

T50T01
Maryland Technology Development Corporation

Operating Budget Data

(\$ in Thousands)

	<u>FY 05</u> <u>Actual</u>	<u>FY 06</u> <u>Working</u>	<u>FY 07</u> <u>Allowance</u>	<u>FY 06-07</u> <u>Change</u>	<u>% Change</u> <u>Prior Year</u>
General Fund	\$5,467	\$4,811	\$25,861	\$21,050	437.5%
Total Funds	\$5,467	\$4,811	\$25,861	\$21,050	437.5%

- Of the \$21.1 million increase for fiscal 2007, \$20 million is for a proposed stem cell research fund.
- The Maryland Technology Development Corporation (TEDCO) does not report personnel data through the State budget system because the agency's employees are not State employees, but the agency reports that it has 10 full-time State funded positions and 4 federally funded positions.

Analysis in Brief

Major Trends

Investment Programs: Follow-on Funding Is Ranging from \$15 Million to \$20 Million Annually; Company Sales and Licensing Performance Varies: Follow-on funding for businesses receiving Maryland Technology Transfer Fund support came in at \$20.7 million in fiscal 2005, above the estimate of \$17 million. The track record has varied for providing pre-seed or seed stage funding to at least six companies annually that reach product sales, as has the record for assisting companies that execute license agreements for their technology.

Technology Transfer: Patent Support and Partnering Agreements Generally Reach Their Objectives: TEDCO generally has reached its objectives to support more than 100 patent applications annually from fiscal 2004 to 2006 and to facilitate more than 25 partnering agreements annually by fiscal 2006.

Business Incubator Space and Technology Showcases Are on Track: TEDCO expects to reach its objective in fiscal 2007 to fund 50,000 gross square feet of business incubator space. The agency is on track in sponsoring technology showcases at Maryland's federal labs to help the labs present their intellectual property, ongoing research, and technology needs to potential licensees and collaborators.

Note: Numbers may not sum to total due to rounding.

For further information contact: Monica L. Kearns

Phone: (410) 946-5530

Issues

New Stem Cell Research Fund Proposed at \$20 Million: The fiscal 2007 allowance includes \$20 million to TEDCO for a new Stem Cell Research Fund that would grant awards to Maryland research institutions or private companies. The TEDCO Board of Directors met on January 26, 2006, to begin determining how these funds would be awarded. Information on the board’s decisions so far was not available for this analysis. **The Department of Legislative Services (DLS) recommends that TEDCO’s proposed \$20 million for stem cell funding be reduced to \$10 million, and that budget bill language be added to make the remaining funds contingent upon enactment of legislation specifying uses for the funds.**

Study Finds That Maryland Has Middle or Lower Rank Among Eight States’ Spending on Technology Commercialization: The General Assembly requested that TEDCO analyze efforts in competitor states to commercialize technology developed at higher education institutions and federal laboratories. Eight states were selected for a study of state spending on commercialization, and Maryland ranked fourth or fifth among them. **DLS recommends that TEDCO comment on which of Maryland’s existing or potential technology commercialization efforts appear to hold the most promise for improving performance, and whether State spending aligns with these strategies.**

University-affiliated Research Park Activity Set to Grow; TEDCO Has a Role in Reporting Progress: The State has made significant investments in research parks affiliated with universities, most of which are in the initial stages of development. **DLS recommends that committee narrative be adopted requesting annual reporting by TEDCO on the technology commercialization performance of public universities and their affiliated research parks.**

Recommended Actions

Funds

- | | | |
|----|--|----------------------|
| 1. | Adopt narrative on technology commercialization at universities and their affiliated research parks. | |
| 2. | Add language to make stem cell funds contingent upon enactment of legislation. | |
| 3. | Reduce funds for stem cell research. | \$ 10,000,000 |
| | Total Reductions | \$ 10,000,000 |

Updates

Current Outside Funding Totals \$6.9 Million: TEDCO aims to secure federal and other funds to support its technology transfer and development efforts. The \$6.9 million from outside funding sources as of January 23, 2006, represents nearly a 16 to 1 leverage of TEDCO funds put into the programs. Altogether, TEDCO has secured more than \$9 million in outside funding since its inception in 1998.

TEDCO to Act as Manager for Multi-state Homeland Security and Natural Disaster Group: TEDCO will be the managing organization for the All Hazards Consortium, a new multi-state effort to address natural disaster and homeland security issues. TEDCO reports that most of the consortium's needs and interests are technological, particularly in information technology and biotechnology, and for that reason it aligns with TEDCO's mission and expertise.

Application Submitted for \$25 Million in Federal New Markets Tax Credits: In October 2005, TEDCO submitted an application to the U.S. Department of the Treasury for a \$25 million allocation of New Markets Tax Credits. These credits represent a significant source of development funds for new businesses in distressed areas. TEDCO expects to hear a decision on its application by May 2006.

T50T01 – TEDCO – Maryland Technology Development Corporation

T50T01
Maryland Technology Development Corporation

Operating Budget Analysis

Program Description

The Maryland Technology Development Corporation (TEDCO) was launched in 1998 to help commercialize the results of scientific research and development conducted by higher education institutions and private sector organizations. TEDCO also aims to promote new research activity and investments that lead to business development in Maryland.

To achieve its goals, TEDCO provides non-equity investments to early-stage technology businesses, and it funds development and patenting of new technologies at research universities. TEDCO also develops linkages with federal research facilities in the State and helps companies pursue research funds from federal and other sources.

In 2001, TEDCO was authorized to create, manage, and provide funds for the statewide Maryland Technology Incubator Program. Technology business incubators offer start-up companies physical office space, research space, and an array of business services in hopes of generating new research and jobs.

Performance Analysis: Managing for Results

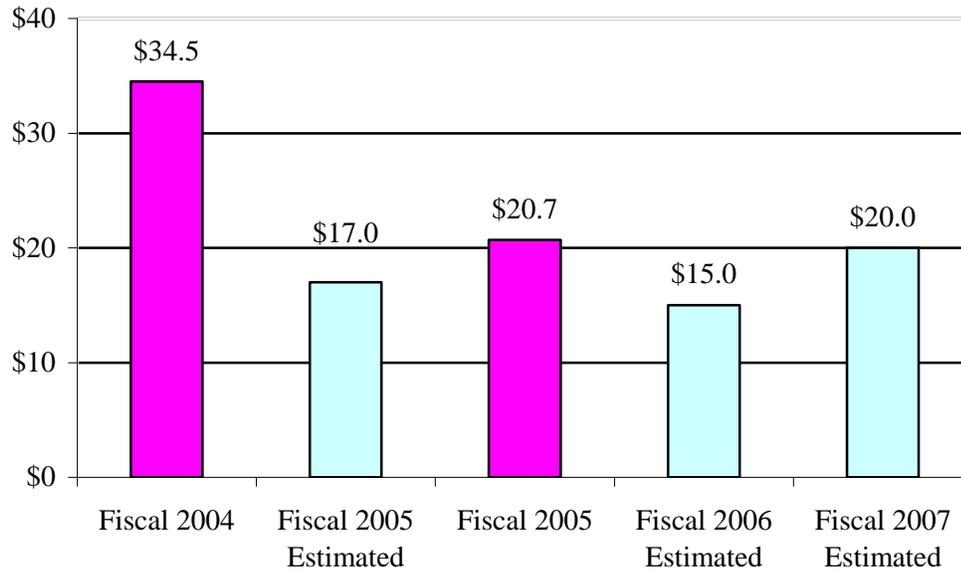
The TEDCO mission is to facilitate business creation and foster business growth in all regions of the State through the commercialization of technology. TEDCO aims to be Maryland's leading source of funding for technology transfer and development and entrepreneurial business assistance.

Investment Programs: Follow-on Funding Is Ranging from \$15 Million to \$20 Million Annually; Company Sales and Licensing Performance Varies

Several investment programs at TEDCO support its mission. One of these programs – the Maryland Technology Transfer Fund (MTTF) – provides seed investments to early stage technology companies that are economically viable but do not have the scope for a venture capital investment. The companies must partner with universities or federal laboratories in Maryland to receive funds. A measure of success for MTTF is the ability of funded start-ups to obtain follow-on funding for commercialization. The primary sources of follow-on funding include federal funds, venture capital and other equity investments, debt consolidation, and Department of Business and Economic Development (DBED) funds.

Follow-on funding for MTTF recipients is shown in **Exhibit 1**. Fiscal 2005 came in at \$20.7 million, above the estimate of \$17 million. Funds for MTTF were reduced in fiscal 2006, so TEDCO expects to make fewer awards and thus generate a lower follow-on funding amount of \$15 million.

Exhibit 1
Follow-on Funding for Recipients of TEDCO Investments
Fiscal 2004 – 2007
(\$ in Millions)



Note: Fiscal 2004 was cumulative and includes \$14.4 million of follow-on funding for one company, Reactive Nano Tech

Source: Maryland State Budget Books, fiscal 2007 and 2006

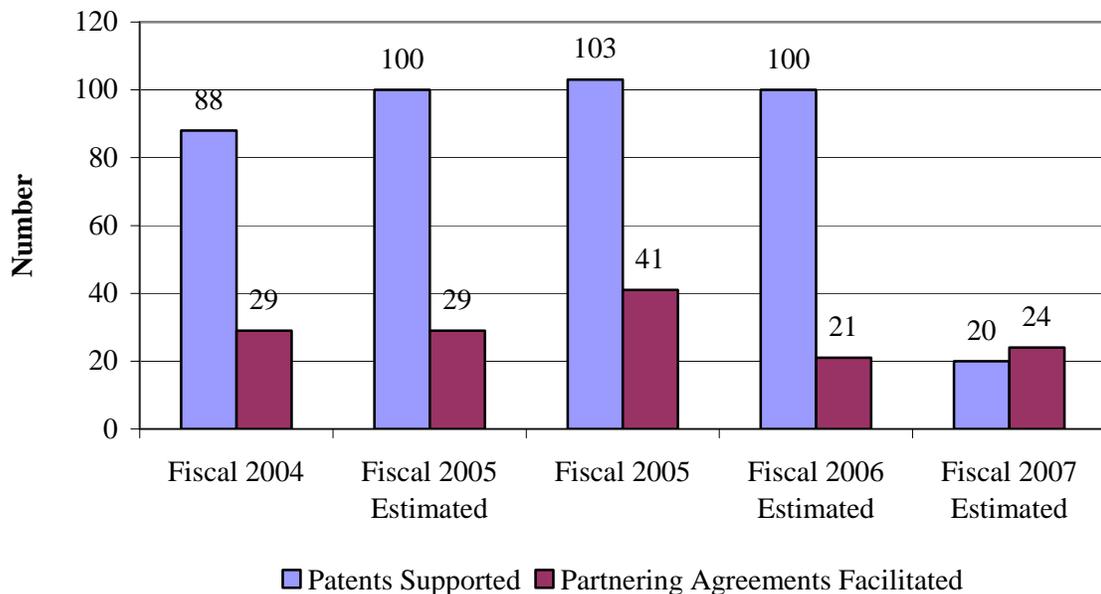
As another measure of its investment programs, TEDCO aims to provide pre-seed or seed stage funding to at least six companies each year that reach product sales by the end of the third year after the investment. In other words, this measure is tracked over three-year timeframes. One company reached product sales in fiscal 2003, eight reached it in 2004, two reached it in 2005, and six are expected to reach it in 2006 and again in 2007. TEDCO also tracks the number of awardee companies that execute license agreements for their technology. Ten companies reached this level in fiscal 2004, five reached it in 2005, and four are expected to reach it in 2006 and again in 2007. TEDCO helps companies work toward sales or technology licensing by assigning each one to a portfolio manager. The portfolio manager contacts the company monthly to discuss issues and link the company with investors and educational workshops.

Technology Transfer: Patent Support and Partnering Agreements Generally Reach Their Objectives

To measure its contribution to technology transfer, TEDCO tracks the number of patent applications by university faculty that it supports. The agency has an objective to support more than 100 applications annually from fiscal 2004 to 2006 with its Maryland University Intellectual Property Support Fund.

Exhibit 2 shows that the patent objective was not reached in fiscal 2004, but it was exceeded in fiscal 2005 and is expected to be achieved in 2006. The number is expected to dramatically decline in fiscal 2007 because TEDCO’s original three-year funding commitment (at \$500,000 per year) for the patent program will end; however, the allowance includes \$100,000 to continue it at a more modest level. The motivation for patent funding stemmed from the findings of a study, prompted by a 2001 *Joint Chairmen’s Report* request, which found Maryland ranks well in terms of federal research and development funds but near the middle of states in terms of commercializing research.

Exhibit 2
Patents Supported and Partnering Agreements Facilitated by TEDCO
Fiscal 2003 – 2007



Note: Patent applications are supported by TEDCO’s University Intellectual Property Support Fund, and partnering agreements represent the number of Maryland Technology Transfer Fund awards TEDCO makes.

Source: Maryland State Budget Books, fiscal 2007 and 2006

Research partnering agreements are another indication of TEDCO’s contribution to technology transfer. The agency has an objective to facilitate more than 25 partnering agreements annually by fiscal 2006. Exhibit 2 shows that this objective was exceeded in fiscal 2004; fiscal 2005 exceeded the target, and 2006 is expected to nearly reach it. Partnering agreements represent the number of MTTF funding awards TEDCO makes since a written agreement between companies and their partner university or federal lab must be executed before awards are given.

Business Incubator Space and Technology Showcases Are on Track

TEDCO helps technology business growth by supporting incubator space and organizing technology showcases. TEDCO expects to reach its objective in fiscal 2007 to fund 50,000 gross square feet of incubator space. Business incubator support is further discussed in the section on the Governor's proposed budget.

TEDCO sponsors technology showcases at Maryland's federal labs to help the labs present their intellectual property, ongoing research, and technology needs to potential licensees and collaborators. Showcase attendees include business owners and entrepreneurs, investors, scientists, and economic development professionals. TEDCO organizes four to five showcases each year. The State has more than 50 federal research facilities, including the National Institutes of Health, the National Institute of Standards and Technology, the National Aeronautical and Space Administration Goddard facility, Naval Surface/Naval Air Warfare Centers, and the Army Research Lab.

Governor's Proposed Budget

The fiscal 2007 TEDCO allowance is budgeted as a State general fund grant of \$25.9 million. Of this amount, \$20 million is specified for stem cell research funding. Not including the stem cell funds, the allowance represents a 21.8% increase over the fiscal 2006 working appropriation. **Exhibit 3** summarizes the major changes, and **Exhibit 4** shows the TEDCO budget by program. The stem cell funds are discussed further in Issue 1.

Exhibit 3
Governor's Proposed Budget
TEDCO – Maryland Technology Development Corp
(\$ in Thousands)

How Much It Grows:	General Fund	Total
2006 Working Appropriation	\$4,811	\$4,811
2007 Governor's Allowance	<u>25,861</u>	<u>25,861</u>
Amount Change	\$21,050	\$21,050
Percent Change	437.5%	437.5%

Where It Goes:

Personnel Expenses

Salaries and wages.....	\$65
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Non-personnel Operating Expenses

Business incubator operating support.....	199
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Other operating changes	-64
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Investment Programs

New Stem Cell Research Fund.....	20,000
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Maryland Technology Transfer Fund.....	750
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Incubator Company Loan Fund (for working capital).....	500
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University Intellectual Property Support Fund.....	-400
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Total	\$21,050
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Note: Numbers may not sum to total due to rounding.

TEDCO does not submit personnel data through the State budget process, but the agency reports that it has 10 full-time State funded positions and 4 federally funded positions. The fiscal 2007 budget for salaries and wages is \$1.4 million, which represents a \$65,478 increase over the 2006 appropriation.

Salaries and wages includes all employer payroll taxes; health, life, and disability insurance; 401k management; workers compensation and unemployment insurance; and educational benefits.

Exhibit 4
TEDCO State Budget
Fiscal 2004 – 2007
(\$ in Thousands)

	<u>FY 04</u>	<u>FY 05</u>	<u>FY 06 Working</u> <u>Appropriation</u>	<u>FY 07</u> <u>Allowance</u>	<u>Change</u> <u>06 – 07</u>	<u>% Change</u> <u>06 – 07</u>
Operations						
Program Development and Outreach	217	399	361	322	-40	-10.9%
Technology Transfer Programs and Services	756	1,166	1,280	1,374	94	7.4%
Business Incubation	193	562	363	562	199	54.9%
Executive Management	335	340	357	303	-54	-15.2%
Operations Subtotal	1,500	2,467	2,361	2,561	200	8.5%
Investments						
Maryland Technology Transfer Fund	1,500	1,750	1,500	2,250	750	50%
University Technology Development Fund	500	750	450	450	0	0.0%
University Intellectual Property Support Fund	500	500	500	100	-400	-80.0%
Incubator Company Loan Fund (for Working Capital)	0	0	0	500	500	0
Investments Subtotal	2,500	3,000	2,450	3,300	850	34.7%
Capital – Business Incubator Investment Program	1,000 (b)	2,500 (b)	0	0	0	0
Total Operations, Existing Investments, and Capital	5,000	7,967	4,811	5,861	1,050	21.8%
New Stem Cell Research Fund	0	0	0	20,000	20,000	0
Grand Total	5,000	7,967	4,811	25,861	21,050	437.5%

(a) PAYGO capital funds

(b) General obligation bond funds

Source: TEDCO

Operating Budget Increases, Particularly for Business Incubator Support

TEDCO operating activities are set to grow 8.5% in the allowance, particularly from an increase in support for business incubators, as shown in Exhibit 4. Business incubators offer start-up companies physical office space and an array of business services which can include marketing, accounting and finance, networking, finding sources of financing, and linking to universities and colleges. In the case of technology incubators, scientific research space also is available. The goal is to provide guidance so client companies can “graduate” from the incubator and stand successfully on their own.

TEDCO business incubator support includes operating and capital funds. The agency allocated \$363,000 in fiscal 2006 for incubator operating support which increases to \$562,000 (the 2005 level) in the allowance. Through fiscal 2006, TEDCO supported creation of 178,000 gross square feet of incubator space with more than \$5 million in PAYGO and capital funding.

Existing Investment Programs Set to Grow Nearly \$1 Million

TEDCO has four primary investment programs, including a new business incubator revolving loan fund. Overall, investment programs increase \$850,000 (34.7%) in the fiscal 2007 allowance, not including the proposed stem cell research fund.

The new incubator loan fund receives \$500,000 in the allowance. TEDCO received a \$325,000 start-up grant from the federal Economic Development Administration for the fund, and TEDCO provided a \$325,000 match. (A business incubation conference received \$50,000 of the funds and the remaining \$100,000 will be used to manage the fund for two years.) The fund will provide working capital loans of \$15,000 to \$50,000 to incubator tenant companies located in economically distressed areas of the State.

MTTF awards seed funding to early-stage companies that partner with universities or federal laboratories in Maryland. The allowance includes a \$750,000 increase for this program. MTTF awardee companies must have a commercialization strategy to qualify, and awards are up to \$75,000 in non-equity investments per company. The companies serve as a “farm team” for DBED’s Challenge program, which serves businesses at a later stage of development. In February 2005, MTTF absorbed the TEDCO Federal Lab Partnership Program, which offered pre-seed funding for partnerships between new companies and federal labs. TEDCO has memoranda of understanding with 12 federal research facilities.

The University Technology Development Fund provides pre-seed funding for technologies at the earliest stages of the development process. The allowance does not change the funding level for this program. Program awards go to university technology licensing offices, with initial awards up to \$50,000 each. The offices use the funds to develop their intellectual property portfolios, namely by hiring university researchers to further develop certain technologies and make them more attractive to potential licensees. Proposals must show that a patent for the technology has been filed and a market has been identified.

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The Maryland University Intellectual Property Support Fund provides pre-seed funding for universities' patent application activities. The allowance includes \$100,000 to continue this program, even though TEDCO's three-year, \$500,000 annual commitment ends in fiscal 2006. Proposals for these funds are required to include a first U.S. patent application. The funds are awarded based on a formula that factors in universities' research expenditures, invention disclosures, and patents awarded per \$10 million in research expenditures. The formula also includes an equity component to give institutions with smaller research portfolios an advantage, and a minimum of \$20,000 per year has been awarded to institutions without a technology transfer office.

Issues

1. New Stem Cell Research Fund Proposed at \$20 Million

The fiscal 2007 allowance includes \$20 million to TEDCO for a new Stem Cell Research Fund. The fund would support stem cell research and development at Maryland research institutions or private companies. The TEDCO Board of Directors met January 26, 2006, to begin determining how these funds would be awarded. Information on the board's decisions so far was not available for this analysis.

A key issue is whether the funds would support research based on stem cells from embryos as well as adults. There are four primary sources of embryonic stem cells: existing stem cell lines, aborted or miscarried embryos, unused in-vitro fertilized embryos, and cloned embryos. Current federal policy limits federally funded research to use of embryonic stem cell lines created before August 2001. TEDCO reports that most venture capital company investments in stem cell research have been based on adult stem cells because these efforts are usually closer to commercial application. Other issues to decide include determining how members will be chosen for the review panel that evaluates proposed research activities.

Many states have enacted policies on stem cell research funding, according to the National Conference of State Legislatures. Some encourage stem cell research funding, while others restrict it. Nebraska prohibits use of state tobacco settlement funds on embryonic stem cell research, and in Illinois state funds may not support research on fetuses from induced abortions. New Jersey has provided \$5 million for adult and embryonic stem cell research grants and \$15 million for a new stem cell institute, and \$380 million has been proposed for additional research grants and facilities for the new institute. California's Proposition 71 of 2004 authorizes \$3 billion in bonds, up to \$350 million per year, for embryonic and adult stem cell research grants and loans. The measure also provides \$3 million as a general fund loan to establish a new institute to award the funds. California will benefit from any payments from patents, royalties, and licenses resulting from research funded by the institute.

Maryland's fiscal 2007 allowance includes additional support for stem cell research with \$12 million in capital funds for a Center for Regenerative Research at the University of Maryland, Baltimore Biopark and \$1.5 million in operating funds for this center.

DLS recommends that TEDCO's proposed \$20 million for stem cell funding be reduced to \$10 million and that budget bill language be added to make the remaining funds contingent upon enactment of legislation specifying uses for the funds.

The reduction would be an important step in improving the State's fiscal condition, given that with the 2007 allowance the State would spend more than the revenues it is expected to bring in, resulting in a \$403 million structural gap for general funds. Making the remaining funds contingent upon enactment of legislation would ensure that the funds are spent according to criteria determined by the General Assembly.

2. Study Finds That Maryland Has Middle or Lower Rank Among Eight States' Spending on Technology Commercialization

In the 2005 *Joint Chairmen's Report* (JCR), the General Assembly requested that TEDCO analyze efforts in competitor states to commercialize technology developed at higher education institutions and federal laboratories. The intent was to help develop objective criteria for determining the necessary level of State resources, particularly seed and pre-seed funding, for technology-based economic development. Seed and pre-seed financing refers to taking discoveries that are fresh out of the laboratory and turning them into businesses that, hopefully, receive additional financing and eventually sell products or license their technology.

Eight comparison states were selected for the study: the five competitor states of Massachusetts, New Jersey, North Carolina, Pennsylvania, and Virginia; and three benchmark states including Georgia, Michigan, and Ohio for insight into alternative approaches. Unfortunately, although North Carolina was selected for comparison, data for this state were not available. For the report, TEDCO hired a Johns Hopkins University faculty member and an analyst from the State Science and Technology Institute to gather information on operating and capital spending for particular programs from all State-supported fund sources. To the extent possible, the study showed the raw data as well as the data normalized according to certain criteria, such as size of the state economy or amount of university-performed research.

The TEDCO report argues that comparisons of total budgets for technology-based economic development are virtually meaningless. For one reason, states may have different goals, such as promoting new research and development versus commercializing research already underway. Also, some states may be more successful in using indirect incentives, such as tax credits and deductions, rather than direct spending. Since the JCR request focused on technology commercialization as a goal, the report gathered information on the following types of programs, and a comparison of state spending on them is shown in **Exhibit 5**:

- **University-focused technology development:** These efforts include research projects carried out jointly by faculty and businesses, support for university patent applications, and capital funds for university facilities related to economic development. Note that Exhibit 5 includes only operating funds because the data are for one point in time (fiscal 2004), and capital funding for these types of projects can vary widely from year to year.
- **Financing assistance:** Financing assistance includes equity investments in and loans to companies that are commercializing technology. States also may contribute to venture capital investment funds, offer special tax incentives for research and development, and help businesses pursue federal research dollars by providing matching funds or providing for professional help in preparing applications.
- **General commercialization assistance:** General assistance includes support for business incubators, management assistance for new companies, commercialization project grants, and other staff-provided assistance.
- **Other commercialization expenditures:** Other expenditures include support for partnerships with federal labs, technology business councils, and regional initiatives. Data for this category was not finalized by the time this analysis was published.

Exhibit 5
Comparison of State Spending on Technology Commercialization
Fiscal 2004

	<u>GA</u>	<u>MD</u>	<u>MA</u>	<u>MI</u>	<u>NJ</u>	<u>OH</u>	<u>PA</u>	<u>VA</u>	MD Rank Among 8 States
University-focused technology development:									
Operating spending on university commercialization programs per \$1,000 in university-performed research	\$8.41	\$2.85	\$1.84	\$0.18	\$1.11	\$44.47	\$9.19	\$0.00	4
Financing assistance:									
Spending on financing programs per \$1 million of the Gross State Product three-year average *	\$10.15	\$23.30	\$99.77	\$37.52	\$154.05	\$8.89	\$23.71	\$3.79	5
General commercialization assistance:									
Operating support (\$ in millions)	\$14.9	\$3.6	\$1.6	\$12.6	\$2.0	\$10.3	\$39.0	\$3.4	5

*New Jersey's funds include \$60 million for transferable research and development tax credits.

Source: TEDCO, *State Budgets for Technology Commercialization*, January 2006

Maryland ranked fourth in university-focused technology development spending and fifth in financing assistance and general commercialization spending. The report also includes some preliminary information on strategic investments in university research capacity. For example, Maryland's operating and capital support for the University of Maryland Biotechnology Institute was cited.

Next Step: Compare Spending to Performance

The next step in exploring the technology commercialization issue would be to compare state spending with performance. Are states with the highest spending performing the best? On what types of programs are the best-performing states spending money? Does Maryland have a research base that could produce similar results?

In looking only at university-based activity, Massachusetts is by most measures the top-performing competitor state in commercializing research, according to data from 2000 previously collected by TEDCO. **Exhibit 6** shows the detail. Yet Massachusetts did not rank high in fiscal 2004 spending on university-focused technology development. The spending and performance data are from different years, and this could explain some of the variance. However, Maryland and Massachusetts have similar levels of university-based research activity, so it would not appear that different resource base sizes would explain the difference.

Further analysis into spending and performance among states could help Maryland determine how to best fund its technology commercialization efforts. The state spending data can help test previous findings on how Maryland should move forward. In its 2003 *Maryland Innovation and Technology Index*, TEDCO indicated that Maryland needs to improve in the following areas:

- business incubation;
- investment in technology transfer offices at universities;
- intellectual property negotiations;
- entrepreneur access to pre-seed funding; and
- business assistance in competing for federal Small Business Innovation Research awards.

DLS recommends that TEDCO comment on which of Maryland's existing or potential technology commercialization efforts appear to hold the most promise for improving performance and whether State spending aligns with these strategies.

Exhibit 6
State Comparison
University Research and Development and Commercialization
Calendar 2000

	<u>MD</u>	<u>MA</u>	<u>NJ</u>	<u>NC</u>	<u>PA</u>	<u>VA</u>	<u>MD Peer Rank</u>	<u>US</u>
Research and Development:								
Research and development performed by universities (\$ in billions) ¹	\$1.51	\$1.49	\$0.57	\$1.04	\$1.55	\$0.59	2	\$30.97
Commercialization:								
University invention disclosures	567	795	254	478	757	329	3	10,802
University new patent applications filed	350	373	174	186	454	234	3	5,623
US patents issued to universities	140	314	68	142	195	64	4	3,272
University licenses executed	171	231	55	161	156	98	2	3,606
University total active licenses and options	654	1,314	291	1,187	589	332	3	17,540
Percent of university licenses and options yielding income	34.9%	48.9%	34.0%	22.3%	38.4%	54.2%	4	43.1%
University license income received (\$ in thousands)	\$15,775	\$59,442	\$7,561	\$10,895	\$36,835	\$6,688	3	\$1,108,939
University new research funding related to licenses (\$ in thousands) ²	\$10,746	\$7,283	\$1,670	\$18,452	\$15,724	\$9,700	3	
Start-ups based on university technology	13	41	6	16	20	13	4 (tie)	368
Industry-sponsored R&D at university (\$ in thousands)	\$50,154	\$138,667	\$29,817	\$169,979	\$159,669	\$53,380	5	

¹Includes research funded by the federal government, industry, and other sources.

² Massachusetts is lower than expected because data were not available for the Massachusetts Institute of Technology.

Source: Selected indicators from *Maryland Innovation and Technology Index 2003*, Maryland Technology Development Corporation, based on 2000 data

3. University-affiliated Research Park Activity Set to Grow; TEDCO Has a Role in Reporting Progress

During the 2005 interim, DLS researched the status of the State’s university-affiliated research parks (UARPs). These parks intend to bring together businesses and faculty to enhance lines of research and commercialize technology. The State has made significant investments in UARPs and would benefit from information on their characteristics and performance.

Most Research Parks Are in Initial Stages of Development; State Support Totals \$30.6 Million through Fiscal 2006

Maryland’s UARPs are, for the most part, in the initial stages of development. **Exhibit 7** shows major characteristics of the parks. In 2005, two new UARPs began operating: the BioPark at the University of Maryland, Baltimore (UMB) and M Square at the University of Maryland, College Park (UMCP). The University of Maryland Baltimore County’s (UMBC) existing park, bwtech@umbc, opened a new building in 2005 that dramatically increased the number of tenant companies.

Exhibit 7
Maryland Research Park Characteristics

<u>Research Park/ Date Established</u>	<u>Existing Sq. Ft.</u>	<u>Est. Full Build-out Net Sq. Ft.</u>	<u>Est. Full Build-out</u>	<u>Incubator</u>	<u>Dominant Technology</u>	<u>Total State Funding¹</u>
UMB (2004)	120,000	800,000	2017	Yes ²	Life Science	\$5,000,000
UMBC (2001)	121,100	330,000	2010	Yes	High Tech.	2,940,000
UMCP (2005)	184,317	1,680,000	2018	Yes	High Tech.	5,400,000
EBBP (2004)	0	2,000,000	2015	Yes	Life Science	17,000,000
ABC/FSU (2001)	0	48,000	2012	Yes	High Tech.	259,000
Shady Grove (1980s)	1,671,454	1,671,454	Completed	Yes	Life Science	0
Total	2,096,871	6,529,454				\$30,599,000

Note: Development of the research parks is market driven and thus there is no preconceived timetable for the park’s overall future development. However, the parks estimate one building every two years.

¹ State funding through fiscal 2006, including \$4.7 million in Sunny Day funds approved in December 2005.

² UMB is planning a Bio accelerator. Bio accelerators typically accommodate companies that are further along in the business life cycle and that are better capitalized.

ABC – Allegany Business Center at Frostburg State University

FSU – Frostburg State University

UMB – University of Maryland, Baltimore

UMBC – University of Maryland Baltimore County

UMCP – University of Maryland, College Park

EBBP – East Baltimore Biotechnology Park

Sq. Ft. – Net assignable square feet

Source: Individual research parks

Another research park currently in development, the East Baltimore Biotechnology Park (EBBP), is immediately adjacent to Johns Hopkins University (JHU). This park is not officially affiliated with JHU, but it will benefit from its proximity to a major research university and JHU will be a primary tenant. The Allegany Business Center (ABC) is affiliated with Frostburg State University (FSU) and is nearly ready for development. Maryland also has the Shady Grove Life Sciences Center, which is owned by Montgomery County and features a significant university research and teaching presence.

The State has contributed approximately \$30.6 million through fiscal 2006 (including \$4.7 million in Sunny Day funds in December 2005) to develop five UARPs, as shown in Exhibit 7. The funding has been provided primarily through the Sunny Day Program and the capital budget.

Performance: Maryland Compares Well on Research and Development; Technology Commercialization Has Room to Grow

Performance measures for research parks usually relate to technology commercialization and employment. Since all but one of Maryland's UARPs are new or in development, a statewide view of performance is difficult to assess, particularly for employment. However, some available data on research and development and technology commercialization can begin to paint a picture of Maryland's UARP activity.

In terms of university research and development, Maryland ranks second among six comparable states, as shown in Exhibit 6. JHU accounts for about 60% of the Maryland total. University research and development is not a direct measure of performance at UARPs, but it gives important insight into the technology commercialization opportunities available for the parks. University-based technology commercialization measures range from invention disclosures to patents to technology license income. In general, Maryland ranks in the middle of six comparable states on these measures. Again, JHU tops the Maryland universities.

Performance Data Needed as Research Parks Develop

Neither Managing for Results nor Maryland Higher Education Commission peer data include consistent technology commercialization performance measures among the State's public research institutions. **DLS recommends that committee narrative be adopted requesting annual reporting by TEDCO on the technology commercialization performance of public universities and their affiliated research parks.**

In order to measure the return on the State's investments and reveal overall progress toward technology commercialization, UMCP, UMB, and UMBC as well as the University of Maryland Biotechnology Institute and the University of Maryland Center for Environmental Science should annually report to TEDCO on important university technology commercialization measures.

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The measures should include invention disclosures, cumulative active licenses and options, and adjusted license income received, among others. This type of information already is collected by most higher education research institutions and reported to the Association of University Technology Managers. Measures of affiliated business incubator performance also should be included. The University System of Maryland and TEDCO should work collaboratively to develop appropriate measures, and TEDCO should collect and report those performance measures annually to the General Assembly. (Additional information is available in a full-length version of this issue to be published as a separate report.)

Recommended Actions

1. Adopt the following narrative:

University and Affiliated Research Park Performance Data: The State has made significant investments in university-affiliated research parks. Through fiscal 2006, spending has totaled \$30.6 million for five of these parks, which bring together businesses and faculty to enhance lines of research and commercialize technology.

In order to measure the return on the State’s investments and evaluate overall progress toward technology commercialization, the committees request that the Maryland Technology Development Corporation (TEDCO) report annually on performance at the State’s primary public research institutions as well as the research parks affiliated with them. The following institutions should report data to TEDCO: the University of Maryland, College Park (including its research park); the University of Maryland, Baltimore (including its research park); the University of Maryland Baltimore County (including its research park); the University of Maryland Biotechnology Institute; and the University of Maryland Center for Environmental Science. Currently, neither Managing for Results nor Maryland Higher Education Commission peer data include consistent technology commercialization performance measures among these institutions.

The measures should include invention disclosures, cumulative active licenses and options, and adjusted license income received, among others. This type of information already is collected by most higher education research institutions and reported to the Association of University Technology Managers. Measures of affiliated business incubator performance also should be included. The University System of Maryland (USM) and TEDCO should work collaboratively to develop appropriate measures.

Information Request	Authors	Due Date
Annual report on technology commercialization at universities and their affiliated research parks	TEDCO and USM	November 1, 2006, and November 1 of each year thereafter

2. Add the following language to the general fund appropriation:

. provided that this appropriation is contingent upon enactment of legislation establishing a program for funding stem cell research in Maryland. Further provided that the stem cell research funds may only be expended as specified in the legislation. Authorization is hereby granted to transfer funds as necessary to implement the legislation.

Explanation: This language ensures that any funds appropriated for stem cell research would be spent according to criteria determined by the General Assembly.

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	<u>Amount Reduction</u>	
3. Reduce funds for stem cell research.	\$ 10,000,000	GF
Total General Fund Reductions	\$ 10,000,000	

Updates

1. Current Outside Funding Totals \$6.9 Million

TEDCO aims to secure federal and other funds to support its technology transfer and development efforts. **Exhibit 8** shows that, as of January 23, 2006, TEDCO had \$6.9 million from outside funding sources. This represents nearly a 16 to 1 leverage of TEDCO funds put into the programs. Altogether, TEDCO has secured more than \$9 million in outside funding since its inception in 1998.

2. TEDCO to Act as Manager for Multi-state Homeland Security and Natural Disaster Group

TEDCO will be the managing organization for the All Hazards Consortium, a new multi-state effort to address natural disaster and homeland security issues. The private non-profit consortium will serve as an educational and networking forum through which participants can improve their readiness, response, and recovery efforts. TEDCO reports that most of the consortium's needs and interests are technological, particularly in information technology and biotechnology, and for that reason it aligns with TEDCO's mission and expertise.

The consortium includes state and local government, higher education, private sector, and non-profit representatives from seven Mid-Atlantic states and the District of Columbia. TEDCO's annual report states that it will assist the consortium's board of directors, provide a web presence, promote the All Hazards Forum annual meeting, and link vendors with procurement opportunities provided by consortium members' disaster and homeland security needs. These services are analogous to what TEDCO provides to the State Task Force on Broadband Communications Deployment in Underserved Rural Areas.

3. Application Submitted for \$25 Million in Federal New Markets Tax Credits

In October 2005, TEDCO submitted an application to the U.S. Department of the Treasury for a \$25 million allocation of New Markets Tax Credits. These credits allow investors to receive a credit against federal income taxes for making qualified equity investments in designated community development entities. The development entity, which in this case would be TEDCO, in turn makes investments in low-income communities. Investors receive a credit up to 39% of the investment amount that is claimed over a seven-year period.

The New Markets Tax Credit program represents a significant source of development funds for new businesses in distressed areas. The Treasury Department annually allocates the credits to development entities under a competitive application process. Since the program's inception in 2002, the Treasury Department has made 170 awards totaling \$8 billion in allocation authority. The fall 2005 funding round was for \$3.5 billion. TEDCO expects to hear a decision on its application by May 2006.

Exhibit 8
TEDCO's Outside Funding Sources
As of January 23, 2006

<u>Program</u>	<u>Amount</u>	<u>Source</u>	<u>TEDCO Match</u>	<u>Year Funded</u>	<u>Term of Grant</u>
Aberdeen Technology Transfer Initiative *	\$1,100,000	U.S. Army	\$0	FY06	To be determined
TEDCO/Maryland Research and Applied Sciences Consortium Applied Research Demonstration Project *, **	\$1,000,000	U.S. Army	\$0	FY06	2 years
Maryland Minority Research and Development Initiative *	\$600,000	SBA	\$0	FY06	2 years
Business Incubator Working Capital Loan Fund *	\$325,000	EDA	\$325,000	FY06	2 years
Fort Detrick Technology Transfer Initiative*	\$799,697	U.S. Army	\$0	FY05	22 months
NAVAir Technology Commercialization Initiative *	\$1,311,866	U.S. Navy	\$0	FY05	18 months
ACTiVATE (with the University of Maryland Baltimore County)	\$600,000	NSF	\$60,000	FY05	2 years
Council of State Governments *	\$99,997	CSG	\$0	FY05	1 year
Maryland Technology Partnership for Innovation (with Morgan State University)	\$600,000	NSF	\$60,000	FY04	2 years
New Markets Growth Fund (Dingman Center at the University of Maryland, College Park) ***	\$500,000	SBA/FHLBAtl	\$0	FY03	3 years
Total	\$6,936,560		\$445,000		
Leverage of TEDCO Funds	15.6 to 1				

* Funds flow through TEDCO

** This consortium represents the State's five historically black higher education institutions

*** \$166,666 flows through TEDCO

SBA = U.S. Small Business Administration

EDA = U.S. Department of Commerce – Economic Development Administration

SBA/FHLBAtl = U.S. Small Business Administration/Federal Home Loan Bank of Atlanta

NSF = National Science Foundation

CSG = Council of State Governments

Source: TEDCO

Current and Prior Year Budgets

**Current and Prior Year Budgets
Maryland Technology Development Corporation
(\$ in Thousands)**

Fiscal 2005	<u>General Fund</u>	<u>Special Fund</u>	<u>Federal Fund</u>	<u>Reimb. Fund</u>	<u>Total</u>
Legislative Appropriation	\$5,467	\$0	\$0	\$0	\$5,467
Deficiency Appropriation	0	0	0	0	0
Budget Amendments	0	0	0	0	0
Reversions and Cancellations	0	0	0	0	0
Actual Expenditures	\$5,467	\$0	\$0	\$0	\$5,467
Fiscal 2006					
Legislative Appropriation	\$4,811	\$0	\$0	\$0	\$4,811
Budget Amendments	0	0	0	0	0
Working Appropriation	\$4,811	\$0	\$0	\$0	\$4,811

Note: Numbers may not sum to total due to rounding

Note: TEDCO received capital appropriations of \$1 million in fiscal 2004 and \$2.5 million in 2005 for business incubator facilities (funded through general obligation bonds). No capital appropriations are included in the fiscal 2007 allowance.

Audit Findings

TEDCO does not have a fiscal compliance audit. Fiscal 2005 was the first year TEDCO directly received a general fund grant under its own budget code. Previously, TEDCO's general fund grant was budgeted through the Board of Public Works.

Pursuant to Article 83A, Section 5.2A-06 of the Annotated Code of Maryland, TEDCO provides annual reports on its activities, including a complete operating and financial statement, to the Governor and General Assembly. TEDCO financial statements are audited by an independent public accountant. For the sixth consecutive year, TEDCO received an unqualified ("clean") audit of its financial statements in fiscal 2005, and for the second consecutive year, no management findings.

**Object/Fund Difference Report
TEDCO – Maryland Technology Development Corp**

<u>Object/Fund</u>	<u>FY05 Actual</u>	<u>FY06 Working Appropriation</u>	<u>FY07 Allowance</u>	<u>FY06 - FY07 Amount Change</u>	<u>Percent Change</u>
Objects					
12 Grants, Subsidies, and Contributions	\$ 5,467,000	\$ 4,811,000	\$ 25,861,000	\$ 21,050,000	437.5%
Total Objects	\$ 5,467,000	\$ 4,811,000	\$ 25,861,000	\$ 21,050,000	437.5%
Funds					
01 General Fund	\$ 5,467,000	\$ 4,811,000	\$ 25,861,000	\$ 21,050,000	437.5%
Total Funds	\$ 5,467,000	\$ 4,811,000	\$ 25,861,000	\$ 21,050,000	437.5%

Note: The fiscal 2006 appropriation does not include deficiencies, and the fiscal 2007 allowance does not reflect contingent reductions.

Fiscal Summary
TEDCO – Maryland Technology Development Corp

<u>Program/Unit</u>	<u>FY05 Actual</u>	<u>FY06 Wrk Approp</u>	<u>FY07 Allowance</u>	<u>Change</u>	<u>FY06 - FY07 % Change</u>
01 Tech. Development, Transfer and Commercialization	\$ 5,467,000	\$ 4,811,000	\$ 5,861,000	\$ 1,050,000	21.8%
03 Stem Cell Research Fund	0	0	20,000,000	20,000,000	
Total Expenditures	\$ 5,467,000	\$ 4,811,000	\$ 25,861,000	\$ 21,050,000	437.5%
General Fund	\$ 5,467,000	\$ 4,811,000	\$ 25,861,000	\$ 21,050,000	437.5%
Total Appropriations	\$ 5,467,000	\$ 4,811,000	\$ 25,861,000	\$ 21,050,000	437.5%

Note: The fiscal 2006 appropriation does not include deficiencies, and the fiscal 2007 allowance does not reflect contingent reductions.