

SENATE STAFF ANALYSIS AND ECONOMIC IMPACT STATEMENT

(This document is based on the provisions contained in the legislation as of the latest date listed below.)

BILL: CS/SB 1844

SPONSOR: Commerce and Economic Opportunities Committee and Senators King and Klein

SUBJECT: Technology Development

DATE: March 7, 2002 REVISÉD: _____

	ANALYST	STAFF DIRECTOR	REFERENCE	ACTION
1.	<u>Bimholz</u>	<u>Maclure</u>	<u>CM</u>	<u>Favorable/CS</u>
2.	_____	_____	<u>CA</u>	_____
3.	_____	_____	<u>AGG</u>	_____
4.	_____	_____	<u>AP</u>	_____
5.	_____	_____	<u>RC</u>	_____
6.	_____	_____	_____	_____

I. Summary:

This committee substitute creates the “Florida Technology Development Act,” which establishes a process for the State Board of Education (board) to develop, approve, and authorize expenditures for a plan for establishing one or more centers of excellence within, and in collaboration with, the State University System. The process includes, subject to legislative appropriation, the creation of the Emerging Technology Commission (commission) within the Governor’s Office for the purpose of recommending preliminary plans to the board for consideration. When developing these plans, the commission must consider certain input from Florida Research Consortium, Inc., and individual experts in relevant fields.

This committee substitute creates section 240.72, Florida Statutes.

II. Present Situation:

“Technology Transfer” Defined and Described

“Technology transfer” is commonly used to refer to a complex commercialization process through which an entity that develops a new technology, but does not have the wherewithal or desire to bring it to market, transfers that raw technology to another entity that does. Many different types of donor-recipient pairings can engage in technology transfer, including university-to-business, business-to-business, and federal government-to-business.

Technology transfer between a university and a business can occur in many different ways. The Council on Governmental Relations describes six major models of technology transfer:

- **Sponsored Research:** Typically, a corporation provides funding for a specified statement of work for a limited period of time.

- Collaborative Research: Collaborative research, especially when partially funded by government, enables participants to leverage limited resources in the achievement of mutually beneficial research objectives.
- Consortia: In a university-based research consortium, participating companies join forces and contribute resources, often in the form of an annual fee, to support research in a technical area of common interest.
- Technology Licensing: Consideration for a university license agreement is offered by a licensee to obtain commercialization rights in intellectual property owned by a university.
- Start-up Companies: New companies are established to commercialize a university technology, rights to which are obtained through a license agreement.
- Exchange of Research Materials: Material transfer agreements generally stipulate that the materials are provided for research purposes only and not for commercialization.¹

A business's use of university faculty as consultants or its hiring of university students could also be considered forms of technology transfer.²

Benefits of Technology Transfer

Research indicates that “university-industry technology transfer can be a stimulant, precursor, or complement to building a high-skills, high-wage state economy.”³ In fact, the licensing of innovations by universities and other research entities added more than \$40 billion to the U.S. economy and supported 270,000 jobs in 1999.⁴

Moreover, as described by the Industrial Research Institute, technology transfer provides many other benefits to both businesses and universities.⁵ Corporate benefits include accessing expertise not available in corporate laboratories, assisting in the renewal and expansion of a company's technological inventory, gaining access to students as potential employees, using the university as a means of facilitating the expansion of external contacts for the industrial laboratory, expanding pre-competitive research with universities and with other companies, and leveraging internal research capabilities. Technology-transfer benefits to universities include obtaining financial support for a university's educational and research missions; broadening the experience

¹ Council on Governmental Relations, *A Review of University Industry Research Relationships*, at <http://www.cogr.edu/univ.htm>, 1996 (last visited October 9, 2001).

² Business-Higher Education Forum, *Working Together, Creating Knowledge: The University-Industry Research Collaboration Initiative*, 2001, p. 21.

³ Louis G. Tornatzky, Ph.D., *Building State Economies by Promoting University-Industry Technology Transfer* (Washington, D.C.: National Governors Association, 2000), p.7.

⁴ Association of University Technology Managers, Inc., *Surveys – Common Questions & Answers About Technology Transfer*, at <http://www.autm.net/pubs/survey/qa.html>, November 13, 2000 (last visited September 23, 2001).

⁵ Industrial Research Institute, *A Report on Enhancing Industry-University Cooperative Research Agreements* (Washington, D.C., 1995), p. 1, as cited by the Business-Higher Education Forum, *supra* note 2, at 22.

of students and faculty; identifying significant, interesting, and relevant problems; enhancing regional economic development; and increasing employment opportunities for students.

It is important to note, though, that, while technology licensed to either in-state or out-of-state businesses is valuable, it does not result in many of the aforementioned benefits that stem from close university-industry collaboration or from the spin-off of local, university-generated start-up companies. Many state governments recognize that it is through these mechanisms, as well as through the related attraction of research and development-oriented firms from other states, that “university-industry collaborations can play a central role in economic development efforts.”⁶

Florida Universities’ Technology Transfer Lags That of Peers⁷

There are many different ways to measure a university’s technology-transfer performance, including the number of invention disclosures by university researchers, the number of patent applications filed and patents received, the number of licenses executed and start-up companies formed, and the amount of revenue generated by technology-transfer transactions. While invention disclosures and patents are important because they indicate how much potentially transferable technology a university is creating, licenses, start-up companies, and associated revenue can provide insight into how effectively a university is translating its innovations into income and economic development.

With the possible exceptions of the University of Florida’s (UF) patent generation, the University of South Florida’s company establishment, and UF’s and Florida State University’s (FSU) license-income levels, Florida universities, in general, do not appear to be performing as much technology transfer as many of their peer universities. Moreover, most of FSU’s and UF’s revenues were derived from a total of three products.⁸

Lack of Technology Transfer-Related Inputs Constrains Development⁹

Many different types of inputs are required to fuel the technology-transfer process, including research and development (R&D) and commercialization resources.

Research and development. The reality of R&D is that it usually involves much more research than development since few innovations have commercial potential. As with the University of Florida and Florida State University, the success of high-grossing research universities is typically due to a small number of blockbuster patents or copyrights. In fact, of the 20,000 active

⁶ Business-Higher Education Forum, *supra* note 2, at 22-23.

⁷ Senate Committee on Commerce and Economic Opportunities, *Technology Transfer and Commercialization*, Interim Project Report 2002-123, November 2001, pp. 4-5.

⁸ Auditor General, *Assignment by Universities of Intellectual Property and Related Income to University Research Foundations*, Report No. 01-144, May 2001, p. 11. FSU holds a patent related to Taxol, a cancer-fighting drug. UF holds a patent related to Trusopt, a drug used in treating glaucoma, and receives royalties from the sale of Gatorade.

⁹ Senate Committee on Commerce and Economic Opportunities, *supra* note 7, at 6-7.

U.S. university licenses in place in FY 2000, only 120 have generated annual revenues in excess of \$1 million over a number of years¹⁰

Despite the importance of R&D to the technology-transfer process, the state is lagging behind many of its competitors in terms of R&D intensity (i.e., the ratio of R&D expenditures to gross state product). Although ranked 13th in the nation in 1998 in total R&D expenditures, Florida was ranked 31st in overall R&D intensity, last among the top 15 R&D-performing states.^{11, 12} More specifically, Florida ranked 45th in the nation in terms of R&D performed by its universities and colleges as compared to the gross state product.

Commercialization resources. While universities perform a mixture of basic and applied research, technology investors are typically interested in more-developed, and thus less risky, products. Thus, there is often a gap between the raw research results of a university and the need of a company for a working product prototype or an experienced management team to commercialize a product.¹³ The gap is sometimes called the “Valley of Death” because it is a key reason why many university invention disclosures are never commercialized.^{14, 15} Research indicates that closing this gap in order to license products to existing or university spin-off companies usually requires a variety of resources, including pre-venture “seed” funding, sound business guidance, and administrative support.¹⁶

Furthermore, as noted by Berglund and Clarke, “the availability of capital to support start-up and emerging companies – the type of companies on which the new economy depends – is essential if a region is to build its R&D base.”¹⁷ Florida, however, is not attracting venture capital at a rate

¹⁰ According to Raymond Bye, Jr., Vice President for Research, Florida State University, in a letter to staff of the Senate Committee on Commerce and Economic Opportunities, September 6, 2001, this data will soon be reported by the Association of University Technology Managers, Inc.

¹¹ The top-performing states ranking higher than Florida in R&D intensity were Massachusetts, Maryland, Michigan, Washington, California, New Jersey, Colorado, Pennsylvania, Virginia, Illinois, Ohio, New York, North Carolina, and Texas.

¹² Analysis is based on the National Science Foundation’s most current data regarding R&D expenditures in the nation. See National Science Foundation, Division of Science Resources Studies, *National Patterns of R&D Resources: 2000 Data Update*, Arlington, VA (NSF 01-309), March 2001, and U.S. Department of Commerce, Bureau of Economic Analysis, *Regional Accounts Data, Gross State Product Data*, June 4, 2001.

¹³ Raymond Bye, Jr., *supra* note 10.

¹⁴ The term “Valley of Death” was used by Raymond Bye, Jr. See *id.*

¹⁵ Although 10,052 invention disclosures were received in 1999 by the 139 U.S. universities that responded to the most recent licensing survey of the Association of University Technology Managers, Inc., those universities only executed 3,295 licenses/options (i.e., a ratio of approximately three disclosures for every license/option). [*AUTM Licensing Survey, FY 1999 Survey Summary*, 2000, p. 34] The ratio for the four Florida universities described in Exhibit 1 of this report is nearly six disclosures received for every license/option executed.

¹⁶ Senate Committee on Commerce and Economic Opportunities, *supra* note 7, at 7.

¹⁷ Dan Berglund and Marianne Clarke, *Using Research and Development to Grow State Economies* (Washington, D.C.: National Governors Association, 2000), p. 8.

comparable to that of many of its competitors. Although ranked 10th and 11th in the nation in total venture capital investment in 1999 and 2000, respectively, Florida was ranked 20th in terms of the ratio of 1999 venture capital investment to gross state product, next-to-last among the top 15 venture-capital-attracting states.^{18, 19} Moreover, over the past 3-5 years, venture capital investment in Florida has grown more slowly than the investment in most of those states and has been concentrated in relatively fewer firms.²⁰ The bursting of the “dot-com” bubble has sharply reduced venture capital investment in Florida (and across the nation) with investors focusing on established, rather than start-up, companies.²¹

Florida Research Consortium, Inc.

Florida Research Consortium, Inc., a recently created, private not-for-profit advisory board to ITFlorida.com, Inc., is composed of volunteer university heads and industry leaders whose goal is to establish progressive research programs at Florida’s universities.^{22, 23} These programs are to focus on attracting leading scholars and researchers in technology-based disciplines to Florida’s universities in order to build the state’s knowledge base; endowing faculty and research chairs in targeted disciplines; facilitating the work of technology-transfer offices at member universities; promoting collaboration between academic and industrial researchers, scientists, and engineers; and promoting collaboration between Florida industry and academia to facilitate the development and deployment of new technologies.

¹⁸ The top-performing states ranking higher than Florida in terms of the ratio of venture capital investment to gross state product were California, Massachusetts, Colorado, Washington, New York, Virginia, Maryland, Connecticut, Pennsylvania, Georgia, Texas, Illinois, and New Jersey.

¹⁹ Venture Economics/NVCA/Thomson Financial Securities Data, Internet, 2001, as cited in State Science & Technology Institute, “Total Venture Capital Investments By State 1991-2000,” *SSTI Weekly Digest*, August 31, 2001, and U.S. Department of Commerce, Bureau of Economic Analysis, *Regional Accounts Data, Gross State Product Data*, June 4, 2001.

²⁰ Venture Economics/NVCA/Thomson Financial Securities Data, Internet, 2001, as cited in State Science & Technology Institute, “Total Venture Capital Investments By State 1991-2000” and “Number of Companies Receiving Venture Capital Investments By State 1991-2000,” *SSTI Weekly Digest*, August 31, 2001.

²¹ Christopher Boyd, “Venture capital trickles in,” *Orlando Sentinel*, November 1, 2001; Jane Bussey, “Venture capital investment slacking off,” *The Miami Herald*, November 1, 2001.

²² ITFlorida.com, Inc., *Florida Research Consortium*, at <http://www.itflorida.com/tech/consortium.asp> (last visited March 2, 2002).

²³ The Legislature created the Information Service Development Technology Taskforce in June 1999 to focus on the development of state policies that would enable Florida to compete successfully in the information age. The taskforce was dissolved in July 2001. ITFlorida.com, Inc., an outgrowth of the taskforce, is an umbrella, not-for-profit organization that represents Florida’s diverse technology community on a statewide basis. ITFlorida.com, Inc., promotes the common interests of its members by doing the following: advocating on behalf of its members and formulating policy recommendations to federal, state, and local government; serving as a clearinghouse for technology-related information; and sponsoring statewide conferences, symposia, and other events focused on issues important to its members and the state. See ITFlorida.com, Inc., *About*, at <http://www.itflorida.com/browse/about.asp> (last visited March 2, 2002).

Education Governance²⁴

Currently, the Governor and Cabinet serve as the State Board of Education. This board is the chief policy making body of public education in the state. Additionally, there is a Department of Education under an elected Commissioner of Education.

In the 1998 General Election, Floridians amended the State Constitution, effective January 7, 2003, to require a new state board of education consisting of seven members appointed by the Governor and subject to confirmation by the Senate and to require that the State Board of Education appoint the Commissioner of Education. The 2000 Legislature addressed the constitutional amendment by enacting the Florida Education Governance Reorganization Act of 2000 (ch. 2000-321, L.O.F.). This act proposes to achieve, within existing resources, systemic change in education governance by establishing a seamless academic system that fosters an integrated continuum of kindergarten through graduate school education for Florida's citizens. The act provides for the creation of an 11-member task force to address implementation issues for transition to the new governance system. The task force submitted its recommendations to the Legislature on March 1, 2001.

Based on the recommendations of the task force, the 2001 Legislature passed the Florida Education Governance Reorganization Implementation Act (act) (ch. 2001-170, L.O.F.). Effective July 1, 2001, the act transferred the powers and duties of the Board of Regents, which governed the state universities, to local boards of trustees for each university and the newly created Florida Board of Education (FBOE).²⁵ The Florida Board of Education oversees the entire K-20 educational system. Members of the FBOE are appointed by the Governor and must be confirmed by the Senate. The FBOE is housed within and operates under the direction of the State Board of Education. Activities of the FBOE are subject to review and approval by the State Board of Education. The act also required the Governor to appoint, by July 1, 2001, a Secretary of the FBOE to serve as the FBOE's primary liaison with all entities involved in the reorganization of education. The Secretary of the FBOE serves as the head of the Education Reorganization Workgroup and the K-20 education leadership team.

III. Effect of Proposed Changes:

This committee substitute creates s. 240.72, F.S., which may be cited as the "Florida Technology Development Act" (act). The act provides for the following:

²⁴ Unless otherwise cited, material in this subsection of the analysis is primarily drawn from and based on two sources: House of Representatives Council for Lifelong Learning, *Education Governance Fact Sheet*, September 2001, and Office of Program Policy Analysis and Government Accountability, *Justification Review, State University System, Department of Education*, Report No. 01-28, May 2001, pp. 2-4.

²⁵ The State University System consists of the following eleven public postsecondary institutions: the University of Florida, Florida State University, Florida Agricultural and Mechanical University, the University of South Florida, Florida Atlantic University, the University of West Florida, the University of Central Florida, the University of North Florida, Florida International University, Florida Gulf Coast University, and New College of Florida. See House of Representatives Council for Lifelong Learning, *State University System (SUS) Fact Sheet*, September 2001.

- Defines the term “center of excellence” to mean a program that, among its functions:
 - Facilitates the identification of collaborative research opportunities between universities and businesses.
 - Facilitates the acquisition of public and private funding for collaborative research opportunities and maximizes the leveraging of such funds.
 - Creates partnerships between industrial and governmental entities to advance knowledge and research and to move technologies from academic laboratories and research centers to commercial sectors.
 - Stimulates and supports new venture creation through partnerships with venture capital firms and other business, governmental, and educational entities.
 - Assists in the enhancement of advanced academic curricula through improved communication between academia and businesses.
 - Increases the number of graduates and faculty researchers in advanced technology programs while ensuring that a larger percentage of such graduates pursue careers in Florida industries.
 - Recruits and retains eminent scholars in advanced technology disciplines.
 - Provides capital facilities necessary to support research and development.
- Subject to legislative appropriation, creates the Emerging Technology Commission (commission) within the Governor’s Office for the purpose of guiding the establishment of centers of excellence within, and in collaboration with, the State University System. The commission would consist of:
 - Nine regular members, appointed on or before July 1, 2002, who must be recognized business leaders, industrial researchers, academic researchers, scientists, or engineers. The regular members include four regular members and the chair appointed by the Governor; two regular members appointed by the House Speaker; and two regular members appointed by the Senate President.
 - The Secretary of Education as an ex officio nonvoting member, to be replaced, effective January 7, 2003, by the Commissioner of Education as an ex officio nonvoting member.
 - As ex officio nonvoting members, the state senator and state representative who serve as members of the Florida Research Consortium, Inc.²⁶

Commission members must serve without compensation but are entitled to receive certain per diem and travel expenses while performing their duties. The Governor’s Office must provide staff support for the commission and per diem and travel expenses for commission members.

²⁶ Florida Research Consortium, Inc., is a recently created, private not-for-profit advisory board to ITFlorida.com, Inc. It is composed of volunteer university heads and industry leaders whose goal is to establish progressive research programs at Florida’s universities. At the time of the writing of this analysis, one state senator and one state representative serve as ex officio members on the organization’s board of directors. See ITFlorida.com, Inc., *Board of Directors of the Florida Research Consortium*, at http://www.itflorida.com/tech/consort_board.asp (last visited March 7, 2002), and ITFlorida.com, Inc., *Board of Directors of the Florida Research Consortium*, at <http://www.itflorida.com/press/ResearchConsortium.pdf> (last visited March 7, 2002).

- Provides, that, by August 1, 2002, Florida Research Consortium, Inc., must provide a report to the commission, which describes and prioritizes factors that contribute to the success of the creation of centers of excellence. At a minimum, the factors must include:
 - 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.
- Provides that, by September 15, 2002, the commission must develop and approve criteria for evaluating university-submitted proposals for creating centers of excellence. When developing such criteria, the commission must consider the report provided by Florida Research Consortium, Inc., and hold at least two public hearings for the purpose of soliciting expert testimony. By October 1, 2002, the commission must provide a list of such criteria to each university in the State University System and to the State Technology Office for publishing on the Internet within 24 hours after the office's receipt of the list. Concurrent with the provision of the criteria list to the universities, the

commission must notify each university of the opportunity to submit to the commission written proposals for establishing one or more centers of excellence. Proposals must specifically address the evaluation criteria developed by the commission and delineate how funding would be used to develop one or more centers of excellence. Proposals must be submitted to the commission by December 1, 2002. Upon an affirmative vote of a majority of its members, the commission may accept a proposal submitted after the deadline.

- Provides that, by February 1, 2003, the commission must submit to the State Board of Education at least two, but no more than five, recommended plans for the establishment of one or more centers of excellence in the state. Recommended plans must specifically address the evaluation criteria developed by the commission and delineate how funding would be used to develop the centers of excellence. When developing such recommended plans, the commission must consider the submitted university proposals and hold at least three public hearings for the purpose of soliciting expert testimony, including, but not limited to viewing presentations of the university proposals.
- Provides that, by March 15, 2003, the State Board of Education must develop and approve a final plan for the establishment of one or more centers of excellence in the state and authorize expenditures for implementation of the plan. The final plan must allocate at least \$25 million to each center of excellence established by the plan. When developing this final plan, the board must consider the commission's recommended plans and hold at least one public hearing for the purpose of soliciting expert testimony. The final plan must include performance and accountability measures that can be used to assess the progress of plan implementation and the success of the centers of excellence established under the final plan. By March 22, 2003, the board must provide a copy of the final plan to the Governor, the President of the Senate, and the Speaker of the House of Representatives.
- Provides that, beginning June 30, 2003, the commission must report quarterly to the Commissioner of Education on the progress of the implementation of the final plan and the success of the centers of excellence established under that plan.
- Provides that the provisions of this act expire effective July 1, 2004.
- Provides that the sum of \$50,000 is appropriated from the General Revenue Fund to the Executive Office of the Governor for the 2002-2003 fiscal year for the purpose of providing staff support to the commission and per diem and travel expenses for commission members.

This act shall take effect upon becoming a law.

IV. Constitutional Issues:

A. Municipality/County Mandates Restrictions:

None.

B. Public Records/Open Meetings Issues:

None.

C. Trust Funds Restrictions:

None.

V. Economic Impact and Fiscal Note:

A. Tax/Fee Issues:

None.

B. Private Sector Impact:

Not only do university-industry partnerships increase the speed and frequency with which new discoveries move from the laboratory to the market, but “university-industry technology transfer can be a stimulant, precursor, or complement to building a high-skills, high-wage state economy.”²⁷ Thus, to the extent the provisions of this committee substitute increase the amount of technology transfer occurring in the state, businesses and individuals could benefit.

C. Government Sector Impact:

Subject to legislative appropriation, this committee substitute creates the Emerging Technology Commission (commission) within the Governor’s Office for the purpose of guiding the establishment of centers of excellence within, and in collaboration with, the State University System. The committee substitute provides that the sum of \$50,000 is appropriated from the General Revenue Fund to the Executive Office of the Governor for the 2002-2003 fiscal year for the purpose of providing staff support to the commission and per diem and travel expenses for commission members.

Technology transfer can be a source of revenue for universities.²⁸ Thus, to the extent the provisions of this committee substitute increase the amount of technology transfer occurring in the state, universities could benefit.

VI. Technical Deficiencies:

None.

VII. Related Issues:

None.

²⁷ Association of University Technology Managers, Inc., *supra* note 4; Tornatzky, *supra* note 3, at 7.

²⁸ Senate Committee on Commerce and Economic Opportunities, *supra* note 7, at 2 and 5.

VIII. Amendments:

None.

This Senate staff analysis does not reflect the intent or official position of the bill's sponsor or the Florida Senate.
