

FINAL REPORT

- Section One: History of the Centers of Excellence Program.
- Section Two: Action by the Florida Research Consortium.
- Section Three: Action by the Emerging Technology Commission.
- Section Four: Final Recommendation.
- Section Five: Oversight and Measurement Procedures.
- Section Six: Additional Recommendations.
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Section One: History of the Centers of Excellence

It would be difficult to report the findings of the Emerging Technology Commission without first providing a brief history of the program and the legislation that created the commission. In the Fall of 2001, Governor Jeb Bush expressed concern that while Florida's economy was thriving and fairly diversified, it had not achieved the type of diversification strategy developed by some other states that include a targeted effort to facilitate the production of a wide array of capital-intensive and high-wage businesses. His concern was part of an overall recognition that while Florida's economic success has been built on the strength of the tourism, agriculture, and the military/defense industries, these alone may not be capable of keeping Florida economically competitive in the future. Governor Bush charged his Office of Tourism, Trade, and Economic Development with identifying best practices in other states and searching for another sector to develop within the state's economic framework. However, he reminded his staff that the identification process should include thoughtful consideration of the impact that the development of another sector might have on Florida's pillar industries.

Enterprise Florida, in conjunction with OTTED, had already laid out an aggressive effort, to develop Florida's burgeoning high-tech industries, and it seemed only logical to take some action to stimulate further growth in that sector for a number of reasons including the following: the average wage of a high-tech employee in the state of Florida is over \$50,000, nearly double that of the average regular wage; high-tech startups and early-stage businesses are natural magnets for a greater share of the national venture capital market; facilities for high-tech production sometimes require a high level of infrastructure and capital investment; and high-tech products are relatively clean and therefore do little to threaten the quality of life and environment upon which Florida's tourism and agricultural industries thrive. Because of these reasons, more emphasis in research was placed upon developing a strategy for building out the high-tech sectors.

In November of 2001, OTTED staff reviewed some of the best practices of key competitor states as it related to their respective efforts to build out their high-tech sectors. California, Texas, North Carolina, Massachusetts, Virginia, and Maryland were the states most closely examined due to their high rankings in various studies related to high-tech employment, job growth, venture capital attraction, and workforce initiatives. The research revealed one common element in each of the states examined. That is that high-tech states were the beneficiary of one or more high-tech industrial clusters that had been built out over time, and those clusters were developed around a core research entity that was producing much of the technology that was being taken to market. In every case, that core was a university or other research entity that was responsible for a profound impact on industry. In turn, the industry was profoundly impacting the university or research entity with workforce options and training and a process of licensing and patents to yield the funding for additional collaborative research. Governor Bush determined that one step that could be taken to accelerate the development of the high-tech sectors would be to more strongly link Florida's university research institutions with industry, thus creating a core around which future businesses could be built on the basis of the commercialization of that research. A natural by-product of this linkage would be the improvement of the state's educational, capital, and workforce development needs.

In his annual State of the State Address in 2002, Governor Bush articulated his desire to set aside 100 million dollars for the development of university research centers so that Florida would become an international nexus for some types of technology research. Furthermore, with the assistance and support of Senator Jim King, Senator Ron Klein, and Representative Chris Hart, Governor Bush proposed legislation, and the Legislature passed legislation known as the Technology Development Act. However, the dollar amount allocated for funding the Centers of Excellence effort was trimmed to 30 million dollars. The legislation was codified in both statute and budget proviso language and outlined a four step process for the construction or designation of a Center of Excellence and maintained that a Center should be funded with a minimum investment of 10 million dollars. This constraint provided for only three Centers to be created in this first round of the program. The six step program is outlined as follows:

- By July 1, 2002, the Governor, Speaker of the House, and President of the Senate were to appoint a Chairman and eight other members of the Emerging Technology Commission. The Governor was to appoint the Chair and four regular members. The Speaker and President were to appoint two members respectively. The Secretary of Education, the Member of the Florida House serving on the Florida Research Consortium board, and the Member of the Florida Senate serving on the Florida Research Consortium board were to be ex-officio non-voting members of the Commission. The Governor appointed Joe Lacher to be Chairman and named Beverly Kitaoka, Penny Haskins, Joshua High, and David Gury to be regular members of the Commission. The Speaker named Jeff Saunders and Keith Hulbert to be regular members of the Commission, and the President named Joe Richardson and Dr. Robert Smallridge to be regular members of the Commission.

- By August 1, 2002, the Florida Research Consortium was to provide a report to the Emerging Technology Commission on the criteria that should be used for judging technologies indigenous to the state's university system.
- By September 15, 2002, the Emerging Technology Commission was to approve and adopt a finalized set of criteria.
- By October 1, 2002, the Emerging Technology Commission was to notify every entity in the State University System of the criteria and also provide them with the opportunity to make formal proposals for a Center of Excellence.
- By December 1, 2002, any proposal for a Center of Excellence was to be submitted to the Emerging Technology Commission.
- By February 1, 2003, after at least three public hearings, the Emerging Technology Commission was to submit to the State Board of Education a formal report and recommendation outlining at least two possible plans for consideration in the development of the Centers of Excellence program.

After the Board of Education receives the report outlining the plans and makes a decision, that decision will have to be ratified by the Legislative Budget Commission as defined in the budget proviso language that funded the legislation authorizing the creation of the Centers of Excellence program. In every other way, the Emerging Technology Commission has complied with every statutory requirement related to action and timing.

Section Two: Action by the Florida Research Consortium

In a well-defined effort to execute its statutory duty, the Florida Research Consortium, a private non-profit corporation made up of research scientists, technology-transfer experts, businessmen, and technologists, convened several times to develop a set of criteria for the Emerging Technology Commission to use in creating a plan for the establishment of Centers of Excellence. Much of the Research Consortium's deliberation centered around the factors outlined in the Florida statute. Those factors are the following:

- Maturity of existing university programs relating to a proposed center of excellence.
- Existing amount of university resources dedicated to activities relating to a proposed center of excellence.
- Comprehensiveness and effectiveness of site plans relating to a proposed center of excellence.
- Regional economic structure and climate.
- The degree to which a university proposed to house a center of excellence identifies and seizes opportunities to collaborate with other public or private entities for research purposes.

- The presence of a comprehensive performance and accountability measurement system.
- The use of an integrated research and development strategy utilizing multiple levels of the educational system.
- The ability of a university proposed to house a center of excellence to raise research funds and leverage public and private investment dollars to support advanced and emerging technological research and development projects.
- The degree to which a university proposed to house a center of excellence transfers advanced and emerging technologies from its laboratories to the commercial sector.
- The degree to which a university proposed to house a center of excellence stimulates and supports new venture creation.
- The existence of a plan to enhance academic curricula by improving communication between academia and industry.
- The existence of a plan to increase the number, quality, and retention rate of faculty, graduate students, and eminent scholars in advanced and emerging technology-based disciplines.
- The existence of a plan to increase the likelihood of faculty, graduate students, and eminent scholars pursuing private-sector careers in the state.
- Ability to provide capital facilities necessary to support research and development.

By mid-July, the Florida Research Consortium had created an official recommendation and was prepared to present to the Emerging Technology Commission a proposed list of criteria for the process. That recommendation is included in this report as Attachment A.

Section Three: Action by the Emerging Technology Commission

On August 1, 2002, in Orlando, Florida, Chairman Joe Lacher called the first meeting of the Emerging Technology Commission to order. Included in that agenda was an official review of the statute authorizing the creation of the Commission, an election of the offices of Vice-Chair and Secretary, and a briefing of the Sunshine Laws. Furthermore, the Commission heard the official report of the Florida Research Consortium and debated the merits and value of the recommended criteria.

On September 4, 2002, in Miami, Florida, the Commission met again to hold public discussion on the criteria. Enterprise Florida briefed the Commission on the long-term strategic plan of the state and provided materials describing some of the state's emerging technology sectors. Also in that meeting, the Commission officially heard experts and economists provide testimony and presentations describing the best practices of other states with similar programs and how to maximize the economic impact from the Centers of Excellence program in Florida. More debate and discussion about the final criteria was also included as part of the day's session.

On September 13, 2002, the Commission met by public conference call to further debate the criteria and adopted a final list of the criteria that would be codified and published for the state's universities' use. The Chairman and the Commission directed the staff support to produce a Proposal Information Package to be mailed to each university in the state. The package included the final set of criteria adopted by the Commission, a list of instructions for submission of a proposal, and a description of the process. That Proposal Information Package is included with this report as Attachment B. Universities were instructed to submit a letter of intent if they desired to submit a proposal.

Due to the fact that December 1st fell on a weekend, the Commission granted interested universities the opportunity to submit their proposals by Tuesday of the week following the 1st. By that time, the Emerging Technology Commission received sixteen proposals for a Center of Excellence. A grid outlining the proposals is included with this report as Attachment C, but a brief listing is included in the following:

- **Florida Atlantic University's Proposal for a Center for Intermodal Transportation, Safety and Security.**
- **Florida Gulf Coast University's Proposal for a Florida Gulf Coast University Triad.**
- **Florida International University's Proposal for a Florida Information Security Center.**
- **The University of Central Florida's Proposal for a Modeling and Simulation Center of Excellence.**
- **The University of North Florida's Proposal for a Center for Innovation in Information Technology.**
- **Florida Agricultural and Mechanical University's Proposal for a Center of Excellence for Atomic, Molecular, and Plasma Physics.**
- **The Florida Space Research Institute's Proposal for a Center for Spaceport Technology, Biotechnology, Remote Sensing, and Telecommunications.**
- **The Florida Solar Energy Center's Proposal for a Center of Excellence for Hydrogen Research.**
- **Florida State University's Proposal for Securing Florida and the Nation's Electrical Energy Systems.**
- **The University of Central Florida's Proposal for a Florida Photonics Center of Excellence.**
- **Florida Atlantic University's Proposal for a Center for Biomedical and Marine Biotechnology.**
- **Florida State University's Proposal for the Bio-Nanotechnology Nexus.**
- **The University of Florida's Proposal for a Center of Excellence in Regenerative Health and Biotechnology.**
- **The University of Florida's Proposal for a NanoBio Science and Engineering Center of Excellence.**
- **The University of Miami's Proposal for a Center for Biotechnology Development in Cellular Therapies, Tissue Engineering, and Reparative Medicine.**

- **The University of South Florida's Proposal for a Center of Excellence in Bioengineering and Life Science.**

The proposals can be roughly divided into three categories. Five of them were related to Information Technology, five proposals related to miscellaneous technologies, and six proposals related to Biomedical and Life Sciences. The proposals are not listed in alphabetical order but in the order in which they were heard according to group.

After the sixteen proposal teams were notified that their proposal was accepted for consideration, the Emerging Technology Commission held three public hearings on December 16, 2002, January 9, 2003, and January 16, 2003. In the first hearing, the five presentation teams of those proposals related to Information Technology made an oral presentation before the Commission. In the second, the miscellaneous teams made their oral presentations, and in the third public hearing the Biomedical and Life Science teams made their oral presentations. In each public hearing, the Commission maintained a full quorum, and public policy and technology experts were made available for the Commission's counsel. The format for each presentation was to allow an hour with approximately 20-30 minutes for a powerpoint presentation followed by a question and answer session with both the commissioners and the expert panelists.

On January 24, 2003, the Emerging Technology Commission met in a final session of deliberation. No formal comment from any presentation team was permitted although expert panelists were available for questions as they arose. Chairman Joe Lacher formally led the discussion. To gain consensus, the commissioners grouped the proposals into three general categories. The highest or best category was the one that the individual voting commissioners felt most closely matched the criteria for a Center of Excellence. The following list includes proposals that received at least one commissioner's vote as being most closely aligned with the criteria for a Center of Excellence:

- **Florida International University's Proposal for a Florida Information Security Center.**
- **The University of Central Florida's Proposal for a Modeling and Simulation Center of Excellence.**
- **The University of North Florida's Proposal for a Center for Innovation in Information Technology.**
- **The Florida Space Research Institute's Proposal for a Center for Spaceport Technology, Biotechnology, Remote Sensing, and Telecommunications.**
- **The Florida Solar Energy Center's Proposal for a Center of Excellence for Hydrogen Research.**
- **Florida State University's Proposal for Securing Florida and the Nation's Electrical Energy Systems.**
- **The University of Central Florida's Proposal for a Florida Photonics Center of Excellence.**

- **Florida Atlantic University's Proposal for a Center for Biomedical and Marine Biotechnology.**
- **Florida State University's Proposal for the Bio-Nanotechnology Nexus.**
- **The University of Florida's Proposal for a Center of Excellence in Regenerative Health and Biotechnology.**
- **The University of Florida's Proposal for a NanoBio Science and Engineering Center of Excellence.**
- **The University of Miami's Proposal for a Center for Biotechnology Development in Cellular Therapies, Tissue Engineering, and Reparative Medicine.**
- **The University of South Florida's Proposal for a Center of Excellence in Bioengineering and Life Science.**

From this list, further consolidation was developed by consensus to bring the list to the following top seven:

- **The Florida Solar Energy Center's Proposal for a Center of Excellence for Hydrogen Research.**
- **Florida State University's Proposal for Securing Florida and the Nation's Electrical Energy Systems.**
- **The University of Central Florida's Proposal for a Florida Photonics Center of Excellence.**
- **Florida Atlantic University's Proposal for a Center for Biomedical and Marine Biotechnology.**
- **The University of Florida's Proposal for a Center of Excellence in Regenerative Health and Biotechnology.**
- **The University of Florida's Proposal for a NanoBio Science and Engineering Center of Excellence.**
- **The University of South Florida's Proposal for a Center of Excellence in Bioengineering and Life Science.**

From this list, further consolidation was developed by consensus to bring the list to the following top four:

- **The University of Central Florida's Proposal for a Florida Photonics Center of Excellence.**
- **Florida Atlantic University's Proposal for a Center for Biomedical and Marine Biotechnology.**
- **The University of Florida's Proposal for a Center of Excellence in Regenerative Health and Biotechnology.**
- **The University of Florida's Proposal for a NanoBio Science and Engineering Center of Excellence.**

It was these four proposals that captured the remainder of the Commission's debate in the attempt to develop options for the Board of Education to examine as a part of its statutory duty.

Section Four: Final Recommendation.

In developing a final recommendation for the Board of Education, the Emerging Technology Commission engaged in a laborious and painstaking process to gather information from industry experts, provide ample opportunity for testimony to the presentation teams, and engage in ample debate as to the issues related to drawing Florida's research universities into a stronger alliance with the economic development strategy of the state. After considerable debate and discussion, the Commission unanimously rendered a decision. The statute requires the Commission to present the Board with a minimum of two plans for consideration of funding. The Commission, in its final deliberations, agreed upon four funding options that are outlined in Attachment D to this letter. These options fulfill the requirement of the statute, and while the Board of Education may wish to consider these alternatives, the Emerging Technology Commission recommends Option 1. This option would provide 10 million dollars each to fund three Centers of Excellence in the state.

RECOMMENDATION OF THE EMERGING TECHNOLOGY COMMISSION

- **Florida Atlantic University's Proposal for a Center of Excellence for Biomedical and Marine Biotechnology at 10,000,000.00 dollars. This Center will focus on the discovery and development of compounds and medicines capable of treating various diseases including cancer, cardiovascular disease, and arthritis. Collaborative efforts with industry and other universities will be utilized in a long-term commercialization strategy, and the Center will house faculty capable of attracting research funds at levels necessary for continued research**
- **The University of Central Florida's Proposal for a Photonics Center of Excellence at 10,000,000.00 dollars. This Center will build upon efforts already underway at UCF to make Florida the world leader in optics, lasers, and photonics research and education. Will also expand its research into the areas of nanophotonics and biophotonics. The Center will work closely with existing industry, the High Tech Corridor Council, and the UCF Technology Incubator to commercialize new applications.**
- **The University of Florida's Proposal for a Center of Excellence in Regenerative Health Biotechnology at 10,000,000.00 dollars. The UF Center will house two facilities for microbial fermentation and vector production. Both will be used for developing probiotics and gene therapies for treating cancer and genetic diseases. It will also provide technological advances in gene therapy and adult stem cell transplantation. The very nature of the research and production being performed at the Center will have immediate**

and long-term economic impact and will serve as a magnet for future state and federal funds.

To ensure compliance with the Florida statute governing the Emerging Technology Commission, the Commission made a preliminary summary report by letter to Board of Education Chairman Phil Handy on Thursday, January 30, 2003. A copy of that letter is included with this report as Attachment E.

Section Five: Oversight and Measurement Procedures

It would be duplicative of the Commission to re-write each one of the proposals into a single plan; therefore, the three proposals will be submitted along with this report as a part of a single binder to be used for the Board of Education's consideration. It should be noted that Florida Atlantic University's proposal was originally budgeted at 14 million dollars. Since only 10 million dollars was available as a part of the recommended funding option, at the instruction of the Commission, FAU's presentation team revised both their budget and their proposal to provide a greater focus on marine biotechnology, a research area in which Florida has a decided advantage over other states.

The three proposals were selected to be a part of the Commission's final recommendation because of their respective compliance with the criteria adopted by the Commission. It should be noted, though, that several of the other proposals included elements of great interest. Some of those elements, while not being written directly into the proposals selected, will be made a part of the recommended standard for performance review so that they may by default be a part of each proposal that is funded. For instance, the University of South Florida's K-20 education integration in their proposal should be made standard in each of the other proposals and will be included in the performance review standards.

Part of the statutory duty of the Emerging Technology Commission is to provide a plan for the oversight and review of the success of the Centers of Excellence. As a part of the written and oral presentation process, the presentation teams were encouraged in their proposals to identify measurement standards for their programs including factors related to economic success. The Commission recognizes that commercialization of some of the basic research may be a long-term process rather than one that produces immediate impact, and so with that knowledge, the Commission developed general oversight review standards as well as specific review standards for each program. These standards will be based upon the proposals as well as how the presentation teams asked to be measured. In its quarterly review and oversight meetings, the Commission will use these standards as a measurement tool.

General Measurement Standards:

- Full financial disclosure of expenditures related to the cost proposal of the Center of Excellence.

- Report on the effectiveness and success of the research being performed within the Center of Excellence.
- Report on the state of research collaboration with other universities or research entities as well as private industry.
- Report generally on the state of personnel additions relative to the Center of Excellence and the core research being performed therein.
- Report on the integration of the mission of the Center of Excellence with all levels of the K-20 education system.
- Report on the number of industry internships granted to graduate and post-doctorate students as a result of interaction with the Center of Excellence.
- Report on the Overall Economic Impact of the Center's Existence including number of inventions, number of patents, number of licensed technologies, and amount of revenue generated from royalties and licenses.
- Report on the development of start-up businesses as a result of technology research being performed in the Center.
- Report on the impact of the Center's relationship with out of state businesses.
- Report on the leveraging of financial resources including the obtaining of public and private matching funds as well as direct Federal grants or contracts.
- Report on any interest of direct collaboration with Venture Capital entities.

Florida Atlantic University Center of Excellence Specific Standards:

- Report on the status of the construction of a Core Facility for research.
- Report on the establishment of an analytical lab at Harbor Branch.
- Report on the status and effectiveness of the graduate student and postdoctorate workforce training programs.
- Report on the status and effectiveness of the seminar programs.
- Report on the use of submersibles and other ocean exploration equipment.
- Report on the status of the Marine Biotechnology Executive Education program.

University of Central Florida Specific Standards:

- Report on the development of a state of the art nano-fabrication facility for greater photonics and optics research.
- Report on improvements in a more high quality graduate education in optical science and engineering.
- Report on the enhancement of optics education at all levels including the 2+2 Community College partnership.
- Report on making FPCE research topics part of existing courses in photonics and optics.
- Report on the status of the effort to win a National Science Foundation Engineering Research Center in association with the Center of Excellence.
- Report on the number of publications of scientific research results.

University of Florida Specific Standards:

- Report on the status of the purchase of the buildings to house the Center of Excellence.
- Report on the status of the construction of the Vector Production facility, the microbial fermentation facility, and the cell culture facility.
- Report on the status of the joint program with Santa Fe Community College related to the Biotech training program, the High-Tech training program, and the Regulatory Affairs training program.
- Report on the status of the joint program with the Florida Community College in Jacksonville in a course study in Bioinformatics.
- Report on the status of the development of an IDP track in Biotechnology in the UF College of Medicine.
- Report on whether new companies have begun to initiate plans to move into the new Center of Excellence.

It is the intention of the Emerging Technology Commission to use these general and specific review criteria beginning with our first statutorily required measurement and reporting meeting on June 30, 2003. Some of the specific criteria may change over time due to completion of construction projects, but at that time, a new criterion will be substituted.

Section Six: Additional Recommendations

The recommendations included in this section go beyond the responsibility of the Commission but capture observations made during the course of the process. The Commission offers them to the State Board of Education for consideration. It is unfortunate that the Centers of Excellence program was funded in the 2002 Legislature at only 30 million dollars. There is no doubt that all sixteen of the proposals represent an extraordinary collection of the fine research being performed at our universities, and had the funding been available, the state would have benefited significantly if more Centers could be established. Of special consideration in this regard is the University of Florida's Bio-Nanotechnology proposal. This was fourth of our top four proposals and the only one we could not fund within the thirty million dollar cap.

The degree of collaboration between the universities exhibited in these proposals was exceptional. This joint effort between our public and private universities provides significant benefits to the state, and the State Board of Education should urge Florida universities to pursue other opportunities for collaboration.

The degree of success in commercialization of research developed at our universities varies widely. The University of Florida's success is significantly above the national average. The business incubator at the University of Central Florida is recognized as one of the top in the country. These are just two examples of excellence witnessed during the presentations. What is lacking is a systematic way of capturing the best practices of all the universities. Enterprise Florida, or some other appropriate entity such as the Florida Research Consortium, should be asked to create a collaborative effort of the universities to enhance their efforts at privatization.

The University of South Florida had an exceptional program for involving students and faculty from all levels of the state's K through 20 education system. Again, this is a best practice that should be captured and emulated throughout Florida.

Each of the sixteen presentation teams exercised grace and cooperation with the Commission. They are to be commended for their effort and commitment to this process. Many comments have been expressed about the unprecedented cooperation between university and university and between university and industry as this process has unfolded. In short, it has breathed new life into the research community in Florida.

Special recognition also should be provided to the members of the Emerging Technology Commission who spent many hours of valuable personal time in service to their state. A full collection of the Commission's biographies is included with this report as Attachment F.

It is important that special thanks be provided to Senator Ron Klein, and Representative Chris Hart for their commitment to this program. Their active involvement in the hearings and the insights and advice they provided the commission were invaluable.

Finally, it is important to recognize the leadership provided by Governor Jeb Bush, President of the Senate Jim King, and the Speaker of the House Johnnie Byrd in assuring that this process was a non-partisan, independent effort to assure the best outcome for the citizens of Florida. Their continued leadership will assure the future success of Centers of Excellence.