltimore County. The program's goal is to network companies in Maryland incubators with angel investors. The program culminates with formal presentations by the companies to a panel of angel investors.

Maryland's Incubator Companies of the Year Awards: TEDCO sponsors an annual award to recognize outstanding incubator companies in cooperation with the leading seed venture capital firms in the region and co-sponsors Saul Ewing and American Express Tax and Business Services.

Maryland's Incubator Update: Maryland's Incubator Update is a monthly newsletter detailing the most recent news on TEDCO and Maryland's business incubators. It is edited by the Maryland Business Incubation Association and funded by a grant from TEDCO.

B. Incubator Development Fund: The Incubator Development Fund is designed to develop technology-oriented business incubators around the state. With a $5 million appropriation from the General Assembly, TEDCO provides matching funds to qualified groups. This seed funding is designed to leverage other public and private investments in the incubator. TEDCO also provides leadership and technical assistance.

An applicant organization submits a business plan to obtain funds and "payback" on the investment is expected to fund further incubator activities. Other requirements include:

- 1 to 1 match is required. The match can be either operating or capital funds.
- The primary use of funds is capital development not operations.
- Both current and proposed incubators are eligible.
- Both public and non-profit organizations are eligible.
- No jurisdiction can receive more than $1 million in assistance in any one year.
- The finance instruments may vary (e.g., debt, equity, guarantees, creative financing alternatives).

There have been three recipients of this funding.

Capital Facilities Program: During the 2001 legislative session, the General Assembly approved a $5 million capital appropriation to TEDCO for new business incubator facilities. In addition, the state funded a business incubator facilities program through TEDCO at a level of $3.75 million to manage a program to provide matching funding to local governments and higher education institutions. Working with the Business Incubator Technical Advisory Committee, TEDCO and Department of Business and Economic Development (DBED) staff developed policy guidelines and application materials. The regulations outlined six factors to be used in determining eligibility for funding, which include quality of feasibility study, impact on current incubators, higher-education relationship, smart growth location, specialized facilities and cooperation among incubators. Two incubators have received funding so far:

Silver Spring Innovation Center (SSIC): Montgomery County Department of Economic Development SSIC is a private/public undertaking responding to Montgomery County's increased demand for information technology incubator space. The incubator will be part of a two-building commercial development known as the "Silver Spring GATeWAY" project and will be comprised of 11,000 square feet ofClass "A" office space.

Emerging Technology Center @ Hopkins Eastern: This project is a 45,000 square foot communication, information and emerging high technology business center located in Baltimore This project is to support emerging technology that may come from a university, a federal lab or private entrepreneur by providing affordable office space and business assistance services. The Center will become part of a larger economic development strategy being employed by the City to bring academic and private sector talent together.

C. *Best Practices Grant Program:* TEDCO provides matching funds to support the development of best practices programs in current incubators. In the first round of funding, grants were made for the following: creation of a seed investor network, development of assessment and training program for new incubator companies, creation of an incubator resource management information system, and development of a business assistance coaching program.

Benchmarking Study: In 2000, TEDCO sponsored a study of best practices for technology incubators conducted by the National Business Incubation Association (NBIA). *Best Practices in Business Incubation* surveyed national and international incubator best practices to identify key programs that could be usefully adopted by Maryland-based incubators. The results can be adapted to benefit technology incubators throughout the United States. The research involved an in-depth examination of the practices of select U.S. and international incubators (such as in Israel and Great Britain) and new models such as virtual incubators. The NBIA study identified key practices that could be applied by Maryland's network of business incubators in the following areas: comprehensive business assistance programs, professional infrastructure, client capitalization and financing, client networking, technology transfer and commercialization, university and federal laboratory linkages, facility basics, governance and staffing, client screening and graduation, and incubator evaluation. This was the first time any state has worked with NBIA to benchmark best practices as the basis of an incubator program. Utilizing the information contained in this report, in 2001, seven incubators received challenge grants of $25,000 to implement best practices, each matched by $25,000 locally.

Results[37]

Business Incubation Program: Through 2001, TEDCO investments of $1.9 million leveraged $7.5 million dollars for the business incubation program.

Economic Impact of Incubators: In December 2000, RESI, a regional economic research institute, conducted an economic impact study of six Maryland incubators. Through the multiplier effect, the six Maryland incubators under consideration in this study had a total economic impact ranging from roughly 2,200 to 6,800 jobs, paying over $36,000 on average in 2000. This compares to the average annual wage in Maryland of $35,000. Moreover, incubator firms generate between $184 and $530 million dollars in gross state product and between $31 and $96 million dollars in taxes annually.

4. NORTH CAROLINA: Small Business and Technology Development Center (SBTDC)

The SBTDC is a business development service of The University of North Carolina system operated in partnership with the United States Small Business Administration (SBA). It is the primary organization through which the state of North Carolina provides counseling and technical assistance to the business community . The SBTDC helps clients increase revenues, create jobs, and commercialize technology.

[37] TEDCO, *Annual Report on Operations: 2001.*

History

The SBTDC was launched in 1984 by the university system. It has had the "Technology" designation in it's name since it's inception. The organization was created with the focus of helping emerging technology companies. However, it also the provides services and support to non-technology companies typically associated with an SBDC program. About six years ago, the SBTDC began directing significant effort to working with high-growth companies.

Structure

The SBTDC is very closely tied to the university system. There are 80 full time associates in 11 regional service centers. Each center is located on the campus of a college or university. Typically, they have 350 graduate students working in their offices each year. Each center director reports to a senior administration officer at their host university. The SBTDC director reports to the president of the university system. He is a *defacto* university staff member and serves the role of a liaison between the university and the North Carolina Department of Commerce. Although the offices are regionally based, industry specialists are available to help companies in any part of the state.

The SBTDC also has established *cooperative working agreements* with the US Department of Defense, Export- Import Bank of the United States, North Carolina Biotechnology Center, and the NC Department of Commerce.[38]

Funding

Primary funding is provided by The University of North Carolina system and by the US Small Business Administration. . With a $5.8 million budget, approximately $2.6 million comes from the federal government. The university system provides $1.7 directly and about $1 million in waived indirect costs. Another $500,000 is received from the State Department of Commerce and the North Carolina Biotechnology Center.[39]

Services[40]

In 2001, 12% of services and resources went to helping startup companies. Another 30% went to serving high-growth potential companies at any phase beyond startup.

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[38] Conversation with Scott Daugherty, Executive Director of the SBTDC, December 2, 2002

[39] Daughtery conversation, December 2, 2002.

[40] http://www.sbtdc.org/

- Primary focus is *management counseling*, addressing issues including financing, marketing, human resources, operations, business planning, and feasibility assessment.
- Provide targeted, research-based *educational products* which are focused on change management, strategic performance, and leadership development for owners and managers.
- Offer *specialized market development assistance* in government procurement, international business development/exporting, marine trades services, technology development and commercialization

Marine Trades Services: The only industry-specific program in the country providing confidential business services to marinas, boatyards, boat builders and boat manufacturers, boat dealers, marine construction firms. Specialists provide assistance with business planning, marketing, regulatory, sales to government agencies, and international sales.

Technology Development and Commercialization: This includes one-on-one counseling to assist in the commercialization of innovative technologies. The SBTDC technology team also provides assistance to technology transfer offices at universities and other institutions for the purpose of supporting their development of spin-off companies. Emphasis is placed on the following areas:

- Technology transfer: new product development /commercialization strategies, strategic and business planning, technology marketing, and licensing strategy
- Research & development funding: assist clients with application to special state and federal technology funding programs including SBIR, STTR, North Carolina Biotechnology Center and ATP
- Intellectual Property issues
- Networking/Resource identification
- Financing Alternatives

Results[41]

Businesses that have worked with the SBTDC have experienced an 85-percent survival rate (when the national average is less than 40 percent over a six-year period). And clients typically grow five times faster than the average for North Carolina small businesses.

- Since its inception, the SBTDC has counseled over 75,000 clients. In 2001, the SBTDC provided over 45,000 hours of counseling to more than 6,000 clients.
- Since 1993, the SBTDC has helped clients raise over $400 million in debt and equity capital (exclusive of owner's equity) to start and grow their businesses. This funding enabled the creation or retention of almost 18,000 jobs in North Carolina during the last eight years.
- In addition to over $40 million in debt financing, the SBTDC helped clients leverage over $20 million in equity from venture capitalists, private ("angel") investors and other sources in 2001.

[41] Small Business and Technology Development Center, 2001 Annual Report, 2002. http://www.sbtdc.org/publications/annual_report.pdf

- SBTDC's Procurement Technical Assistance Center helped clients obtain over $340 million in contract awards from government agencies and prime contractors to expand their businesses in 2001.
- Job Growth: SBTDC Clients 14.5 % compared to the NC average of 2.6 %
- Sales Growth: SBTDC Clients 41.8 % compared with the NC average of 3.8%.
- Results from 1999-2000:
  - Taxes Leveraged: $26.0 million
  - SBTDC Program Cost: $ 4.3 million
    - Compared to the total cost of operating the SBTDC, the counseling provided to both established and pre-venture clients generated $6.12 in tax revenues for every $1.00 spent on the entire program.
    - Clients estimate the value of SBTDC services received to be worth $39.6 million.

5. CALIFORNIA: University Support for Innovative Entrepreneurial Initiatives

California supports technology companies primarily through technology transfer programs (CALTip). In this study, the researchers felt it was important to look at innovative ways public universities have supported entrepreneurship through cooperation with local business communities. Two examples from California have been particularly successful and are models for replication in other parts of the US and overseas: The Software Business Cluster in San Jose and CONNECT in San Diego. A description of each program is offered here, featuring the involvement of a local public university and how the program is structured.

Software Business Cluster, San Jose, California

History

In the early 1990's the City of San Jose adopted the moniker "Capital of Silicon Valley." At that time, however, San Jose had less than 10 software/Internet companies of any significance operating within the city's boundaries, and none operating within the downtown area. The city sponsored the formation of the Software Business Cluster, a software/Internet focused incubator to be located in the downtown core of San Jose. In 1994, Jim Robbins developed the incubator patterned after successful industry focused incubators in California.[42]

Structure[43]

[42] National Business Incubator Association, *Best Practices in Incubation* prepared for the Maryland Technology Development Corporation (2000)

[43] http://www.sjsbc.org/cluster/index.html

The Software Business Cluster of San Jose was the first software and Internet incubator in California. It is a non-profit entity, supported by leading businesses and organizations within Silicon Valley. The incubator houses 18 software start-ups and emerging businesses .

To be included in the SBC, candidates must meet some initial requirements. A company must be an Internet or software technology business, product or service in the start-up, early-stage development, or restructure/re-focus phase of development. It must have a viable business plan, market identification and knowledge, a product defined with a development plan, technical capability, a financial plan, potential for creating new jobs, and the ability to pay the low participation costs.

Applicants are reviewed on the following criteria: business potential, quality of business plan, clarity of market focus, reality of assessment of competition, quality of management team, and the ability to utilize cluster services. The cluster makes an attempt to attract a diverse group of start-ups in non-competitive market sectors.

When a business is established, it is expected to move out of the cluster to make room for new start-ups. The maximum period any business may remain is two years.

Services[44]
The SBC provides member companies with attractive, inexpensive space and furnishings in a setting conducive to software development as well as shared office equipment and common rooms. It provides information and linkages to funding sources, start-up coaching and assistance and technology transfer and joint venture opportunities between start-ups and established corporation. Tenants also enjoy increased visibility and media attention.

Included in the basic lease rate are core facility services: month-to-month full service lease, furnished office space, administrator/receptionist, 24-hour access to a secured building, shared conference rooms and projection equipment, kitchen, lobby, shared copier, fax, and postal meter, local area network and T1 interconnect, network servers and Internet service, and home page host facility.

Core business services include consultation of on-site SBC Director, advisors and executive associates, business development seminars, business assistance through a network of volunteers, interns, and members of the business community, and introductions to business resources and the capital investment community.

Cluster businesses contract for and pay separately for the following: telephone installation and monthly usage, liability and personal property insurance, copier and postage meter usage at cost, college student interns at cost (when available), media and public relations announcements via PR NewsWire at cost, and parking.

[44] SBC Web site and *Best Practices in Incubation*, 2000

Coaching and Facilitation: The SBC assesses the needs of its clients on a continuous basis. During the screening process, initial, basic needs are assessed. When a company becomes a tenant, it's managers have frequent, often daily, meetings with the SBC director to address a list of priority items identified by the client.

Networking: The SBC has established an extensive network of professionals through its board of directors, partners and sponsors consisting of senior level professionals from around Silicon Valley with specific expertise in the software/Internet industry. Representatives include partners at law firms, accounting firms and consulting firms who have agreed to work with SBC clients on a deferred billing basis (until the company secures financing) or for equity in lieu of payment. Use of the network is facilitated by staff on an as needed basis in response to the three to five priority items identified by the client.

> *Executive Associates Program*: The program consists of 10 to 20 experienced business people offering pro bono assistance to the Cluster's businesses. Former CEOs, CFOs, Marketing Managers, and other senior business people experienced specifically in the software industry have been recruited to staff this program. By limiting the number of individuals involved, the cluster can provide sufficient business development opportunities to each participant to justify their commitment of time to the program.
>
> *Brown Bag Lunch Program*: This program consists of monthly lunch seminars by local business professionals from incubator bankers, outplacement specialists, venture capitalists, lawyers, accountants and others. The topics are selected based on information gathered during the regular coaching and facilitation meetings conducted by the executive director and/or managing director.
>
> *CEO's Roundtable*: This program consists of a monthly meeting that allows the CEOs from client businesses to present success stories, discuss common problems, provide advice, and exchange ideas on issues with their peers. These discussions focus on assigned topics identified during the regular coaching and facilitation meetings conducted by the executive director and/or managing director. A different CEO facilitates each session.

Venture Capital Referral Program: The program assists clients in securing equity capital from venture capital and angel investors. Each SBC client's business plan/model is reviewed from the perspective of potential investors. Staff provide comments, questions and suggestions to help the client restructure the business/plan model and give assistance in preparing a funding presentation.

Internship Program: Approximately 15 teams of San Jose State MBA students are assigned to clients to assist with market research and business planning. Each team works with a client for one semester, with many students securing employment with the client upon graduation.

Key elements to the success of this program have been[45]

- A highly successful Venture Capital Referral Program that has resulted in over 80 percent of SBC clients receiving venture capital funding.

- Strong financial and political support from the City of San Jose, which has financed the facility with redevelopment funds since the incubator opened. The city allows the SBC to retain the income it generates from charging market rate rents to cover operating expenses.

- A pro-active partnership with San Jose State University, which provides the 501(c)(3) nonprofit umbrella for the SBC through its foundation. San Jose State provides both fiscal and administrative support to the SBC, and the SBC's staff are employees of the university, which allows them to receive the benefits that go along with this designation. In addition, San Jose State serves as a resource to SBC clients by providing student intern teams as well as technical consulting from faculty at no cost to the client and broad-based financial support. Private sector sponsors contributed $150,000 to assist with the launch of the SBC and there continue to provide contributions to finance special projects undertaken by the SBC.

- Broad-based private sector supported programs established to assist SBC clients. These programs include the Executive Associate Program, the Brown Bag Lunch Program and others.

Results
The Software Business Cluster was named National Incubator of the Year for 2000 by the National Business Incubation Association. Over $400 million in venture investment has been made in SBC companies over its history, and three SBC companies went public in 1999. During its history, the SBC has spawned 75 software companies and 60% of those companies are still in business. Seventy-five percent of SBC's clients indicated that they would not have started their business in San Jose except for the SBC. The City of San Jose continues to provide the funding for rent for the SBC space and is planning a new business cluster based around the biotechnology industry. It will be managed by the SBC staff.[46]

University of San Diego CONNECT
UCSD CONNECT is a successful regional program linking high-technology and life science entrepreneurs with the resources they need for success: technology, money, markets, management, partners, and support services.

History
CONNECT was founded in 1985 at the urging of San Diego's business community.

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[45] *Best Practices in Incubation*, 2000.

[46] Conversation with Chuck Erickson, Director of the Software Business Cluster, December 2, 2002.

Structure
CONNECT is part of the University of California, San Diego. It delivers targeted expertise to San Diego's technology business community by teaming up with the region's prominent industry-specific organizations and individuals, and by partnering with UCSD resources, such as the School of Medicine, Jacobs School of Engineering, San Diego Super Computer Center, and Scripps and Salk Institutes.

Funding
CONNECT is entirely self-supporting and receives no funding from the university or the state of California. It is supported through membership dues, course fees, and corporate underwriting for specific programs. The operation was able to get going with just $75,000 in private funding. CONNECT currently operates with an annual budget in excess of $2 million.

Services[47]
CONNECT's services are tailored to meet the varying needs of San Diego entrepreneurs at all stages of their business life cycles and growth. Its programs serve as a catalyst for the development and exchange of ideas, a forum to explore new business avenues and partnerships, and an opportunity to network with peers.

Springboard is a year-round program started in 1993, that helps aspiring entrepreneurs turn their business visions into reality by helping them develop their business concepts and strategies. The program has assisted all levels of emerging companies and guides entrepreneurs in the arduous art of business development, corporate strategy and raising capital. Once a company is accepted into the program, they undergo four to ten weeks of one-on-one coaching sessions, critiques, and strategic issues with a member of UCSD CONNECT's staff, a management fellow, or an industry domain specialist. The company is then invited to present their refined business idea to an invitation-only panel of 10 to 15 people. Each panel is unique and all the panelists are selected with respect to their domain expertise or their potential solution to specific strategic issues. Typically, panels consist of a venture capitalist or private investor, an accountant, corporate and patent attorneys, marketing professional, a potential customer and an experienced executive from a well-established company in the same industry. The 9th Annual Springboard Luncheon is the capstone of the program, where selected companies present their business plans to investors and the San Diego business community.

BioTech Business Development CONNECT is primarily a networking group for business development executives in the San Diego biotech community. It was started in 1997 as a venue for informal meetings and exchanges of information.

CEO CONNECT is an exclusive peer group of CEOs who meet monthly to discuss their own issues in a confidential forum. This program allows candid feedback and advice from a close network of CEOs. This is a continuous program so members get feedback from a network of individuals that know them intimately. There are also industry specific groups.

[47] UCSD CONNECT, http://www.connect.org/about/index.htm

These executive sessions are professionally facilitated by CEO CONNECT facilitators. Each group is limited to 14 technology CEOs who run non-competing companies. Once selected, members agree to participate in at least 10 of the 12 scheduled monthly group meetings, maintain strict confidentiality about all issues discussed among members , and pay in advance the quarterly fee of $975.

CONNECT Entrepreneur Development is a joint effort between UCSD CONNECT and the Business Department at UCSD Extension. CONNECT Entrepreneur Development provides emerging technology companies and their executives with educational conferences, seminars, courses, and programs. Recent programs include: presentation skills for entrepreneurs, selling to the government, corporate partnering, venture capital financing, and business plan development.

Breakthrough Business Strategies is a monthly program designed to address the various issues developing and growing technology companies face through their many stages and provide networking opportunities. These are in-depth programs addressing timely issues such as funding, accounting, R& D, corporate structure, sales & marketing, and business development.

Evolving Markets in Telecommunications Conference is a "state of the industry" event in its 9th tear. Co-hosted by CONNECT, the San Diego Telecom Council, and the San Diego Venture Group, the conference showcases the region's most promising small-, mid- and large-sized telecom/wireless firms and provides insight and information on future industry trends.

Global CONNECT is currently under development in response to the increasing interest generated by the success of UCSD CONNECT. Global CONNECT will offer support services and guidance to other regions of the U. S., and the world, to aid in the creation of more CONNECT organizations.

HR CONNECT holds meetings on a quarterly basis. Usually comprised of seminars or roundtable discussions, the events serve as a venue for Human Resource practitioners and professionals to gather with their peers to learn about issues facing their industry today.

The Life Sciences Financial Forum provides pre-screened San Diego Life Science, Therapeutic, Diagnostic, Medical Device, Drug Discovery Instrumentation and / or software, Bioinformatics, and AgBio companies an opportunity to showcase their innovative new technologies to capital providers, pharmaceutical industry representatives, and biotechnology / biomedical companies.

UCSD Connect and Los Alamos National Laboratory's Technology Commercialization Office are joining forces to provide technology assessment capabilities and to offer cutting-edge technology licensing opportunities for entrepreneurs.

The Most Innovative New Products Awards is an annual competition that honors the vision, hard work, and perseverance that transform ideas and technologies into products.

Now in its 15th year, the Awards continue the tradition of showcasing local companies with cutting-edge high technology.

San Diego Tech Coast Angels is a group of private investors who invest in and assist early-stage, Southern California companies. It is the San Diego network of the Southern California-based Tech Coast Angels organization, which also has networks in Santa Monica and Newport Beach. (more information on this group is provided in the next section).

Technology Financial Forum features exhibit booths and business plan presentations from over two dozen of Southern California's most promising early-stage companies. After 19 years, the Forum still performs its original mission – helping technology-based companies prepare to raise venture capital and then meet potential investors. The companies selected to present satisfy three main criteria in that: 1) they had to have already received venture capital or significant seed investment; 2) they must be in need of venture funding; and, 3) they must be related to high technology: software/internet, electronics, computer hardware, telecommunications, biomedical/scientific instruments and bioinformatics.

UCSD Translational Medicine Program (TransMed) has been created to assist in the critical task of moving medical research closer to commercial ready medical technology within the University in order to benefit patients and the public at large. Developed by UCSD CONNECT, the School of Medicine and the Technology Transfer & Intellectual Property Services Office, TransMed facilitates access to early funding alternatives for faculty research teams whose work does not fit the model typically funded by federal granting agencies or other traditional funding mechanisms. This program is specifically designed to support promising "translational" research which is still laboratory based, but is nearing the stage of clinical testing and application.

VentureForth@UCSD is a student-initiated, pre-professional, entrepreneurial organization created to nurture and establish a dynamic entrepreneurial environment at UCSD and promote innovation, leadership, self-motivation, networking and professionalism. VentureForth holds events such as an annual Business Plan Competition, Workshop Forums, Newsletter / Web site, and speaker / networking sessions. The aim is to expose emerging technologies and entrepreneurial ideas to students and on the flip-side, assist industry by sparking student interest and involvement in their respective fields.

Results

Since its inception, CONNECT has assisted more than 800 technology companies. Because of its success, the CONNECT model has been replicated in other cities (San Antonio being one) and countries, including Scotland, Denmark, Norway, and Sweden.

While each of the state programs highlighted in this section represent very different approaches to providing direct assistance to entrepreneurs, some general commonalties appear in analyzing the programs overall:

- *Long term commitment*: All of the examples offered here, except Maryland, have at least a decade of operating history and most of them nearly two decades of programs. Solid programs take time to develop and reflect an on-going state commitment beyond election cycles and partisan politics. It takes time to generate results like those in Pennsylvania and Ohio and any state considering an investment in support entrepreneurs needs to be willing to look beyond a single budget cycle.[48]
- *Strategic focus*: "states that view entrepreneurs as a unique segment of the economy tend to adopt policies and programs that directly support an entrepreneurial economy. States that do not make this distinction are more likely to adopt the perspective that entrepreneurs benefit from economic development policies and initiatives that are designed for a broader audience." [49] The former is evident in the strategic initiatives of the states studied here. The latter is more common.
- *Focused statewide initiatives:* each of the programs featured here (except for California) developed out of a statewide mandate, centrally vested in one agency or quasi-public statewide organization, and developed regional programs from that central agency to respond to the entrepreneurial needs in local communities. There is one clear focus in each of those four states for technology entrepreneurs and the organizations have marketed themselves sufficiently to make that known statewide.
- *Significant funding:* there are significant funds invested in each of these programs, whether coming from state coffers, federal support or private fundraising. In fact, nearly all the programs use some combination of funding from several sources, though it is clear that the base of government support (in all cases but San Diego) is critical to attracting the other funding. When states are investing upwards of $10 million in these programs, they are showing their commitment to this sector of their economies.
- *Intrastate cooperation:* In Ohio, there is significant mingling of funds to achieve different purposes. A willingness to partner among state agencies, cooperation from state universities, and local support all work together to provide a broad base of funding support so that a cut in one funding source does not endanger a program.
- *Reporting and Measurement:* all of the programs have focused on collecting and maintaining data on their programs and outcomes to be able to provide their funders with evidence of their impact. While job creation and increases in tax base are critical considerations, these programs further look at impact in terms of

[48] From interviews and from *Growing New Businesses with Seed and Venture Capital: State Experiences and Options,* Robert G. Heard and John Sibert, © National Governors' Association, 2000.

[49] Jay Kayne, "State Entrepreneurship Policies and Programs", Kauffman Center for Entrepreneurial Leadership at the Ewing Marion Kauffman Foundation. November, 1999.

leveraged investments, attraction of outside capital, recruitment of talent from outside the region, and improvement in the types of jobs created.

- *Regional Flexibility and Focus on Regional Strengths:* rather than create identical programs in several locations around a state, the programs featured here have looked critical at their regional economies and industrial base to develop expertise and support specific to those locales. As an example, the Edison programs in Ohio offer specialized expertise that focuses on industry clusters in different regions of the state, but make their services available to companies throughout the state. The flexibility to use the state programs to meet the needs of a region gives these programs the ability to sustain their impact over time and to adapt to changes in their local environment.

C. Early Stage, Seed and Angel Funding

Perhaps reflecting the most visible (and often most vexing) part of an entrepreneur's life, this aspect of entrepreneurial support seems to have engendered the largest number of studies and on-going research efforts. Whether focused on angel financing, the development of publicly-supported venture funds, or the ability to bring venture financing to rural areas, there is no shortage of analysis on the topic! CIT has funded two studies, DBA a third, and the Virginia Chamber of Commerce a fourth on how to develop angel investment and other financing options for growing companies.

This analysis will focus on two specific sources of financing for early stage companies: angel investors and early stage seed funds.

On a macro level, the shift in where each group (angels and early stage venture funds) is focusing its efforts has been pronounced over the past 18 to 24 months. Where venture capital firms were ready (and eager!) to provide start-up and seed stage financing during the Internet bubble of 1998-2000, those funds are now looking for later stage ventures in which to invest, leaving start-ups and early stage (pre-revenue) companies to look elsewhere. The founder/family/friends/fools group still serves as the primary source of financing for these ventures, but angels and angel groups are now becoming better organized and prepared to make investments in these early stage companies. George Lipper of the National Association of Seed Venture Funds (NASVF)[50] points out that there has been a rapid expansion in the number of legally incorporated angel investment clubs and states are recognizing that these groups are the key to entry into the venture capital world for many companies.

It is also clear that angel groups tend to be stronger and better organized where institutional venture capital is already in place. These angels know that there is follow-on financing available to their portfolio companies and that these companies can more likely "graduate" to later stages of financing simply because it is more readily accessible.

As well, angels are looking for downside risk protection. Even if angels put the vast majority of the money into a deal, they find the arrangement more palatable if there is

[50] Email correspondence and interview with George Lipper, NASVF, November 20-26, 2002.

another partner they know is sharing the risk. This can take the form of indirect state investments into angel funds (Minnesota is one example of this). The government is not involved in the investment decision, valuation determinations, or due diligence but can share in the upside potential when these investments are successful.

Having said that, here is a summary of several programs and approaches related to both angel investing and state supported venture capital:

ANGEL INVESTMENTS

> There appears to be an evolving marketplace with angel investors, where angels, once desiring anonymity and appearing recalcitrant, are now forming legal organizations and actively and publicly seeking deal flow. Angels are filling the early stage financing gap in funding entrepreneurial endeavors, both with money and mentoring skills. Until recently, very few states have given much attention to this sector of the private equity market. Only in the past two years, have many states, aware of the scarcity of venture capital, tried to encourage more angel activity with locally designed programs. These often take the form of tax credits for participating angel clubs as well as individual angels. Sometimes the efforts are as small as underwriting the cost of creating and forming the club and sometimes can be much more intensive if targeted to a specific state objective. [51]

As well, some angel groups got burned in the bubble and are re-trenching or closing up shop altogether as they re-evaluate their investment priorities or decide to wait out their existing investments for an exit event before making any more. The Colorado Capital Alliance, for example, just closed its doors in November, 2002, choosing to sell its primary asset (a training program for angels) to the Kauffman Foundation. Marcia Schirmer, one of the founders of the group, explained that there were many burned investors and not enough new ones interested in taking on investments at this time. There was no longer a compelling reason to exist.[52]

For states like Minnesota, which have invested in developing angel networks in rural areas, the bubble created less of an issue than the fact that once invested, the networks have to wait for companies to capitalize on an exit strategy before they can consider any additional investments. With only a few investments in companies located in small towns, those exit events aren't early and frequent enough to keep the deal flow moving. [53]

The inefficiencies of the angel market, the lack of standard process and deal selection, and the lack of infrastructure within most angel groups have all contributed to the lack of attention from state governments. Those states that have given greater consideration to the angel market tend to have a larger rural population. Called "flyover" states by some, the traditional venture capital firms have not developed a presence and angel investing is often

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[51] George Lipper, November 26, 2002.
[52] Interview with Marcia Schirmer, Kauffman Foundation, November 19, 2002.
[53] Interview with Cliff Smith, MIN-Corp Executive Director, November 19, 2002.

the only option and is quite appropriate for the type of deal flow and capital expectations for most companies in these areas.[54]

From John May's research and George Lipper's observations, it is clear that no state is directly funding angel networks or clubs. Four states have undertaken active initiatives aimed at stimulating angel network formation (Minnesota, Oklahoma, Washington and Wisconsin). Several others have developed or are developing tax incentives to encourage angel investment; two states (Colorado and North Carolina) have implemented programs to train new angel investors. [55]

Offered here are two examples of state programs developed to support and stimulate angel networks: Minnesota and Oklahoma. Following that is an example of a private angel network that is supported administratively by a university (Tech Coast Angels and CONNECT of San Diego).

MIN-Corp, The Minnesota Example

History
In 1992, the State of Minnesota funded Minnesota Technology, Inc., a quasi-state agency, with $7 million to invest in companies around the state. MTI made 15 investments over five years. By 1998, this initial funding was depleted and the state was not prepared to make new funds available. Instead, MIN-Corp was created, re-capitalized with that $7 million, and set up to invest in regional angel networks. Called Regional Angel Investor Networks (RAIN), these groups are seeded with a direct investment from MIN-Corp equal to 10% of what is raised at the local level to a maximum of $100,000. Minimum fund size to break escrow is $750,000.

Two groups were started, one in Worthington and one in Alexandria. Both groups are now fully invested and waiting for an exit event. A second fund is under development in Alexandria as of this writing, but is not yet established and an attempt in Albert Lea failed because it fell short of the minimum. The concern is that there will be no active angel groups in Minnesota in a short time because of the difficulty in starting these groups in the current economic climate.

MIN-Corp's strategy has been to identify a champion in each locality who then develops a list of individuals he/she believes would participate and is willing to approach to participate. Once legally in place, the champion's job is to first sign up three to four other people and then , together, that core group encourages others to participate. Investors have to put 10% of their commitment into the fund up front with the remaining 90% to remain on call.

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[54] *Catalyzing Angel Investing: A Best Practice Survey of States,* New Vantage Group, March, 2002.
[55] Taken from *Catalyzing Angel Investing* and from interview with George Lipper, November 26, 2002.

State Funding History
MIN-Corp received its initial funding of $7 million from the State of Minnesota and continues to work from this funding base; additional funding has come from banks, individuals, and CDFI but no new state funding has been provided.

Future Strategy
MIN-Corp is in a "wait and see" mode, waiting both for economic conditions to improve so that angels in the state will more readily join a local network, waiting for existing porfolio companies to find an exit opportunity so that investors, including the state, will see a return on their capital, and waiting for opportunities from other regions to arise for MIN-Corp to develop additional networks. Cliff Smith believes this quantification will need to happen before the state invests additional funds.[56]

Oklahoma Technology Commercialization Center[57]

History
OTCC was created in 1998 as an initiative for commercializing technology in Oklahoma as part of the work of the Oklahoma Center for the Advancement of Science and Technology (OCAST). The impetus for OTCC's creation was the need to improve the state's economy and the private sector's request that the legislature and governor help provide resources to do that. OCAST was given funding for the development of a commercialization program; they put out an RFP inviting organizations in the state to make proposals. The Oklahoma Technology Development Council (OTDC) won the bid; OTDC is composed of representatives from the state's chambers of commerce, economic development professionals and business leaders. OTDC then created OTCC and set it up as a separate non-profit organization. Its board of directors is said to be a "who's who" in Oklahoma and includes representatives from each of the state's universities. The organization has worked to remain independent because of concerns that this not be seen as a "state" or "university" program.

OCAST awards a contract to OTDC to operate OTCC each year; there is no guarantee of long-term funding, but the organization believes the track record to date will provide support for renewal each year.

OTCC found the biggest need was for capital and began the Oklahoma Capital Network. It started within 60 days of the beginning of the program when the first 10 to 20 clients all appeared looking for money. Dr. Randy Goldsmith, Executive Director, approached the resident venture capitalist in town who told him they were all too early for him. His advice was to find a way to share the plans with angels and gave him some leads to start that process. OTCC then found the angel groups in the area and let them take the lead, telling OTCC what they needed and what they expected from someone sending them deals. From this, the Capital Network began, adding other angel groups from around the state once they saw the success the one in Oklahoma City was having. The angels indicated they wanted consistent, quality deal flow and administrative support for screening them. OTCC agreed

[56] Interview with Cliff Smith, November 19, 2002 and conclusions from *Catalyzing Angel Investing.*
[57] Information provided through interview with Randy Goldsmith, February, 2002.

to provide these services to the angel groups at no cost and now has 300 angel investors in its network, nearly all of whom are part of one of the 12 organized groups in the state.

OTCC's focus is on preparing the deals for presentation and helping the companies work through their valuation issues. If a company meets OTCC's qualifications, the organization will then help with introductions. OTCC now has assumed the role of the network coordinator, setting up teleconferences for presentations and helping angel networks make connections among themselves.

From this short history, OTCC has developed a process for working with clients to help them determine their ability to secure angel financing and prepare for the process. This involved a rigorous training program for the staff. A "boot camp" format helps those who pass the initial OTCC screening to get ready for the early stage investor process. In its first three years, OTCC saw 700 clients and found 450 worthy of sending on to the angel networks.

The process has evolved to two stages: 1) validation: evaluating the technology, the market potential, the business model, management team, and determining if this is a venture deal. Clients pay $750 for this process. Once the company is screened and deemed appropriate to go on, there is 2) a valuation assessment process to arrive at agreement on valuation and begin preparing for presentations to angels and VCs. The cost for this is $500. At the end of the line is the investor presentation; Dr. Randy Goldsmith, President of OTTC, signs off on each client before that company is presented to the angel groups.

In the last two quarters of 2001, a total of $9 million in angel financing was made through the network.Along with this, there is a small seed capital fund of $1 million to provide up to $100K to early stage ventures.

Factors For Success

1) Dynamic, strong leadership in the program. Dr. Goldsmith has garnered a national reputation for what he has done and is clearly the innovator and driving force behind OTCC.
2) Strong state agency support: in this case, OTCC believes they needed the government involvement because there was not a cohesive group in the private sector that could pull this off.
3) Private sector involvement: Mr. Paris felt this was critical- there needed to be both public and private parties at the table to make it work.

Early on, OTCC got comments from the legislature that the state shouldn't be spending its money this way; after some success stories, those comments aren't heard anymore.

New Initiatives and Staffing

OTCC has a staff of 13 with nine people in Oklahoma City and four in Tulsa. These 13 people also serve Norman, Stillwater and Lawton. Staff does all of the screening and training for entrepreneurs with support from the service providers as needed.

OTCC is currently developing an incubator program in targeted areas and four industry trade groups for targeted technology sectors of interest to investors and for which there is a critical mass in the state (biotech, advanced materials, telecommunications, and software). There is also an Enterprise Institute offered advanced business topics for technology companies and training for investors, particularly on valuation issues and due diligence processes.

OTCC also recently closed on a $6 million co-investment fund in January 2002. Investment results will take several years to measure. Dr. Goldsmith has indicated that cumulative investment totals for OTCC clients since the programs inception will surpass $50 million this year. However, their ultimate success of the angel is still to be determined. The networks have not had any exits yet and both OTCC and the networks are growing on the basis of their respective reputations and leadership. [58]

As John May commented in his *Catalyzing Angel Investments* report:

> The core strength of the OTCC is its one-stop shopping for developing companies. Their focus is on the entrepreneur first and foremost. Their reputation for quality service and assistance with experienced entrepreneurial leadership makes them a central point for the community and the state. They are tied to but not directly involved with the angel group formation, leaving the angels to be lead by "peer" not government. The OTCC's foray into the follow-on investment fund provides a vehicle to continue to help their client companies and will be a test of the "one stop shop" model.[59]

Private Sector Initiative with Minimal Public Support: Tech Coast Angels

History
Founded in 1997 by a group of angel investors in Orange County, California, the organization began with an inaugural dinner with 70 potential members. Also, in 1997, the San Diego Band of Angels began with a small group of interested investors and grew to 120 members by the time the Band merged with Tech Coast Angels in September, 2000. There are now three groups in southern California: Orange County, Los Angeles, and San Diego. The Orange County and Los Angeles operations are assisted with administrative matters by a local accounting firm. These services are provided by CONNECT for the San Diego group.

Structure
The organization has a board of directors composed of representatives from each of the networks and executives elected by the board. There are eight operating committees composed of members of the group; they serve as volunteers and provide all deal screening for presentation to the groups. There are now over 200 members, each of whom invest as individuals. There are no pooled funds.

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[58] *Catalyzing Angel Investing*
[59] Ibid.

The organization has prided itself on developing a process that is used consistently with all deals that come to the group for consideration. This includes forms, step by step instructions and a consistent methodology for evaluating deals.

Luis Villalobos, TCA's founder, feels that the success and sustainability enjoyed by Tech Coast Angels is largely due to the fact that the organization was developed by angels for angels. The investors themselves have to do everything to make the organization work. The administrative assistance provided by CONNECT and the accounting firm is limited to managing the logistics for meetings, providing accounting and financial services, and screening the forms submitted by those hoping to present to the group.[60]

The venture capital community has noticed and asked to participate in some way. TCA set up a VC Affiliates program in 2002 with 20 VC firms as members. There are now 22 VC affiliates whose prime interest is in expanding their access to potential partners for their funds. Rather than an interest in deal flow, these firms have found the value is in access to these high net worth individuals.

Other Initiatives
One unique effort TCA undertook was to develop a trade fair for companies to exhibit their technologies for the Department of Defense. DoD sent 25 people for the event and a total of 65 companies displayed their products; the event extended beyond the TCA portfolio, but a number of TCA funded companies participated.

Now, Luis Villalobos is looking to take the TCA process along with successful models from other angel groups to provide centralized screening and due diligence services for other angel groups. Called Angel-Led Venture Investments LLC ("ALVI"), it intends to be the managing partner for a national network of angel groups and for a related SBIC. Angel-Led is negotiating a long-term agreement with ACE-Net (online angel network started by the US Small Business Administration) to provide ALVI exclusive access for posting angel and private equity deals.

Results
Average deal size is in the range of $500,000 to $800,000. The organization has completed 59 deals in its history, representing $43 million in invested capital. The portfolio companies have raised a total of $445 million in other investments.

Involvement with Other Entrepreneurial Support Organizations: TCA was started by angels and remains committed to maintaining its "by angels, for angels" structure. Where support from other organizations has been helpful is in the administration of the networks, as CONNECT provides in San Diego. Affiliated with the University of California, San Diego, CONNECT has an infrastructure in place to offer these administrative services and can then offer its clients first hand knowledge of how best to access this angel network.

[60] Phone interview with Luis Villalobos, November 27, 2002.

ALVI also points to a support mechanism on a national scale to provide a way for angel groups across the US to access deal flow and extend a public sector program (ACE-Net) to a larger network with the assurance that the screening for deals presented in that database has been consistent. While details are sketchy at this point, this effort is intended to bring angel groups together for deals beyond their own backyards. (Villalobos)

SEED VENTURE CAPITAL FUNDING

Many states have developed public programs to increase the availability of venture capital for entrepreneurs in their states. The most common methods for states to support venture capital programs are as follows.[61]

- *Publicly funded, publicly managed venture capital funds* –The organization is usually capitalized with state money and the Fund management is provided by public or quasi-public agency. These funds have had mixed success and much depends on the ability to support the next stage of financing. For "flyover" states, this is difficult because there is limited investment by traditional venture capital and companies receiving early stage funds from a state managed program have no where to go for the next round.
- *Publicly funded, privately managed funds*–State money is generally placed in private venture capital institutions, and/or public incentives such as tax credits are used to encourage the placement of private money in funds. A private party manages the fund. Two models have been used:
  - CAPCos (Certified Capital Companies) are created by enabling state legislation where state money is invested in privately formed and managed entities. Those CAPCos then make all investment decisions and manage the funds. Four companies have captured this market and have succeeded in setting up CAPCos in four states. The tendency is for CAPCos to do debt rather than equity financing and some feel they have not met their mandate of providing risk capital for early stage companies.[62]
  - Tax Credits: states provide legislation and funding through contingent tax credits that are then sold to major taxpayers in the state (banks, utilities and other large companies). The cash created by these salkes are then invested in a fund of funds. That entity then invests the money in established venture capital funds, who bid for the funding when they are in a round of fundraising themselves. The goal is to create keen competition for these funds and thereby encourage venture capital firms to create a presence in that state. In one state, Oklahoma, the return has been five times the state investment in terms of additional investment capital coming back into the state. [63]

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[61] Information taken from *Director of State Assisted Venture Capital Programs, 2002* published by the Rural Policy Institute. 2000.

[62] *Public Involvement in Venture Capital Funds: Lessons from Three Program Alternatives.* Published by the Rural Policy Institute, November, 1999. Updated February, 2000.

[63] Interview with George Lipper, November 26, 2002 and from *Catalyzing Angel Investment.*

Example Programs

Maryland: Department of Business and Economic Development and Maryland TEDCO

Maryland offers examples of several forms of state funding of venture funds: publicly funded, publicly managed programs through the Department of Business and Economic Development (DBED) and public investment in private venture capital funds both through DBED and through TEDCO. Briefly, here is information on these various programs and funding mechanisms.

Department of Business and Economic Development

Using state funds, Maryland has established three programs through its Department of Business and Economic Development[64]:

The Challenge Investment Program provides financing for seed-stage companies up to $50,000, with incremental investments to a maximum of $150,000. Applicants must have no more than 25 employees and annual sales of less than $1 million. A minimum 1:1 co-investor match is required. Applicants are limited to high tech companies whose principal place of business is located in Maryland and companies must remain in Maryland for at least three years.

Repayment is in the form of royalties on revenue and on equity raised in excess of $500,000. Royalty payments are capped at three times the Challenge investment received. Awards received from the Challenge Program can convert to equity if the company receives an investment from the Enterprise Investment Fund (see below).

Enterprise Investment Fund Program makes direct equity investments in emerging technology companies with patented or proprietary products or manufacturing processes and a marketing strategy in place. Amount of investment ranges from $150,000 to $500,000. Maryland has targeted five technologies for funding through this program: biotechnology, telecommunications, information technology, life sciences and advanced materials. Businesses must agree to maintain their principal place of business in Maryland for five years. A minimum 3:1 match by a sophisticated investor is required.

The Enterprise Venture Capital Limited Partnerships: The Enterprise Fund has invested in seven venture capital limited partnerships all based in Maryland (Anthem Capital LP, Boulder Ventures Limited, CIP Capital LP, Grotech Partners V LP, Inflection Point Ventures LP, Toucan Capital Corp. and Walker Investment Fund II, LLP). The intention is for these investments to stimulate private sector investment in Maryland companies and complement the Department's other funding initiatives. The concern is that these venture funds invest in companies throughout the region and not just in Maryland ventures, leaving the state vulnerable to accusations of financing companies in other states.

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[64] Information taken from http://www.choosemaryland.org/business/financing/investment.asp and for phone interview with Elizabeth Good, November 12, 2002.

Maryland TEDCO

TEDCO Ventures: the State of Maryland allocated $4 million to TEDCO through the Department of Business and Economic Development to underwrite the creation of a new life science focused venture fund . That funding was then awarded to Toucan Capital Corp, an SBIC based in Maryland, to be included in its Toucan Capital Fund II. This is a $120 million fund that began making investments in summer 2001. Toucan has agreed to review executive summaries of businesses submitted and reviewed by TEDCO and/or DBED. The investment focus is weighted towards life sciences (goal of 60% of portfolio) with 40% dedicated to IT and other technologies. Toucan's investments usually range between $100,000 and $5 million per transaction.

The fund has made eight investments to date, four of which are in MD companies. Several other MD investments are under consideration. As a relatively new fund, returns are not yet realized.

Pennsylvania: Innovation Works

As described previously, Pennsylvania has directly invested in quasi-public organizations that then make direct investment with those state funds in early stage ventures. The format for this form of investment has only been used since 1999 when Innovation Works was created as a new format for the Ben Franklin program in southwestern Pennsylvania. Innovation Works has invested in 48 companies to date, with 30 companies currently in its portfolio. The organization does not have measures of long term success but can point anecdotally to companies receiving significant venture capital investments. To be considered for an investment, companies must be located in one of the nine counties served by the organization, or agree to relocate to the area. They must also offer substantial potential for future growth through the development of an innovative technology, or innovative application of a technology, in industries such as computer software and hardware, communications, robotics, or biotechnology. There is a preference for products rather than services in each of those industry segments.

The Ben Franklin program imposes very stringent reporting requirements so that results can be interpreted for the state. There are two basic goals in funding the program: job growth and an increased tax base. When considering an investment, Innovation Works therefore considers the following as part of its criteria: Is there an opportunity to create wealth for a group of people (one way of measuring an increased tax base) and is the venture likely to create a significant number of jobs?

Because there has not been enough history to develop measurements of success for the format Innovation Works now uses, the organization uses other forms of measurement in assessing its performance annual, some of which include the following:

Number of companies funded
Number of companies still in business
Amount raised from other investors
Number of jobs created
Number of companies seeking investment

Number of companies merged or acquired
Number of executive level managers recruited from outside the region

Bob Starzynski of Innovation Works identified these three particular issues the program has grappled with over the past few years:

1) It is difficult being an ROI driven organization using taxpayer money. There is a sense of entitlement among those who approach Innovation Works for financing and if they are turned down, they often go to their state representatives to seek redress or reconsideration. The program has had to employ a Director of External Relations to serve as a liaison with state agencies and the legislature. There is a need for careful communication and education on the state level to continue to put the mission of the Ben Franklin program in proper perspective.
2) As a corollary to the first issue, Innovation Works staff have to provide careful, clear written reasoning as to why a venture is turned down for financing. Unlike private venture capital firms, BFTP cannot simply say "no, we're not interested." A written record of these decisions with specific reasoning behind the denial of funding needs to be on file.
3) In select cases, a company that has received an investment from Innovation Works then has secured a much larger commitment from a traditional venture capital fund. The VC fund has asked the company to clean up its capitalization table at the time of its investment and simply has wanted Innovation Works out. Innovation Works has little leverage in this cases and therefore fails to realize any significant return on its investment at that point.

North Carolina: Eno River Capital

As another example of where a state has invested directly into a venture capital fund, Eno River Capital was formed in 1998 and was selected by the North Carolina Biotechnology Center to help organize and manage the Center's Bioscience Investment Fund. Seeded by $7.5 million in funding from the state's General Assembly, the fund set an initial goal of $30 million in funding.[65] Closing at $26 million, the fund invested in 16 start- up companies, 15 of which were in the RTP area. Almost half the companies are now out of business or struggling, according to the *Business Journal*.[66] Eno's recent attempts to raise a second fund of $70 million in North Carolina floundered earlier this year and the firm has abandoned the effort in favor of focusing on Florida. The firm hopes to raise $40 ($100?- two different reports) million by targeting investors in the Gainesville, Florida area for its Florida Technology Fund. The plan is to focus on bioscience companies clustered around the University of Florida.

Media reports indicate that Eno is not giving up on North Carolina, but is looking elsewhere for this next fund.

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[65] Press Release, NC Biotechnology Center, April 7, 1998.
[66] "Eno Fund Shifts Efforts to Florida, *Business Journal,* September 23, 2002.

CONCLUDING OBSERVATIONS

Examining angel investment and venture capital investment in the same breath leaves a lot to cover. In looking at the variety of programs offered and the relative youth of some of the program, definitive observations are difficult to make. Here is an attempt at some analysis:

- *Long Term Commitment:* As with state business assistance programs, any commitment by a state to a financing program is best governed by a long term perspective. Business cycles ebb and flow and even more so with early stage companies. While this is counter to the ways states think about programs they fund, it is this perspective that will foster confidence in a state's commitment to entrepreneurial initiatives.
- *States need to be seen as a partner:* just as any limited partner in a pooled fund, states need to have confidence that they will receive the same return on their investment as any other investor would. This also means that states need to understand they are taking the same risk as other investors as well. Whether investing directly into funds or in providing administrative support, an understanding of the risk/reward trade off is helpful.
- *Professional management is key:* as with any other successful program, the people involved make all the difference. If looking at developing a publicly funded, publicly managed fund, a state needs to consider how it will attract and retained qualified management. That hurdle alone may be enough for a state to back away from this option and instead look at investing its funds through established, private venture funds with experienced management already in place. It is this issue that also serves as a caution for states considering an investment in angel funds or angel groups.
- *Money isn't everything:* nearly every organization featured in this report recognizes that money is only part of the equation. Supporting companies with knowledge and connections, education and mentoring are equally as important. Setting up a financing program in a vacuum is not likely to be successful; it is part of a whole approach to supporting entrepreneurial ventures.
- *You've got to have enough to make a difference:* again, scale is important. The experience in Minnesota exemplifies the need to provide enough resources (capital and support) to keep the engine moving. If the funds are small, they can only move in fits and starts. If funds are not available, then the challenge is to find ways to pool resources so that the net result is that there is a larger pool of money to access (as has been done in Oklahoma and Southern California).
- *The sum of the parts is greater than the whole:* having a graduated succession of financing alternatives available is optimal. With only a seed fund, companies can only go so far before they have to look elsewhere for additional resources. Iowa's experience is illustrative in this respect. States need to consider the whole financing lifecycle of a company in looking at how best to invest its resources to make sure there are adequate alternatives throughout that lifecycle.
- *State money can best be used to facilitate processes:* states don't want to compete with angels or with venture funds and cannot do so successfully on a long term

basis. Government resources can best be used to facilitate the process of connecting investors with companies or by providing links between groups. The difficulty for a public entity is the inability to measure the success of such linkages and the fact that this is a long term process.[67]

[67] From conversation with Dr. Jeffrey Sohl, Center for Venture Research, University of New Hampshire, December 5, 2002.

INTERVIEW CONTACTS

California
Chuck Erickson, Director
San Jose Software Business Cluster
2 North First Street, Fourth Floor
San Jose, CA 95113
Phone: 408-535-2709
Fax: 408-535-2711
Email: chuck@sjsbc.org

Luis Villalobos
Tech Coast Angels
949-654-3795
luvil@cox.net

Colorado
Marcia Schirmer (now with the Kauffman Foundation)
Colorado Capital Alliance and Power of Angel Investing Training
(303)-499-9646
mschirmer@earthlink.net

Maryland
Heidi Sheppard
Business Incubation Program Manager
Maryland Technology Development Corporation
5575 Sterrett Place
Suite 240
Columbia MD 21044
410-715-4173
410-740-9422 (FAX)
hsheppard@marylandtedco.org

Elizabeth Good
Department of Business and Economic Development
Financing Programs
217 East Redwood Street
Baltimore, Maryland 21202
Toll free: 1 888-ChooseMD
http://www.choosemaryland.org/business/financing/investment.asp

Minnesota
Cliff Smith
MIN-Corp.
1600 University Avenue West
St. Paul, MN 55104
(651)-632-2142
csmith@mincorp.org

North Carolina
Scott Daugherty
Executive Director SBTDC
State Headquarters
5 West Hargett Street, Suite 600
Raleigh, NC 27601-1348
(919)715-7373 x601
e-mail: info@sbtdc.org

Monica Doss
Council for Entrepreneurial Development
104 T.W. Alexander Drive, Building One
RTP, NC 27709
(919)- 549-7500
mdoss@cednc.org
www.cednc.org

Ohio
Norm Chagnon
Assistant Director
Ohio Department of Development
Technology Division
77 South High Street, 25th Floor
Columbus, Ohio 43215-6130
(800)848-1300 ext 6-3887
Fax 614/644-5758
nchagnon@odod.state.oh.us

Jackie Rudolph
Edison Program
JRudolph@odod.state.oh.us
(614)466-0488

Holly Schick
State Director, SBDC Program
(800)-848-1300
hschick@odod.state.oh.us

Karen Sha'Uri
Associate State Director, SBDC Special Programs
Same as above

Oklahoma
Dr. Randy Goldsmith
Steve Paris
Oklahoma Technology Commercialization Center
1-800-337-OTCC
www.otcc.org

Pennsylvania
Terry Singer, Director, Statewide Affairs
200 North Third Street Suite 400
Harrisburg, PA 17101
(717) 234-1748
tsinger@benfranklin.org

Bob Starzynski
Innovation Works
2000 Technology Drive Suite 250
Pittsburgh, Pennsylvania 15219-3109
412.681.1520
bob@innovationworks.org

Virginia
Mary Macpherson
Netpreneur
11600 Sunrise Valley Dr.
Suite 310
Reston, Virginia 20190
703) 648-3920
mmacpherson@morino.org

John May
New Vantage Partners
(703)-255-4930

National
George Lipper
National Association of Seed Venture Funds (NASVF)
702/254-9229
glipper@nasvf.org

Dr. Jeffrey Sohl
Center for Venture Research
University of New Hampshire
(603)-862-3373

Eric Pages
National Commission on Entrepreneurship
(703)-434-8060

Mark Lange
Edward Lowe Foundation
800-232-5693
mark@lowe.org

BIBLIOGRAPHY OF STUDIES

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Appendix A

Summary of HJ206 Legislation

HJ206 Bill Summary
"Study; Technology-Based Businesses"
Patron – Samuel A. Nixon, Jr.

Commercialization of intellectual property; Seed capital and angel investor. Requests the Secretary of Technology, in conjunction with the Secretary of Commerce and Trade, to establish a task force to study best practices for assisting the development of technology-based businesses that will produce jobs and other economic benefits throughout the Commonwealth. The task force shall (i) focus on best practices designed to assist in the development of a business environment and infrastructure conducive to the discovery and commercialization of new technologies and the development and growth of technology-based businesses throughout the Commonwealth; (ii) review existing initiatives in other states, including best practices being defined and followed in those states; (iii) seek the voluntary participation of representatives of the House of Delegates and Senate of Virginia, Virginia-based technology businesses, Virginia-based investors, and Virginia's institutions of higher education; and (iv) submit periodic progress reports to the Joint Commission on Technology and Science (JCOTS) and a final progress report in time for JCOTS to finalize its legislative recommendations for the 2003 Session of the General Assembly.

The task force must submit its written findings and recommendations to the Governor and the 2003 Session of the General Assembly.

Appendix B

HJ206 Joint Task Force Appointees

Office of the Secretary of Technology

Eugene Huang

Deputy Secretary of Technology
202 N. Ninth Street
Suite 506
Richmond, VA 23219
804-786-9579 x 3808 (w)
804-786-9584 (f)
ehuang@gov.state.va.us

Office of the Secretary of Commerce and Trade

Matt Erskine

Deputy Secretary for Commerce & Trade
Ninth Street Office Building
Suite 723
Richmond, 23219
804-786-7831 (w)
804-371-0250 (f)
merskine@gov.state.va.us

John Sternlicht

General Counsel, Legislative Director
VEDP
901 E. Byrd Street
19th Floor
P.O. Box 798
Richmond, VA 23218
804-371-0036 (w)
804-371-8112 (f)
Jsternlicht@yesvirginia.org

Joe Meredith

President
Virginia Tech Corporate Research Center for Innovative Technology 1872 Pratt Drive
Suite 1000
Blacksburg, VA 24060
540-961-3600 (w)
joe.Meredith@vtcrc.com

R. Carter Scott III

Partner
McGuire, Woods Battle & Boothe
901 E. Cary Street
One James Center
Richmond, VA 23219
804-775-4389 (w)
804- 698-2181 (f)
cscott@mcguirewoods.com

Delegate Jeannemarie Devolites
Delegate, 35th District
P.O. Box 936
Vienna, VA 22183
804-698-1035 (w)
703-938-7972 (f)
del_devolites@house.state.va.us

Chuck Mills

Director
Virginia Department of Business Assistant
707 E. Main Street, Suite 300
P.O. Box 446
Richmond, VA 23218-0446
804-371-8215 (w)
804-371-8111 (f)
cmills@dba.state.va.us

Senator Malfourd W. "Bo" Trumbo

Senator, District 22
P.O. Box 448
Fincastle, VA 24090
540-473-2781 (w)
540-473-2188 (f)
no e-mail

Ben English
Partner
LeClair Ryan
707 E. Main Street
11th Floor
Richmond, VA 23219
804-343-4070 (w)

Delegate Samuel A. Nixon

Delegate, 27th District
The Computer Solution Company
1525 Huguenot Road
Midlothian, VA 23221

Marianne Vermeer

President
The Venture Forum
East 3, 1520 West Main Street, Suit 201
Richmond, VA 23220

benglish@leclairryan.com

804-794-3491 (w)
804-794-6194 (f)
san@tcsc.com

804-261-7676 (w)
804-301-9089 (f)
mvermeer@mindsrping.com

Gerald Gordon

President & CEO
Fairfax County Economic Development Authority
8300 Boone Boulevard
Suite 450
Vienna, VA 22182
703-790-0600 (w)
703-893-1269 (f)
klofgren@fceda.org

Scott Parsons

Executive Director
Virginia Small Business Finance Authority
707 E. Main Street, Suite 300
P.O. Box 446
Richmond, VA 23218-0446
sparsons@dba.state.va.us

Patrick Von Bargen

Executive Director
National Commission on Entrepreneurship
444 North Capital Street, Suite 399
Washington, DC 20001
202- 434-8060 (w)
202-434-8065 (f)
pvb@sso.org

Mary MacPherson

Executive Director
NetPreneur Program
Morino Institute
11600 Sunrise Valley Drive, Suite 300
Reston, VA 20191
703-620-8971 (w)
703-623-4552 (m)
mmacpherson@morino.org

Susan Payne

Payne, Ross & Associates
206 E. Jefferson Street
Charlottesville, VA 22902
434-977-7607 (w)
434-977-7610 (f)
susan@payneross.com

Senator Willliam Wampler, Jr.
Senator, District 40
510 Cumberland Street
Suite 308
Bristol, VA 24201
276-669-751
276-645-6722
district40@sov.state.va.us

Tom Weithman
Director, Entrepreneurship & Finance
Virginia Center for Innovative Technology
2214 Rock Hill Road
Herndon, VA 20170
703-689-3060 (w)
703-464-1714 (f)
tweithman@cit.org