

June 2008

F L O R I D A ' S

I N N O V A T I O N

B E N C H M A R K S T U D Y



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## INTRODUCTION

At its heart, economic development is about improving quality of life through enhancing economic opportunity. As Florida and the global economy begins the 21st Century, economic opportunity is quickly developing a growing dependency on the ability to create economic value through development and innovation of new products and services. How a state, its regions and communities respond to this 21st Century Challenge to be creative, adaptable and innovative will determine whether it continues to improve the standard of living of its citizens, or whether its collective quality of life will begin to decline.

The issues impacting Florida's future economic development path are far too numerous and interrelated to fully address each in the context of this study. The objective of this project is to assess Florida's movement toward a more innovative and knowledge-based economy while benchmarking the effort against other states.

The study was not intended to be an analysis of traditional economic development incentives and did not focus on recruitment of large-scale projects from out-of-state into Florida. Rather, it **looked at a combination of policy, programs and incentives that are geared toward the organic growth and support of an innovation-based economy.**

This report provides an analysis and summary of innovation-based economic development policies, programs and initiatives, and includes some examples of how other states have addressed challenges similar to those Florida is now facing. It is not intended to provide specific recommendations, but rather observations on the current status of Florida's innovation efforts and possible tools to accelerate the momentum.

Florida has achieved a great deal of success and notoriety in its efforts to build a technology and innovation-based economy in the last five to ten years. As a result, there are pockets of an emerging and diverse technology-based economy around the state. This study was undertaken to provide a platform for discussion and contribute to recognition of the importance of building a consensus around a long-term strategy designed to position Florida as an economic leader in the 21st Century.

As a tool to facilitate discussion, this report is not a rear-view mirror critique of past performance, but rather a realistic look at what Florida has in place to support future innovation-economy growth, how it compares with selected competitive states and what it should consider doing to increase the momentum of its progress.

## METHODOLOGY

Three primary channels of research were undertaken during this study: one-on-one interviews, out-of-state program research, and benchmarking of Florida rankings. First, 41 Floridians were interviewed, either by phone or face-to-face (See *Appendix A* for list of interview participants). Those interviews obtained a cross-section of viewpoints on the current status of Florida's competitive position in the innovation economy. The interviews focused on the individuals' personal perceptions and opinions on the challenges and opportunities facing Florida's diversifying into a more innovation-based economy.

Twenty of the interviews were conducted with funding sponsors of the study, while 21 were conducted with stakeholders who are involved on a day-to-day basis working within the innovation economy. The interviewees crossed three distinct segments – traditional economic developers, university-based technology commercialization officials and private sector innovation-based company representatives. The interviews were not a random scientific sampling of un-biased observers, but rather a group of individuals that are closely involved with strong opinions on the topic. See *Appendix B* for a full summary of all stakeholder interviews.

The second line of research involved investigating policies, programs and incentives of other states, regions and communities that are structured to enhance development of their respective innovation and knowledge-based economies. The number of programs in existence is far too extensive to claim a definitive survey of them all. States and programs were selected based on one or more of the following criteria:

- Recommended by an interviewee.
- Cited as a best practice by recognized authorities at organizations such as the Kauffman Foundation and the State Science & Technology Institute.

- Addressed a perceived gap in Florida's innovation support system.
- Appeared to be transferable to Florida given the components of the program and the realities of Florida's business climate and geography.
- Known to Boyette Levy through our involvement in the global economic development community.

Programs were identified and screened through the above criteria, and preliminary research was conducted on more than 51 identified programs (See *Appendix C* for list of all programs reviewed).

Thirty-one of those programs were selected for interim review and 16 were selected to be incorporated into the final report. Some "programs" are not actually specific programs, but summaries of a type of initiative that contained too many variations to select just one example. The intent of the highlighted programs is to demonstrate what other states have done to fill some of the perceived gaps that exist in Florida. The comparison will serve as a basis for further discussion and prioritization as the state and its regions plan strategic next steps.

The third element of analysis involved the selection of seven states to benchmark against Florida with indicators that are acknowledged as factors determining a state's ability to develop its innovation economy. These factors include: 2005 Total Research and Development (R&D), Change in Total R&D from 2004 to 2005, R&D Per Capita, Academic R&D, Industry R&D, Federal R&D, Small Business Innovation Research Contracts, Scientist and Engineering PhDs Awarded, Patents Issued, Venture Capital Investment and Professional, Technical and Scientific Employment. These metrics are among the numerous indicators of a state's capacity to compete in the innovation economy.

All are relevant and some are recognized as the feed stock for future success.

The states benchmarked were California, Texas, New York, Pennsylvania, Ohio, Georgia and North Carolina. These states were selected because, in Boyette Levy's experience, Florida competes less and less with its Southeastern neighboring states and more and more with the larger, more technologically advanced and economically diverse states. These are states that Florida aspires to compete with and/or emulate as it looks toward developing its innovation economy.

California, New York and Texas share Florida's large and diverse geographic and demographic profile. Each has its own unique economic history and approach to economic development. They are included in the statistical benchmarking based on their size and resulting governing complexity. Pennsylvania and Ohio were selected because they are relatively large states, with multiple urban centers and the fact that each has developed a comprehensive statewide program designed to stimulate their respective innovation economies. Georgia and North Carolina were selected based on their similar position to Florida as a Southeastern state striving to diversify their economies through more innovation-based development.

During the course of the research project, Boyette Levy consulted with project management representatives of the Funding Sponsors to prioritize and select the final benchmark programs and states. This assistance was invaluable in achieving the primary goal of producing information relevant to current challenges.

## About Boyette Levy

Boyette Levy is an economic development, public policy and communication strategy firm that helps companies, communities, organizations and governments accomplish their strategic aims, whether it's providing location analysis services, expanding business, advancing a policy initiative or communicating effectively.

Boyette Levy is composed of team members with unique skill sets and backgrounds in economic development strategy, location analysis, incentives negotiation, communications and law. Its principals and associates have a proven track record of generating measurable results for chambers of commerce, economic development organizations, elected officials and Fortune 500 companies. The Boyette Levy team members supporting this project were:

Del Boyette, principal of Boyette Levy, has more than 20 years experience in economic development strategy, incentives negotiation/policy and location analysis. Seven years ago, Del successfully transitioned from economic development practitioner to the consulting world at KPMG and later at Deloitte. From 1993 to 1997, Del served as Executive Director of the Arkansas Economic Development Commission and was a cabinet-level advisor for two governors. From 1997 to 2000, Del was Deputy Commissioner for Economic Development of the Georgia Department of Industry, Trade and Tourism. He was responsible for Georgia's statewide economic development effort, the establishment of regional offices, technology, and bioscience programs.

Charlie Sloan brings 20 years of diversified economic development experience to Boyette Levy. Since 1987 Charlie has worked in virtually all aspects of state, regional and local economic development. Charlie began his economic development career as Director of Foreign Direct Investment for the state of Arkansas. Prior to joining Boyette Levy in May of 2007, Charlie served as Executive Vice President of the Metro Orlando Economic Development Commission where he managed strategic planning and tactical implementation for corporate, international, technology and creative industry development.

Tracy King Sharp brings nine years of experience in negotiated incentives, location analysis and economic development strategy to Boyette Levy. Tracy has

helped a wide range of companies formulate location and expansion strategies. She has also worked with numerous economic development organizations on developing targeted industry studies and attracting direct foreign investment, as well as on general strategy and planning.

Victoria Tucker joined Boyette Levy in January 2005 and has worked with numerous organizations on economic development strategies and public policy recommendations, as well as research around corporation location projects. Victoria primarily conducts research related to targeted industry sectors, company targets, business incentives, best practices from comparable cities, business retention programs, and marketing strategies.

## EXECUTIVE OVERVIEW

### Introduction

Historically, Florida is a geographically large and culturally diverse state. Its economy is built upon agriculture, tourism, retirement services, defense and the real estate development resulting from each. Over the last 50 years, Florida has transformed from a sparsely populated, southern frontier state, to the suburbanized melting pot we know today. The next 20 to 50 years will continue to provide economic challenges and opportunities. How the state, its regions and communities respond to such challenges and opportunities, will determine whether Florida continues to enhance the standard of living of its citizens, or whether the quality of life Floridians so value will begin to decline.

The issues impacting Florida's future economic development path are far too numerous and interrelated to fully address each in the context of this study. The objective of this project is to assess Florida's movement toward a more innovative and knowledge-based economy while benchmarking the effort against other states. The study was not intended to be an analysis of traditional economic development incentives and did not focus on recruitment of large-scale projects from out-of-state into Florida. Rather, it looked at a combination of policy, programs and incentives that are geared toward the organic growth and support of an innovation-based economy.

This report provides an analysis and summary of innovation-based economic development policies, programs and initiatives, and includes some examples of how other states have addressed challenges similar to those Florida is now facing. Many of the topics and issues that are covered are already familiar to the funding sponsors of the study. The report is designed to reach a broader audience and raise the profile of the discussion surrounding Florida's need to diversify through innovation. The findings are not intended to provide specific recommendations, but rather observations on the current status of Florida's

innovation efforts and possible tools to accelerate the momentum. **The three combined perspectives (in-state snapshot, out-of-state benchmarks and state benchmarked rankings) are designed to provide a platform for discussion by the broader economic development community to begin to build and coalesce around a long-term strategy designed to position Florida as an economic leader in the 21st Century.**

Florida has made a great deal of progress over the past five to ten years building a foundation for an emerging 21st Century innovation-based economy. Recent establishment of life science projects through state appropriated funding, creation of new programs, policies and tools such as the Centers of Excellence and Opportunity Fund, and the added emphasis on commercialization of technology at most of the state-supported universities are all positive and welcomed steps toward future enhancements for the innovation economy. Despite these advances, there is a lingering perception that greater progress could be achieved by working more closely together through a unified state-wide vision and consistent implementation strategy. The objective of this study is to identify best practices in the U.S. that could serve as possible models for future efforts.

### Research Overview

Three primary channels of research were undertaken during this study. First, 41 Floridians were interviewed, either by phone or face-to-face. Those interviews obtained a cross-section of viewpoints on the current status of Florida's competitive position in the innovation economy. The interviews focused on the individuals' personal perceptions and opinions on the challenges and opportunities facing Florida's diversifying into a more innovation-based economy. Twenty of the interviews were conducted with funding sponsors of the study, while 21 were conducted with

stakeholders who are involved on a day-to-day basis working within the innovation economy. The interviewees crossed three distinct segments – traditional economic developers, university-based technology commercialization officials and private sector innovation-based company representatives.

The second line of research involved investigating policies, programs and incentives of other states, regions and communities that are structured to enhance development of their respective innovation and knowledge-based economies. The number of existing programs is too extensive to claim a definitive survey of them all. States and programs were selected based on one or more of the following criteria:

- Recommended by an interviewee.
- Cited as a best practice by recognized authorities at organizations such as the Kauffman Foundation and the State Science & Technology Institute.
- Addressed a perceived gap in Florida's innovation support system.
- Appeared to be transferable to Florida given the components of the program and the realities of Florida's business climate and geography.
- Known to Boyette Levy through our involvement in the global economic development community.

Programs were identified and screened through the above criteria, and preliminary research was conducted on more than 50 identified programs.

Thirty-one of those programs were selected for interim review and 16 were selected to be incorporated into the final report. Some “programs” are not actually specific programs, but summaries of a type of initiative that contained too many variations to select just one example.

Thirdly, seven states were selected to benchmark against Florida using 14 different metrics that are acknowledged to be relevant to innovation economy

economic development. The selection of those states and the data points benchmarked is discussed below.

## Interview Synopsis

The results of the interviews are critically important for many reasons. Not only do they provide insight into current effectiveness of Florida's innovation-based initiatives, they begin a process of defining gaps in the system and building a coalition of support across the lines of the three representative groups. This latter collateral benefit of the interview process could well provide the greatest long-term impact of the overall project.

### *Interview Synopsis - Innovation Economy Defined*

Before moving too deeply into the study it was important to define “innovation” and correspondingly an “innovation-based economy.” The terms technology-based, knowledge-based and innovation-based are frequently used interchangeably. For the purpose of this project, “innovation-based” was selected.

Although a few respondents narrowly defined “innovation economy” to be based on the research and development aspects of science and technology, the majority viewed it as broadly encompassing not only technical inventions, but also improvements in process. It was also clear that although some industry sectors are most commonly associated with the innovation economy (e.g. BioSciences); the innovation economy is not a collection of target industries, but as one interviewee stated “can exist across most any industry sector, since it is more about the enabling technology behind the products within the sector.” It was the clear majority opinion that innovation applies to all industries and not just limited sectors, including “business model innovation.”

Many interviewees related innovation to companies “preparing for global competition.” “Creating value through inventions and improvements” was frequently mentioned as the reason innovation is so

important to Florida's economy. It was acknowledged that talent and human resources is a critical component and therefore an integral aspect of an innovation economy. The spirit and culture of entrepreneurs was also frequently mentioned, as were high-value, high-wage jobs when describing an innovation economy. One interviewee summarized the connection between jobs, value and global competitiveness by saying "if Florida companies cannot continue to develop new products, processes and materials through creative research and development, then Florida will not be able to successfully compete for the high-value jobs of the future." In short, one respondent summarized this point as "taking bright ideas and creating wealth from them by doing things differently, better and faster than before."

A proposed definition for "innovation economy" for this project that is consistent with the majority of interviewees is the creation of value through the adoption and exploitation of new ideas throughout the economy.

#### **INNOVATION ECONOMY**

***The creation of value through the adoption and exploitation of new ideas throughout the economy***

#### *Interview Synopsis - Strengths and Weaknesses*

Many interviewees felt that Florida is faced with the challenge of continuing to transition from a historically low-cost Southeast state that competed with other southern states to an economy that competes globally for talent, ideas and discoveries. The reality of Florida's economic history and incumbent power structure being derived from agriculture and real estate development has resulted in a culture that is not as supportive of education and innovation as that of many competitive states.

Innovation economies are built around the people that fuel its growth through their individual and collaborative creative thinking. Florida possesses a quality of life that is appealing to many individuals. Maintaining this attractive environment will be critical to future success, but it will not alone guarantee Florida's ability to transition and diversify as needed.

The most often cited weakness of Florida is its human capital and talent development. Almost every interviewee mentioned the current lack of availability of skill sets in critical disciplines and an inadequate public education system to produce the needed talent for the future. Although an in-migration of talent will continue to be important, companies cannot sustain significant growth and bear the cost of relocating most of its critical staff. The universities and community colleges must produce the engineering and technical graduates, but the high schools have to provide enough qualified students for a successful pipeline of talent.

Many interviewees also felt that Florida's size and diversity are both a strength and a weakness. Its size dictates the fragmentation that exists and the "City State" economies manifest both positive and negative attributes. Despite the recognition that economies ignore political boundaries and evolve along regional lines, many of the interviewees view the lack of state-level coordination and support as an inherent weakness. Despite the positive results of the intra-state competition, the overall effect is sub-optimization of the state's resources and assets.

A lack of start-up and early-stage capital was frequently mentioned as a weakness. It was noted, however, that several recent legislative initiatives which have been passed have not yet been fully implemented, e.g. Opportunity Fund. Those tools combined with the apparent willingness of established venture capital (VC) firms to invest in Florida given the right opportunities led many of the interviewees to view the trend as favorable. They stressed, however, that Florida is really just beginning to get started and

has a great deal of catching up before it can slow its continued efforts.

Another weakness cited was the general lack of legislative patience to develop a thoughtful set of solutions and then “allow them the time to pay off.” The belief that there could be any short-term magic solution to “jump starting an innovation economy is a fallacy.” This ad hoc and inconsistent approach to diversifying Florida’s economy was frequently cited as a primary impediment to progress. Organizations and

institutions that are funded and charged with developing an innovation economy will have to be given the time and flexibility to pursue the chosen strategy long enough to determine if it is making a difference.

Following is a list of strengths and weaknesses derived from the interviews. The strengths were mentioned as assets that will contribute to future efforts, while the weaknesses are viewed as deficits that must be addressed in order to be successful. *(Note: All are listed alphabetically.)*

Interview Synopsis	
Strengths	Weaknesses
Ability to attract talent	Ad hoc and inconsistent state-level support
Accessibility of universities	Availability of certain skill sets
Corporate partnerships with many universities	Gaps in early-stage funding
Culturally diversified	Inadequate K-12 education system
Florida Venture Forum	Inadequate private sector support for innovation initiatives
Focused curriculum of many community colleges	Lack of engineering and technical graduates
Hidden talent	Legislative impatience
Overall quality of life	Non-supportive culture for education and technology
Recent collaboration among universities	Over-reliance on government
Significant pool of talent	Regional fragmentation
State’s community colleges	Student-faculty ratio highest in the nation
State’s university system	Technology community too dispersed
	Tradition as a “low cost” state
	Tuition lowest in the nation
	University funding 73 percent of national full-time employee average

### Interview Synopsis – Opportunities and Challenges

The challenges and opportunities are corollaries of many of the above mentioned strengths and weaknesses. The common theme most often mentioned when asked “what are the major challenges facing Florida’s ability to compete in the innovation economy?” was the state’s cultural resistance to taking the necessary steps to build an innovation economy. This was summarized by one respondent as **“inertia is the biggest impediment.”** The general sentiment is that the vast majority of 17 million Floridians are not connected to the innovation economy.

The current quality of K-12 education has far reaching effects, not only on the students it produces, but on the image of the state and its ability to recruit individuals and companies. Several respondents felt that addressing the K-12 education system is the single greatest challenge to long-term success with one saying Florida “must shore up education and do it quickly with dramatic changes.” One respondent summarized the education challenge as “smart companies hire smart people and they want their kids to go to good schools.”

Modifying the current economic development model to reflect the need to focus more on innovation and entrepreneurs was frequently mentioned. Many interviewees recognized the need to continue recruiting companies to fill some of the gaps in the state's economy, but stated a **strong need for economic development organizations to add an equally aggressive focus on supporting innovation-based entrepreneurs.** This new model was usually described as a system of locally and regionally-based programs and services supported and enhanced by state-level policies, funding and collaborative facilitation. In addition to modifying the current economic development model, the measurements of success will also have to be addressed. It was often noted that since wealth creation is the objective of innovation, this metric should be considered in determining the long-term success of future efforts.

Despite the weaknesses and challenges mentioned above, a significant majority of those interviewed felt there is now a "window of opportunity" for Florida to make significant progress in this area. Some even said it is "now or never" and believe that as other economies transition, Florida has a chance to reposition itself among the innovation leaders, but that the window will last 10 years or less.

**A significant majority of interviewees believe that strong support of universities is the best and most direct path to creating an innovation economy.** The current baseline of university research in Florida is about \$1.5 billion in research, comparable with Georgia and in the same range as North Carolina at \$1.8 billion (note that additional statistics on baseline research and other areas are found in the Comparative Data Analysis). This indicates an emerging critical mass to succeed. Increased state support of research and commercialization as well as availability of funding for companies being created around the discoveries are simultaneously a challenge and an opportunity.

Although "huge gaps" in early-stage funding were cited as a challenge, the venture capital markets appear poised to invest in Florida. One interviewee stated, "The world is ready to invest in Florida once we demonstrate that we have enough companies worthy of investment with management know-how and leadership..."

The other area of opportunity for Florida lies within the quality of life still prevalent in the state. Many interviewed believe that an attractive quality of life drives the development of the innovation economy since innovation depends on individuals with location choice. Despite many of the areas of current concern, Florida still offers a great quality of life versus many of its competitive states.

Many references were made to California and how Florida's greatest challenge is to find a way to adapt and diversify its economy to a higher cost and higher value. Many contest this goal, but some see Florida's potential as becoming innovation's "California of the East." The recent establishment of the Florida operations of the California-based research institutes, such as Scripps, Burnham, SRI International, and Torrey Pines, were cited as an indicator of this potential. These alone, however, will not ensure transition of the economy. Policy makers, elected officials and private sector leadership will have to recognize the reality of where Florida as a state stands vis-à-vis its competition and commit to the difficult choices that will be required to fund a pathway to success.

The lack of legislative patience was also cited as a weakness of Florida's. Although budget and fiscal constraints have to be reconciled, one could conclude that the recently completed 2008 Legislative Session continued the ad hoc approach to building an ecosystem for innovation. Programs that were recently created, e.g. Centers of Excellence, had funding reduced or withdrawn. A summary of the opportunities and challenges derived from the stakeholder interviews are below. *(Note: All are listed alphabetically.)*

Interview Synopsis	
Opportunities	Challenges
Attractive quality of life	Adapting to higher cost environment
Concept gaining momentum	Addressing diverse geographic needs
Positive baseline of University R&D	Building synergies between regions
Recent legislation – Opportunity Fund, Florida Research Consortium, Commercialization Institute	Improving K-12 education
Recent R&D institute locations	Inadequacy of university resources
Timing – “now or never”	Inertia
VC markets poised to invest in Florida	Lack of innovation culture
	Modifying economic development model
	Providing a consistent business climate
	Recognizing wealth creation as success measurement

### *Interview Synopsis – Perceived Gaps*

Perceived gaps in Florida’s support infrastructure for innovation-based companies could also be viewed as a weaknesses or challenge. Although Florida has competitive jobs-based economic development incentives, e.g. Qualified Targeted Industry Tax Refund (QTI), it was frequently cited by interviewees that, although appreciated, those incentives do not make a substantial impact on a small innovation company’s ability to grow. It was stated that emerging innovation-based companies need funding or access to funds that will offset upfront costs, which QTI does not do. These funds could be provided as investments of state dollars or investment of private dollars facilitated through better organized angel and venture capital networks – both were cited by interviewees as gaps that need to be addressed in Florida. The needed funding should support continued R&D and/or testing to further company growth. In order to affect the growth of these companies, the state needs “relevant” assistance. The Florida Research Commercialization Grant Program that failed to pass in the recent Legislative Session was designed to meet this need.

This deficiency is not unique to Florida, but Florida is behind other state’s efforts to address such funding gaps. One interviewee responded, “I am not a big government fan, but the state needs the grants to help fund the gap to get technology that is showing promise to the commercialization stage. Pennsylvania

started its Ben Franklin Fund 20 years ago and it took 10 years before it started to show results.”

The Innovation Fund was mentioned frequently as a positive development. It was noted; however, that this fund was used mostly for large-scale projects and that some of the fund should be set aside for projects that range from \$10 to \$20 million in total investment, with the Innovation Fund supporting a portion of those costs.

A lack of incentives for projects of this size was noted as a gap in the system. The other deficiency of the Innovation Fund mentioned by interviewees was the inability of smaller communities to provide the required dollar for dollar match to access the funds. This requirement is seen as exacerbating the split between the larger urbanized regions of the state and the mid-sized cities or rural areas. Although funds were not appropriated for the Innovation Incentive Fund in the 2008 Legislative Session it is hoped this incentive will be reinstated in the future. In preparation, modifications to the Fund criteria should be considered.

Human capital continues as to be a gap in the system. Several interviewees felt that “raw material,” i.e. ideas and discoveries, is being produced in the state, but that the “greatest need is to recruit CEOs, bankable CEOs to take companies from \$3 to 4 million to \$20 million.”

Physical infrastructure also continues to be a gap. The lack of wet lab space available for lease throughout the state was mentioned by virtually every respondent involved with biotechnology. Several noted that wet lab space is being planned around the state, but that it is not yet in place to benefit companies in need. Growing companies stated they have to have the space, are willing to pay market rate and will move to another state that makes it available if that is what it takes to be successful.

**The final “gap” that was mentioned by numerous respondents was the lack of an organized, statewide “support infrastructure” for innovation-oriented start-up companies.**

One interviewee stated the fact that “the state does not support a network of assistance providers surprised me.” Others observed that some regions have developed a model that embraces entrepreneurs around certain clusters and that those best practices should be developed regionally, and then spread around the state. *(Note: All are listed alphabetically.)*

Interview Synopsis
Perceived Gaps in Innovation Continuum
Bankable CEO talent
Biggest gap is funding and particularly with early stage
Funding that will offset costs of R&D and/or testing
Innovation Fund – More should be used for smaller projects
Innovation Fund – Smaller communities’ inability to meet state match requirement
Recognition of importance of creating and growing innovation-based companies
Statewide organized support infrastructure
Wet lab space

### *Interview Synopsis - Innovation as a Priority*

Different respondents date the history of Florida’s effort to build an innovation economy to different times. Some go back almost 20 years while others start with the Scripps, Burnham, SRI International,

and Torrey Pines projects, with several picking points in between. Virtually 100 percent of the interviewees acknowledged that significant work and progress has been made, with a clear majority citing the need to do more at what they consider to be a critical juncture in the state’s development cycle.

Interview Synopsis
Innovation as a Priority – Representative Responses
The effort has been appropriate with real progress in the last few years.
The effort has not received enough attention. If we want to be competitive we need to catch up. We are making progress, but we are still behind.
Timing is critical. The soft economy gives us an opportunity to be more creative and focused. The state needs a strategy.
Florida is heading in the right direction. How fast we will get there remains to be seen, but we are doing a lot of the right things.

There was no agreement on how widely accepted the need to diversify the economy around innovation is in the public eye, or even the level of awareness of what the state currently has in place. All felt the issue is

now getting more recognition than before, but felt the test is whether or not the support goes beyond “lip service” and gets the level of actual support it requires.

Interview Synopsis
Current level of Support for New Initiatives - Representative Responses
The population seems on board.
I don't see a ground swell, but it is time to get a higher level of public awareness.
The topic is catching on – the Governor's Innovation Pyramid is an indicator.
Leadership in the state is starting to “get it.”
The private sector is poised to support.

Clearly the group of interviewees is biased toward more state involvement and support of innovation economic development. They are also a representative group that is aware of the competitiveness of this effort and what it takes to succeed. Most would like to see a more clearly defined and coordinated strategy that recognizes the importance of the respective regional economies and supports their development through a consistent set of policies, programs and incentives. Most all respondents sharing this opinion felt that the state has developed a good platform and should now take advantage of it, acknowledging that “we are getting started, but with a very fragmented system.” The coordinated strategy should include all regions, as well as rural areas and contain a strategy for each constituent group.

*Interview Synopsis - Chief Science Adviser*

In the review of benchmarked state programs that follows, many states have created positions that could be characterized as a “Chief Science Adviser.” In many respects, the Florida Research Consortium is designed to fill this role, but its mandate and funding is not as far reaching as exist in many competitive states. The exact title takes many forms, but the overall portfolio of responsibility is similar – to ensure innovation-based economic development efforts are based on sound science, are championed within state government and are coordinated throughout the state. As noted, above, Florida's approach to this challenge is fragmented not only geographically, but within state government as well. The question asked was whether or not Florida should have this functional position, regardless of the title.

Interview Synopsis
Need for a Chief Science Adviser - Representative Responses
Yes, assuming he or she has authority and/or an advisory board with direct access to Governor.
Yes, assuming he or she has no authority and is just an adviser.
No, would just be another layer of bureaucracy.
No, there is an advantage to various organizations negotiating results.
Yes, somebody at a high-level should have responsibility for innovation.
Yes, a Scientific Evangelist at that level would be great.

*Interview Synopsis - Additional Comments*

At the conclusion of each interview, the interviewee was asked if he or she had any thoughts that were not

captured by the questions. Several of these responses were incorporated into the above categories, but others were not.

<b>Interview Synopsis</b>
<b>Final Comments of Interviewees</b>
Supporting start-ups is important and states and regions must increase their efforts in this area, but we do not have enough critical mass to stop attracting the medium and larger firms. Our future depends on it.
The state must focus on building its clusters.
Florida's size and geographic diversity, like California's, requires more research universities to meet the demands and opportunities of the innovation economy.
The state should allow its institutions and organizations to be more flexible, with outreach programs and structures to make quick decisions. The FHTCC matching grants program works well and should be duplicated throughout the state.
Whatever state programs may result from this effort, decentralize, decentralize, and decentralize.
How do you recruit foreign technical talent? Eighty percent of applicants are Chinese/Indian. Someone needs to be looking at how companies can recruit and secure these foreign nationals. Even with in-state students from local universities, the vast majority are foreign nationals.
Florida can sustain, and an innovation economy demands, more research institutions.
A plan and continuity of the plan tied to resource allocation is needed. The plan should come from the Governor and be bold and huge. The state needs to be strategic and proactive.
Several large, nationally known companies are asking "why are we wasting resources in Florida." These companies are making conscious decisions to hire and locate tech people out-of-state or avoid investing in the state altogether. With the current state of education and supply of talent, the state cannot support a large-scale technology company.
Technology development should be the third leg of the state's economic stool.
Whatever programs are developed, please don't make the application for the benefit too painful. Small business won't pursue if the costs are too high.
Baby boomers are continuing to retire in Florida and represent our "hidden talent pool." There should be some way to identify those that are interested in staying active and involved through investment or management.
Existing Florida industries are underutilized. Using vendor lists, economic developers should be able to make a case for an increased presence of those suppliers.
People need to look internationally (e.g. Ireland) to see what can be done with very good public policy – education, tax base, and economic development.
Innovations happen at the intersections of technology (where ideas bang into one another). Creation of any ecosystem that helps interaction between business and higher education would be good.
The state needs an engine for creating innovation.
The state should ask itself if it is doing enough to make an actual difference toward a structural change of the economy, more innovation and wealth creation, and, if not, do more.

## Comparative Data Analysis

Based on the information gained through the interview process, programs reviewed and Boyette Levy's expertise, seven states were selected to benchmark with indicators that are acknowledged as factors determining a state's ability to develop its innovation economy. The states were California, Texas, New York, Pennsylvania, Ohio, Georgia and North Carolina. The reviewed data included 2004 Total Research and Development (R&D), Change in Total R&D from 2003 to 2004, R&D Per Capita, Academic R&D, Industry R&D, Federal R&D, Small Business Innovation Research Contracts, Scientist and Engineering PhDs Awarded, Patents Issued, Venture Capital Investment and Professional, Technical and Scientific Employment.

Some who view this report may already know but for the broader audience this report confirms that Florida

ranks below the benchmark states in most of the criteria that is acknowledged as relevant to an innovation economy. Of the 14 benchmark metrics, Florida ranked above its fourth place population position in only one – total change in R&D spending by percentage from 2004 to 2005. Considering Florida's economic history vis-à-vis the other states, this data should not be viewed as a criticism of past performance, but rather the reality facing the state as it plans for its future. Conversely, the positive trends indicated by the one-year increase in overall R&D spending and Venture Capital funding should not instill excessive confidence. Florida is assured success as it develops its innovation economy. Although these two positive indicators are welcomed and applauded, the trend lines have not continued long enough to alter the state's position relative to the benchmarked states.

<b>Florida's Rankings Against the Seven Benchmark States</b>	
<b>Metric</b>	<b>Florida's Rank (out of eight)</b>
Population and GSP	4
Total R&D – 2005	7
Total R&D increase by percentage 2004 to 2005	3
Total R&D increase by dollars 2004 to 2005	6
R&D per capita	8
Academic R&D	7
Industry R&D	7
Federal R&D	6
SBIR Contracts	6
Scientist & Engineering PhDs Awarded	6
Patents	8
VC Investment Dollars	5
VC Number of Deals	7
Professional, Technical and Scientific Employment	5

## Benchmark Programs

Success or failure in developing a vibrant innovation-based economy is not dependent on any single factor, program, policy or incentive. Rather, it is frequently the result of a continuum of factors, programs, policies, and incentives that create an ecosystem that provides as many ingredients of success as possible. A realistic acknowledgement of the state or region's current status along the innovation development spectrum also greatly impacts prescribed actions and relevant benchmark initiatives.

The programs selected are both representative of initiatives Florida should consider, as well as illustrative of what competitive states have done in order to increase their likelihood of success in this field. The list of covered programs is by no means a definitive one, since the numbers and variations are almost infinite. Programs will address the following categories:

- Statewide Innovation Development Models
- R&D Tax Credit Programs
- Research and Commercialization Programs
- Angel Funding Programs
- Venture Funding Programs
- Pension Fund Investment Programs
- Local Programs

### *Statewide Innovation Development Models*

States approach the organization of their innovation and technology-based economic development efforts differently. As the competition for research, capital and innovation-oriented companies increase between states, many that have not approached innovation in a collaborative and strategic fashion are doing so now. Some aggregate under a Department of Commerce or equivalent organization, while others create stand-alone agencies to manage these functions. Both models can and do work. Below are five representative successful state-led development models and one newly launched initiative in Missouri:

#### **North Carolina Board of Science and Technology**

In 1963, the North Carolina General Assembly established the North Carolina Board of Science and Technology (the Board) to encourage, promote, and support scientific, engineering, and industrial research applications in North Carolina. The Board works to investigate new areas of emerging science and technology and conducts studies on the competitiveness of state industry and research institutions in such fields. The Board also works with the General Assembly and the Governor to put into place the infrastructure that keeps North Carolina on the cutting edge of science and technology.

Initially, the Board focused on persuading firms to locate in North Carolina, particularly if they needed professionally trained people and scientific and engineering support. Eventually, the Board's emphasis evolved to building North Carolina's research and education base. Currently, the Board continues these efforts and others to ensure that science and technology play an important role in promoting the economic growth and development of the state. The Board is a division of the North Carolina Department of Commerce and is managed by an Executive Director with its members appointed pursuant to enabling legislation.

Past projects of the board include the North Carolina School of Science and Mathematics, the North Carolina Biotechnology Center, the Technology Development Authority, the North Carolina Research and Education Network, and the North Carolina Aquaculture Program.

### **Ohio Third Frontier Commission and Project**

The Third Frontier Commission was created by the Ohio General Assembly in 2003 and is responsible for allocating funds appropriated by the General Assembly to support the programs of the Third Frontier Project. Members of the Third Frontier Commission include the Director of the Ohio Department of Development, the Chancellor of the Ohio Board of Regents, the Governor's science and technology adviser, and six regional commissioners appointed by the Governor. The Commission also has a 16-member advisory board made up of leaders from industry, academia and government.

The Third Frontier Project, a 10-year, \$1.6 billion initiative, is Ohio's largest commitment to expanding high-tech research capabilities and promoting innovation and company formation. The overall mission of the Third Frontier Project is to build world-class research capacity in the state, support early-stage capital formation and the development of new products, and finance advanced manufacturing technologies to help existing industries increase productivity. The Third Frontier Project offers a comprehensive set of programs that support research, commercialization, information technology infrastructure, training, and job creation.

One program of note is the Entrepreneurial Signature Program (ESP) which provides grants to a single, non-profit organization in each of the six regions of Ohio with the goal of significantly increasing entrepreneurial commercialization outcomes in technology-based sectors that offer the best economic development prospects for the region. Each ESP represents a coordinated network of services and providers to assist entrepreneurs and small tech-based companies in the region.

Fiscal Year 2007 marked the mid point of the 10-year Third Frontier Project, and more than \$637 million has been awarded to companies, universities, and economic development organizations throughout the state. The Third Frontier Internship program also awarded internships valued at \$3,000 each at Ohio companies to more than 900 students to learn about career opportunities and the practical application of technology.

### **Oklahoma Center for the Advancement of Science and Technology**

The Oklahoma Center for the Advancement of Science and Technology (OCAST) was established in 1987. It is funded by state appropriations and governed by a board of directors with members from both the private and public sectors. In June 2006, OCAST was charged with the responsibility of administering the newly-created \$150 million Economic Development Generating Excellence trust fund (EDGE Fund), created for the purpose of increasing private and public applied research and development, technology transfer and technology commercialization in Oklahoma.

OCAST manages several different programs toward fulfilling its stated mission "to foster innovation in existing and developing businesses." The programs provide general assistance, research grants, commercialization grants, seed funding, internships and sector-specific initiatives.

Since 1987, OCAST has invested \$151 million in Oklahoma research, development, technology commercialization and manufacturing modernization and, with this funding, has attracted nearly \$2.6 billion in private investments and federal funding. There are several "success stories" of OCAST backed companies, with Novazyme Pharmaceuticals being the most recognized. In 2001, it was acquired by Genzyme Corp. in a sale estimated to be \$225 million with the research arm continuing to be headquartered in Oklahoma City.

**Pennsylvania Technology Investment Office  
(Ben Franklin Technology Partners)**

Pennsylvania's technology development strategy is coordinated by the Technology Investment Office (TIO) of the Department of Community and Economic Development and governed by the Ben Franklin Technology Development Authority. The Ben Franklin Authority is appointed by the Governor and chaired by the Secretary of Community and Economic Development. The program operates under the name Ben Franklin Technology Partners (BFTP), which celebrated its 25<sup>th</sup> Anniversary in 2007.

The mission of the TIO and BFTP is to facilitate growth and competitiveness through a comprehensive set of initiatives including funding, partnerships and support services. The TIO also plays a significant coordinating role to ensure that the numerous other technology-based economic development groups and initiatives are working collaboratively.

The mission of the TIO is to serve as a catalyst for the growth and competitiveness of Pennsylvania companies through technology-based economic development (TBED) initiatives including funding, partnerships and support services. The goal of the TIO is to ensure that the variety of TBED organizations and initiatives located throughout the Commonwealth are working collaboratively to fully leverage the wealth of research, capital resources, and support services available to build a comprehensive infrastructure that supports company growth.

A recent independent study indicated a substantial return of taxpayer dollars by the BFTP. From 1989 to 2001, BFTP boosted the state's economy by \$8 billion and helped to create 93,105 jobs. In addition, during the same period, every public dollar invested by BFTP yielded nearly \$23 of additional state income. In addition to the return on investment of state funds, many innovative technologies and scientific discoveries have resulted from BFTP support.

**Georgia Research Alliance**

The Georgia Research Alliance (GRA) was established in 1990 and is a model public-private partnership between Georgia universities, business and state government. The program focus areas are:

- Eminent Scholars - For each scholar, GRA invests \$750,000 for an endowment, an amount that the research university matches in private funds on a minimum 1-1 basis. GRA also makes investments in developing the world-class research laboratories the scientists need.
- Centers of Research Excellence – Many Centers are led by Eminent Scholars and involve collaboration across universities and with private industry. GRA's funding is often in the form of matching funds to attract federal and private research grants.
- Commercialization – VentureLab is GRA's signature technology commercialization program. Launched in 2002, VentureLab helps build high-growth companies around laboratory discoveries at GRA's partner universities. VentureLab seeks out university-based research innovations, evaluates their commercial potential, and provides resources to address the management, market and technology risks that come with new ventures. Each participating university has an active technology incubator with which VentureLab partners. GRA also makes competitive investments, Industry Partnership grants, in R&D projects conducted jointly by university faculty and Georgia-based companies.

GRA is a proactive, synthesizing and facilitating organization that works with six Georgia research universities. Each of its programs and initiatives are customized to meet the requirements of the opportunities they are designed to exploit. GRA operates as an independent not-for-profit governed by leaders from industry and academia. GRA does not receive state funding for investments in research, but its operations are funded through foundation and industry contributions.

GRA has a demonstrated track record of success. Since 1990 they have recruited 58 Eminent Scholars; established 24 Centers of Research Excellence; leveraged \$2 billion in federal and private research; served 100 plus corporations by university partnerships; created 125 companies and 4,000 plus jobs.

### Missouri “Grow Me State” Initiative

The “Grow Me State” initiative began as a research project to gain a better understanding of the state’s capital formation needs. The December 4, 2007, revised report titled “Missouri’s Need for Risk Capital: An Assessment and Recommendations,” suggested that the state’s capital formation strategy should be guided by seven principles:

1. Missouri’s capital formation strategy must recognize and respond to the competition it faces from other states for private capital.
2. Missouri’s capital formation strategy should focus on the pre-seed and seed stages of capital formation.
3. Missouri’s capital formation strategy should leverage money from other sources.
4. Missouri’s capital formation programs should connect innovators, entrepreneurs, businesses, investors, scientists, and marketing experts.
5. Missouri’s capital formation strategy must be embedded in a strategy for stimulating the creation of high-quality start-ups in Missouri.
6. Missouri must make a long-term commitment to both capital formation and innovation.
7. Missouri must measure the results of its capital formation programs.

As a result, the “Grow Me State” Steering Committee recommended a Statewide Blue Ribbon Panel of leadership from key technology employers and financiers be formed to guide the state in the creation of a five-year Technology Based Economic Development Strategy to capitalize on existing strengths.

As stated previously, many interviewees felt the fragmentation of this effort in Florida should be addressed. The model programs above represent a comprehensive combination of policy development, funding initiatives, support services and partnership coordination.

Enterprise Florida is charged with and addresses many of those functions, but is not mandated or staffed to provide a comprehensive approach. When Enterprise Florida was established, the organization contained many of those functions, but rather than

evolve them to better address the Florida marketplace, the division was eliminated.

Because of Florida’s geographic size and regional diversity, it would be difficult and ill-advised to provide the support services from the state-level. However, providing coordinated policy development, management of state-level programs as a wholesaler to the regions and communities while providing competitive grant funding to help establish local efforts where they have yet to develop would contribute greatly to developing a statewide ecosystem necessary to support an innovation-based economy.

## R&D Tax Credit Programs

A wide range of R&D Tax Credits are available throughout the United States. An estimated 41 states have enacted some type of tax credit policy to enhance research and development. Since 1982, the emerging consensus among states is that the benefits of R&D exceed the profits companies earn on their R&D investments. These additional benefits are due to “spillover effects” of the new inventions that multiply their benefits to society many times over.

R&D activities and the resulting innovation is clearly becoming the theme of economic development throughout the United States. States with some type of R&D Tax Credit have increased as follows: 1982 – 1; 1992 – 14; 2002 – 31; 2006 – 41. There are many variations in how states have enacted their respective R&D legislation. As of 2006, there were 28 states

with legislation providing credits related to the incremental increases in R&D investments. Of those 28 states, 19 use the Federal Tax Formula to determine the incremental increase while nine have developed their own formulas.

**“States that do not offer tax incentives to R&D investments face an increasing risk of losing R&D activities to states that offer such incentives...especially if those states are nearby.”**

**– Daniel J. Wilson, Federal Reserve  
Bank of San Francisco, 2007**

Florida does not currently have an R&D tax credit and a legislative proposal for a Florida R&D credit did not pass this year.

### Maryland R&D Tax Credit

The Maryland Research and Development Tax Credit program was enacted during the 2000 session of the Maryland General Assembly and subsequently amended to require the Department of Business and Economic Development (DBED) to submit a report to the Governor and General Assembly on the applicants certified for the R&D income tax credits and the amount of credits approved. DBED is responsible for administering the certification process.

The Maryland Research and Development Tax Credit Program includes two separate, but related, tax credits. One credit is calculated on a firm’s average level of research; the other credit is calculated on a firm’s increase in R&D expenditures over previous years.

- **Basic R&D Tax Credit:** This credit is three percent of eligible R&D expenses that do not exceed the firm’s average R&D expenses over the last four years. However, if the total amount of credits claimed by all firms exceeds \$3 million, then the Basic R&D tax credit will be prorated. Moreover, if there is money left over from the Growth R&D tax credit allotment, then this money will be added to the \$3 million.
- **Growth R&D Tax Credit:** This credit is 10 percent of eligible R&D expenses that exceed the firm’s average R&D expenses over the last four years. However, if the total amount of credits claimed by all firms exceeds \$3 million, then the Growth R&D tax credit will be prorated. Moreover, if there is money left over from the Basic R&D tax credit allotment, then this money will be added to the \$3 million.

The unused credit carry-forward has been reduced from 15 years to seven years. The \$3 million cap was set based on the lack of reliable information on the potential applications. The basic R&D credit was 7.5 times oversubscribed and the growth credit was 6.1 times oversubscribed. These limits reduced the *effective rate* for the basic credit to 0.4 percent and the *effective rate* for the growth credit to 1.63 percent. This R&D Credit is included to demonstrate the repercussions of estimating and capping the available pool of credits.

### **Pennsylvania R&D Tax Credit Assignment Program**

The Pennsylvania Research and Development Tax Credit (R&D Tax Credit) Assignment program was established to assist the growth and development of technology-oriented businesses, particularly small start-up technology businesses. Since many small businesses in the early stages of development are not yet profitable and do not have significant tax liability, they have not bothered to apply for the available R&D Tax Credits for which they were eligible. With this R&D Tax Credit Assignment program, technology businesses can now sell unused R&D Tax Credits on the open market to help advance and grow the business.

The R&D Tax Credit program is a key component of the economic stimulus program to assist Pennsylvania's home-grown technology businesses to grow and produce jobs and other economic benefits. The actual R&D Tax Credits are issued or approved by the Pennsylvania Department of Revenue. Businesses that have not used all or part of their issued R&D Tax Credits within one year after the R&D Tax Credits were approved by the Department of Revenue may apply to the Pennsylvania Department of Community and Economic Development (DCED) for approval to assign their eligible R&D Tax Credits to a "buyer" – another taxpayer that can then use the purchased credits to offset up to 75 percent of its own tax liability with the purchased credit.

The amount of the credit is 10 percent of the company's increased R&D expense over a base period. The total cap of the credit program is \$15 million, with individual credits being pro rated accordingly. Up to 20 percent of the total pool is set aside for small businesses. Credits may be carried over for a maximum of fifteen (15) taxable years.

Note that elements of the R&D Tax Credit programs that apply to individual investors' personal income tax liability will not be modeled in Florida. It was mentioned in the interview process that Florida should consider making credits available to individual investors by enabling them to apply the credit toward their cumulative Florida tax liability as determined by the sum of a basket of personal tax obligations, primarily personal property and sales tax.

#### *Research and Commercialization Programs*

Through Florida's nine Centers of Excellence, six "Innovation Fund" Research Institutes and the recently established Institute of Commercialization for Public Research, the state has made significant progress in creating the foundation for primary and applied research. Note that the Centers of Excellence initiative was not funded this year.

Once a promising discovery is made and a company is formed, additional funding is required to prove the concept has market potential and further development toward commercialization. These funding needs are generally met through Federal grants, private pre-seed and seed funding and/or state research grants.

The types of grant programs vary from state to state. Some are designed to match Small Business Innovation Research (SBIR) Phase I or Phase II grants, while others are independent of the Federal grant program. Leveraging the due diligence infrastructure of the Federal SBIR program not only increases the efficiency of the state evaluation process, it increases the potential volume of Federal R&D funding coming into Florida by meeting a critical Federal award factor. The proposed Florida Research Matching Grant Program that failed to pass in the recent legislative session would have provided significant assistance to fledgling Florida technology companies.

### **Indiana's 21<sup>st</sup> Century Research and Technology Fund (21 Fund)**

Created by the Indiana General Assembly in 1999 and brought under the leadership of the Indiana Economic Development Corporation (IEDC) in 2005, Indiana's 21 Fund focuses on entrepreneurial ventures that have demonstrated a market potential for commercialization of innovative technologies. The 21 Fund has set aside 20 percent of its budget for an SBIR Program Office, created to support companies that are applying for or have received federal SBIR awards.

To qualify for a grant, each company must propose a technology idea or business plan that demonstrates innovation and clear commercialization intent. The 21 Fund awards grants to companies based on proposal reviews completed by science and technology researchers and experts in economics from across the country. To guarantee that the grant is invested in Indiana and companies grow their businesses in the state, grants require mandatory repayment of funds in certain circumstances.

The Phase I Matching Program has been expanded to support later stage commercialization activities of Phase II SBIR/ Small Business Technology Transfer (STTR) awardees. In fiscal year 2006-07, the 21 Fund awarded 17 grants totaling \$16,303,695; and during the 2005-07 bienniums, the 21 Fund awarded 38 grants totaling \$42,254,599. Through these awards, the 21 Fund has demonstrated a dramatic shift toward primarily supporting small, entrepreneurial companies with 90 percent of the \$42.3 million awarded directly to small companies.

### **Ohio Research Commercialization Grant Program (ORCGP)**

The Ohio Research Commercialization Grant Program (ORCGP) provides grants to improve the commercial viability of technologies developed through federal Small Business Innovation Research (SBIR), Small Business Technology Transfer (STTR) and Advanced Technology Program (ATP) research and development projects. The goal of the grant program is to improve the ability of small technology companies to assess and realize the commercial potential of research projects and to promote the competitiveness of such companies through the augmentation of federal research and development funding. The program also supplements SBIR Phase II awardees by funding commercialization activities which are not allowed under the SBIR programs.

The Third Frontier Commission awards grants of up to \$350,000 to eligible companies that submit a proposal for consideration. Twenty-six organizations have been awarded a total of \$8,614,308.00 and 37 grants through this program. In 2008, the Third Frontier Commission plans to award up to \$2 million in grants.

### **Wisconsin Technology Bridge Grants**

The Wisconsin Technology Bridge Grants program was introduced in 2003 by Governor Jim Doyle as part of the state's Grow Wisconsin initiative. Technology Bridge Grants provide assistance to small Wisconsin businesses experiencing severe financial hardship while awaiting a decision on Phase II or other funding applications. Funds granted under this program may only be applied to necessary costs directly related to maintaining research and basic business operations until the company's follow-on funding or federal grant application is approved or denied.

Eligible companies must have fewer than 100 employees and must have received early-stage financing from the federal government or from some other source. Companies are selected to receive bridge grants based on criteria such as the amount of economic impact the company will have in the state and the likelihood that the company will successfully commercialize technology.

### *Angel Funding Programs*

As established Venture Capital firms increase their funding minimums and shift funding to later investment rounds, Angel networks and funding is becoming more and more important to the growth cycle of innovation-based companies. One unknown Venture Capitalist was heard to say, “Florida has more Angels than anywhere except Heaven.” This could well be a true statement, but locating them and convincing them to invest in Florida-based opportunities is another matter.

The growth of the Florida Venture Forum and several maturing Angel investment groups around the state is a testament to the progress Florida has made in this area over the past ten years. Although these investment groups should continue to be locally and regionally based, many states have benefited from the networking and information sharing resulting from a state-level coordination program.

#### **Wisconsin Angel Network**

The Wisconsin Angel Network (WAN) was formed in January 2005 to serve as an umbrella organization to provide services and resources to the early-stage investing community. WAN seeks to build early-stage capital capacity throughout Wisconsin and increase the number and amount of equity investments in Wisconsin's entrepreneurs. The organization, which is operated by the Wisconsin Technology Council, does not operate a fund or make recommendations on potential investments.

WAN serves as a clearinghouse for resources for both investors and entrepreneurs. For potential investors, the organization offers tools to help establish an angel network, sample term sheets, and research reports on angel investing. Entrepreneurs can receive assistance with raising capital, applying for grants and loans, creating a presentation for a potential investor or developing a thorough and well-organized business plan, devising a marketing plan, and networking. WAN's website hosts a deal-flow pipeline, which includes more than 60 executive summaries from entrepreneurs seeking funding.

### *Venture Funding*

Virtually every interviewee mentioned the need for more venture funding in Florida, though most differed on the most critical factors that could be addressed to increase it. In general, there is a three-way split between those who think the major challenge is a shortage of one of the following: investment capital, fundable deals or fundable management teams. With the exception of the first quarter of 2008, Florida's share of VC funded projects has been decreasing. It is too soon to determine whether or not the trend is turning.

The imminent launching of Florida's Opportunity Fund that was established by the Legislature in 2007 and is currently being formed will be a welcomed addition to Florida's innovation efforts. The program is a fund-to-fund co-investment program that will

attract the attention and capital of out-of-state VC firms.

### *Pension Fund Investment Programs*

A number of states use state controlled and managed pension funds as a tool to increase available risk capital. Although the primary obligation of these funds is the fiduciary responsibility to their beneficiaries to generate a reasonable rate of return, these states have determined that investing in emerging and growth companies in their states and regions can be compatible with generating returns. Two examples of such efforts are the New York State Common Retirement Fund's In-State Investment Program and the Oregon Investment Fund. The recently completed Florida 2008 Legislative Session

produced similar legislation authorizing the State Board of Administration to invest up to 1.5% of its portfolio in technology and growth investments. The two programs below were included due to the timing

and uncertainly of this bill becoming law, as well as to reiterate that the primary consideration for such funds continues to be appropriate risk-adjusted returns.

#### **New York State Common Retirement Fund's In-State Investment Program**

In 1999, the New York State Legislature passed legislation calling on the Common Retirement Fund (CRF) to invest \$250 million in New York companies. By 2003, the CRF had committed \$104 million to the In-State Private Equity Investment Program. Between 2003 and 2006, the CRF has added \$321 million and now has a total of \$425 million committed to 15 funds. Since the CRF requires its investment partners to put up their own money and raise other funds, the total pool of capital currently available is \$750 million.

The In-State Investment Program is designed to stimulate New York's economy but also complies with prudent risk management practices. New York State Controller Allan G. Hevesi was quoted as saying, "Although the program, which the Legislature had the vision to create in 1999, has provided significant economic benefits to the State's economy, my primary objective is to obtain an appropriate risk-adjusted return comparable to what would be available for other investments with similar characteristics. It is first and foremost an investment program. The fiduciary responsibility of the Comptroller's office is always paramount."

The May 2006 CRF status report indicated that it has invested \$145 million in 64 companies, resulting in a total of \$920 million invested. The program has also resulted in out-of-state companies agreeing to locate in New York in order to access the funding.

#### **Oregon Investment Fund**

In July 2003, the Oregon State Legislature created the Oregon Investment Council ("OIC") to design and implement a \$100,000,000 program that encourages the growth of small businesses within the state of Oregon. The OIC invests in all State of Oregon funds, including the Oregon Public Employees Retirement Fund and the State Accident Insurance Fund. The OIC's statutory mandate is to achieve the highest return possible on its investments.

To accomplish this mandate the OIC chose to develop a fund of funds, the Oregon Investment Fund ("OIF"). This fund, which is capitalized by funds from the OIC, has committed capital to private equity and venture capital funds that in turn invest in companies located primarily in the state of Oregon, as well as the Pacific Northwest region. In addition, a percentage of the assets of the OIF may be invested directly into operating companies alongside the OIF's private equity and venture capital managers.

The OIF seeks to build successful, innovative enterprises for the benefit of its investors. In addition, OIF facilitates partnerships among the private equity community in Oregon and between entrepreneurs in the state.

#### *Locally-Based Programs*

Most of the analysis and programs have focused on state-level initiatives that enable local innovation-based development. Components of some of the reviewed programs provide both framework and funding for regional organizations and efforts that meet the state criteria. Since the state-level programs

are dependent on state action, an effort is being summarized to provide programmatic examples of initiatives that could be started locally without state support.

### Littleton, Colorado – Economic Gardening

In 1987, Littleton, Colorado, faced economic development challenges with a shift away from “hunting” to what was called “economic gardening.” Littleton pursued this strategy through significant research and development of training programs and real-time information that is made available to its entrepreneurs. The program, which has evolved over time by dropping training programs determined to be ineffective, is not a specific model of programs and services. It is, however, indicative of an attempt to build a culture of innovation-based entrepreneurialism that can serve as a guide to others.

The objectives of the program are to create a culture and environment that is conducive to supporting innovation and entrepreneurs throughout the economy. Research revealed that a close connection exists between product and process innovation and successful entrepreneurs who create high-growth companies. Littleton identified several key common characteristics of successful entrepreneurs and began addressing each through policies, programs and spending.

The initiative has evolved and is currently focused on three critical areas: Information, Infrastructure and Connections. Although Littleton has won several awards for its efforts, it is the first to concede, however, that there is no one model of success and that “success” is never achieved, since the process is long and never ending. Littleton has “succeeded” in bringing attention to itself as it builds an environment and culture with the entrepreneur in mind. In this respect it is proving one of its tenets of success, i.e. success breeds success.

#### *Incubator and/or Accelerator Programs*

The terms incubator and accelerator are frequently used interchangeably and in fact, many examples of each provide products and services of the other. There is, however, an evolving distinction between the two. Incubators are more and more viewed as organizations that provide assessment and planning services and facilities for companies in the earliest stage of development, i.e. “incubation.” Accelerators have developed and been labeled for entities that provide a physical location, as well as access to expertise and advice to companies that have already proven their concept, obtained some funding and achieved some level of sales. The facility and attendant support services can be provided on a cost or no-cost basis, and the accelerators can be built on a profit or non-profit platform. The objective is to expedite, i.e. “accelerate” the path to profitability for the client companies.

Florida has several examples of successful incubators that also include services that are associated with accelerators. The University of Central Florida Technology Incubator, the Enterprise Development Corporation of South Florida and the Sid Martin Biotechnology Development Incubator is among many successful examples. The number and variation of incubators across the country are too numerous to randomly select one or two examples to follow as specific models. Each incubator and/or accelerator should be designed based on local economic factors and supported by a network of local expertise. Successful examples can be found that are university oriented as well as those that are community-centric and not tied to a university. There are also for-profit and government supported non-profit centers that have successful track records.

## *Talent Development*

An economy cannot prosper on ideas and innovation alone. It must have a deep pool of creative, talented and goal oriented residents to sustain the growth and potential of the companies throughout the state. Regardless of their size, companies depend on their employees to compete. It is impossible for every

region to have an available supply of talent trained in an industry that is underrepresented in the market. A state and region must respond to the opportunities through increasing their commitment to provide the long-term pipeline of required talent.

### **The Georgia Intellectual Capital Partnership Program**

The Georgia Intellectual Capital Partnership Program (ICAPP), the University System of Georgia's ("USG") economic development program, was developed in 1995 by the Georgia Board of Regents to connect the intellectual resources of Georgia's 35 public college and universities to the state's business community. The primary role of ICAPP is to act as a broker and catalyst to strategically link USG with the state's economic development efforts.

The centerpiece of ICAPP is the ICAPP Advantage Program. This program helps meet company hiring needs through an expedited curriculum designed by a college or university to train knowledge workers. Knowledge workers are defined by ICAPP as persons who generate value for other people by sharing, creating or using ideas; complete a job using intellect and experience instead of machinery; and earn above the Georgia per capita income.

A USG institution may apply for ICAPP Advantage funding to help pay for the costs of instruction, including faculty, equipment, and space. The application for this funding is not available publicly and may not be obtained without a Freedom of Information Act request.

In addition, an ICAPP student may apply for an ICAPP service cancelable loan to help pay for expenses (tuition, books and living expenses), while participating in the ICAPP program. Such loans may range from \$7,500 to \$10,000 and are cancelable up to \$2,500 per year for three to four years if a graduating student joins the company participating in the program or a related company in the targeted industry program.

Although ICAPP has focused on addressing a shortage of nurses since 2004, the structure of the program and its ability to connect universities with economic development projects is the basis for inclusion in this study. The program provides a mechanism for universities to accelerate curriculum development and delivery to companies considering expansion and/or relocation into Georgia.

## Conclusion

Florida has made tremendous strides in placing critical building blocks for the development of an innovation economy. The highlights of these efforts over the past five years are:

- Locating the Innovation Initiative Fund projects
- Creation of the Centers for Excellence
- Funding of the Opportunity Fund
- Establishment of the Florida Research Consortium
- Authorizing State Board of Administration to invest in technology and growth companies

These, and more, initiatives have added to the landscape and ecosystem that is required for Florida to compete in the 21<sup>st</sup> Century economy. There are, however, some fundamental and specific challenges still facing Florida in its quest to diversify its economy.

As Florida transitions from a low-cost operating environment to one more focused on value, it must acknowledge that the states (and countries) it competes with change as well. Although Florida has experimented with various innovation-based programs and policies, the comparative data suggests that Florida must do more than its competitors to close gaps and present a better statistical image of its innovation capacity. Several of these indicators, e.g. Venture Capital funding, are showing improvement, but not to the level where future growth will be self-generating.

Although the need to address the primary and secondary education deficiencies in Florida was frequently mentioned as a glaring weakness of the state's ability to compete, a full investigation of the possible solutions to this challenge was beyond the scope of this study. Boyette Levy does acknowledge the importance of general and technical education across the population, but did not pursue an analysis of the status of Florida's education system or possible

solutions to remedy its clear negative perceptions that persist as part of this study. It must be noted, however, that for the state to truly succeed, education at all levels (primary, secondary, community colleges, and universities) must be a part of the planning and solutions.

Florida's regional diversity is both a strength and a weakness. The diverse, strong regional economies enable Florida to diversify within itself and create sufficient critical mass in a variety of industries. However, the same diversity results in a fragmented and ad hoc approach to innovation-based strategic planning and execution. Despite the existence of state-level strategic planning at Enterprise Florida and other organizations, there is currently not a clearly defined and resourced state-level effort to facilitate and coordinate the development and delivery of enabling programs and services throughout Florida's diverse regions. The statewide fragmented and uncoordinated innovation development model was most frequently mentioned as an existing gap in the system. These comments were not critical of any existing organization, but recognition that the functional responsibilities as they relate to innovation economic development are neither clearly mandated nor funded.

Past ad hoc efforts have encompassed elements of this coordination, but they have either been abandoned or are too narrowly focused to provide the proper balance between planning, execution and state/local partnership. In addition, the ad hoc approach to innovation-based economic development has diminished or eliminated initiatives before they were able to demonstrate success.

The goal is not to create a level of bureaucracy, but to raise the level of awareness and commitment across the state for a thoughtful strategy that creates the environment where individuals and institutions are encouraged to innovate, creating value and wealth for the state as a result. These efforts should continue to be based on regional strengths and delegated down to

the regional level. They should, however, leverage state programs, policies and funding, thereby aligning the diverse regions under a state-wide umbrella of enablers.

Innovation takes place at all levels of society and throughout the public and private sectors. Although this report defines innovation as “*the creation of value through the adoption and exploitation of new ideas throughout the economy,*” it has focused on

technology-based innovation. It is impossible to deny the linkage between well-funded research universities and the vibrancy of an innovation economy. Florida must continue to increase its commitment and support for the universities that create the “raw material” around which companies are formed. In order to compete against the benchmarked states, as well as others, Florida will have to find a mechanism to support the universities that are the cornerstone of their region’s economies.

## COMPARATIVE DATA ANALYSIS

### Introduction

Florida has an interesting and unique economic history that is unknown to many both in and outside of Florida. It also has a much “younger” history than the other Eastern Seaboard states, resulting in more similarities with western frontier states than expected. As in every state, agriculture played a predominate role in the beginning, but because of the mild winter weather, tourism and real estate development quickly rose to prominence as the state experienced a long succession of boom and bust cycles.

Similar to other technology-oriented states, Florida’s technology history is steeped in the military and the industries that it supports. Since 1962 and the establishment of NASA’s launch facilities on Florida’s east coast, space exploration has been the image of Florida’s technology and innovation economy. As the space industry approaches major shifts due to retirement of the Shuttle and commercial pressures on launch economics, now is a good time to assess the direction Florida is moving as it relates to the continued growth and development of an innovation and knowledge-based economy.

Beyond the space, defense and a few emerging technology clusters such as medical devices and bioscience, Florida has continued to rely on a low-cost business environment as the cornerstone of its economic diversification efforts. Although this reliance has shifted significantly over the last ten years as technology and skills began to overtake labor costs as the determinative factor in corporate location, there are still many fundamental and systemic weaknesses in Florida that inhibit its successful transition to a higher value operating environment.

An innovation economy is built through a combination of knowledge and creativity that is brought together to create and satisfy market demand. Since it is impossible to predict precisely the success or failure of any particular innovation or industry

sector, building an infrastructure that will generate the greatest possible quantity of “raw material” and a system that will facilitate the selection and development of these innovations for the marketplace is how a state can influence its development toward a more innovation-based economy.

There are numerous indicators of a state’s capacity to compete in the innovation economy. All are relevant, but some are recognized as critical for future success. This study involved a comparison of seven states: California, Texas, New York, Pennsylvania, Ohio, Georgia and North Carolina. These states were selected because Florida competes less and less with its Southeastern neighboring states and more and more with the larger, more technologically advanced and economically diverse states and countries. In many respects, these are states that Florida aspires to compete with and/or emulate as it looks toward developing its innovation economy.

California, New York and Texas all share Florida’s large and diverse geographic and demographic profile. Each has its own unique economic history and approach to economic development. They are included in the comparative data analysis based on their size and resulting governing complexity. Pennsylvania and Ohio were selected because they are relatively large states, with multiple urban centers, as well as the fact that each state has developed a comprehensive statewide program designed to stimulate their respective innovation economies. Georgia and North Carolina were selected based on their similar position to Florida as a Southeastern state striving to diversify their economies through more innovation-based development. Admittedly, selection of these seven states is somewhat subjective and several other states could provide just as relevant comparative data. There are also additional metrics that could be included for a more comprehensive statistical comparison. This comparative data

analysis is not the primary objective of this study, but was intended to help determine weaknesses and gaps in Florida's current ability to compete.

The benchmark states and their respective populations and Gross State Products are as follows:

<b>Population and Gross State Product</b>		
<b>State</b>	<b>2007 Population</b>	<b>2006 GSP* (millions of dollars)</b>
<b>United States</b>	301,825,750	13,149,033
California	36,983,904	1,727,355
Texas	23,624,214	1,065,891
New York	19,356,927	1,021,944
Florida	18,486,255	713,505
Pennsylvania	12,486,937	510,293
Ohio	11,504,135	461,302
Georgia	9,409,496	379,550
North Carolina	8,925,167	374,525

Source: *Decision Data Resources report generated May 6, 2008, and Bureau of Economic Analysis, U.S. Department of Commerce, \*2007 Data available June 2008*

## Total Research and Development Expenditures

Research and Development (R&D) dollars come from three sources: academic, federal government and private sector. Achieving an accurate and timely comparison of cumulative R&D investments in all states is a challenge given the time delays and

methodology of the various components. For example, this data does not include non-traditional investments in R&D such as Scripps, Burnham, Torrey Pines, SRI and the other Innovation Initiative Fund projects. According to the *AeA Cyberstates 2008* report that was released in April 2008, Florida ranks seventh out of the eight benchmarked states in total R&D from all three sources.

<b>Total R&amp;D Expenditures 2005 (Dollars in millions)</b>		
<b>State</b>	<b>Total</b>	<b>National Rank</b>
<b>United States</b>	<b>323,041</b>	–
California	63,874	1
Texas	15,867	4
New York	14,103	7
Pennsylvania	11,916	9
Ohio	8,267	13
North Carolina	7,329	14
Florida	6,224	16
Georgia	3,867	22

Florida did experience significant growth in its total R&D investments in 2005, and ranks third among the seven other states in percentage growth from 2004 to 2005.

<b>Total R&amp;D Change 2004 - 2005 (Dollars in Millions)</b>		
<b>State</b>	<b>Dollar Change</b>	<b>Total % Change</b>
<b>United States</b>	<b>35,255</b>	<b>12.3%</b>
North Carolina	838	12.9%
Texas	1,434	9.9%
Florida	525	9.2%
Pennsylvania	974	8.9%
New York	970	7.4%
California	3,374	5.6%
Ohio	252	3.1%
Georgia	-202	-0.5%

Source: *National Science Foundation*

When considering total R&D spending per capita, Florida ranks last among the benchmarked states and 40<sup>th</sup> overall in the United States.

<b>2004 R&amp;D Per Capita Spending</b>		
<b>State</b>	<b>Total</b>	<b>National Rank</b>
<b>United States</b>	<b>\$980</b>	<b>–</b>
California	1,688	8
Pennsylvania	883	18
North Carolina	760	23
Ohio	700	25
New York	680	26
Texas	642	31
Georgia	456	35
Florida	328	40

Source: *AeA Cyberstates 2008*

## Academic R&D

Florida has a solid foundation of academic R&D, but it is still seventh of the eight benchmark states. Academic R&D expenditures do not guarantee the

creation of successful innovation companies, but its volume is a critical element in all state and regional innovation ecosystems.

<b>R&amp;D expenditures at universities and colleges for FY 2006 (Dollars in thousands)</b>	
<b>State</b>	<b>R&amp;D Expenditures</b>
<b>United States</b>	<b>47,760,402</b>
California	6,493,388
New York	3,789,658
Texas	3,270,728
Pennsylvania	2,428,346
North Carolina	1,710,496
Ohio	1,636,472
Florida	1,527,666
Georgia	1,302,570

Source: *National Science Foundation*

## Industry R&D Investment

Although University-based academic research is critical, private industry accounts for more than four

times the R&D conducted in the United States. Florida also ranks seventh of the eight benchmarked states in this metric.

<b>Industry R&amp;D investment for FY 2005 (Dollars in millions)</b>		
<b>State</b>	<b>Total</b>	<b>National Rank</b>
<b>United States</b>	<b>226,159</b>	–
California	50,683	1
Texas	12,438	5
New York	9,474	8
Pennsylvania	8,846	9
North Carolina	5,158	12
Ohio	5,900	13
Florida	4,164	17
Georgia	2,282	23

Source: *National Science Foundation*

## Federal R&D

The third critical component of R&D is the Federal government and its various granting institutions.

Florida ranks sixth out of the eight benchmarked states in this metric.

<b>Federal Obligations for R&amp;D 2005 (Dollars in thousands)</b>	
<b>State</b>	<b>Total</b>
<b>United States</b>	<b>106,986,449</b>
California	19,379,567
Texas	4,988,545
New York	4,955,670
Pennsylvania	3,234,522
Ohio	2,369,822
Florida	2,197,889
North Carolina	1,791,495
Georgia	1,707,465

Source: *National Science Foundation*

## Small Business Innovation Research Grants

A critical component of Federal support for the commercialization of academic and private sector

R&D are the SBIR grants. Florida ranks sixth out of the eight benchmarked states in this metric.

<b>SBIR Grants Awarded 2000-2005</b>		
<b>State</b>	<b>Total</b>	<b>National Rank</b>
<b>United States</b>	<b>33,289</b>	–
California	6,756	1
Texas	1,426	6
New York	1,335	7
Ohio	1,323	8
Pennsylvania	1,224	9
Florida	790	11
North Carolina	462	19
Georgia	349	23

Source: <http://www.nsf.gov/statistics/nsf07322/tables/summary.xls>

## Scientists and Engineers

Another driver of innovation is the number of scientists and engineers living and working in a state.

Florida ranks sixth out of eight for this metric.

<b>Scientist and Engineers Doctorates Awarded in 2005</b>		
<b>State</b>	<b>Total</b>	<b>National Rank</b>
<b>United States</b>	<b>27,974</b>	–
California	3,600	1
New York	2,419	2
Texas	1,781	3
Pennsylvania	1,397	5
Ohio	1,041	8
Florida	977	9
North Carolina	863	10
Georgia	742	12

Source: <http://www.nsf.gov/statistics/nsf07322/tables/summary.xls>

## Patents Issued

For many new products, the patent is the first step toward development and commercialization. Although there is debate over the connection between where a patent is registered and where the discovery

was made, patent registration is another indicator of a state's ability to compete in the innovation economy. Although Florida experienced the third highest growth rate from 2001-2006, its overall rank is eight out of eight for this metric.

<b>United States Patents Awarded in 2006</b>			
<b>State</b>	<b>Patents per 100,000 workers</b>	<b>2006 rank</b>	<b>% change 2001-2006</b>
<b>United States</b>	<b>76.413</b>	--	<b>0.89</b>
California	161.5	2	12.9
New York	76.0	15	-11.1
Texas	67.7	20	-1.1
Ohio	62.0	21	-16.8
Pennsylvania	56.9	23	-14.0
North Carolina	56.3	24	-1.3
Georgia	42.7	29	6.2
Florida	41.0	30	3.0

Source: <http://www.ssti.org/Digest/Tables/121907t.htm>

## Venture Capital Investment

The objective in innovation-based economic development is to build companies that create wealth through exploitation of new ideas and research. High value direct and indirect jobs are a byproduct of the companies' success and sustained growth.

A critical indicator in how a state is translating its research into companies is the level of Venture Capital invested. Florida ranked fifth out of eight in volume of VC dollars invested and sixth out of eight in number of deals funded.

<b>2007 Venture Capital Investment (Millions of Dollars)</b>		
<b>State</b>	<b>VC Dollars</b>	<b>Share of U.S. VC Dollars</b>
<b><i>United States</i></b>	<b><i>\$30,245,933,500</i></b>	<b><i>100%</i></b>
California	\$13,802,961,100	45.64%
Texas	\$1,416,470,600	4.68%
New York	\$1,195,328,800	3.95%
Pennsylvania	\$835,166,500	2.76%
Florida	\$608,338,400	2.01%
North Carolina	\$577,022,200	1.91%
Georgia	\$462,935,400	1.53%
Ohio	\$170,030,200	0.56%

<b>2007 Venture Capital Investment by Deals</b>		
<b>State</b>	<b>Number of VC Deals</b>	<b>Share of U.S. VC Deals</b>
<b><i>United States</i></b>	<b><i>3900</i></b>	<b><i>100%</i></b>
California	1564	40.10%
New York	191	4.90%
Texas	166	4.26%
Pennsylvania	150	3.85%
Georgia	73	1.87%
North Carolina	69	1.77%
Florida	63	1.62%
Ohio	49	1.26%

Source: <http://www.ssti.org/vc/>

## Professional, Scientific and Technical Service Employment

In addition to the research and operating funding required to advance a state in the innovation

economy, a technical and skilled workforce is also required. Florida ranks fifth out of the eight benchmark states in the percentage of the labor force working in professional, scientific and technical services occupations.

<b>2007 Employment by Industry: Professional Scientific and Technical Services</b>	
<b>State</b>	<b>Percentage</b>
<b>United States</b>	<b>5.86%</b>
California	7.37%
New York	6.89%
Texas	5.79%
Georgia	5.75%
Florida	5.73%
Pennsylvania	5.44%
North Carolina	4.63%
Ohio	4.89%

Source: *Decision Data Resources report generated May 6, 2008*

## Conclusion

The above data indicates Florida ranks below the benchmark states in most of the criteria that is recognized as relevant to an innovation economy. Of the 13 benchmark metrics, Florida ranked above its fourth place population position in only one, total change in R&D spending from 2003 to 2004. Considering Florida's economic history vis-à-vis the other states, this data should not be viewed as a criticism of past performance, but rather the reality facing the state as it plans for its future. Conversely, the positive trends indicated by the one year increase in overall R&D spending and Venture Capital funding should not instill excessive confidence that Florida is assured success as it develops its innovation economy. Although these two positive indicators are welcomed and applauded, the trend lines have not continued long enough to alter the state's position relative to the benchmarked states.

Innovation implies change and change creates opportunity. The data suggest that Florida is competitive with many states in most of the indicators (last only in two of the 13, R&D per capita and patents), placing it in a position to seize the opportunities created by an evolving economy. Success or failure will not be determined by the mere size of the state or any single indicator. Each state in the benchmark tables has taken a different path to their respective rankings, and Florida will have to create its own as well. Strategies that develop or enhance Florida's ability to compete in an innovation-based economy should be designed to improve Florida's position in these areas. Improving Florida's position in these metrics will require time, resources and patience.

## BENCHMARK PROGRAM REVIEW

### North Carolina Board of Science and Technology

In 1963, the North Carolina General Assembly established the North Carolina Board of Science and Technology (the Board) to encourage, promote, and support scientific, engineering, and industrial research applications in North Carolina. The Board works to investigate new areas of emerging science and technology and conducts studies on the competitiveness of state industry and research institutions in such fields. The Board also works with the General Assembly and the Governor to put into place the infrastructure that keeps North Carolina on the cutting edge of science and technology.

Initially, the Board focused on persuading firms to locate in North Carolina, particularly if they needed professionally trained people and scientific and engineering support. Eventually, the Board's emphasis evolved to building North Carolina's research and education base. Currently, the Board continues these efforts and others to ensure that science and technology play an important role in promoting the economic growth and development of the state. <sup>1</sup> The Board is a division of the North Carolina Department of Commerce and is managed by an Executive Director with its members appointed pursuant to enabling legislation. <sup>2</sup>

The Board's mission is the same as the Governor's stated mission: to provide "every citizen an opportunity for a high quality of life, including a good job and a good education, regardless of where they live - rural or urban, east or west, north or south." <sup>3</sup>

Its work falls within four principle areas:

- Accelerating next generation technology and technology companies.
- Investigating new areas of emerging science and technology.
- Conducting studies on the competitiveness of state industry and research institutions in selected fields.
- Working with the General Assembly and the Governor to establish the infrastructure required to maintain North Carolina's momentum and leadership position in science and technology. <sup>4</sup>

Past projects of the board include the North Carolina School of Science and Mathematics, the North Carolina Biotechnology Center, the Technology Development Authority, the North Carolina Research and Education Network, and the North Carolina Aquaculture Program. <sup>5</sup>

### Ohio Third Frontier Commission and Project

The Third Frontier Commission was created by the Ohio General Assembly in 2003 and is responsible for allocating funds appropriated by the General Assembly to support the programs of the Third Frontier Project. Members of the Third Frontier Commission include the Director of the Ohio Department of Development, the Chancellor of the Ohio Board of Regents, the Governor's science and technology adviser, and six regional commissioners appointed by the Governor. The Commission also has a 16-member advisory board made up of leaders from industry, academia and government. <sup>6</sup>

The Third Frontier Project, a 10-year, \$1.6 billion initiative, is Ohio's largest commitment to expanding high-tech research capabilities and promoting innovation and company formation. The overall mission of the Third Frontier Project is to build world-class research capacity in the state, support early-stage capital formation and the development of new products, and finance advanced manufacturing technologies to help existing industries increase productivity.<sup>7</sup>

The Third Frontier Project offers a comprehensive set of programs that support research, commercialization, information technology infrastructure, training, and job creation:<sup>8</sup>

- Asset-Based Company Attraction Program
- Biomedical Research and Commercialization Program
- Contractor Services I & II
- Engineering and Physical Science Research and Commercialization Program
- Entrepreneurial Signature Program
- Innovation Ohio Loan Fund
- New Research and Development Center Cost Share Program
- Ohio Research Commercialization Grant Program
- Pre-Seed Fund Initiative
- Product Development Pilot Program
- Research Commercialization Program
- The Ohio Research Scholars Program
- Third Frontier Advanced Energy Program
- Third Frontier Fuel Cell Program
- Third Frontier Internship Program
- Wright Centers of Innovation in Biosciences
- Wright Centers of Innovation in Engineering and Physical Sciences
- Wright Mega-centers of Innovation
- Wright Projects

### *Entrepreneurial Signature Program*

The Entrepreneurial Signature Program (ESP) provides grants to a single, non-profit organization in each of the six regions of Ohio with a goal of significantly increasing entrepreneurial commercialization outcomes in technology-based sectors that offer the best economic development prospects for the region. Each ESP represents a coordinated network of services and providers to assist entrepreneurs and small tech-based companies in the region.<sup>9</sup>

### *Innovation Ohio Fund*

The Innovation Loan Fund (IOF) was established to assist existing Ohio companies in the development of next-generation products and services in specific targeted industry sectors, including manufacturing, biosciences, advanced materials, and information technology, by financing acquisition, construction, and related costs of technology, facilities, and equipment. The IOF addresses an identified need in the capital-funding continuum by supplying financing to Ohio enterprises unable to secure funds from conventional sources due to risk factors associated with the development of a new product or service. The IOF can finance up to 75 percent of a project's allowable costs to a maximum of \$3 million and a minimum of \$500,000.<sup>10</sup> The program has provided more than \$23 million in loans for 20 projects resulting in 800 new jobs in the state.<sup>11</sup>

### *Technology Commercialization Incentive*

The Technology Commercialization Incentive (TCI) was created by the Ohio General Assembly in April 2007 to aid the transfer or licensing of technology created by Ohio's universities to the commercial market or toward the enhancement of partnerships with businesses in Ohio.<sup>12</sup> Eligible institutions include Ohio's 14 public institutions and two private universities, which offer doctoral programs.

Awards are granted based on a weighted index score, based on the following criteria:<sup>13</sup>

- Each university's research expenditures provided by in-state companies, normalized by the total statewide research contributions from in-state companies during the previous fiscal year. (50 percent)
- Each university's number of productive technology licenses developed from their intellectual property during the past six years, normalized by each university's total research expenditures during the previous fiscal year. (25 percent)
- Each university's number of new business start-ups based on their intellectual property during the past six years located within the state, normalized by each university's total research expenditures during the previous fiscal year. (25 percent)

The first three institutions to receive awards were the University of Akron (\$200,000), Ohio State University (\$150,000) and Case Western Reserve University (\$150,000).<sup>14</sup>

### *Thomas Edison Program*

The mission of the Thomas Edison Program (Program) is to retain and expand high-wage jobs and high-growth companies, and to create and grow early-stage technology companies. The Program also encourages collaborations with other economic development organizations in the state.

The Program consists of a network of Edison Technology Incubators and Edison Technology Centers around the state that provide services to new and existing businesses with the goal of growing the number of high-tech companies in Ohio and aiding in the commercialization of technology to market.<sup>15</sup>

Edison Technology Incubators help technology-oriented start-up companies during their concept

definition and development stages by enabling entrepreneurs to dedicate their limited financial resources toward developing new products and services. Incubators provide business support services, capital acquisition strategies, financial planning advice, and access to technology and technical support. Many incubators also offer laboratory, manufacturing and business office space for tenant companies. Each incubator has a board made up of successful entrepreneurs, community leaders and representatives from the local academic community which guides incubator clients as well. Ohio currently has 10 incubators located throughout the state.<sup>16</sup>

The Thomas Edison Program also includes seven Edison Technology Centers that offer product and process innovation and commercialization services to both established and early-stage technology-based companies. The Centers, which are located throughout the state, each have a different focus area such as CAD/CAM; prototyping; materials selection and handling; plant layout and design; quality systems; information systems; machining; joining technology assistance; and biotechnology business consulting.<sup>17</sup>

Fiscal Year 2007 marked the mid point of the 10-year Third Frontier Project, and more than \$637 million has been awarded to companies, universities, and economic development organizations throughout the state including \$84 million to support six Entrepreneurial Signature Projects and new company formation, and \$60 million to expand the internationally recognized expertise of the Cleveland Clinic in the area of cardiovascular medicine. The Third Frontier Internship program also awarded internships valued at \$3,000 each at Ohio companies to more than 900 students to learn about career opportunities and the practical application of technology.<sup>18</sup>

The Third Frontier Project is exceeding the original expectations set forth when it was first launched and others are noticing Ohio's successes. Toledo was recognized by *The Economist* as a contender for the

nation's "clean energy capital" as a result of the Third Frontier Wright Center of Innovation in Photovoltaics and Hydrogen and the city's associated cluster of advanced energy companies. The Pew Center on the States and the National Governors Association's "Investing in Innovation" report highlighted Ohio as a model for its Third Frontier Project. And the Kauffman Foundation met with Third Frontier funded organizations and state administrators to learn about Ohio's programs.<sup>19</sup>

### Oklahoma Center for the Advancement of Science and Technology

The Oklahoma Center for the Advancement of Science and Technology (OCAST) was established in 1987. It is funded by state appropriations and governed by a board of directors with members from both the private and public sectors. In June 2006, OCAST was charged with the responsibility of administering the newly-created \$150 million Economic Development Generating Excellence trust fund (EDGE Fund), created for the purpose of increasing private and public applied research and development, technology transfer and technology commercialization in Oklahoma.<sup>20</sup>

OCAST manages several different programs toward fulfilling its stated mission "to foster innovation in existing and developing businesses." Some of these are:

- The Oklahoma Health Research (OHR) program awards seed funds for one- to three-year research projects related to human health.
- The Oklahoma Plant Sciences Research (OPSR) program supports basic and applied research in the field of plant sciences by allocating resources according to merit, promoting collaborations and leveraging federal and private resources.

- The R&D Intern Partnerships (RDIP) program supports internships between local industries and two- and four-year colleges and universities.
- The Oklahoma Applied Research Support (OARS) program funds one- to three-year research and development projects with significant potential for commercialization. Oklahoma businesses, universities and nonprofit foundations are eligible to compete for OARS awards.
- The Oklahoma Nanotechnology Applications Project (ONAP) assists qualified Oklahoma companies with the process of applying nanotechnology through development and manufacturing to improve current products or processes or create new, cutting-edge products or processes.
- The Small Business Innovation Research (SBIR) program helps Oklahoma's small advanced technology companies tap into more than \$3 billion in federal R&D money. OCAST provides money for proposal development, money to bridge gaps in federal funding, technical support and business mentoring.
- The Inventors Assistance Service (IAS) provides assistance and training to inventors. The program is managed through a contract with Oklahoma State University.
- The Oklahoma Technology Commercialization Center (Tech Center), assists start-up, advanced technology-related companies by providing business development services such as feasibility studies, marketing plans, business plans and access to early stage risk capital.

- The Technology Business Finance Program (TBFP) provides limited pre-seed financing for start-up advanced technology firms that are in a development stage prior to full production.
- The Oklahoma Seed Capital Revolving Fund has been crafted to be an economic development tool with a goal of making equity investment in early stage companies that are engaged in the commercialization of promising new technologies in Oklahoma.<sup>21</sup>

Since 1987, OCAST has invested \$151 million in Oklahoma research, development, technology commercialization and manufacturing modernization and, with this funding, has attracted nearly \$2.6 billion in private investments and federal funding. There are several “success stories” of OCAST backed companies, with Novazyme Pharmaceuticals being the most recognized. In 2001, it was acquired by Genzyme Corp. in a sale estimated to be \$225 million with the research arm continuing to be headquartered in Oklahoma City.<sup>22</sup>

### Pennsylvania Technology Investment Office and Ben Franklin Technology Partners

Pennsylvania’s technology development strategy is coordinated by the Technology Investment Office (TIO) of the Department of Community and Economic Development and governed by the Ben Franklin Technology Development Authority.<sup>23</sup> The Ben Franklin Authority is appointed by the Governor and chaired by the Secretary of Community and Economic Development. The program operates under the name Ben Franklin Technology Partners (BFTP), which celebrated its 25<sup>th</sup> Anniversary in 2007.

The mission of the TIO and BFTP is to facilitate growth and competitiveness through a comprehensive set of initiatives including funding, partnerships and support services. The TIO also plays a significant coordinating role to ensure that the numerous other

technology-based economic development groups and initiatives are working collaboratively.

The mission of the TIO is to serve as a catalyst for the growth and competitiveness of Pennsylvania companies through technology-based economic development (TBED) initiatives including funding, partnerships and support services. The goal of the TIO is to ensure that the variety of TBED organizations and initiatives located throughout the Commonwealth are working collaboratively to fully leverage the wealth of research, capital resources, and support services available to build a comprehensive infrastructure that supports company growth.

An independent study indicated a substantial return of taxpayer dollars by the BFTP. From 1989 to 2001, BFTP boosted the state's economy by \$8 billion and helped to create 93,105 jobs. In addition, during the same period, every public dollar invested by BFTP yielded nearly \$23 of additional state income.<sup>24</sup>

In addition to the return on investment of state funds, many innovative technologies and scientific discoveries have resulted from BFTP support. Among these are process control systems used in the U.S. Navy's defense operations; anti-viral agents for treating HIV/AIDS; pioneering medical devices; advanced automated microstructure metrology tools for the semi-conductor industry; proprietary software products that accelerate the pace of scientific research and discovery; state-of-the-art training tools for new drivers; and enhanced recycling processes and systems.<sup>25</sup>

### Georgia Research Alliance

The Georgia Research Alliance (GRA) was established in 1990 and is a model public-private partnership between Georgia universities, business and state government. The GRA helps build Georgia’s technology-based economy in three major ways: through attracting Eminent Scholars to Georgia’s research universities; through helping create centers of research excellence and through converting research into products, services and jobs. Its objective

is “opportunity creation – sparking or facilitating new science and technology efforts that have the potential to help people while creating a substantial economic impact.”<sup>26</sup>

The program focus areas are:

- Eminent Scholars - For each scholar, GRA invests \$750,000 for an endowment, an amount that the research university matches in private funds on a minimum 1-1 basis. GRA also makes investments in developing the world-class research laboratories the scientists need.
- Centers of Research Excellence – Many Centers are led by Eminent Scholars and involve collaboration across universities and with private industry. GRA’s funding is often in the form of matching funds to attract federal and private research grants.
- Commercialization – VentureLab is GRA’s signature technology commercialization program. Launched in 2002, VentureLab helps build high-growth companies around laboratory discoveries at GRA’s partner universities. VentureLab seeks out university-based research innovations, evaluates their commercial potential, and provides resources to address the management, market and technology risks that come with new ventures. Each participating university has an active technology incubator with which VentureLab partners. GRA also makes competitive investments, Industry Partnership grants, in R&D projects conducted jointly by university faculty and Georgia-based companies.<sup>27</sup>

GRA is a proactive, synthesizing and facilitating organization that works with six Georgia research universities. Each of its programs and initiatives are customized to meet the requirements of the opportunities they are designed to exploit.<sup>28</sup> GRA operates as an independent not-for-profit governed by

leaders from industry and academia. GRA does receive state funding for investments in research, but its operations are funded through foundation and industry contributions.<sup>29</sup>

GRA has a demonstrated track record of success. Since 1990 they have recruited 58 Eminent Scholars; established 24 Centers of Research Excellence; leveraged \$2 billion in federal and private research; served 100+ corporations by university partnerships; created 125 companies and 4,000+ jobs.<sup>30</sup>

### Missouri “Grow Me State” Initiative

The “Grow Me State” initiative began as a research project to gain a better understanding of the state’s capital formation needs. A report titled “Missouri’s Need for Risk Capital: An Assessment and Recommendations” suggested that the state’s capital formation strategy should be guided by seven principles:<sup>31</sup>

1. Missouri’s capital formation strategy must recognize and respond to the competition it faces from other states for private capital.
2. Missouri’s capital formation strategy should focus on the pre-seed and seed stages of capital formation.
3. Missouri’s capital formation strategy should leverage money from other sources.
4. Missouri’s capital formation programs should connect innovators, entrepreneurs, businesses, investors, scientists, and marketing experts.
5. Missouri’s capital formation strategy must be embedded in a strategy for stimulating the creation of high-quality start-ups in Missouri.
6. Missouri must make a long-term commitment to both capital formation and innovation.
7. Missouri must measure the results of its capital formation programs.

As a result, the “Grow Me State” Steering Committee recommended the following initiatives be pursued in cooperation with the resources of member organizations and of the state: <sup>32</sup>

- Convene a Statewide Blue Ribbon Panel of leadership from key technology employers and financiers to guide the state in the creation of a five-year Technology Based Economic Development Strategy to capitalize on existing strengths.
- Introduce “Grow Me State Initiative for Capital Formation” legislation for fiscal year 2009.
  - Establish the Missouri “Grow Me State” Angel Tax Credit to create a 25 percent tax credit.
  - Ensure continuity of funding for the Missouri Technology Corporation (\$1 million).
  - Create two “Grow Me State” Technology Business Finance Programs to facilitate the creation of companies from the technologies and innovations within the state.
- Encourage the Governing Boards of Missouri’s 116 state and local pension funds to establish proactive policies for In-State Private Equity Investment & Economically Targeted Investments.

## Maryland R&D Tax Credit

The Maryland Research and Development Tax Credit program was enacted during the 2000 session of the Maryland General Assembly and applied to tax years ending before December 31, 2004. In 2005, legislation was passed that reestablished the Maryland Research and Development Tax Credit and required the Department of Business and Economic Development (DBED) to submit a report to the Governor and General Assembly on the applicants certified for the R&D income tax credits and the amount of credits approved.<sup>33</sup>

The statute requires that each firm wishing to receive tax credits apply for certification on or before September 15th for R&D expenses incurred in the preceding tax year. DBED is responsible for administering the certification process. After receiving certification, firms may then amend their 2005 returns and receive refunds. If a firm receives more R&D credits than it paid in taxes for 2005, the unused portion of the credit may be carried forward for up to 15 years. Beginning in TY 2005, the carry-forward has been reduced from 15 years to seven years. The Maryland Research and Development Tax Credit Program includes two separate, but related, tax credits. One credit is calculated on a firm’s average level of research; the other credit is calculated on a firm’s increase in R&D expenditures over previous years.

- Basic R&D Tax Credit: This credit is 3 percent of eligible R&D expenses that do not exceed the firm’s average R&D expenses over the last four years. However, if the total amount of credits claimed by all firms exceeds \$3 million, then the Basic R&D tax credit will be prorated. Moreover, if there is money left over from the Growth R&D tax credit allotment, then this money will be added to the \$3 million.<sup>34</sup>
- Growth R&D Tax Credit: This credit is 10 percent of eligible R&D expenses that exceed the firm’s average R&D expenses over the last four years. However, if the total amount of credits claimed by all firms exceeds \$3 million, then the Growth R&D tax credit will be prorated. Moreover, if there is money left over from the Basic R&D tax credit allotment, then this money will be added to the \$3 million.<sup>35</sup>

In the sixth year of the Research and Development Tax Credit, DBED certified 110 firms to receive credits for research conducted in Maryland for their tax year ending in 2005. The successful applicants reported \$937.2 million in Maryland eligible research and development expenses.

At the *nominal statutory rates* of 3 percent for the basic research credit and 10 percent for the growth credit, applicants would have received \$22.6 million in basic research credits and \$18.4 million in growth credits. However, the General Assembly established limits of \$3 million for each of the two R&D credit components because there was no reliable information on Maryland qualified research with which to predict application rates. The basic R&D credit was 7.5 times oversubscribed and the growth credit was 6.1 times oversubscribed. These limits reduced the *effective rate* for the basic credit to 0.4 percent and the *effective rate* for the growth credit to 1.63 percent.<sup>36</sup>

### Pennsylvania R&D Tax Credit Assignment Program

The Research and Development Tax Credit (R&D Tax Credit) Assignment program was established to assist the growth and development of technology-oriented businesses, particularly small start-up technology businesses. R&D Tax Credits have been issued by the Commonwealth to offset state tax liabilities for some time, and there has been a special minimum portion of the R&D Tax Credits reserved for small businesses. However, many small businesses in the early stages of development are not yet profitable and do not have significant tax liability. In the past, these businesses have often not bothered to apply for the available R&D Tax Credits for which they were eligible. With this R&D Tax Credit Assignment program, technology businesses can now sell unused R&D Tax Credits on the open market to help advance and grow the business.<sup>37</sup>

The R&D Tax Credit program is a key component of the economic stimulus program to assist Pennsylvania's home-grown technology businesses to grow and produce jobs and other economic benefits. The actual R&D Tax Credits are issued or approved by the Pennsylvania Department of Revenue. Businesses that have not used all or part of their issued R&D Tax Credits within one year after the R&D Tax Credits were approved by the Department of Revenue may apply to the Pennsylvania Department of Community

and Economic Development (DCED) for approval to assign their eligible R&D Tax Credits to a "buyer" – another taxpayer that can then use the purchased credits to offset up to 75 percent of its own tax liability with the purchased credit.<sup>38</sup>

The amount of the credit is 10 percent of the company's increased R&D expense over a base period. The total cap of the credit program is \$15 million, with individual credits being pro rated accordingly. Up to 20 percent of the total pool is set aside for small businesses.<sup>39</sup>

R&D Tax Credits not used by the business to which the credits were initially issued, and not assigned to a 'buyer' taxpayer, may be carried over for a maximum of 15 taxable years. Therefore, R&D Tax Credits issued to a calendar year taxpayer on December 15, 2003, and not assigned may be used by the business to which the credits were issued until the tax calendar year ending December 31, 2018, assuming all tax reports were filed for a full calendar year.<sup>40</sup>

### The Indiana 21st Century Research and Technology Fund

The Indiana 21st Century Research and Technology Fund (21 Fund) was created in 1999 by the Indiana General Assembly to stimulate and diversify Indiana's economy by developing and commercializing advanced technologies in the state. The 21 Fund provides financial support to entrepreneurial companies which have demonstrated a market potential for the commercialization of new technologies. In 2005, the 21 Fund was brought under the leadership of the Indiana Economic Development Corporation (IEDC) and three changes were made to its operations and focus:<sup>41</sup>

1. Shifted the focus of 21 Fund investments from university-industry cooperative research projects to product development and testing initiatives led by high-tech start-up companies.
2. Increased the emphasis on job creation as criteria for making awards.

3. Supplemented the funding program request technical review process with an enhanced business review.

To qualify for a grant, each company must propose a technology idea or business plan that demonstrates innovation and clear commercialization intent. The 21 Fund awards grants to companies based on proposal reviews completed by science and technology researchers and experts in economics from across the country.<sup>42</sup> To guarantee that the grant is invested in Indiana and companies grow their businesses in the state, grants require mandatory repayment of funds in certain circumstances such as:<sup>43</sup>

- Moving the project outside of Indiana.
- Moving or establishing any business operation resulting from the project outside of Indiana.
- Payment of more than 50 percent of salaries and benefits to persons who are not full-time residents of Indiana.
- Making a false statement of material fact in reports submitted to the IEDC.
- Defaulting under the terms and conditions of the agreement.

Between 2005 and 2007, the 21 Fund awarded 38 grants totaling \$42.3 million, of which 90 percent of the amount awarded was granted to small companies in the areas of aerospace, defense, and security; advanced manufacturing and engineering; communications and electronics; energy, environment and agriculture; information technology and software development; and life sciences and health care. The companies receiving grants have considerable commercial potential and projections indicate that 5,000 new, highly compensated jobs are likely to be created in the next three to five years as a result of the 21 Fund.<sup>44</sup>

## Ohio Research Commercialization Grant Program

The Ohio Research Commercialization Grant Program (ORCGP) provides grants to improve the commercial viability of technologies developed through federal Small Business Innovation research (SBIR), Small Business Technology Transfer (STTR) and Advanced Technology Program (ATP) research and development projects. The goal of the grant program is to improve the ability of small technology companies to assess and realize the commercial potential of research projects and to promote the competitiveness of such companies through the augmentation of federal research and development funding.<sup>45</sup> The program also supplements SBIR Phase II awardees by funding commercialization activities which are not allowed under the SBIR programs.<sup>46</sup>

The Third Frontier Commission awards grants of up to \$350,000 to eligible applicants in order to commercialize a core competency technology, such as, advanced materials; instruments, controls, and electronics; biosciences; power and propulsion; and information technology; or to support other business activities related to the commercialization of a core competency technology.<sup>47</sup> To qualify for a grant, companies must submit a proposal to the Third Frontier Commission. Twenty-six organizations have been awarded a total of \$8,614,308.00 and 37 grants through this program.<sup>48</sup> In 2008, the Third Frontier Commission plans to award up to \$2 million in grants through this program.<sup>49</sup>

## Wisconsin Technology Bridge Grants

The Wisconsin Technology Bridge Grants program was introduced in 2003 by Governor Jim Doyle as part of the state's Grow Wisconsin initiative.<sup>50</sup> Technology Bridge Grants provide assistance to small Wisconsin businesses experiencing severe financial hardship while awaiting a decision on Phase II or other funding applications.

Funds granted under this program may only be applied to necessary costs directly related to maintaining research and basic business operations until the company's follow-on funding or federal grant application is approved or denied.<sup>51</sup>

To be eligible, a company must have fewer than 100 employees and must have received early-stage financing from the federal government or from some other source. Eligible businesses may receive funding up to 75 percent (maximum of \$100,000) of the eligible project costs, and a cash match of 25 percent is required of all applicants.<sup>52</sup>

Companies are selected to receive bridge grants based on criteria such as:<sup>53</sup>

- The amount of economic impact the company will have in Wisconsin.
- The level of need demonstrated by the company.
- The company's past record of obtaining early stage financing, including federal funds.
- The likelihood that the company will successfully commercialize technology.
- The company's management plan and management team.
- The likelihood that the company will maintain operations in Wisconsin.

## Wisconsin Angel Network

The Wisconsin Angel Network (WAN) was formed in January 2005 to serve as an umbrella organization to provide services and resources to the early-stage investing community. WAN seeks to build early-stage capital capacity throughout Wisconsin and increase the number and amount of equity investments in Wisconsin's entrepreneurs. The organization, which is operated by the Wisconsin Technology Council, does not operate a fund or make recommendations on potential investments.<sup>54</sup>

WAN serves as a clearinghouse for resources for both investors and entrepreneurs. For potential investors, the organization offers tools to help establish an angel

network, sample term sheets, and research reports on angel investing.<sup>55</sup> Entrepreneurs can receive assistance with raising capital, applying for grants and loans, creating a presentation for a potential investor or developing a thorough and well-organized business plan, devising a marketing plan, and networking.<sup>56</sup>

WAN is staffed by a full-time director and also utilizes many interns to provide support functions and develop initiatives. The organization also has a seven member board called the Angel Advisory Committee which is made up of leaders from the investment community, business professionals and governmental representatives.<sup>57</sup>

Membership in WAN is limited to funds and angel networks which are often private groups of individuals (typically friends or family members) who do not publicly announce they are an "angel network." Angel networks wishing to join WAN must request and submit an application to be considered for membership.<sup>58</sup> Members have exclusive access to educational programs, investing guides, and the deal-flow pipeline hosts more than 60 executive summaries from entrepreneurs seeking funding.<sup>59</sup>

## New York State Common Retirement Fund's (CRF) In-State Investment Program

In 1999, the New York State Legislature passed legislation calling on the CRF to invest \$250 million in New York companies.<sup>60</sup> By 2003, the CRF had committed \$104 million to the In-State Private Equity Investment Program. Between 2003 and 2006, the CRF has added \$321 million and now has a total of \$425 million committed to 15 funds. Since the CRF requires its investment partners to put up their own money and raise other funds, the total pool of capital currently available is \$750 million.<sup>61</sup>

The In-State Investment Program is designed to stimulate New York's economy but also complies with prudent risk management practices. New York State Controller Allan G. Hevesi was quoted as saying,

“Although the program, which the Legislature had the vision to create in 1999, has provided significant economic benefits to the State’s economy, my primary objective is to obtain an appropriate risk-adjusted return comparable to what would be available for other investments with similar characteristics. It is first and foremost an investment program. The fiduciary responsibility of the Comptroller’s office is always paramount.”<sup>62</sup>

In May of 2006, the CRF released a status and investment review of the In-State Investment Program. The report’s key findings include:

- \$425 million in CRF’s capital has been made available to 15 different funds for investments in New York State. This represents a \$321 million increase from the \$104 million available in January 2003 and a tripling of the number of managers.
- The CRF has invested \$145 million in 64 companies. In January 2003, only \$17 million was invested in seven companies.
- Since CRF investments are always made with other investors, a total of \$920 million has been invested in these 64 New York companies, including \$450 million in upstate New York.<sup>63</sup>

The program has also resulted in out-of-state companies agreeing to locate in New York in order to access the funding. Three such companies relocated between 2003 and 2006, despite the primary object of the program being to fund local in-state companies.<sup>64</sup> Past investment success and positive returns are continuing to persuade the CRF to invest in innovation. The most recent example is the April 8, 2008, announcement by State Comptroller Thomas DiNapoli that the CRF will invest \$500 million in clean and green technologies over the next three years. DiNapoli said he launched the Green Strategic Investment Program because green companies typically yield good financial returns. “Clean technology and renewable energy have become increasingly profitable,” he said. “It’s not just about doing good for the environment.”<sup>65</sup>

## Oregon Investment Fund

In July 2003, the Oregon State Legislature created the Oregon Investment Council (“OIC”) to design and implement a \$100,000,000 program that encourages the growth of small businesses within the state of Oregon.<sup>66</sup> The OIC invests in all State of Oregon funds, including the Oregon Public Employees Retirement Fund and the State Accident Insurance Fund.<sup>67</sup> The OIC’s statutory mandate is to achieve the highest return possible on its investments. To accomplish this mandate the OIC chose to develop a fund of funds, the Oregon Investment Fund (“OIF”). This fund, which is capitalized by funds from the OIC, has committed capital to private equity and venture capital funds that in turn invest in companies located primarily in the state of Oregon, as well as the Pacific Northwest region. In addition, a percentage of the assets of the OIF may be invested directly into operating companies alongside the OIF’s private equity and venture capital managers. The OIC chose Credit Suisse’s Customized Fund Group to develop and manage this fund on a discretionary basis.<sup>68</sup>

The OIF seeks to build successful, innovative enterprises for the benefit of its investors. In addition, OIF seeks to ensure the following:

- Foster the creation and growth of young and maturing companies in Oregon and the Pacific Northwest.
- Encourage the growth of the Oregon and the Pacific Northwest private equity community.
- Facilitate public and private partnerships within the state.
- Foster interaction between entrepreneurs and private equity firms in which OIF has invested.
- Provide a platform for private equity firms in which OIF has invested for the purpose of deal flow generation and due diligence discussion<sup>69</sup>

As a fund of funds, the OIF investment strategy is to build an overall portfolio with:

- Investments that are mainly in Oregon or Pacific Northwest-based companies;
- Investments that are mainly placed through Oregon/Pacific Northwest focused and based private equity funds;
- Investments that are mainly made in funds that intend to invest in venture capital, growth capital or later-stage buyout companies; and
- Funds that intend to make investments that could ultimately benefit start-up companies coming out of Oregon universities and colleges.

In 2007, the OIF's portfolio funds invested \$84 million in Pacific Northwest companies, and outside investors invested another \$45 million in those same companies, for a total investment of \$129 million. The OIF created or retained 2,767 jobs during 2007.<sup>70</sup>

### Littleton, Colorado - Economic Gardening

In 1987, Littleton, Colorado, faced economic development challenges with a shift away from "hunting" to what was called "economic gardening." Littleton pursued this strategy through significant research and development of training programs and real-time information that is made available to its entrepreneurs. The program, which has evolved over time by dropping training programs determined to be ineffective, is not a specific model of programs and services. It is, however, indicative of an attempt to build a culture of innovation-based entrepreneurialism that can serve as a guide to others.

The objectives of the program are to create a culture and environment that is conducive of supporting innovation and entrepreneurs throughout the economy. Research revealed that a close connection exists between product and process innovation and successful entrepreneurs who create high-growth companies. Littleton identified several key common characteristics of successful entrepreneurs and began

addressing each through policies, programs and spending. The tenets of success were:

- Rate of growth is more critical than "small vs. large"
- Relationship between growth and innovation
- Temperament of CEO/Entrepreneur is greatest determinative of growth
- Businesses are complex systems, responding differently to identical external forces
- High growth companies vacillate between stability and chaos and improve as a result
- Organizations that self-correct are more scalable than "command-and-control"
- Success breeds success

The initiative has evolved and is currently focused on three critical areas:

- Information
  - Critical information is critical.
  - Littleton spends three-quarters of its time providing tactical and strategic information one-on-one, as well as through seminars.
- Infrastructure
  - Quality of life, intellectual capacity and transportation are all key ingredients.
- Connections
  - Entrepreneurs have to be networked to all possible resources

The community of Littleton has won several awards for its innovation. It is the first to concede, however, that there is no one model of success and that "success" is never achieved, since the process is long and never ending. Littleton has "succeeded" in bringing attention to itself as it builds an environment and culture with the entrepreneur in mind. In this respect it is proving one of its tenets of success, i.e. success breeds success.<sup>71</sup>

## Georgia Intellectual Capital Partnership Program

The Georgia Intellectual Capital Partnership Program (ICAPP), the University System of Georgia's ("USG") economic development program, was developed in 1995 by the Georgia Board of Regents to connect the intellectual resources of Georgia's 35 public colleges and universities to the state's business community.<sup>72</sup> The primary role of ICAPP is to act as a broker and catalyst to strategically link USG with the state's economic development efforts. ICAPP collaborates with a number of organizations and business entities including but not limited to USG; the state, national and international business communities; approximately 150 chambers of commerce or economic development authorities located all over the state; the office of the Governor; the state department of economic development, labor, revenue, and technical and adult education; and the office of planning and budget.<sup>73</sup>

ICAPP was originally conceived in order to help the state of Georgia convince Total Systems Services, Inc. ("TSYS"), an IT company located in Columbus, Georgia, to expand in Georgia rather than moving to another state in the mid-1990s. TSYS needed 1,500 programmer jobs to support its business but the demand for such skilled positions outpaced supply. ICAPP listened to the company's needs and coordinated with the resources of USG to meet the need. The success of ICAPP with this project led to the creation of 1,500 new jobs and a capital investment in the state of \$100 million over a three-year period.<sup>74</sup>

The centerpiece of ICAPP is the ICAPP Advantage Program. This program helps meet company hiring needs through an expedited curriculum designed by a college or university to train knowledge workers. Knowledge workers are defined by ICAPP as persons who generate value for other people by sharing, creating or using ideas; complete a job using intellect and experience instead of machinery; and earn above the Georgia per capita income.<sup>75</sup>

ICAPP Advantage is unique in that it was one of the first times a major higher education system in this country had invited IT companies to its campuses in order to assist such companies with the development of an educational curriculum for students seeking degrees.<sup>76</sup>

In order to be funded as an ICAPP Advantage project, several requirements must be met:

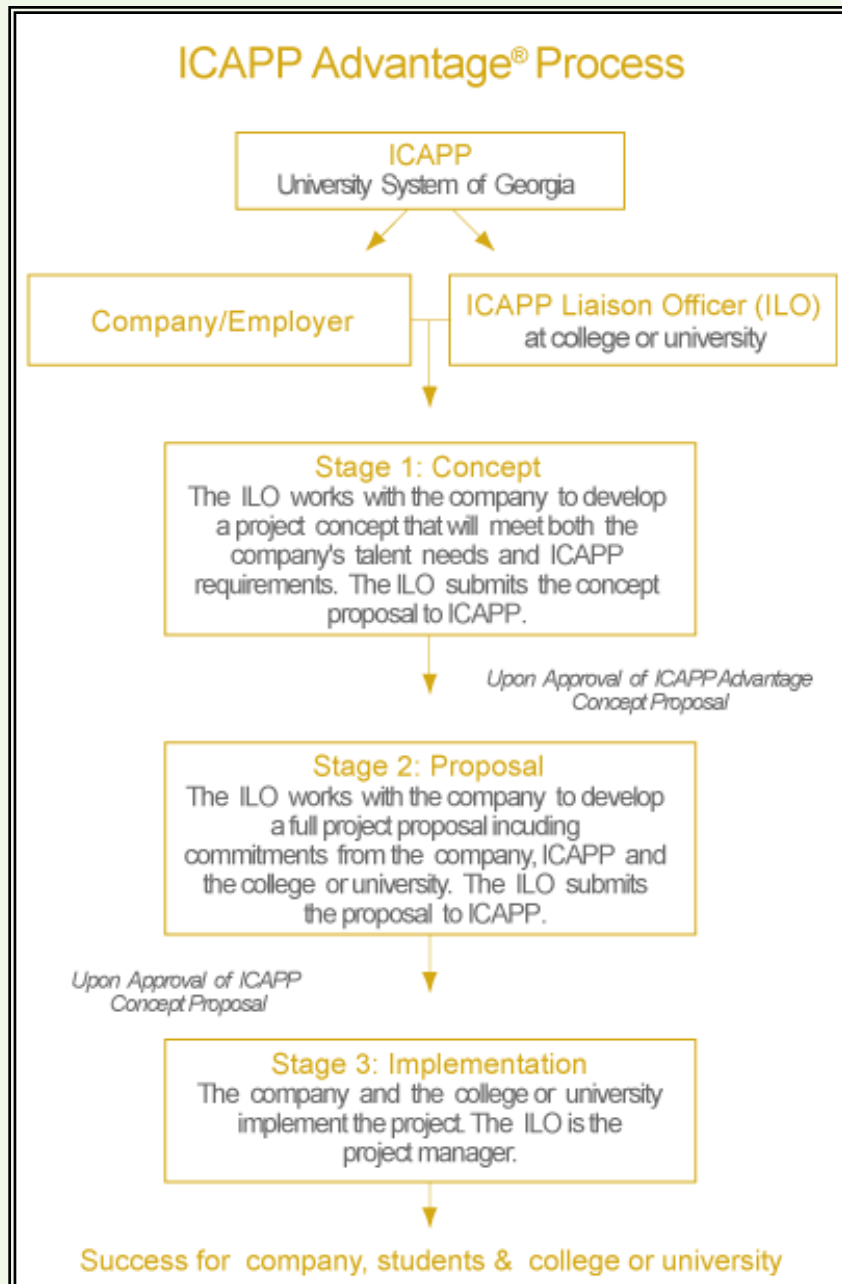
- At least 10 new knowledge jobs must be created.
- The project must involve the employment of knowledge workers.
- There must be a documented industry shortage of the type of worker needed.
- A study program must be designed by the company and a USG college or university to prepare students for the jobs needed and the company must agree to hire each ICAPP graduate trained for that position.
- ICAPP students must be full-time and instruction compressed in a shorter time-frame.
- The USG college or university administering the program must certify that the educational need being addressed cannot be met by other existing programs.<sup>77</sup>

A USG institution may apply for ICAPP Advantage funding to help pay for the costs of instruction, including faculty, equipment, and space. The application for this funding is not available publicly and may not be obtained without a Freedom of Information Act request.

In addition, an ICAPP student may apply for an ICAPP service cancelable loan to help pay for expenses (tuition, books and living expenses), while participating in the ICAPP program. Such loans may range from \$7,500 to \$10,000 and are cancelable up to \$2,500 per year for three to four years if a

graduating student joins the company participating in the program or a related company in the targeted industry program.<sup>78</sup>

The ICAPP Advantage Process shown below is taken directly from the ICAPP website:<sup>79</sup>



## BENCHMARK PROGRAM OVERVIEW CHART

### Statewide Innovation Development Models

Name	Mission/Objectives	Focus Companies/Industries	Governance Structure	Results and Successes
<b>North Carolina Board of Science and Technology</b>	<p>Established by the North Carolina General Assembly to investigate new areas of emerging science and technology and to study the competitiveness of state's industry and research institutions in such fields.</p> <p>Main objectives:</p> <ul style="list-style-type: none"> <li>- Accelerate emerging technology and technology companies.</li> <li>- Investigate emerging areas of science and technology.</li> <li>- Establish infrastructure required to maintain North Carolina's momentum and in science and technology.</li> </ul>	<ul style="list-style-type: none"> <li>- General Assembly and Governor to maintain R&amp;D momentum.</li> <li>- Advises the Secretary of Commerce and the Economic Development Board on the role of science and technology in the economic growth and development of North Carolina.</li> </ul>	<ul style="list-style-type: none"> <li>- Division of North Carolina Department of Commerce</li> <li>- Board appointed pursuant to legislation</li> <li>- Managed by Executive Director</li> </ul>	<p>Has supported the creation of numerous technology focused groups such as the NC Biotechnology Center, the Technological Development Authority, North Carolina Research and Education Network, and the NC School of Science and Mathematics.</p>

Name	Mission/Objectives	Focus Companies/Industries	Governance Structure	Results and Successes
<b>Ohio Third Frontier Commission</b>	<p>Created by the Ohio General Assembly and is responsible for allocating funds appropriated by the General Assembly to support programs of the Third Frontier Project.</p> <p>Mission is to build world-class research capacity in the state, support early-stage capital formation and the development of new products, and finance advanced manufacturing technologies to help existing industries increase productivity.</p>	<ul style="list-style-type: none"> <li>- World-class research, commercialization, training, and information technology</li> <li>- Infrastructure designed to accelerate company growth and job creation throughout Ohio.</li> </ul>	<ul style="list-style-type: none"> <li>- Administered by nine-member Commission. Six regional appointments by Governor, plus Director Department of Commerce, Chancellor Board of Regents and Governor's Science and Technology Adviser.</li> <li>- 16-member Advisory Board advises on strategic planning, general management and program coordination.</li> <li>- Executive Director of Technology Division, Ohio Department of Commerce</li> </ul>	<ul style="list-style-type: none"> <li>-Fiscal Year 2007 marked the mid point of the 10-year Third Frontier Project.</li> <li>- More than \$637 million has been awarded to companies, universities, and economic development organizations throughout the state including \$84 million to support six Entrepreneurial Signature Projects and new company formation.</li> <li>- \$60 million to expand the Cleveland Clinic.</li> <li>- 900 Internships valued at \$3,000 each at Ohio companies.</li> </ul>

Name	Mission/Objectives	Focus Companies/Industries	Governance Structure	Results and Successes
<b>Oklahoma Center for the Advancement of Science and Technology (OCAST)</b>	OCAST administers the \$150 million Economic Development Generating Excellence trust fund (EDGE Fund), created for the purpose of increasing private and public applied research.	<ul style="list-style-type: none"> <li>- Works in partnership with the private sector, higher education, workforce agencies and the Oklahoma Department of Commerce.</li> <li>- Funded research projects are first reviewed by out-of-state science and business experts and ranked according to scientific merit and commercial potential.</li> <li>- The state's only agency whose sole focus is technology – its development, transfer and commercialization.</li> <li>- Works closely with its strategic partners – the Oklahoma Manufacturing Alliance, the Oklahoma Technology Commercialization Center and the Inventors Assistance.</li> </ul>	<ul style="list-style-type: none"> <li>- Created by state legislation as a agency of state government in 1987.</li> <li>- Governed by a board of directors with members from both the private and public sector.</li> <li>- Executive Director runs day-to-day operations.</li> </ul>	<p>Since 1987, OCAST has invested \$151 million in R&amp;D, technology commercialization and manufacturing modernization.</p> <p>OCAST has also attracted nearly \$2.6 billion in private investments and federal funding.</p>

Name	Mission/Objectives	Focus Companies/Industries	Governance Structure	Results and Successes
<b>Pennsylvania Technology Investment Office (TIO) and Ben Franklin Technology Partners (BFTP)</b>	<p>The TIO coordinates Pennsylvania's technology development strategy and ensures that technology-based economic development groups in the state are working collaboratively.</p> <p>BFTP provides seed and venture capital emerging technology-based businesses, support for commercialization activities, and resources for established companies to grow their businesses.</p>	Technology-driven companies such as information technology, life sciences, communications, advanced manufacturing, advanced materials and environmental technology.	<ul style="list-style-type: none"> <li>- Coordinated by the Technology Investment Office (TIO) of the Department of Community and Economic Development.</li> <li>- Governed by the Ben Franklin Technology Development Authority this is appointed by the Governor and chaired by the Secretary of Community and Economic Development.</li> <li>- The program operates under the name Ben Franklin Technology Partners (BFTP), which celebrated its 25<sup>th</sup> Anniversary in 2007.</li> <li>- Programs are coordinated by a Director, Statewide Affairs with the regional partnerships managed by their respective President/CEOs.</li> </ul>	<p>From 1989 to 2001, BFTP boosted the state's economy by \$8 billion and helped to create 93,105 jobs.</p> <p>Innovative technologies and scientific discoveries resulting from BFTP support include process control systems used in the U.S. Navy's defense operations; anti-viral agents for treating HIV/AIDS; pioneering medical devices; state-of-the-art training tools for new drivers; and enhanced recycling processes and systems.</p>

Name	Mission/Objectives	Focus Companies/Industries	Governance Structure	Results and Successes
<b>Georgia Research Alliance</b>	Build Georgia's technology-based economy through attracting scholars to research universities, helping create centers of research excellence and converting research into products, services and jobs. All with the objective of "opportunity creation – sparking or facilitating new science and technology efforts that have the potential to help people while creating a substantial economic impact."	Primary focus is working collaboratively with six Georgia research universities: -Clark Atlanta University -Emory University -Georgia Inst. of Technology -Georgia State University -Medical College of Georgia -University of Georgia  Also provides competitive grants with industry partners of participating universities.	-Operates as an independent not-for-profit governed by leaders from industry and academia -Receives state funding for investments in research through Governor's budget and Legislative appropriation -Operations are funded through foundation and industry - Staff of seven, led by President & CEO	Since 1990 has: -Recruited 58 Eminent Scholars -Established 24 Centers of Research Excellence -Leveraged \$2 billion in federal and private research -Served 100+ corporations by university partnerships - Created 125 companies and 4,000+ jobs

Name	Mission/Objectives	Focus Companies/Industries	Governance Structure	Results and Successes
<b>Missouri "Grow Me State" Initiative</b>	The Grow Me State initiative began in 2007 as a research project to gain a better understanding of the state's capital formation needs.  The project's final report recommends: - Formation of a Blue Ribbon Panel of leadership to create a five year Technology Based Economic Development Strategy; - Introduction of legislation related to commercialization funding and an angel tax credit; - Establishment of proactive policies for In-State Private Equity Investment & Economically Targeted Investments.	Legislature	Initiative was managed by a 13-member Steering Committee.	Not applicable at this time.

## Research and Development Tax Credit Programs

Name	Mission/ Objectives	Eligible Companies/Industries	Application/ Selection Process	Results and Successes
<b>Maryland R&amp;D Tax Credit</b>	Encourage increased level of private sector investment in R&D.	<p>- Basic R&amp;D Tax Credit- This credit is 3% of eligible R&amp;D expenses that do not exceed the firm's average R&amp;D expenses over the last four years. Total program cap of \$3 million, with prorated credits when applications exceed cap.</p> <p>- Growth R&amp;D Tax Credit- This credit is 10% of eligible R&amp;D expenses that exceed the firm's average R&amp;D expenses over the last four years. Also has \$3 million program cap with prorate provision.</p>	Each firm wishing to receive tax credits apply for certification on or before September 15th for R&D expenses incurred in the preceding tax year. DBED is responsible for administering the certification process. After receiving certification, firms may then amend their 2005 returns and receive refunds.	<p>- In the sixth year of the Research and Development Tax Credit, DBED certified 110 firms to receive credits for research conducted in Maryland for their tax year ending in 2005. The successful applicants reported \$937.2 million in Maryland eligible research and development expenses.</p> <p>- The basic R&amp;D credit was 7.5 times over subscribed and the growth credit was 6.1 times oversubscribed. These limits reduced the <i>effective rate</i> for the basic credit to 0.4 percent and the <i>effective rate</i> for the growth credit to 1.63 percent.</p>

Name	Mission/ Objectives	Eligible Companies/Industries	Application/ Selection Process	Results and Successes
<b>Pennsylvania R&amp;D Tax Credit Assignment Program</b>	<p>Established to assist the growth and development of technology-oriented businesses, particularly small start-up technology businesses.</p> <p>The R&amp;D Tax Credit program is a key component of the economic stimulus program to assist Pennsylvania's home-grown technology businesses to grow and produce jobs and other economic benefits.</p>	The credit is 10% of the company's increased research and development expense over a base period. The total cap of the credit program is \$15 million, with individual credits being pro rated accordingly. Up to 20% of the total pool is set aside for small businesses.	R&D Tax Credits are issued or approved by the Pennsylvania Department of Revenue. Businesses that have not used all or part of their issued R&D Tax Credits within one year after the R&D Tax Credits were approved may apply to the Pennsylvania Department of Community and Economic Development (DCED) for approval to assign their eligible R&D Tax Credits to a "buyer".	Data Unavailable

## Research and Commercialization Programs

Name	Mission/ Objectives	Eligible Companies/Industries	Application/ Selection Process	Results and Successes
<b>The Indiana 21st Century Research and Technology Fund</b>	Provides financial support to entrepreneurial companies which have demonstrated a market potential for the commercialization of new technologies, product development and testing initiatives.	High-tech areas such as aerospace, defense, and security; advanced manufacturing and engineering; communications and electronics; energy, environment and agriculture; information technology and software development; and life sciences and health care.	<p>Each company must propose a technology idea or business plan that demonstrates innovation, clear commercialization intent, and potential for job creation.</p> <p>Proposals are reviewed by science and technology researchers and experts in economics from across the country.</p> <p>To guarantee that the grant is invested in Indiana and companies grow their businesses in the state, grants require mandatory repayment of funds in certain circumstances.</p>	<p>Between 2005 and 2007, 38 grants were awarded totaling \$42.3 million.</p> <p>Companies receiving grants have considerable commercial potential and projections indicate that 5,000 new, highly compensated jobs are likely to be created in the next three to five years.</p>

Name	Mission/ Objectives	Eligible Companies/Industries	Application/ Selection Process	Results and Successes
<b>Ohio Research Commercialization Grant Program (ORCGP)</b>	ORCGP provides grants to small technology companies to improve commercial viability of technologies developed through Small Business Innovation research (SBIR), Small Business Technology Transfer (STTR) and Advanced Technology Program (ATP) research and development projects.	Companies involved in a core competency technology, such as, advanced materials; instruments, controls, and electronics; biosciences; power and propulsion; and information technology; or to support other business activities related to the commercialization	To qualify for a grant of up to \$350,000, companies must submit a proposal to the Third Frontier Commission.	<p>Twenty six organizations have been awarded a total of \$8,614,308.00 and 37 grants through this program.</p> <p>In 2008, the Third Frontier Commission plans to award nearly \$2 million in grants.</p>

Name	Mission/Objectives	Eligible Companies/Industries	Application/Selection Process	Results and Successes
<b>Wisconsin Technology Bridge Grants</b>	<p>Introduced in 2003 by Governor Jim Doyle to provide assistance to small businesses experiencing “severe financial hardship” while awaiting a decision on Phase II or other funding applications.</p> <p>Funds granted under this program may only be applied to necessary costs directly related to maintaining research and basic business operations.</p>	<p>Eligible companies must have fewer than 100 employees and must have received early-stage financing from the federal government or another source.</p> <p>Eligible companies may receive funding up to 75 percent (maximum of \$100,000) of the eligible project costs.</p> <p>A 25 percent cash match is also required from all companies.</p>	<p>Companies are selected to receive grants based on criteria such as:</p> <ul style="list-style-type: none"> <li>- amount of economic impact the company will have in Wisconsin;</li> <li>- level of need demonstrated by the company;</li> <li>- company’s past record of obtaining early stage financing;</li> <li>- likelihood that the company will successfully commercialize technology;</li> <li>- company’s management plan and management team;</li> <li>- likelihood that the company will maintain operations in Wisconsin.</li> </ul>	<p>Data Unavailable</p>

Name	Mission/Objectives	Eligible Companies/Industries	Application/Selection Process	Results and Successes
<b>Wisconsin Angel Network (WAN)</b>	<p>The WAN was formed in January 2005 to serve as an umbrella organization to provide services and resources to the early-stage investing community.</p> <p>WAN seeks to build early-stage capital capacity throughout Wisconsin and increase the number and amount of equity investments in Wisconsin’s entrepreneurs.</p>	<p>Potential investors can access tools to help establish an angel network, sample term sheets, and research reports on angel investing.</p> <p>Entrepreneurs can receive assistance with raising capital, applying for grants and loans, creating a presentation for a potential investor or developing a thorough and well-organized business plan, devising a marketing plan, and networking. Entrepreneurs seeking funding may also post summaries about their projects in the deal-flow pipeline for free.</p>	<p>Membership is limited to funders and angel networks that must request and submit an application to be considered for membership.</p> <p>Members have exclusive access to educational programs, investing guides, and the deal-flow pipeline hosts more than 60 executive summaries from entrepreneurs seeking funding.</p>	<p>Data Unavailable</p>

## Pension Fund Investment Programs

Name	Mission/Objectives	Eligible Companies/Industries	Application/Selection Process	Results and Successes
<b>New York State Common Retirement Fund's (CRF) In-State Investment Program</b>	<p>In 1999, the New York State Legislature passed legislation encouraging the CRF to invest \$250 million in New York companies.</p> <p>The In-State Investment Program is designed to stimulate New York's economy while also complying with risk management practices.</p>	<p>The CRF requires investment partners to put up their own money and raise other funds. The total pool of capital currently available is \$750 million.</p>	<p>-CFR staff and private equity consultant review applications. -Both must agree before undertaking preliminary review -Preliminary review -Instructions to investment manager for placing investment</p>	<p>Between 2003 and 2006 the CRF has added \$321 million and now has a total of \$425 million committed to 15 funds.</p> <p>In May 2006 the CRF status report indicated that it had invested \$145 million in 64 companies, resulting in a total of \$920 million invested.</p>

Name	Mission/Objectives	Eligible Companies/Industries	Application/Selection Process	Results and Successes
<b>Oregon Investment Fund</b>	<p>In July 2003, the Oregon State Legislature created the Oregon Investment Council (OIC) in order to design and implement a \$100 million program to encourage the growth of small businesses within the state of Oregon.</p> <p>The OIC developed the Oregon Investment Fund (OIF) which is funded with both IOC monies and capital from private equity and venture capital funds.</p>	<p>The OIF is a fund of fund with investment strategy based on investments that are:</p> <ul style="list-style-type: none"> <li>- mainly in Oregon or Pacific Northwest-based companies;</li> <li>- placed through Oregon/Pacific Northwest focused and based private equity funds;</li> <li>- made in funds that intend to invest in venture capital, growth capital or later-stage buyout companies;</li> <li>- beneficial to start-up companies coming out of Oregon universities and colleges.</li> </ul>	<p>Fund is managed by Credit Suisse's Customized Fund Investment Group on a discretionary basis.</p>	<p>In 2007, the OIF's portfolio funds invested \$84 million in Pacific Northwest companies, and outside investors invested another \$45 million in those same companies, for a total investment of \$129 million.</p> <p>The OIF also created or retained 2,767 jobs during 2007.</p>

## Locally-based Programs

Name	Mission/Objectives	Eligible Companies/Industries	Application/Selection Process	Results and Successes
<b>Littleton, Colorado – Economic Gardening</b>	<p>Littleton's economic gardening strategy creates a culture supportive of innovation and was formed through a review of training programs, policies and other programs to determine which as more beneficial to entrepreneurs.</p> <p>The program focuses on three main areas:</p> <ul style="list-style-type: none"> <li>- Availability of information critical to success;</li> <li>- Infrastructure, such as quality of life, intellectual capacity and transportation</li> <li>- Connections and networking opportunities for entrepreneurs.</li> </ul>	<p>Entrepreneurs and start-up companies.</p> <p>Not limited to technology.</p>	N/A	Data Unavailable

## Talent Recruitment

Name	Mission/Objectives	Eligible Companies/Industries	Application/Selection Process	Results and Successes
<b>Georgia Intellectual Capital Partnership Program (ICAPP)</b>	<p>ICAPP was created in 1995 by the Georgia Board of Regents to connect the intellectual resources of Georgia's 35 public college and universities to the state's business community.</p> <p>The primary role of ICAPP is to act as a broker and catalyst to strategically link USG with the state's economic development efforts.</p> <p>The centerpiece of ICAPP is the ICAPP Advantage Program which helps meet company hiring needs through an expedited curriculum designed by a college or university to train knowledge workers.</p>	<p>Eligible companies primarily fall into information technology and medical or healthcare related fields.</p> <p>Knowledge workers are defined by ICAPP as persons who generate value for other people by sharing, creating or using ideas; complete a job using intellect and experience instead of machinery; and earn above the Georgia per capita income.</p>	<p>To be funded as an ICAPP Advantage project, several requirements must be met:</p> <ul style="list-style-type: none"> <li>- Creation of at least 10 new knowledge jobs.</li> <li>- Involve the employment of knowledge workers</li> <li>- Documented shortage of the type of worker needed for the industry.</li> <li>- Creation of a full-time and compressed study program to prepare student for the job.</li> <li>- Agreement by the company to hire each ICAPP graduate trained for that position.</li> </ul>	<p>Since 1997, ICAPP Advantage secured more than 7,000 jobs in Georgia.</p>

## APPENDIX A

### Funding Sponsor and Stakeholder Interview List

	<b>Name</b>	<b>Title and Organization</b>
1.	Russell Allen	President & CEO, BioFlorida
2.	Stephen Beatus	Associate Executive Vice President, Beacon Council
3.	Sena Black	Senior Vice President of Marketing and Information, Enterprise Florida
4.	Rodney Carson	Director of Business Development, Central Florida Development Council
5.	Tony Carvajal	Executive Vice President, Florida Chamber Foundation
6.	Rod Castow	Associate Vice President for Economic Development, University of South Florida
7.	Brent Christensen	President, Gainesville Area Chamber of Commerce
8.	Bob Cordes	Manager of Economic Development, Gulf Power
9.	David Day	Director of Technology Licensing, University of Florida
10.	Jaap Donath	Vice President, Beacon Council
11.	Ann Duncan	President, Vertical Integration and member Florida Board of Governors
12.	Scott Farris	Founder & CEO, Planar Energy Devices
13.	Mary Ann Fiala	Executive Director, AeA Florida Council
14.	John Frazer	Executive Director, Office of IP Development and Commercialization, Florida State University
15.	John Fremstad	Vice President Technology Development, Metro Orlando Economic Development Commission
16.	George Gordon	President, Tampa Bay Technology Forum
17.	John Haley	Vice President, Business Recruitment, Jacksonville Cornerstone
18.	Chris Hart	President, Workforce Florida, Inc.
19.	Howard Haug	Senior Vice President and CFO, Space Florida
20.	Joe Hice	Associate Vice President for Marketing and Public Relations, University of Florida
21.	Gary Hines	Senior Vice President, Palm Beach County Business Development Board
22.	Louie Laubscher	Senior Vice President and COO, Enterprise Florida
23.	Mike Meidel	Director, Pinellas County Economic Development

*Funding Sponsor and Stakeholder Interview List continued..*

	<b>Name</b>	<b>Title and Organization</b>
24.	Bill McDermott	Economic Development Director, Seminole County
25.	Jo Moskowitz	Director of Community and Government Affairs, Citrix Systems
26.	Robert Nagro	Head of Project Operations, Tyra Tech
27.	Tammie Nemecek	President, Economic Development Council of Collier County
28.	Tom O'Neal	Associate Vice President for Research and Commercialization, University of Central Florida
29.	Tom Patton	Director, Central Florida Development Council
30.	Randy Poliner	Partner, Antares Capital Corporation
31.	Steve Quello	Director, CEONexus
32.	Keisha Rice	Deputy Director, Office of Tourism, Trade and Economic Development
33.	Dan Rini	President, Rini Technologies
34.	Erik Sanders	Director of Industry Programs, University of Florida
35.	Regina Smith	Director, Economic Development Office, Lee County
36.	Jack Sullivan, Jr.	President & CEO, Florida Research Consortium
37.	Jane Teague	Executive Director, Economic Development Corporation
38.	Pete Tesch	President, Ocala/Marion County Economic Development Corporation
39.	Joe Wallace	Executive Director, Central Florida Research Park
40.	Lynda Weatherman	President, Space Coast Economic Development Council
41.	Al Wenstrand	Executive Director, Florida's Great Northwest

## APPENDIX B

### Summary of Funding Sponsor and Stakeholder Interviews

The purpose of this study is to identify possible gaps in Florida's support system designed to facilitate the development of an innovation-based economy. As the first step to identifying perceived gaps, 41 individuals were interviewed, either by phone or face-to-face. Twenty of the interviews were with funding sponsors of the study, while 21 were with stakeholders who are involved on a day-to-day basis working within the innovation economy.

#### *Innovation - Working Definition*

Before embarking on specifics of the study, it was important to determine how each interviewee defined innovation and an innovation-based economy. The terms technology-based, knowledge-based and innovation-based are frequently used interchangeably. For the purpose of this project, "innovation-based" was selected for its potentially broader meaning.

Although a few respondents narrowly defined "innovation economy" as based on the research and development aspects of science and technology, the majority viewed it to broadly encompass not only technical inventions, but also improvements in process. It was also clear that although some industry sectors are most commonly associated with the innovation economy (e.g. BioSciences); the innovation economy is not a collection of target industries, but as one interviewee stated "can exist across most any industry sector, since it is more about the enabling technology behind the products within the sector." It was the majority opinion that innovation applies to all industries and not just limited sectors, including "business model innovation" as well.

Many interviewees related innovation to companies "preparing for global competition." "Creating value through inventions and improvements" was

frequently mentioned as the reason innovation is so important to Florida's economy. It was acknowledged that talent and human resources is a critical component and therefore an integral aspect of an innovation economy. A spirit and culture of entrepreneurship was also frequently mentioned, as were high-value, high-wage jobs when describing an innovation economy. One interviewee summarized the connection between jobs, value and global competitiveness by saying, "If Florida companies cannot continue to develop new products, processes and materials through creative research and development, then Florida will not be able to successfully compete for the high-value jobs of the future." In short, one respondent summarized this point as "taking bright ideas and creating wealth from them by doing things differently, better and faster than before."

A proposed definition for "innovation economy" for this project that is consistent with the majority of interviewees is *the creation of value through the adoption and exploitation of new ideas throughout the economy.*

#### *Strengths of Florida for Innovation*

Florida's list of assets as it relates to the innovation economy in many respects mirrors its list of weaknesses. The state's geographic and economic diversity and its development history present both opportunities and challenges as the state works to add more innovation-oriented jobs. The strength that was mentioned by virtually every interviewee is Florida's quality of life and its ability to attract and nurture globally competitive talent, from throughout the U.S. and abroad, especially Latin America. Many respondents feel there is a significant pool of knowledge and talent currently resident in the state which can be leveraged in the future. Florida is a "great state to recruit people and has lots of hidden talent" was heard often.

The strength of the state's universities and community colleges were frequently mentioned as assets. Many feel that the universities are central to the state's innovation effort and are leading the effort, despite their own funding challenges. The accessibility of the universities and recent development of entrepreneurial programs was also frequently cited. Recent university collaboration was also cited as a growing strength of the state.

### *Weaknesses*

Florida is faced with the challenge of transitioning from a historically low-cost southeast state that competed with other southern states for job creating investment projects to an economy that competes globally for the talent, ideas and discoveries that drive today's marketplace. For the purposes of this study, a weakness is something that is viewed as a defect in the system that makes the transition to an innovation economy more difficult. The most often cited weakness of Florida is with human capital and talent development. The current availability of skill sets in the right disciplines and the inadequate education system to produce them for the future was mentioned by almost every interviewee.

Except in isolated pockets, the out-of-state perception and the reality of Florida's secondary education system is seen as a significant deterrent to development of an innovation economy. While acknowledging the need for more engineering and technical graduates in Florida, one respondent stated that "high school graduates don't even have the prerequisites to enter engineering" if they had the interest. The education system is a challenge for urban and rural school districts alike.

The fact that Florida's economy acts more like several "City States," than a well organized and planned single state is seen as an inherent weakness by many. The "territorialism of universities" precludes greater potential partnering among universities, while the "City States are all working toward their own advantage, with each considering itself the lead." Despite the positive results of the intra-state

competition, the overall effect is sub-optimization of the state's resources and assets. One interviewee put it this way: "Florida's tech community has too large of a footprint, is too fragmented and has too many fiefdoms."

Florida's economic history and power structure is based on "old money" from agriculture and real estate development. This reality has resulted in a culture that is not as supportive of education and innovation as that of some competitive states. The state's history was also cited as a basis for the perceived lack of private sector support for the issues critical to success in a 21<sup>st</sup> Century economy. This position was summed up by one interviewee who said "In Florida, there seems to be an over reliance on government; the private sector should take a more aggressive posture on these issues." Another respondent mentioned that when comparing Florida to some other states, "the fundamental problem is that in Florida the government drives what business does rather than the business community driving what the state does."

Another weakness cited related to the government was a general lack of legislative patience to develop a thoughtful set of solutions and then "allow them the time to pay off." The belief that there could be any short-term magic solution to "jump starting an innovation economy is a fallacy." Organizations and institutions that are charged with developing an innovation economy will have to be given the time and flexibility to pursue the chosen strategy long enough to determine if it is making a difference.

Other items that were mentioned as inherent weaknesses included:

- Tale of two Florida's. How do smaller communities plug in to this economy?
- State's lack of supporting and embracing its own successful technology companies through both words and deeds.

- University funding at 73 percent of the national average for full-time equivalent students, which ranks last in the U.S.
- Student faculty ratio highest in nation.
- Tuition lowest in the nation.
- No known global technology company, i.e. “anchor store;” the technology landscape in Florida is “all strip malls.”

### *Challenges to Florida’s Future in the Innovation Economy*

Challenges and weaknesses are in many respects one in the same. For the purposes of this study, however, the question was asked in both ways. Issues that present a certain degree of difficulty to overcome have been characterized as “challenges”. The common theme most often mentioned when asked “What are the major challenges facing Florida’s ability to compete in the innovation economy?” was the state’s cultural resistance to taking the necessary steps to build an innovation economy. This was summarized by one respondent as “inertia is the biggest impediment.” The general sentiment is that the vast majority of 17 million Floridians are not connected to the innovation economy. Generating community support in this environment for initiatives and resources is seen as one of the biggest obstacles facing Florida. Several respondents mentioned that until this shift occurs, the state will lack the dedication and patience to be successful. Another noted that it is “silly to draw fences around the status quo. It may feel good now, but won’t when Florida gets run over by other states that did not get lulled into the status quo.”

The recent controversy surrounding teaching creationism in the public schools was cited as both evidence of this cultural bias and a road block to recruiting the caliber of talent required to be globally competitive.

The overall status of the state’s K-12 education system as it affects companies’ ability to attract top talent was also mentioned frequently as a major challenge. The current quality of K-12 education has far reaching effects, not only on the students it produces, but on the image of the state and its ability to recruit companies and individuals. Several respondents felt that addressing the K-12 education system is the single greatest challenge to long-term success with one saying Florida “must shore up education and do it quickly with dramatic changes.”

Most acknowledged that Florida is going through a lot of dynamic change, recognizing that its future is not with competing against other southeastern states for manufacturing, but with other economies and countries for higher value jobs and companies. Many references were made to California and how Florida’s greatest challenge is to find a way to adapt and diversify its economy to a higher value environment. To accomplish this transformation, many said the state must be honest with itself about the quality of the K-12 and university systems and make the necessary investments to raise their standards and performance to be globally competitive. Several noted what one described as a “disconnect between reality and what the state is willing to pay for.” One respondent summarized the education challenge as follows: “smart companies hire smart people and they want their kids to go to good schools.”

Modifying the current economic development model to reflect the need to focus more on innovation and entrepreneurs was mentioned by many respondents. Most recognize the need to continue recruiting medium and large-sized companies to fill some of the gaps in the state’s economy, but stated a strong need for economic development organizations to add an equally aggressive focus on supporting innovation-based entrepreneurs. Different opinions were expressed as to whether these new efforts should be developed and incorporated by existing state and local economic development groups, or whether new initiatives should be created to better conform to and support the entrepreneurial culture.

One respondent felt it could be successful under either model as long as the approach was properly balanced with the entrepreneurial efforts being given the necessary latitude to succeed.

Other challenges to success that were mentioned included:

- Florida's tax policy needs predictability and consistent support, even in years of budget challenges, and recognition that stability is important.
- Connecting the dots of the fragmented technology community throughout the state.
- The huge gaps in early-stage funding.
- The lack of people seeing the value in growing companies from one person to 10 that continues to grow.
- Providing strong support for the state universities as the best and most direct path for creation of an innovation economy.

### *Opportunities*

Despite the weaknesses and challenges enumerated above, a great majority of those interviewed felt there is now a "window of opportunity" for Florida to tell its story and make significant progress. Some even said it is "now or never" and believe that as other economies transition, Florida has a chance to reposition itself among the innovation leaders, but that the window will last 10 years or less.

Opportunity itself, many stated, should be viewed through a different prism than in the years past. Wealth creation through innovation should be the measurement, not job creation alone. Most felt that the healthy job creation would be a byproduct of the wealth creation, but that investment and productivity should take precedent over job creation as the critical metric.

Although "huge gaps" in early-stage funding were cited as a challenge, the venture capital markets

appear poised to invest in Florida. One interviewee stated, "The world is ready to invest in Florida once we demonstrate that we have enough companies worthy of investment with management know-how and leadership..." Another observed that "markets like Boston have been overrun with capital, so they are looking for pockets of innovation and are looking outside their typical two-hour radius." Others felt there is current opportunity for wealth creation through investments by the state and its pension funds that should generate great returns if properly managed. In short, "the good news is that there is nothing more mobile than capital—Boston, New York and California guys are here everyday looking for deals."

The other area of opportunity for Florida lies within the quality of life still prevalent in the state. Although there are still some challenges associated with recruiting top management level and top technical talent into the state, most companies and universities have successful track records. Many interviewed believe that an attractive quality of life drives the development of the innovation economy since innovation depends on individuals with location choices. Despite many of the areas of concern, Florida still offers a great quality of life versus many of its competitive states.

Other areas of opportunities mentioned:

- Florida has potential to be the "California of the East."
- Florida planted its stake with Scripps and put itself on the map in many circles. Now it needs to build on that recognition with more marketing support.
- Universities in Florida do about \$1.5 billion in research, comparable with Georgia and in the ballpark with North Carolina at \$1.8 billion showing that Florida has the critical mass to succeed.
- The "private sector" has an appetite for supporting innovation projects, but not an appetite for creating bureaucracy.

### *Opinions on Out-of-Market Perception of Florida*

All the interviews were with in-state Floridians. They were, however, asked about their perceptions of how the outside world views Florida's ability to compete in the innovation arena. Almost all the respondents noted that "it is better than five years ago and lots, lots better than 20 years ago." The two instances most cited were Citrix's successful "exit" from its start-up, venture-funded phase and the state's investment in Scripps and the subsequent research institutes. More referred to the Life Science initiatives than anything else. The Florida Venture Forum was also cited as an event that has improved the knowledge of Florida's innovation economy outside its borders. One respondent summarized others' views of Florida as the "up and coming kid in the rear view mirror."

Despite this positive movement, Florida is still not regarded as an "innovation state." It has improved its perception as a positive "business climate," but has a great deal of progress to be made before it will seriously be considered among the technology and innovation leaders in the U.S., much less the world. The perception continues to persist that Florida is all and only about tourism, retirement and beaches. The "poor perception and in many cases reality" of education in Florida and having Florida "lumped in with the south continues to be a challenge."

Although Florida's universities are doing significant things and making great improvements, they are still not considered to be known for much more than sports nationally. Another significant observation in this category is the fact that the "state brand" in the innovation area is associated with NASA. As NASA declines and the launch business model changes, there is nothing else that is stepping up to fill the vacuum.

### *Personal Opinions on Florida's Ability to Compete*

Everyone interviewed was in one way or another involved in Florida's economic diversification effort.

Their opinions are therefore only representative of this specific group of people and are not necessarily applicable to a larger, more diverse group of Floridians. With that said, personal opinions as to Florida's prospects vary significantly.

Many felt that Florida can successfully diversify and is doing the right thing in seeding the bio tech industry through the recent research institute investments. This effort was cited as the "new industry" that state and local economic development promoters can point to while working to dispel out-of-market perceptions of the state.

There were conflicting opinions on the "two Florida" question and whether both rural and urban Florida can compete. One opinion was represented by the following quote, "Certain regions of the state can compete and will do it on their own." The state "may not be able to compete, but certain areas can." Several respondents felt that rural Florida can compete in the innovation economy, especially given the broader definition of innovation to include business model and process innovation. A few felt that innovation can work in rural Florida because many knowledge-workers are now looking to live in smaller communities.

There was a minority of respondents that are pessimistic on the future of Florida's economic diversification efforts. They are not sure Florida has the physical and human infrastructure to be successful at this point and think that the state will be challenged with recruiting scientist-based companies because of the "dismal" nature of the state's education system. This group feels that the state wants to be "world class," but is not willing to make the investments to achieve this objective, i.e. they "are not putting their money where their mouth is." Respondents with this opinion believe in Florida and its capabilities, but are frustrated because they don't see others believing the state can succeed. Although many acknowledge Florida is still a 2<sup>nd</sup> tier technology state, it is making progress toward breaking into the top ten and first tier.

### *Perceived Gaps and Deficiencies in Florida*

Responses to this question depended on where the interviewee was located. The answers further dramatized the “tale of two Floridas” and the need to address deficiencies with each in mind. There were, however, some gaps that are common to both segments.

In the area of financial assistance, it was agreed that the job-based tax refunds and exemptions, although appreciated, do not make a substantial impact on a small innovation company’s ability to grow. These companies need funding or access to funds that will offset costs. These funds could be provided as investments of state dollars, or facilitated through better organized angel and venture capital networks – both were cited as gaps that need to be addressed in Florida. State assistance through grants for R&D and/or testing was also cited as a benefit for fledgling innovation companies. In order to affect the growth of these companies, the state needs “relevant” assistance.

The “biggest gap is always funding and particularly in the early stage, since it is hard to get out-of-state funds for early \$500,000 seed stage funding.” This deficiency is not unique to Florida, but the states that address it the most effectively will win. Florida is behind other state’s effort to address these gaps. One interviewee responded, “I am not a big government fan, but the state needs the grants to help fund the gap to get technology that is showing promise to the commercialization stage. Pennsylvania started its Ben Franklin Fund 20 years ago and it took 10 years before it started to show results.”

The Innovation Fund was mentioned frequently as a positive development. It was mentioned, noted; however, that this fund was used mostly for large-scale projects and that some of the fund should be set aside for projects that range from \$10 to \$20 million, with the Innovation Fund supporting a portion of those costs.

Having incentives for projects of this size was noted as a gap in the system. The other fact mentioned with the Innovation Fund is the inability of smaller communities to provide the required dollar for dollar match to access the funds. This requirement is seen as exacerbating the split between the larger urbanized regions of the state and the mid-sized cities or rural areas.

Human capital and physical infrastructure continue to provide gaps in the system. Several interviewees feel that the “raw material,” i.e. ideas and discoveries, is being produced in the state, but that the “greatest need is to recruit CEOs, bankable CEOs to take companies from \$3 to 4 million to \$20 million. Eighty percent of the deals bubbling up in Florida fall short on account of lack of bankable CEOs.” Although a few did not think recruiting this caliber of CEO to Florida was a challenge, the majority that expressed an opinion agreed.

The lack of lab space available for lease throughout the state was mentioned by virtually every respondent involved with biotechnology. Several noted that wet lab space is being planned around the state, but that it is not yet in place to benefit companies in need. Growing companies stated they have to have the space, are willing to pay market rate and will move to another state that makes it available if that is what it takes to be successful.

The final “gap” that was mentioned by numerous respondents was the lack of an organized “support infrastructure” for innovation-oriented start-up companies. It was noted that there appears to be a “lack of desire to switch to a new economic development model” that recognizes the importance of creating and growing innovation-based companies in the state. One interviewee stated the fact that “the state does not support a network of assistance providers surprised me” when I arrived. Another respondent observed that some regions have developed a model that embraces entrepreneurs around certain clusters and that “I do think you can foster that, but haven’t seen many people try.”

## *Is "Innovation" Getting Enough Attention in Florida?*

Again, all interviewees are involved in one way or another with promoting the innovation economy, so all answers should be viewed accordingly.

Responses to this question fell into three different categories:

- The effort has been appropriate with real progress in the last few years.
- The effort has not received enough attention. "If we want to be competitive we need to catch up. We are making progress, but we are still behind."
- Timing is critical. The soft economy gives us an opportunity to be more creative and focused. The state needs a strategy.

Different respondents date the history of Florida's effort to build an innovation economy to different times. Some go back almost 20 years while others start with the Scripps projects with several picking points in between. Everyone acknowledged that significant work and progress has been made, with a clear majority citing the need to do more at what they consider to be a critical juncture in the state's development cycle.

There was no agreement on how widely accepted the need to diversify the economy around innovation is in the public eye or even the level of awareness of what the state currently has. One said that "the population seems on board," while another said, "I don't see a ground swell, but it is time to get a higher level of public awareness." Another observed that "the topic is catching on – the Governor's Innovation Pyramid is an indicator," while another said leadership in the state is starting to "get it." All felt the issue is now getting recognition and felt the test is whether or not it goes beyond "lip service," but gets the level of actual support it requires to be a factor.

The specifics mentioned by those that see the level of attention as appropriate included:

- Scripps – "A very noble effort that will be longer term than most people realize and might just work. It is a big and grand idea and does in fact play to some of our strengths."
- "BioTech...has gotten a lot of attention. That takes a long time to develop and there will be failures along the way."
- The Small Business Innovation Research (SBIR) match program is great. Although not yet passed, this is seen as an indicator of exactly what is needed. The proposed grant "will motivate companies as well as help them get SBIR funding because of the matching component and leverage. The program will bring in more Federal dollars."
- Opportunity Fund. "I have been impressed with progress Florida has made in the last few years, with legislation, etc. Some of the programs like the Opportunity Fund have not come on line as of yet, but will make an impact when they do."
- The Florida Research Consortium (FRC) is a good start. That would have been unheard of a few years ago.
- Florida "is heading in the right direction. How fast we will get there remains to be seen, but we are doing a lot of the right things."

Several comments focused on the need to build on what we have accomplished to date and develop a strategy for future success. Part of this strategy would be to "make the story of innovation and its potential more accessible." Even interviewees that are involved with innovation felt they did not see the big picture. One said, "I think we are probably getting some things right. They talk about us having the 4<sup>th</sup> largest number of high paid jobs in the country. But, where are they?"

Others mentioned the need to better tell the story of innovation, its need and how it can impact the state's economy and to do so through the many success stories currently available.

Several asked questions similar to: "Do we have a long-term plan with systematic objectives? It might be happening but we are unaware of it." Most would like to see what the state is doing, do more of it and most importantly do it consistently. Most all respondents sharing this opinion felt that the state has developed a good platform and should now take advantage of it, acknowledging that "we are getting started, but with a very fragmented system." This group would "like to see a more coordinated, clear plan of how the state will achieve success in this innovation area. The strategy should include all regions, as well as rural areas and contain a plan for each constituent group." Some regions have not been able to participate in the "big projects." In doing so, the state can play a positive role in fostering more regionalism around evolving clusters.

One respondent, who has been involved with this topic for more than 20 years, mentioned that some of the earlier efforts have resulted in success, but it took so long, such success is underappreciated in the market. Documenting what the state has done, successfully or unsuccessfully, would be a good start to outlining what should be done in the future since many of the proposals being mentioned are similar to what has been tried before.

### *Should the State have a "Chief Science Adviser?"*

This question was asked of most the interviewees to begin exploring possible solutions to the perceived fragmentation of Florida's innovation community. In general there was substantial support, with some exceptions and with several different supporting rationales.

Representative opinions included:

- Great idea, assuming he or she has authority and/or an advisory board with direct access to Governor.
- Great idea, assuming he or she has no authority and is just an adviser.
- Bad idea as it would just be another layer of bureaucracy.
- Agree with the idea, but would have to be thought through very carefully, be structurally tied to the Governor and be filled by someone the Governor trusts and includes in all high level policy decisions.
- If it will raise the profile of the need to diversify through innovation, then willing to try anything.
- No, there is an advantage to various organizations negotiating results.
- No, we do not need this type of a position on the state's payroll. It would be better if the Governor led the effort.

Beyond the creation of a position or an entity, there was general recognition of the need to raise the level of awareness of the topic. Several felt that "now and since the beginning, the effort has been grass roots and is fragmented as a result." Others agreed with the opinion that "somebody at a high-level should have responsibility for innovation." Yet another characterized it as "if you could have a Scientific Evangelist at that level that would be great."

### *Desired Outcome of this Project*

Interviewees were asked what they would like to see as a result of this project and process. The responses included:

#### New Programs and Plans

- Florida is no longer a low-cost state and it has to seek ways to transition to a different model. It must find different kinds of business to attract and grow.

- A realistic look at expectations and recommendations on how to get started with an innovation strategy.
- There is a need to look at policy issues to be more competitive, since we are no longer so.
- Statewide program/support for an innovation strategy.
- The state needs a 12-point plan with tools in four different categories.
- Whatever is put in place must decentralize, decentralize, and decentralize.
- Regionalism – could be better. I would like a better ability to truly partner with other jurisdictions. There is no ability to have multi-jurisdictional support of projects.
- An idea of what works in other states.
- An understanding of how we move Florida farther along in our targeted industries through programs in other states we can take and modify.
- Examples of programs that other communities are doing and could be adopted locally.
- A “Database of Talent” for the state is needed.
- The legislature needs to take on something seriously and stick with it. They have to have the intestinal fortitude to stick with it long enough to generate results.
- A “one-stop shop” for state universities should be considered, since it is more and more unlikely that one institution would have enough technology of its own to build a company around.
- Incentives for innovation, not job creation are needed. The state should consider providing incentives for increases in productivity due to investments or innovation.
- A matching SBIR grant that does not require working with the university.
- Increased emphasis on “CEO recruitment.”

- A single web portal that provides a forum for all sectors and creates a social network for technology companies that results in both a database of talent, as well a “meeting place” for statewide researchers across interdisciplinary fields.
- A network that provides more connectivity and collaboration and spontaneous interaction between innovators and entrepreneurs.
- Anything to make entrepreneurship more viable as a local initiative, but integrated and tied together with a big picture vision for the state through a satellite network.

#### Additional Funding

- Make Florida’s universities the best, so the state can compete with the best realizing that an innovation economy is based on strong research universities.
- Programs like Institute for Commercialization and Centers of Excellence are great starts. The importance of funding at higher levels needs to be realized.
- Have something to get the legislators’ attention.
- Increase in public and private investment in R&D (90 percent of R&D is done in the private sector).
- Funding of innovation companies by State Pension Fund.
- Demonstrate that Florida’s population alone does not/will not guarantee success by showing how states with much smaller budgets are investing more into their innovation efforts.
- Propose some type of tax credit (property tax or other) that would help induce more angel investment within Florida by high net worth Floridians.
- Anything that helps K-12 education in Florida will benefit the innovation effort.
- The state has the population and geographic base to support six or seven research universities.

### *Programs Recommended for Review*

Interviewees were asked if they knew of any out-of-state programs/policies/incentives that should be looked at as potential for adopting and/or emulating in Florida. Responses were:

- Massachusetts and California
- States in the upper Midwest have had to retool their economies and developed innovative programs as a result.
- Funding too many research programs is an issue. California, Michigan, North Carolina and Virginia are successful examples of funding research programs.
- Indiana – Eli Lilly - university partnership.
- No cost loans for engineers and STEM degrees.
- Anything that strengthens ties between universities and private sector business.
- California Higher Education – how to bring various universities closer together.
- Other states mentioned for us to look at: California, Indiana, Michigan, North Carolina, Ohio, Pennsylvania, Virginia, and Washington.
- Matching grant programs as they bring about engagement between universities and the private sector.
- A well-managed internship program that places students from key universities in companies throughout Florida.
- North Carolina provides funding for regional efforts, then looks to them to cooperate.
- Washington Software Association. All are members that become their own incubator through mentoring of others.
- Oregon – Each county has to focus and declare their top four target areas. If not on your list, then you don't get the lead from the state. North Carolina has regional offices and sends leads through them.
- Ohio – 3<sup>rd</sup> Frontier.

- Cincinnati - CEO in residence program to help with start-ups, etc. “Gap” financing.
- North Carolina Electronics and Technology Association
- New Jersey – Business Retention & Expansion Program.
- Littleton, Colorado’s “economic gardening” initiative and how it has been adopted on a modified basis in Georgia, Texas, Wisconsin and Wyoming.
- UCSD/University of California – Connect.

### *Interviewees Final Thoughts on Innovation*

- Supporting start-ups is important and states and regions must increase their efforts in this area, but we do not have enough critical mass to stop attracting the medium and larger firms. Our future depends on it.
- The state must focus on building its clusters
- The “big ones” have been done with the Innovation Fund and have the big prizes. Now there is a need to do the smaller ones in the \$2.5 million range—small innovative, real companies that will bring jobs and investments to the state.
- The state should allow its institutions and organizations to be more flexible, with outreach programs and structures to make quick decisions. The FHTCC matching grants program works well and should be duplicated throughout the state.
- How do you recruit foreign technical talent? Eighty percent of applicants are Chinese/Indian. Someone needs to be looking at how companies can recruit and secure these foreign nationals. Even with in-state students from local universities, the vast majority are foreign nationals.
- Timing is critical. Maybe we have a 10-year period to “step up.” If we don't do enough, we will be just another state that is not “in the game.”

- A plan and continuity of the plan tied to resource allocation is needed. The plan should come from Governor and then the Governor should walk the walk and talk the talk. It should be bold and huge. The state needs to be strategic and proactive.
- Several large, nationally known companies are asking “why are we wasting resources in Florida?” These companies are making conscious decisions to hire and locate tech people out-of-state or avoid investing in the state altogether. With the current state of education and supply of talent, the state cannot support a large-scale technology company.
- Whatever programs are developed, please don’t make the application for the benefit too painful. Small business won’t pursue if the costs are too high.
- Technology development should be the third leg of the state’s economic tool.
- Baby boomers are continuing to retire in Florida and represent our “hidden talent pool.” There should be some way to identify those that are interested in staying active and involved through investment or management.
- Existing Florida industries are underutilized. Using vendor lists, economic developers should be able to make a case for an increased presence of those suppliers.
- People need to look internationally (e.g. Ireland) to see what can be done with very good public policy – education, tax base, economic development.
- Florida has potential to be the “California of the East.” Look at California to see what they did, what they did right and what they did wrong.
- Innovations happen at the intersections of technology (where ideas bang into one another). Creation of any ecosystem that helps interaction between business and higher education would be good.
- The state needs an engine for creating innovation.
- The state should ask itself if it is doing enough to make an actual difference toward structural change of the economy toward more innovation and wealth creation and if not, do more.
- Go out and build upon something that is already here.

## APPENDIX C

### List of Original 51 Programs Reviewed

1. The Indiana 21st Century Research and Technology Fund
2. Michigan 21st Century Investment Fund
3. Venture Michigan Fund
4. Ohio Entrepreneurial Signature Program
5. Innovation Ohio Fund
6. Ohio Technology Commercialization Incentive
7. Ohio Thomas Edison Program
8. Pennsylvania Life Sciences Greenhouse Initiative
9. Philadelphia BioAdvance
10. Pittsburgh Life Sciences Greenhouse
11. Life Sciences Greenhouse of Central Pennsylvania
12. Littleton, Colorado – Economic Gardening
13. New York State Common Retirement Fund's In-State Investment Program
14. Oregon Investment Fund
15. California Economic Development Partnership
16. Georgia Research Alliance
17. Michigan 21<sup>st</sup> Century Jobs Fund
18. North Carolina Biotechnology Center
19. North Carolina Board of Science and Technology
20. Ohio Third Frontier Commission and Project
21. Oklahoma Center for the Advancement of Science and Technology
22. Oregon Innovation Council
23. Pennsylvania Technology Investment Office (Ben Franklin Technology Partners)
24. Virginia Center for Innovative Technology
25. Arizona Economic Resource Organization
26. Missouri "Grow Me State" Initiative
27. Georgia Intellectual Capital Partnership Program Advantage Program
28. Ohio STEM Learning Network
29. Utah Recruitment Initiative
30. Hawaii Qualified High Technology Business Tax Credit
31. Hawaii Refundable R&D Credit
32. Indiana Regional Economic Development Partnership Program
33. Indiana Crossroads Partnership/Central Indiana Corporate Partnership
34. Minnesota Strategic Entrepreneurial Economic Development (SEED) Initiative
35. New York Rural Cluster Development Grant Program
36. Ontario's Regional Innovation Networks
37. Innovate Wisconsin
38. Generation Iowa Commission
39. South Dakota Workforce 2025
40. Pennsylvania Jonas Salk Legacy Fund
41. Utah State Advisory Council on Science and Technology
42. Science Foundation Arizona
43. Massachusetts John Adams Innovation Institute
44. Kansas Technology Enterprise Corporation
45. New York State Office of Science, Technology and Academic Research
46. Georgia Advanced Technology Development Center
47. Washington State Information Technology Help Desk Services Business & Occupation Tax Credit
48. California Employment Training Panel
49. Michigan Technical Education Centers
50. Texas Emerging Technology Fund
51. Virginia Technology Zones

## **APPENDIX D**

Presentation to Florida Economic Development Council,  
May 19, 2008



# **Florida's Innovation Benchmark Study**

## **FEDC Snapshot Report**

***May 19, 2008***

# Funding Sponsors



**Beacon Council**  
**Business Development Board of Palm Beach County**  
**Central Florida Development Council of Polk County**  
**Curley & Pynn**  
**Economic Development Commission of Florida's Space Coast**  
**Economic Development Council of Collier County**  
**Enterprise Florida**  
**Florida High Tech Corridor Council**  
**Florida's Great Northwest**  
**Gainesville Area Chamber of Commerce**  
**Gulf Power**  
**Jacksonville Regional Chamber of Commerce**  
**Lee County Economic Development Office**  
**Metro Orlando Economic Development Commission**  
**Ocala/Marion Economic Development Corporation**  
**Pinellas County Economic Development**  
**Seminole County Economic Development Department**  
**Space Florida**  
**Tampa Bay Technology Forum**

# Project Overview



- ❖ Gap analysis of Florida's Innovation Economy support programs, policies and incentives
- ❖ Interview Funding Sponsors to determine opinions and objectives of study
- ❖ Interview Stakeholders as part of gap analysis and to gather opinions on priority areas
- ❖ Benchmark out-of-state programs that address gaps identified in interview process
- ❖ Prioritize benchmark programs
- ❖ Benchmark Florida rankings against selected states

# 21<sup>st</sup> Century Economy



## **The 21<sup>st</sup> Century Economy is characterized by...**

- ❖ **An innovative and entrepreneurial culture**
- ❖ **An educated workforce with high-tech skills**
- ❖ **A global awareness**
- ❖ **An adaptable and strategic approach to policy and economic development**

# 21<sup>st</sup> Century Economy

## The 21<sup>st</sup> Century Economic Development EDO should...

- ❖ **Foster an innovative and entrepreneurial culture for Florida, its regions, and its communities**
- ❖ **Be engaged in product development to assist its communities**
- ❖ **Ensure the needs of business and industry are met, especially in the areas of workforce and high-tech skills training**
- ❖ **Have a solid understanding of the its strengths, weaknesses and advantages on a global level**
- ❖ **Adopt an adaptable, strategic and forward-looking approach to policy and economic development**

# Interview Findings



## Innovation Economy Definition

- ❖ Not a collection of target-industries -- more about the enabling technology
- ❖ Includes “business model innovation”
- ❖ Focused on value creation
- ❖ Driven by a culture of entrepreneurs
- ❖ Need to be globally competitive

### **Proposed definition**

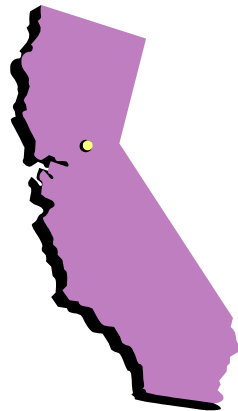
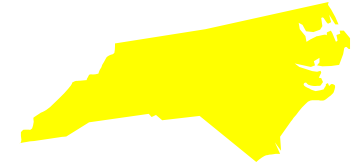
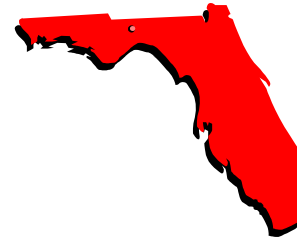
***The creation of value through the adoption and exploitation of new ideas throughout the economy.***

# Interview Findings

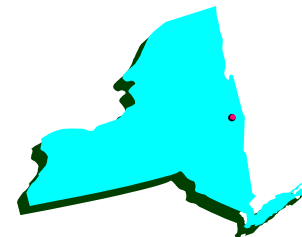
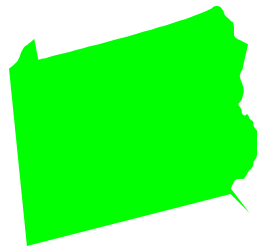


- ❖ State has made a great deal of progress in recent years
- ❖ Effort is fragmented, ad hoc and inconsistent
- ❖ Transition for low-cost to innovation not automatic
- ❖ Regions will cooperate with proper structure and funding assistance
- ❖ Mid-sized cities and rural areas need more support
- ❖ Must invest more in university base
- ❖ Cannot succeed without educated population base
- ❖ Must create a ecosystem of innovation
- ❖ Sunshine helps...and hurts
- ❖ Timing is now

# Where Does Florida Rank?



Historic Competition  
Innovation Competition  
1<sup>st</sup> Tier? 2<sup>nd</sup> Tier? 3<sup>rd</sup> Tier?



# Benchmark States



<b>Population and Gross State Product</b>		
<b>State</b>	<b>2007 Population</b>	<b>2006 GSP (millions of dollars)</b>
<b><i>United States</i></b>	<b><i>301,825,750</i></b>	<b><i>13,149,033</i></b>
California	36,983,904	1,727,355
Texas	23,624,214	1,065,891
New York	19,356,927	1,021,944
Florida	18,486,255	713,505
Pennsylvania	12,486,937	510,293
Ohio	11,504,135	461,302
Georgia	9,409,496	379,550
North Carolina	8,925,167	374,525

Source: *Decision Data Resources* report generated May 6, 2008, and *Bureau of Economic Analysis, U.S. Department of Commerce*, \*2007 Data available June 2008

# Benchmark States



<b>Florida's Rankings Against the Seven Benchmark States</b>	
<b>Metric</b>	<b>Florida's Rank (out of eight)</b>
<b>Population and GSP</b>	<b>4</b>
<b>Total R&amp;D – 2005</b>	<b>7</b>
<b>Total R&amp;D increase by percentage 2004 to 2005</b>	<b>3</b>
<b>Total R&amp;D increase by dollars 2004 to 2005</b>	<b>6</b>
<b>R&amp;D per capita</b>	<b>8</b>
<b>Academic R&amp;D</b>	<b>7</b>
<b>Industry R&amp;D</b>	<b>7</b>
<b>Federal R&amp;D</b>	<b>6</b>
<b>SBIR Contracts</b>	<b>6</b>
<b>Scientist &amp; Engineering PhDs Awarded</b>	<b>6</b>
<b>Patents</b>	<b>8</b>
<b>VC Investment Dollars</b>	<b>5</b>
<b>VC Number of Deals</b>	<b>7</b>
<b>Professional, Technical and Scientific Employment</b>	<b>5</b>

# Benchmark States



## Observations

- ❖ Florida below in most recognized indicators
- ❖ Interviewees were realistic about rankings
- ❖ Younger economic history
- ❖ Competition continues to invest
- ❖ Can't overtake competition by standing still
- ❖ Can't catch up over night

# What Other States Doing



## Types of Programs Reviewed

- ❖ Statewide Innovation Development Models
- ❖ R&D Tax Credit
- ❖ Research and Commercialization
- ❖ Angel Funding
- ❖ Venture Funding
- ❖ Pension Fund Investment
- ❖ Local and Regional Initiatives

# What Florida is Doing

- ❖ Strategic Plan – Enterprise Florida
- ❖ Florida Research Consortium
- ❖ Florida Venture Forum
- ❖ R&D Tax Exemption
- ❖ Innovation Initiative Fund\*
- ❖ Centers of Excellence\*
- ❖ The 21<sup>st</sup> Century Technology, Research and Scholarship Act
  - Florida Technology Research and Scholarship Board
  - World Class Scholars Program\*
  - State University Research and Economic Development Investment Program
- ❖ Closing Fund
- ❖ Opportunity Fund
- ❖ Institute for the Commercialization of Public Research
- ❖ EFI Phase 0 SBIR Program
- ❖ State Board of Administration 1.5% investment authorization
- ❖ Local and Regional Initiatives

\* not funded in 2008

# Program Findings



## **Statewide Innovation Development Models**

- ❖ North Carolina Board of Science and Technology
- ❖ Ohio Third Frontier Commission and Project
- ❖ Oklahoma Center for the Advancement of Science and Technology
- ❖ Pennsylvania Technology Investment Office (Ben Franklin Technology Partners)
- ❖ Georgia Research Alliance
- ❖ Missouri “Grow Me State” Initiative

# Program Findings

## *Statewide Innovation Model*



### **North Carolina Board of Science and Technology**

#### **Main objectives**

- Established in 1963
- Accelerate emerging technology and technology companies
- Investigate emerging areas of science and technology
- Establish infrastructure momentum in science and technology.

#### **Governance Structure**

- Division of North Carolina Department of Commerce
- Board appointed pursuant to legislation
- Managed by Executive Director

#### **Results and Successes**

- Facilitated creation of NC Biotechnology Center, the Technological Development Authority, North Carolina Research and Education Network, and the NC School of Science and Mathematics

# Program Findings

## *Statewide Innovation Model*



### **Ohio Third Frontier Commission**

#### **Main objectives**

- build world-class research capacity in the state
- support early-stage capital formation and the development of new products
- finance advanced manufacturing technologies to help existing industries increase productivity

#### **Governance Structure**

- Administered by nine-member Commission. Six regional appointments by Governor, plus Director Department of Commerce, Chancellor Board of Regents and Governor's Science and Technology Adviser
- 16-member Advisory Board advises on strategic planning, general management and program coordination
- Executive Director of Technology Division, Ohio Department of Commerce

#### **Results and Successes**

- More than \$637 million has been awarded to companies, universities, and economic development organizations throughout the state
- \$84 million to support six Entrepreneurial Signature Projects
- 900 Internships valued at \$3,000 each at Ohio companies

# Program Findings

## *Statewide Innovation Model*



### **Oklahoma Center for the Advancement of Science and Technology (OCAST)**

#### **Main objectives**

- OCAST administers the \$150 million Economic Development Generating Excellence trust fund (EDGE Fund), created for the purpose of increasing private and public applied research

#### **Governance Structure**

- Created by state legislation as a agency of state government in 1987
- Governed by a board of directors with members from both the private and public sector.
- Executive Director runs day-to-day operations

#### **Results and Successes**

- Since 1987, OCAST has invested \$151 million in R&D, technology commercialization and manufacturing modernization
- OCAST has also attracted nearly \$2.6 billion in private investments and federal funding

# Program Findings

## *Statewide Innovation Model*



### **Pennsylvania Technology Investment Office (TIO) and Ben Franklin Technology Partners (BFTP)**

#### **Main objectives**

- TIO coordinates Pennsylvania's technology development strategy and ensures that technology-based economic development groups in the state are working collaboratively
- BFTP provides seed and venture capital emerging technology-based businesses, support for commercialization activities

#### **Governance Structure**

- TIO is part of the Department of Community and Economic Development
- Governed by the Ben Franklin Technology Development Authority this is appointed by the Governor and chaired by the Secretary of Community and Economic Development
- The program operates under the name Ben Franklin Technology Partners (BFTP), which celebrated its 25th Anniversary in 2007
- Programs are coordinated by a Director, Statewide Affairs with the regional partnerships managed by their respective President/CEOs

#### **Results and Successes**

- From 1989 to 2001, BFTP boosted the state's economy by \$8 billion and helped to create 93,105 jobs (most recently available data)

# Program Findings

## *Statewide Innovation Model*



### **Georgia Research Alliance**

#### **Main objectives**

- Creating opportunity through sparking or facilitating new science and technology efforts that have the potential to help people while creating a substantial economic impact

#### **Governance Structure**

- Independent not-for-profit governed by leaders from industry and academia
- Receives state funding for investments in research
- Operations are funded through foundation and industry
- Staff of seven, led by President & CEO

#### **Results and Successes**

- Recruited 58 Eminent Scholars
- Established 24 Centers of Research Excellence
- Leveraged \$2 billion in federal and private research
- Served 100+ corporations through by university partnerships
- Created 125 companies and 4,000+ jobs

# Program Findings

## *Statewide Innovation Model*



### **Missouri “Grow Me State” Initiative**

#### **Main objectives**

- Research project to gain a better understanding of the state’s capital formation needs

#### **Governance Structure**

- Initiative was managed by a 13-member Steering Committee

#### **Recommendations**

- Formation of a Blue Ribbon Panel of leadership to create a five year Technology Based Economic Development Strategy
- Introduction of legislation related to commercialization funding and an angel tax credit
- Establishment of proactive policies for In-State Private Equity Investment & Economically Targeted Investments.

# Program Findings

## *R&D Tax Credit*



### **Benchmark Data**

- 42 states have enacted some type of tax credit policy to enhance research and development
- States with some type of R&D Tax Credit are as follows:
  - 1982 – 1
  - 1992 – 14
  - 2002 – 31
  - 2006 – 41

### **Qualifying Investment**

- 28 states with legislation providing credits related to the incremental increases in R&D investments. Of these 28 states, 19 use the Federal Tax Formula to determine the incremental increase while nine have developed their own formulas.
- Seven states provide R&D Credits against all R&D, not limited to incremental increases.

**“States that do not offer tax incentives to R&D investments face an increasing risk of losing R&D activities to states that offer such incentives...especially if those states are nearby”**

**—Federal Reserve Bank of San Francisco, Daniel J. Wilson-2007**

# Program Findings

## *Talent Development*



### **Georgia Intellectual Capital Partnership Program**

#### **Main objectives**

- Connect the intellectual resources of Georgia's 35 public college and universities to the state's business community
- Act as a broker and catalyst to strategically link USG with the state's economic development efforts
- meet company hiring needs through an expedited curriculum designed by a college or university to train knowledge workers

#### **Criteria**

- Creation of at least 10 new knowledge jobs
- Documented shortage of the type of worker needed for the industry.
- Creation of a full-time and compressed study program to prepare students
- Agreement by the company to hire each ICAPP graduate trained

# Conclusions



- ❖ Florida has the opportunity to transform...does it want to?
- ❖ Florida has a good foundation...if it can connect all the dots.
- ❖ Florida is unique...its approach to success should be as well.
- ❖ Inertia is the biggest challenge...the broader economic development constituency will have to unite to overcome
- ❖ No time is better than now.....

# Questions

[boyettelevy.com](http://boyettelevy.com)

## APPENDIX E

### End Notes

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