



**Report of
The Commission
on**

**Development of
Advanced Technology
Business**

January 12, 2004



MARYLAND

INTRODUCTION

As the national and global economies continue shifting towards new industries, technologies and methods of production, the development of an advanced technology economy is essential for securing Maryland's future economy and competitive position with other states. Advanced technology companies create high quality, higher paying jobs. This creates a ripple effect throughout the economy, creating a broader and deeper tax base that is better able to sustain the State through future challenges.

This potential for rapid and sustainable economic growth through the application of advanced technologies cannot be fully attained unless actions are taken today to align and integrate the competitive advantages that the State of Maryland clearly possesses. These advantages include close proximity to major research and development institutions, a highly educated workforce, tightly coupled relationships with major federal research facilities, access to diverse capital sources, and a growing entrepreneurial culture. This entrepreneurial culture encompasses large corporations, small and emerging businesses, minority and women-owned businesses, and micro enterprises. For the benefits that accrue from the creative and sustained application of advanced technologies to quickly penetrate society it is imperative that all segments of the entrepreneurial community are energized and empowered to develop these emerging technologies into viable business enterprises. It is especially important that women and minority entrepreneurs are encouraged and supported in the commercialization of new and exciting technologies, since they represent two of the fastest growing sectors of the business community.

As a former member of the Maryland General Assembly and U.S. Congress, Governor Robert L. Ehrlich, Jr. is keenly aware of the role of business technology development in our economy. As a former co-chairman of the Congressional Biotechnology Caucus, Governor Ehrlich also recognizes the key role of biotechnology and other emerging industries in Maryland and the nation.

Accordingly, on December 4, 2002, Governor-Elect Ehrlich announced the creation of the Governor's Commission on Development of Advanced Technology Business and selected George F. Pappas to serve as the Chairman. The purpose of the Commission has been to identify the strengths and weaknesses of Maryland's business climate, assess successful technology initiatives in other States, and then to develop and submit to the Governor specific recommendations for further growth of Maryland's technology economy.

On March 24, 2003, Governor Ehrlich named the following twenty-one individuals to the Commission from the ranks of Maryland's academicians, venture capitalists and investment bankers, and industry leaders:

Member	Title	Firm
George F. Pappas, Esq.	Partner	Venable, LLP
Mr. Frank A. Adams	Managing General Partner and Co-Founder	Grotech Capital Group
Dr. M. James Barrett	General Partner	New Enterprise Associates
Mr. Thomas M. Brandt Jr.	Chief Financial Officer	TeleCommunication Systems, Inc.
Dr. William R. Brody	President	Johns Hopkins University
Mr. Anthony A. Caputo	Chairman, Chief Executive Officer, and President	Safenet
Mr. William S. Corey, Jr.	Partner	PricewaterhouseCoopers
Mr. C. Robert Eaton	President	MdBio, Inc.
Mr. Francis X. Gallagher, Jr.	Managing Director	Legg Mason Wood Walker, Incorporated
Dr. Freeman Hrabowski III	President	University of Maryland, Baltimore County
Dr. Jennie C. Hunter-Cevera	President	University of Maryland Biotechnology Institute
Dr. William E. Kirwan	Chancellor	University System of Maryland
Mr. Larry Macks	Founder and General Partner	Boulder Ventures
Mr. Capers McDonald	President and Chief Executive Officer	BioReliance Corporation
Dr. Donald P. McErlean	Deputy Assistant Commander for Research and Engineering	Naval Air Systems Command, U.S. Department of the Navy
Mr. Gary S. Murray Sr.	Managing Member	HumanVision, LLC
Dr. James J. Murray III	Director, Technology and Programs	Lockheed Martin Systems Integration Business Area
Ms. Linda F. Powers	Managing Director	Toucan Capital Corp.
Dr. David J. Ramsay	President	University of Maryland at Baltimore
Mr. Franklin W. Shap	Technology Development Officer	Garrett County Department of Economic Development
Mr. Robert L. Wallace	Founder, President, and Chief Executive Officer	The BiTH Group, Inc.

Shortly thereafter, Christopher C. Foster, State Technology Coordinator with DBED, was chosen as the lead staff person, along with support from the Governor's office, to assist the Commission with its work.

On May 1, 2003, the Commission began its work that has now culminated in the ensuing report. Specific recommendations have been prepared for actions that, in the judgment of the Commission, will:

- make Maryland more competitive in attracting and growing technology companies;
- increase substantially the commercialization of research and development being created by the many government laboratories and universities within Maryland's borders; and
- more effectively market Maryland as a center of valuable research and development and as a home to many leading technology companies.

The Commission's report has been organized purposefully to highlight the specific recommendations by succinctly providing an executive summary and providing the support for each of the recommendations in the full report. In this way, the Commission wishes to make clear that it has proposed a "plan of action" which if implemented will enhance Maryland's technology economy.

Finally, although there were many recommendations that could be made to address the myriad issues facing any State in the current competition for technology business, the Commission determined early in its work that it was critical to Maryland's success that we focus on those recommendations that needed to be implemented in the near-term in order to have maximum impact on the growth of the technology business in Maryland. These recommendations are offered to the Governor and members of the General Assembly for their consideration, discussion, and action to advance the State's technology economy.

EXECUTIVE SUMMARY

I. MAKE MARYLAND MORE COMPETITIVE – Enhance Maryland’s business environment to become one of the premier states in creating, nurturing and retaining advanced technology investment and business.

1. Increase State pension funds investment in private equity

Consistent with national best practices, the governing boards of Maryland state pension funds should increase the funds’ investment of assets into private equity, including venture capital, to a limited percentage of the funds’ portfolio. Among U.S. pension funds for which data were available on asset allocation to private equity and venture capital, the average allocation to private equity is 4.7% and to venture capital is 1.2%. In fact, among the 15 state funds allocating the highest dollar amounts to private equity and venture capital, the average allocations are at 8.1% and 1.7% of total assets for private equity and venture capital, respectively.ⁱ According to the most recent statistics, Maryland’s pension fund allocates only 0.3% of its assets to private equityⁱⁱ and, as a result, Maryland currently ranks 36th out of 38 states for which data were available. Moreover, Maryland’s state pension funds have a total rate of return that is below the national average. If Maryland increased its pension fund allocations to private equity and venture capital to the average allocation made by other states, it should result in a higher rate of return for the State.

In acting on this recommendation, the State Retirement and Pension System should develop a policy consistent with these best practices that gives maximum consideration to firms that invest in Maryland companies.

2. Raise investment by Maryland banks in Small Business Investment Companies (SBICs)

The State of Maryland should undertake a concerted program to encourage banks in the state to invest in SBICs in partial fulfillment of the banks’ obligations under the Community Reinvestment Act (CRA).

3. Restore and increase funding for investment financing programs

The State should increase annual funding of the DBED Investment Financing Group, the Maryland Technology Development Corporation (TEDCO), or similar state entity to provide increased flexibility for support of new and growing Maryland businesses.

4. Encourage foundations in Maryland to invest in technology companies

The State should encourage foundations to fund translational research in addition to basic research for technology companies.

5. Use State tax incentives to affirm the message that Maryland welcomes and encourages advanced technology investments

a. Promote investment in advanced technology equipment and construction materials

Exempt from sales and use tax for an annual aggregate investments of \$500,000 or greater in: (1) computer and telecommunications equipment, and (2) expenditures for building materials utilized in new construction of facilities for technology industries. This would expand Maryland's current sales tax exemption for equipment used in manufacturing or research and development and align incentives for expanding companies of all sides with current drivers of job creation.

b. Align Maryland's tax policy for capital gains on technology investments to be similar to Federal tax policy

Reduce the Maryland personal and corporate income tax by 50% on capital gains arising from equity investments in early stage Maryland companies. This alignment would be similar to federal treatment of capital gains, and Maryland tax treatment of Maryland municipal bonds.

c. Improve research and development credits for businesses

Eliminate the "pooled" \$3 million ceilings on Maryland's "basic" and "growth" research and development tax credits and limit the fiscal impact instead by capping the credit on a per-business basis – e.g., the lower of \$1 million per business or 50% of Maryland tax liability.

d. Provide investment tax credits for early stage investors

Allow a 10% corporate and individual income tax credit for investments in qualified technology companies, with a credit cap of \$25,000 per taxpayer.

6. Survey CEOs on regulatory process

The Department of Business and Economic Development should institutionalize an ongoing process that solicits feedback from Maryland businesses on the State's regulations and regulatory process and in cooperation with relevant state agencies should develop an annual report to the Governor with recommendations for reforms to promote efficiencies consistent with the State's regulatory objectives.

7. Invest in the Business/Technology Case Management Program

Support the growth and development of the Business/Technology Case Management Program in Maryland's Courts to ensure Maryland's judiciary can readily accommodate

complex business litigation. To demonstrate their commitment to this program, the Governor and the General Assembly should appropriate funds as soon as practicable for the purchase and installation of the computers, video screens, video monitors, and other equipment necessary to create at least one “electronic courtroom” in each participating Circuit.

II. HARNESS MARYLAND’S RESEARCH AND DEVELOPMENT ASSETS – Increase commercialization of innovation by coordinating and leveraging the research and development performed in Maryland’s private, government and academic institutions.

1. Establish a permanent State Chief Technology Officer

To ensure that the development of advanced technology business remains a high priority within the Department of Business and Economic Development, the Governor should create a permanent State Chief Technology Officer within DBED, with direct report to the Secretary.

2. Increase utilization and effectiveness of Maryland Technology Councils

Establish a better working relationship with the Technology Councils across the State amongst themselves, State Agencies, and State Government.

3. Encourage entrepreneurial initiatives and technology transfer

The University System of Maryland should review, revise and clarify the regulations and practices relating to intellectual property (IP) ownership, indemnification, and other legal and administrative risk issues to ensure that the practices of the State of Maryland, the University System, and institutional leaders encourage technology transfer and entrepreneurialism. Furthermore, the University System should conduct an annual forum for private technology firms on ways universities could improve industry and university research partnerships, sponsored by the DBED, Technology Council of Maryland, the Greater Baltimore Technology Council, and TEDCO.

4. Support the State’s incubator network with capital and operating funds for best practices

The State should support and expand its existing business incubator network through increased capital and operating funding. This funding should be tied to the implementation of national best practices.

5. Allow State higher education institutions greater leeway under State personnel and procurement rules for activities that are not directly supported by State General Funds

To encourage public universities to attract more research dollars to Maryland, the Governor, with cooperation of the University System of Maryland and other institutions of higher education, should develop a legislative package to reform the state laws, rules

and regulations concerning the expenditure associated with research at Maryland's public universities but not funded by the state, specifically those sections governing procurement and personnel matters.

6. Increase State funding for academic research

The State should increase its support for pre-seed technology development via the TEDCO university technology development fund (UTDF), expand the Maryland Industrial Partnerships (MIPS) program funding, and create new multi-institutional centers of excellence targeted to developing world-class research focused on specific federal and private funding opportunities in areas of importance to the economic development of Maryland.

7. Encourage Maryland research consortia to compete for large federal funding opportunities

Develop a Maryland-based forum that enables consortia of universities, government labs and the private sector to more competitively respond to large-scale federal funding opportunities.

8. Create alternative financing vehicles to create more laboratory space at Maryland's Universities

Maryland's higher education institutions should work with the State to develop alternative capital construction financing models to construct additional laboratory (lab) space, acquire additional lab equipment, and expand university research parks by reforming the State of Maryland and Board of Public Works (BPW) regulations to encourage public/private partnerships, and support Congressional efforts to increase flexibility in federal real estate transactions.

9. Promote increased coordination at University and college tech transfer offices

The technology transfer offices of Maryland's colleges and universities should expand their collaboration to promote cooperation, best practices and greater efficiencies, including exploring ways of sharing administrative functions. The technology transfer offices should also improve the role of advisory panels.

III. MARKET MARYLAND – Increase awareness of Maryland’s competitive advantages as a home for advanced technology investment and business.

1. Leverage the Office of the Governor to encourage and sustain Maryland’s advanced technology enterprises.

The Governor, through a personal commitment and direct involvement, should leverage the prestige and resources of the Office of the Governor to support the development and retention of advanced technology enterprises in Maryland.

2. Develop a comprehensive marketing strategy to “brand” Maryland as a leading home for technology business and innovation.

The State should aggressively develop a brand positioning as part of the process to become a leader in the future of U.S. technology while gaining ground in the national competition for economic development.

3. Create a central database of Maryland academic and federal laboratory technology resources

Maryland’s academic institutions, in conjunction with the Department of Business and Economic Development, should develop a readily accessible, transparent, statewide database of key technology resources at Maryland academic and federal labs, including information on available human and technology resources, equipment and labs, legal and business support services, and funding programs, to facilitate research by private firms on opportunities for technology transfer and commercialization.

4. Pursue targeted international investment in Maryland

The State of Maryland should narrow the focus of its international marketing, and concentrate on building active partnerships with select foreign countries that offer the greatest potential partnership value for the State.

5. Create an Executive Job Corps

The Department of Business and Economic Development and the Governor’s Office on Service and Volunteerism should organize and maintain an Executive Job Corps to assist new technology ventures by matching entrepreneurs with experienced business professionals who can provide advice on business planning, securing capital, marketing and other aspects of business.

6. Create a Governor’s Science Advisory Board

Appoint a Governor’s Science Advisory Board from the private sector and academe to keep the executive branch abreast of scientific developments relevant to Maryland.

THE COMMISSION'S EVALUATION OF MARYLAND'S TECHNOLOGY RELATED ASSETS, BUSINESS CLIMATE, RESOURCES, STRENGTHS AND WEAKNESSES

I. MAKE MARYLAND MORE COMPETITIVE

Maryland, like other states, depends upon high growth companies to create jobs, stimulate the economy and advance economic development. The Governor and the Secretary of Business and Economic Development should look for alternative and creative methods to make Maryland competitive, and where possible implement “Best Practices” to ensure that our existing competitive advantages are maintained and improved.

1. Increase state pension funds investment in private equity

Consistent with national best practices, the governing boards of Maryland state pension funds should increase the funds' investment of assets into private equity, including venture capital, to a limited percentage of the funds' portfolio. Maryland currently ranks 36th out of 38 states that have implemented private equity transactions for their public pension plans. Maryland's state pension funds have a total rate of return that is below the national average. If Maryland simply allocated the average percentage of its assets in private equity it would result in a higher rate of return for the State.

In acting on this recommendation, the State Retirement and Pension System should develop a policy consistent with these best practices that gives maximum consideration to firms that invest in Maryland companies.

Among U.S. pension funds disclosing asset allocation to private equity (funding provided to enterprises whose stock is not publicly traded, such as closely held companies and smaller expanding companies) and venture capital (a subset of private equity made for the launch, early development, or expansion of a business), the average allocation to private equity is 4.7% and to venture capital is 1.2%.ⁱⁱⁱ A majority of the states, including ones neighboring Maryland, have a commitment to private equity from their pension funds. In order to remain competitive with other states, Maryland should increase its pension fund exposure to private equity. Therefore, the Commission strongly recommends that the State legislate increased pension fund investment in private equity.

Discussion

Benefits: Private equity has become an increasing part of public pension portfolios mainly because it has produced higher returns than the traditional asset classes, while

diversifying portfolios due to private equity's lower degree of correlation with other asset classes. Investing pension funds in private equity, including venture capital, would not only enhance our state's investment returns but would provide additional capital sources to assist the emerging and growing technology businesses based in Maryland. There appears to be a significant gap between the funding required by Maryland's bioscience community and the venture capital it has successfully attracted in recent years. As illustrated below, a number of state governments, when facing similar venture funding gaps, have encouraged pension fund investment in private equity, including venture capital.

The State of Maryland government employee pension funds hold \$26.7 billion in assets through the State Retirement and Pension System (SRPS).^{iv} As of Sept. 30, 2002, Maryland ranked 22nd in total assets among state employee funds.^v Among U.S. pension funds for which data was available on asset allocation to private equity and venture capital, the average allocation to private equity is 4.7% and to venture capital is 1.2%. In fact, among the 15 state funds allocating the highest dollar amounts to private equity and venture capital, the average allocations are at 8.1% and 1.7% of total assets for private equity and venture capital, respectively.^{vi} According to the most recent statistics, Maryland's pension fund allocates only 0.3% of its assets to private equity.^{vii} It is our belief that unless the fund managers increase the percentage of their portfolios in private equity, Maryland will lose ground in the national competition for economic development.

Other States' Practices: A majority of the states, including those neighboring Maryland, have a commitment to private equity from their pension funds. States that are considered to have the most welcoming climate for technology based business formation, such as Massachusetts, New York and California, all have a long history of investment in private equity, as shown in the Return Rates table below.^{viii} North Carolina, Colorado and Washington are examples of other states that joined the practice of pension fund investment in private equity. These six state pension funds also have significant rates of return for their pension funds resulting from investment in private equity including venture capital as shown in the table below.^{ix}

Return Rates of Selected Public Pension Funds					Data Source
	1-Year	3-Year	5-Year	10-Year	
LEADERS IN VC ACTIVITY					
California					
CalSTRS Total Fund Return	-5.95%	-1.24%	5.03%	8.51%	California State Teachers' Retirement System Annual Report Data as of June 30, 2002.
<i>Alternative Investments</i>	-8.02%	11.97%	17.44%	18.91%	
CalPERS Total Fund Return	-6.10%	-1.20%	5.30%	9.30%	California Public Employees' Retirement System Annual Report Data as of June 30, 2002.
<i>Alternative Investments/Private Equity</i>	-7.10%	6.90%	12.80%	12.10%	
Massachusetts					
PRIT Core Return	6.49%	0.47%	6.08%	10.55%	Pension Reserves Investment Trust (PRIT) includes assets of the State Teachers' and Employees' Retirement Systems. Data as of June 30, 2002.
<i>Alternative Investments</i>	-10.15%		11.67%		
<i>Special Equity</i>	-2.08%		11.43%		
<i>Venture Capital</i>	-28.30%		12.18%		
New York					
New York State Common	2.76%	3.41%	9.42%	10.74%	2002 Annual Report. Data as of March 31, 2002.
<i>Private Equity</i>	-11.88%				
New York State Teachers	-6.80%	-2.10%	5.40%	10.00%	2002 Annual Report. Data as of June 30, 2002.
<i>Private Equity</i>	-12.90%	-0.20%	11.60%		
MARYLAND NEIGHBORS					
Pennsylvania					
Pennsylvania School Employees	2.70%	-3.40%	2.60%		2003 Annual Report. Total returns as of June 30, 2003. Private equity returns as of March 31, 2003.
<i>Private Equity/Venture Capital</i>	-5.30%	-9.60%	-2.10%		
Virginia					
Virginia Retirement	-7.30%	-0.30%	5.60%		2002 Annual Report. Data as of June 30, 2002.
<i>Private Equity</i>	-9.10%	24.20%	25.10%		
Delaware					
Delaware Public Employees	3.10%		3.50%	9.30%	2003 Annual Report. Data as of June 30, 2003.
OTHER STATES WITH LEADING VC & HIGH TECH ACTIVITY					
North Carolina					
North Carolina Retirement	-4.04%	0.79%	6.01%		"Returns of Selected Public Funds as of June 30, 2002." Pensions & Investments. Nov. 11, 2002.
Colorado					
Colorado PERA	-11.80%	-6.60%	2.30%	8.30%	Public Employees' Retirement Association (PERA) 2002 Annual Report. Data as of Dec. 31, 2002.
<i>Alternative Investments/Private Equity</i>	-12.70%	-9.40%	4.40%		
Washington					
Washington State Investment	-6.40%	0.20%	5.50%		Washington State Investment Board Annual Report. Data as of June 30, 2002.
<i>Private Equity</i>	-12.90%	4.40%	8.90%		
Median Total Return					
	-4.04%		5.40%		
Median Total Return of Public Pension Funds					
	-5.82%	-0.30%	5.16%	9.39%	Source: Trust Universe Comparison Report.
Maryland					
State Retirement and Pension System	-7.60%	-2.20%	3.20%	7.90%	Source: Comprehensive Annual Report. Rolling Total Returns as of June 30, 2002.

States have implemented this investment strategy by statutes that specify a percentage of the portfolio, which may be invested in private equity or have had an advisory board or expert determine the percentage allocation.

North Carolina. The 2001 North Carolina Statute (GS 147-69.1) authorizes the State Treasurer to invest up to 5% of its Retirement System's assets in private equity.^x

Michigan. Public Act 55 of 1982 gave statutory authority to the Michigan Department of Treasury to invest State retirement funds in private equity, including risk (venture) capital investments.^{xi} Michigan has focused on investing in venture capital firms that have successful track records and has co-invested in several programs with other partnerships.^{xii}

Pennsylvania. In 1985, the pension fund for state employees and teachers authorized a 1 % investment in venture capital, which helps to gain support of individuals who were fiercely opposed to the idea of state investment in venture capital. In 1992, a statute governing the state's pension fund's investment policies was increased from 1 % to 2 %. The fund had a goal to invest 2% (\$290 million) in venture capital by 1998. Of this, 24 percent (\$69.6 million) has been targeted for Pennsylvania companies. Targeted return is the S & P 500 plus 5%.

The private equity market is growing rapidly and is accessed by most of the states' retirement plans. In order to remain competitive with other states, Maryland should increase its pension fund exposure to private equity. If it is determined that current law does not permit state pension fund investment in venture capital, the Commission strongly recommends that the State encourage increased pension fund investment in private equity, including venture capital.

2. Raise Investment by Maryland Banks in Small Business Investment Companies (SBICs)

The State of Maryland should undertake a concerted program to encourage banks in the state to invest in SBICs in partial fulfillment of the banks' obligations under the Community Reinvestment Act (CRA).

Encouraging Maryland banks to invest in SBICs will further increase the amount of capital available to start-ups and small businesses in the state, and will help banks fulfill an important regulatory requirement. This initiative will also help banks by making them aware of the regulatory benefits and simplicity of investments in SBICs. Maryland banks have an enormous amount of potential capacity for investment in SBICs: There are presently 58 banks operating around the State of Maryland with \$131 million in SBIC capacity. If a state initiative can mobilize any significant portion of these banks' SBIC investment capacity, such an initiative can have a major impact in increasing capital availability for venture investments.

Discussion

Background: SBICs are private venture capital funds that receive substantial funding from the U.S. Small Business Administration (“SBA”) to make capital available to start-ups and other small businesses that otherwise have difficulty accessing capital. The 1959 Small Business Investment Act created SBICs with the intent to forge a partnership between the Federal government and private capital. This type of public/private partnership has the ability to provide small business financing and essentially bridge the funding gap between venture capitalists and entrepreneurs.

SBICs have been proven successful, and to date, have disbursed over \$9 billion to more than 65,000 small businesses nationally.^{xiii} Maryland-based Radio One, Intel, Apple, Federal Express, Staples and Callaway Golf are a few of the many successful U.S. companies that have received SBIC financing.^{xiv}

Radio One

Radio One, based in Lanham, Maryland, was founded in 1980 and is the seventh largest radio broadcasting company in the U.S. based on 2001 pro forma net revenue.^{xv} Presently, Radio One owns and operates 66 radio stations in 22 major markets.^{xvi} A major contributor to Radio One’s success was that it financed many of its early acquisitions with SBIC financing. Through its participation in the SBIC program, Radio One received \$9.5 million in capital from four different SBIC’s, which financed the acquisition of 21 radio stations in March 2000.

To date, banks’ awareness of SBIC investments have lagged for several reasons. Banks have traditionally been focused on lending and financial services, rather than equity investments. Although the investment component of CRA requirements has been receiving increasing attention, many banks remain hesitant about equity investments and uncertain about how to fulfill that portion of their CRA obligations. In addition, many banks are unaware of the recent CRA regulations providing special credit for banks’ investments in SBICs.

Many banks do not realize that investments in SBICs have two important business advantages, in addition to the special regulatory treatment.

1. Historically, SBICs have produced better rates of return than other kinds of activities that can fulfill the banks’ CRA obligations.
2. Investments in SBICs are much simpler than other kinds of CRA activities.^{xvii} SBICs are subject to rigorous licensing requirements (including extensive prior track record requirements for the managers) and performance scrutiny by the SBA. Banks can rely upon the SBA licensing and oversight, and need to do little unless they choose to do so – especially since all bank investments in any SBICs count automatically for CRA credit.

A state initiative promoting bank investments in SBICs can help banks recognize both the regulatory and the business benefits of SBIC investments. Such an initiative will also benefit Maryland start-up companies by mobilizing a potentially large pool of additional venture capital for such businesses. Maryland banks will require that the SBICs in which they invest put that money to work within the State, because banks only receive CRA credit for activities within their “assessment area” which is generally determined to mean the state within which the bank (or a particular portion of a nationwide bank’s business) is located. Banks have some discretion to define their territory more narrowly, but not more broadly than statewide.

Benefits: Encouraging Maryland banks to invest in SBICs will further increase the amount of capital available to start-ups and small businesses in the state, and will help banks fulfill an important regulatory requirement. This initiative will also help banks by making them aware of the regulatory benefits and simplicity of investments in SBICs.

Maryland banks have an enormous amount of potential capacity for investment in SBICs:

- The eligible 58 banks throughout the State of Maryland have an overall collective capacity of \$131 million to invest in SBICs.
- SBICs are eligible for 2:1 matching funds from the Federal Government. For example, the \$131 million of potential investments by Maryland banks in SBICs could be matched by \$262 million of federal funds, for a total of up to \$393 million for venture capital investments in MD start-ups.

A majority of the total pool of banks is located in proximity to areas where start-up businesses are located. However, a substantial amount of bank capacity is disbursed in rural areas of the state.

Of the 58 banks throughout the state there are currently 36 Banks operating around the State of Maryland with \$131 million SBIC capacity, including:

- Anne Arundel Co., 6 Banks, \$11M SBIC capacity;
- Baltimore City/Co., 16 Banks, \$57M SBIC capacity;
- Frederick County, 2 Banks, \$8M SBIC capacity;
- Montgomery County, 7 Banks, \$17M SBIC capacity;
- Prince George’s Co., 3 Banks, \$5M SBIC capacity; and
- Washington County, 2 Banks, \$5M SBIC capacity;

All banks have a legal obligation under the CRA, enacted more than 20 years ago, to do a certain amount of community-oriented, socially beneficial activity. CRA applies to federally insured depository institutions, national banks, thrifts, and state-chartered commercial and savings banks. The CRA and its implementing regulations require federal financial institution regulators to assess the record of each bank and thrift in helping to fulfill their obligations to the community and to consider that record in evaluating applications for charters or for approval of bank mergers, acquisitions, and branch openings.^{xviii} Three types of CRA activity are required: lending, investment and

services. Banks receive an individual score for each of these three types of community activity, and a composite score for their overall CRA activity. A bank cannot receive a top score in its overall CRA rating unless it achieves at least a “satisfactory” score on the investment component.

Implementation: The State should start by encouraging banks that currently have a low score in the investment component of their CRA rating. These banks have a need to undertake more CRA investment activity and should be receptive to new activities such as SBIC investments. Additionally, encouraging such banks to invest in SBICs will not be displacing other CRA activities, such as minority lending programs.

3. Restore and increase funding for investment financing programs

The State should increase annual funding of the DBED Investment Financing Group, the Maryland Technology Development Corporation (TEDCO), or similar state entity to provide increased flexibility for support of new and growing Maryland businesses.

Discussion

Benefits: Increasingly, state governments are allocating state funds to leverage private investment in their states as a key element of economic development programs. Maryland is fortunate to have a strong team in place that has demonstrated success in managing such resources, but recent reductions in funding have meant the state is under-utilizing this resource. Maryland’s DBED financing group has leveraged \$32 million of equity investment into over \$1 billion in co-investment funding since 1994. In June 2003, the Maryland Department of Business and Economic Development programs, which include the Investment Financing Group, received Financier-of-the-Year recognition at the 7th annual Greater Washington Technology CFO Awards event. The existing loan and investment programs currently in place appear to be flexible enough so that arrangements can be tailored to fit specific job-creation opportunities.

While the primary purpose of these programs is economic development, DBED programs have generated a 32% internal rate of return on an annualized basis over the past ten years, and have returned over \$50 million to the State’s General Fund with funding that has ranged from \$8 million to the current reduced level of \$4 million annually.

In addition, DBED helped create and launch TEDCO, which also plays a key role in pre-seed stage technology business formation in the state. One set of TEDCO’s programs helps start-up companies improve the commercial viability of new technologies on which they are collaborating with in-state universities or Federal labs, by investing an average of \$50,000 per company for this purpose. The funding provided by TEDCO under these programs has been leveraged into 20X downstream funding from venture capitalists and Federal grants to date (\$950,000 leveraged into over \$18 million of other funding). Another set of TEDCO programs helps MD universities improve the attractiveness of their technologies for private commercialization by providing awards averaging \$50,000 for demonstration of proof of concept. A third set of TEDCO programs helps develop

and support business incubators around the state, for example by funding feasibility evaluations of particular sites, and providing awards that help disseminate best practices.

4. Encourage Foundations in Maryland to Invest in Technology Companies

The State should encourage foundations to fund or increase its funding for translational and basic research for technology companies.

Discussion

Background: Many foundations across the U.S. fund the development of new technologies, but almost entirely through basic research. Translational research follows basic research, and involves transferring a technology out of the laboratory into clinical trials, product development or production.

Benefits: Encouraging foundations to increase funding for translational research would be beneficial for both the foundations and the State's technology start-up companies for the following reasons:

- Better achieve foundations' goals of helping patients;
- Still fully involve academic centers and collaborators; and
- Help technology companies fill the funding gap for this crucial period.

Implementation: DBED should embrace this recommendation. The staff at DBED should research and target local and regional foundations that presently fund basic and translation research. Once foundations have been identified, the Governor and the Secretary of DBED should contact and encourage the foundations to provide translational research funding for Maryland technology companies.

5. Use state tax incentives to affirm the message that Maryland welcomes and encourages technology investments.

a. Promote investment in advanced technology equipment and construction materials

Exempt from sales and use tax for an annual aggregate investments of \$500,000 or greater in: 1) computer and telecommunications equipment, and 2) expenditures for building materials utilized in new construction of facilities for technology industries. This would expand Maryland's current sales tax exemption for equipment used in manufacturing or research and development and align incentives for expanding companies of all sides with current drivers of job creation.

Discussion

Benefits: Capital investments in information and communication technology typically improve the efficiency and competitiveness of the companies using the technology. Said investments also represent the core assets of businesses that can “export” goods and services from Maryland, bringing proceeds to fuel well-paying jobs. Therefore, it is good public policy to encourage technology investment in the state.

State promotion of investments in technology is an important signal to companies considering investments in existing or new non-Maryland facilities, and would expand Maryland’s present exemption from sales/use tax of equipment, customized computer software and materials used or consumed in research and development and manufacturing, including testing of finished products.

Additionally, as technology is now the primary driver of employment in our state in the new economy, a sales tax exemption in these areas would align the tax incentive with employment drivers similar to the current sales tax exemption on manufacturing equipment. The sales tax exemption should be available for the materials that are consumed in constructing real property as well as technology equipment.

Incremental technology investments will create or preserve well-paying Maryland jobs; yielding higher tax proceeds from payroll/income taxes, and sales taxes arising from employees’ consumption in the state.

Other states’ practices: States with comparable programs include Arkansas, Delaware, Georgia, Hawaii, Illinois, Iowa, Montana, New Mexico, Oklahoma, Rhode Island, Tennessee, Vermont, Washington, and West Virginia.

Additional specifics:

- The \$500,000 threshold for this tax incentive is designed to target the benefit to larger capital commitments, which are likely to drive employment and have a distinct impact on substantial investment decisions.
- Criteria for qualifying investments (computers, servers, telecom equipment, software) should be defined based on existing Maryland or other states’ precedents.
- To mitigate and monitor potential revenue losses, particularly in the early years of implementation, an annual credit cap of \$100,000 per company should be considered.

b. Align Maryland’s tax policy for capital gains on technology investments to be similar to Federal tax policy

Reduce the Maryland personal and corporate income tax by 50% on capital gains arising from equity investments in early stage Maryland companies. This

alignment would be similar to federal treatment of capital gains, and Maryland's tax treatment of Maryland municipal bonds.

Discussion

Benefits: When choosing whether to locate a new company in Maryland, a neighboring state, or elsewhere, the investor decision-makers would look favorably on the prospect of an enhanced investment return if the business is successful.

Implementation: Prior to implementation, a firm definition of what qualifies, as an early stage Maryland technology company investment must be developed. One suggested definition would be investments made prior in private technology companies.

Provided legislation is pursued, it should specify the length of the holding period. In addition, if the investment-holding period were for a minimum two to five years, there would be no impact on state revenues for the first several years. After this initial period, reliable estimates would be necessary to measure the fiscal impact.

c. Improve research and development credits for businesses

Eliminate the "pooled" \$3 million ceilings on Maryland's "basic" and "growth" research and development tax credits and limit the fiscal impact instead by capping the credit on a per-business basis – e.g., the lower of \$1 million per business or 50% of Maryland tax liability.

Discussion

Benefits: Businesses that incur qualified research and development expenses in Maryland are entitled to a tax credit against corporate income tax or personal income tax, and this helps companies to "stretch" their research and development spending in the state. However, the total credits for all businesses statewide may not exceed \$3 million per year under each of two pools – "basic" and "growth", so that taxpayers must first file preliminary corporate tax returns before learning what proportions of the credit pools are available to them, and then must file amended returns.

The present Maryland ceilings are very low relative to the potential for encouraging research and development in the state, and the administrative inefficiency of amended returns is an unnecessary and discouraging burden for both taxpayers and the state. Elimination of the ceiling would make the tax benefit predictable by Maryland corporations and lead to increase research and development spending in our state.

Other states' practices: At least 30 states offer research and development tax credits. Some states have caps, but many do not. Maryland's credit has been low

compared to the potential credits that would be allowed in other states, because of the low cap.

d. Provide investment tax credits for early stage investors

Allow a 10% corporate and individual tax credit for investments in qualified technology companies, with a credit cap of \$25,000 per taxpayer.

Discussion

Benefits: An investment tax credit focused on qualified Maryland enterprises would help to fund early-stage investments in the state. The fiscal impact would be offset by reducing the investors' tax basis in the qualified investments, increasing taxes on future gains on successful investments.

Other states' practices: Other states offer similar programs including Hawaii, Idaho, Kentucky, North Carolina and Ohio.

6. Survey CEOs on regulatory process *DBED should institutionalize an ongoing process that solicits feedback from Maryland businesses on the State's regulations and regulatory process and in cooperation with relevant state agencies should develop an annual report to the Governor with recommendations for reforms to promote efficiencies consistent with the State's regulatory objectives.*

Discussion

Program: In order to ensure that Maryland develops and maintains a "business friendly" environment while balancing its internal revenue requirements, DBED should establish a program that provides a diverse and detailed analysis of the economic health and climate in the state on an annual basis across both geographic regions and business verticals. The Secretary of DBED should report these detailed findings to the Governor and the General Assembly annually at the beginning of each Legislative session. This report should provide specific feedback from Maryland companies on the regulatory climate, comparative analysis against neighboring states, and National best practices.

7. Invest in the Business/Technology Case Management Program

Support the growth and development of the Business/Technology Case Management Program in Maryland's Courts to ensure Maryland's judiciary can readily accommodate complex business litigation. To demonstrate their commitment to this program, the Governor and the General Assembly should appropriate funds as soon as practicable for the purchase and installation of the computers, video screens, video monitors, and other equipment necessary to create at least one "electronic courtroom" in each participating Circuit.

Discussion

The Business/Technology Case Management Program became operational in the Circuit Courts of Maryland on January 1, 2003. It results from the recommendations of the Task

Force created by the General Assembly of Maryland during the 2000 Session and the implementation of those recommendations by the Conference of Circuit Judges at the direction of Chief Judge Robert M. Bell.

Establishment of this program provides Maryland with a unique opportunity to improve its perception among the business and technology communities as a preferred place to do business by providing judges in the Circuit Courts who are individually assigned to technology cases and who have received training in the types of issues likely to arise in disputes between technology companies.

In order to effectively handle these cases, at least one courtroom in each Circuit participating in this Program should have the necessary equipment installed to serve as an "electronic courtroom." The creation of "electronic courtrooms" has been successfully underway for years in the federal court system and in many states.

II. HARNESS MARYLAND'S RESEARCH AND DEVELOPMENT ASSETS

Enhance and leverage the research performed in Maryland's research institutions to increase transfer and commercialization of innovations to the mutual benefit of the research institutions, Maryland businesses and the State. As the clear leader in federal research and development, Maryland must exercise that significant competitive advantage on the national and international markets.

1. Establish a permanent State Chief Technology Officer

To ensure that the development of advanced technology business remains a high priority within the Department of Business and Economic Development (DBED) the Governor should create a permanent State Chief Technology Officer within DBED, with direct report to the Secretary.

Discussion

Building upon the work already accomplished by DBED, and to ensure that future Secretaries of DBED will continue to focus on the development of advanced technology-related businesses, the Governor should create a Deputy or Assistant Secretary of Technology within DBED. This Senior Executive should have both a technology and business background. This individual should serve as the Governor's principal advisor on issues of science and technology, the State's Chief Technologist, and should chair the Governor's Science Advisory Board. The Deputy or Assistant Secretary of Technology would also manage the various technology panels, and other State technology and business groups, and would have direct oversight for the Maryland Technology Development Corporation (TEDCO).

2. Increase utilization and effectiveness of Maryland Technology Councils

Establish a better working relationship with the Technology Councils across the State amongst themselves, State Agencies, and State Government.

Discussion

The primary mission of Technology Councils is to be effective for the membership that they serve in their region. Part of that mission is to represent their membership on legislative issues, programs that impact economic growth, and broad business issues that impact the region. DBED is well positioned to enable the Technology Councils across the State to significantly improve their ability to assist their members in establishing a

unified voice on legislative issues, and building a cohesive group that can significantly improve collaboration amongst Technology councils and improve the image of Maryland's Advanced Technology Businesses. Maryland technology councils that receive state funding should be required to meet biannually, as a minimum, to assist the Secretary of DBED develop concrete steps to continually improve the State's technology economy.

3. Encourage entrepreneurial initiatives and technology transfer

The University System of Maryland should review, revise and clarify the regulations and practices relating to intellectual property (IP) ownership, indemnification, and other legal and administrative risk issues to ensure that the culture and practices of the State of Maryland, the University System, and institutional leaders encourage technology transfer and entrepreneurialism. Furthermore, the University System should provide an annual forum for private technology firms on ways universities could improve industry/university research partnerships, sponsored by DBED, the Technology Council of Maryland, the Greater Baltimore Technology Council, and TEDCO.

Discussion

Spinning out local start-up companies, as opposed to licensing to existing out-of-state firms, is a key component of using academic R&D funding for technology-based economic development in Maryland. The State of Maryland, research universities, DBED and TEDCO should align tech transfer programs and financial support mechanisms to maximize efforts to create start up companies. The recently enhanced University Tech Transfer Program of TEDCO helps to reduce the financial burden on tech transfer offices to structure immediate licensing deals, allowing the tech transfer offices to develop longer-term and higher risk efforts with start-up companies.

Furthermore, the research universities in the state should establish an annual forum, sponsored by DBED, the Technology Council of Maryland, the Greater Baltimore Technology Council, and TEDCO to share National best practices and to improve and expand industry and university research partnerships. Maryland's proximity to the Nation's capital and major federal research agencies such as the National Institutes of Health, the Food and Drug Administration, and the National Institutes for Standards and Technology, have played an indispensable role in our number one ranking in attracting federally-funded research and development.^{xix} However, Maryland currently ranks only 45th in the area of privately sponsored research and development performed at universities.^{xx} With the scientific capabilities of our research universities and intellectual capacity of our population, there is no reason we cannot increase our stature as a privately funded research and development leader.

4. Support the State's incubator network with capital and operating funds for best practices

The State should support and expand its existing business incubator network through increased capital and operating funding. This funding should be tied to the implementation of national best practices.

Discussion

The enormous pool of R&D capability resident in the State's federal laboratories and universities present a significant opportunity for new business development. Technology companies need access to technology, capital, facilities, and entrepreneurial networks. In addition to limited capital availability, a major constraint to the commercialization of technology from the State's universities and federal laboratories is the lack of incubation space for early stage companies. Business incubators – which provide shared facilities, flexible terms, and supportive environments that nurture start-up companies – are a proven and effective tool for business development.

Maryland is establishing itself as one of the premier states for business incubation, with 12 existing county and university managed incubation programs leveraging the resources of APL, JHU, NSA, NASA, NIH, UMBC, and UMCP. Two of the State's publicly-traded biotechnology companies, Martek and Digene, were spun out of the University of Maryland College Park technology incubator. The General Assembly established the Maryland Technology Incubator Program in 2000, the State's first comprehensive, professionally managed incubator program, and the Maryland Business Incubation Association (MBIA) has been formed to link together the network of facilities. The State's commitment to this activity has received national recognition; the National Business Incubation Association will be holding its Spring 2005 International Conference in Baltimore, and the federal Economic Development Administration has provided a unique grant to disseminate "best practices" among all the facilities.

Opportunities to leverage the State's R&D assets remain at Ft. Detrick, Aberdeen Proving Ground, Patuxent River, and the Eastern Shore, among other locations, as well as at the research parks in existence or under-development at JHU, UMB, UMBC, and UMCP.

The State needs to provide capital funding to complete the build-out of the incubator network. Modest State capital funding has been demonstrated to stimulate the development of incubation facilities. Recent incubator projects have leveraged competitive State grants at ratios up to 6:1, and the first building in UMB's research park will contain 40,000 sq. ft. in its collaboration center.

The State also needs to support this effort with sustained, predictable funding for operational support of incubators. This will provide for high quality services to tenants and smooth out the inevitable ups and downs of rental revenue. Innovative programs – which can leverage federal and foundation funding - must also be pursued. One example is a working capital program for those promising incubator tenants – the majority – that will not attract venture capital.

5. Allow State higher education institutions greater leeway under State personnel and procurement rules for activities that are not directly supported by State General Funds

To encourage public universities to attract more research dollars to Maryland, the Governor, with cooperation of the University System of Maryland and other institutions of higher education, should develop a legislative package to reform the state laws, rules and regulations concerning the expenditure associated with research at Maryland's public universities but not funded by the state, specifically those sections governing procurement and personnel matters.

Discussion

According to the National Science Foundation, most academic research and development funding in Maryland comes from the federal government. Research and development spending attracted by faculty in the State of Maryland supports over 50,000 jobs. The federal government has a complex set of rules, auditing requirements, and oversight agencies to ensure the appropriate expenditure of federal research grants by public and private universities. Federal Office of Management and Budget Circular A-21 provides guidance for spending federally sponsored designated audit agencies of the federal government is responsible for these functions. In addition, the USM Board of Regents provides another layer of oversight to federal research and development expenditures by USM institutions.

Under the Maryland budgetary system, as outlined in the Maryland Constitution, all funds received by state institutions (including public colleges and universities), are treated as 'state funds'. This includes funds from non-state sources, such as the federal government. Under this approach, these federal funds are subject to all the state laws and internal Maryland Department of Budget and Management regulations that are applicable to the expenditure of state funds. This means that federally supported academic research and development grants are subject to both federal and state regulations, despite the fact that these funds are exclusively federal and flow directly to the educational institution, having no direct impact upon the state's general fund. This accounting practice creates impediments for Maryland's public research institutions in securing and effectively utilizing non-state academic research funding, and complicates efforts to attract and retain top research talent.

For example, broad state restrictions on personnel actions (i.e. hiring freezes) implemented to limit expenditures from the state's general funds, can have the unintended affect of preventing institutions from using non-state research grant funds to create new research positions, despite the fact that the position is wholly funded by federal dollars and would have no impact upon the state's general fund.

Likewise, procurement rules established for state funded projects are often applicable to federally funded academic research and development activities. These procurement regulations are at times overly complex and cumbersome, and often exceed the

requirements imposed by the entity funding the research, leading to delays and frustration.

The personnel, procurement and other requirements imposed upon non-state funded research projects are duplicative of existing federal and/or private oversight. This in turn creates complexity, delay, and adds an additional level of bureaucratic frustration for faculty and researchers engaged in the highly competitive process of winning and managing research projects at public universities and research institutes. In recognition of the inefficiencies inherent in such a system, states such as California and Michigan have streamlined the process by exempting public university expenditures of non-state research and development funds from normal state budgetary regulations.

The researchers who are the most successful at winning grants and contracts are highly sought after. These researchers take a proprietary pride in winning grants, and often are recruited to other states or private universities where the ‘bureaucratic hassles’ of administering research and development grants are not as repressive as in states where federal grants are treated as state funds. Rather than managing grants through the hurdles necessary to comply with the added state regulations, University researchers should use their energy identifying and winning additional grants and contracts to be brought back to Maryland.

Previous attempts to address this issue have focused on individual issues, not comprehensive reforms. Therefore, we recommend that the Governor prepare an omnibus state statute providing for reform by exempting research contracts and grants paid for by non-state sources from additional state procurement and personnel rules and regulations. The omnibus statute could be placed in Title 15 of the Maryland Education Code Annotated.

6. Increase state funding for academic research

The State should increase its support for pre-seed technology development via the TEDCO university technology development fund (UTDF), expand the Maryland Industrial Partnerships (MIPS) program funding, and create new multi-institutional centers of excellence targeted to developing world-class research focused on specific federal and private funding opportunities in areas of importance to the economic development of Maryland.

Discussion

University Technology Development Pre-Seed Fund:

Successful commercialization of university technology often requires incremental funding for proof of concept and pre-seed development activities before the technology is capable of being licensed or commercialized by the private sector. Additional funding for pre-seed and proof of concept development will enable more university spin-out companies to be formed and more university-owned technology to be licensed by the private sector.

MIPS:

The Maryland Industrial Partnerships (MIPS) program, managed by the University of Maryland College Park, accelerates the commercialization of technology in Maryland by providing matching funds for collaborative research and development projects between companies and University System of Maryland faculty. Funding is awarded on a competitive basis, and even worthy proposals is not always funded due to budget constraints. Approximately \$1.3 million in MIPS funding is available under current annual appropriations, allowing only about one out of every 3 proposals submitted to be funded.

Since the MIPS program was founded in 1986, a \$22 million investment from the state has leveraged over \$90 million from the private sector for joint research projects at research universities across Maryland. With successes ranging from helping improve the World's 10th best selling biotech drug to developing the U.S.'s only consumer satellite Internet product, MIPS has contributed significantly to the economic development of the state. MIPS is responsible for generating over \$400 million in sales and new research and development contracts since it was created by a budget appropriation to the University of Maryland Clark School of Engineering.

In addition to expanding MIPS funding, consideration should be given to designating community college faculty as eligible recipients of MIPS funding.

Centers of Excellence:

As new state revenues permit creation of new programs, \$15 million in annual funding should be provided to create three centers of excellence in Maryland. Funding would be based on competition among institutions of higher education in Maryland, with awards given to proposals demonstrating institutional collaboration among both universities and federal labs in Maryland, funding commitments for co-funding of \$15 million from the private sector, and impact on the Maryland economy. Either the Governor's Science Advisory Board or the State's Chief Technology Officer at DBED could administer these significant awards.

7. Encourage Maryland research consortia to compete for large federal funding opportunities

Develop a Maryland-based forum that enables consortia of universities, government labs and the private sector to more competitively respond to large-scale federal funding opportunities.

Discussion

The federal government, through the President's Council on Science and Technology, has identified a series of key areas where funding will be available in the future for large-scale scientific projects, including: Combating Terrorism; Nanotechnology; Networking and Information Technology; Molecular-level Understanding of Life Processes; Environmental; and Energy.

A coordinated effort among state research entities would enable Maryland to leverage its key public and private strengths and take a leadership role in areas identified for future funding opportunities.

Grant applications involving multi-institutional submissions from Maryland institutions would receive priority by the state for additional financial support in future years, once state revenues improve, and would receive the state's support from the Governor's Washington office and the Maryland Congressional delegation.

21st Century Nanotechnology Research and Development Act

The United States Congress recently passed Senate Bill 189, the 21st Century Nanotechnology Research and Development Act, which, if enacted, will create a National Nanotechnology Program. Investment in Federal research and develop programs for nanotechnology and related sciences will be a major component of this program. If fully funded, the program could provide up to \$782.8 million of nanotechnology-related funding to five federal agencies in Federal fiscal year 2005, increasing annual to more than \$1 billion by fiscal year 2008. The majority of this funding can be reasonably anticipated to be directed towards research. The legislation calls for the establishment, on a merit-reviewed and competitive basis, of interdisciplinary nanotechnology research centers designed to promote collaboration and interaction of academic institutions, national laboratories and other partners and foster the exchange of technical information and best practices and promote the use of existing nanotechnology expertise both regionally and nationally. As home to several academic and other research institutions already deeply involved in nanotechnology research, a Maryland consortia should be a prime competitor for such a research center. A Maryland proposal could be further strengthened by the inclusion of one of Maryland's several Historically Black Colleges and Universities (such as Morgan State), which would entitle the consortia to enhanced consideration. Although this is program has not been enacted, it is an example of the type of opportunities that Maryland must be prepared to compete, and for which Maryland will be better positioned if it has already established strong research consortia.

Providing federal labs with expanded legal authority to enter venture-backed initiatives would also facilitate increased interactions with this consortium and linkages with university based venture initiatives. Department of Defense (DOD) labs already have authority under federal "Other Transactions" (OT) procurement legislation to create venture-backed entities, such as those created by the CIA and the U.S. Department of Army. This OT authority should be extended to civilian labs, such as NIH, NASA, and NIST, to create greater interaction among the federal, academic and private sectors in Maryland. Extending OT authority to civilian labs will require federal legislation, and should be supported by the Governor and Maryland's Federal delegation.

8. Create alternative financing vehicles to create more lab space at Maryland's Universities

Maryland's higher education institutions should work with the state to develop alternative capital construction financing models to construct additional lab space, acquire additional lab equipment, and expand university research parks by reforming the State of Maryland and Board of Public Works (BPW) regulations to encourage public/private partnerships, and support Congressional efforts to increase flexibility in federal real estate transactions.

Discussion

The physical infrastructure necessary to attract and conduct research and development is a key limiting factor in the attraction of additional research and development dollars to Maryland. Expanding our various research facilities and capacity will further strengthen our competitive edge. Maryland universities already show a deficit of research space according to state planning guidelines. The research space deficit at the University of Maryland, College Park, for example, is projected to reach nearly three quarters of a million square feet of space by 2010.

With the State of Maryland presently unable to use general obligation (GO) bonds to construct new lab space or purchase capital equipment as aggressively as in past years, innovative mechanisms to expand research space need to be considered. Possible mechanisms include alternative financing through the Maryland Economic Development Corporation (MEDCO), leasing of research space constructed by private developers in university-affiliated research parks or available land on campuses, and additional federal/state/university partnerships.

In the past decade, Maryland universities have witnessed hundreds of millions of dollars of residence hall construction on or adjacent to campuses financed by the private sector.^{xxi} Following this model, and in light of the growth in research dollars at Maryland universities, revenues to support debt payments or lease payments for new research facilities may be available through indirect overhead charges or as direct charges to research grants. Facilitating state land leases through the BPW will be necessary to develop these projects since leases of state land to the private sector will be necessary.

Additionally, the Maryland State Retirement and Pension Board's real estate investment portfolio will need to include university research building projects in Maryland to help facilitate construction of these research buildings. State operating budget revenues dedicated to rent payments may be necessary as a guarantor to initiate the construction of privately financed research facilities.

Georgia Tech has been particularly resourceful in constructing new research space without the use of construction bonds backed by the state, by using strategies similar to those outlined above. The use of alternative financing will require the cooperation of university trustees, bond-rating agencies, the Department of Budget and Management and BPW.

In addition to university research lab construction, the state needs to pay greater attention to leveraging the presence of federal labs for local economic development.

Given the number of federal labs in Maryland, and the interest in creating federal/university partnerships, Congressional efforts to reform federal land and real estate procurement regulations should be supported by the Maryland Congressional delegation. Such reform would give federal laboratory managers the tools to jointly develop additional research facilities with universities, or better utilize existing federal lab space for joint activity.^{xxii} The Governor's Congressional experience in leading the Biotechnology Caucus makes him an ideal candidate to lead this effort. This effort will need to be undertaken in cooperation with Congressional delegations from other states with large federal lab and university centers, such as California, Colorado, North Carolina, and Massachusetts.

9. Promote increased coordination at University and college tech transfer offices

The technology transfer offices of Maryland's colleges and universities should expand their collaboration to promote cooperation, best practices and greater efficiencies, including exploring ways of sharing administrative functions. The technology transfer offices should also improve the role of advisory panels.

Discussion

While technology transfer by its nature is a “contact sport” and needs a presence on a campus, administrative partnerships among the individual offices may generate cost savings. For example, pooling retainer contracts for outside patent counsel may reduce costs. Collaboration in licensing related technologies among the offices should be explored. The University System of Maryland institutions currently devote over \$3.3 million annually to pay for operating expenses and patent costs for technology transfer offices. In addition, including technology transfer offices from federal labs in Maryland at these meetings should be considered.

In addition, all technology transfer offices within Maryland should establish advisory boards made up of individuals experienced in business development, venture funding, and related business development areas, as well as specialized scientific areas. A number of technology transfer offices already have such panels. These same advisory boards should be offered to and partner with federal labs in order to strengthen our partnerships with our most valuable resources (federal labs) and to improve the commercialization of intellectual property developed at Maryland's academic institutions and federal facilities.

III. MARKET MARYLAND

The Governor’s Leadership is essential in leading a National and International marketing effort for Maryland. Developing and leading the implementation of a comprehensive campaign to market Maryland is key to the future of Maryland’s economy. In order to achieve this, Maryland must develop programs and strategies to increase local, national, and international awareness of Maryland’s competitive advantages as a home for advanced technology investment and business.

1. Leverage the Office of the Governor to encourage and sustain Maryland’s advanced technology enterprises.

The Governor, through a personal commitment and direct involvement, should leverage the prestige and resources of the Office of the Governor to support the development and retention of advanced technology enterprises in Maryland.

Central to any effort to raise and improve the State’s business profile is the personal commitment and involvement of the Governor. The Governor, through his role as the leading spokesperson for the State, is uniquely able to create a positive business environment. The Governor can accomplish this through a wide range of simple actions, including congratulatory calls to business leaders, annual meetings with industry leaders, and other high-impact, low-cost activities, each intended to convey the message to business community that the Governor and the State are concerned and engaged with economic development and welcome and appreciate the important role that enterprises have in the overall success of Maryland.

2. Develop a comprehensive marketing strategy to “brand” Maryland as a leading home for technology business and innovation.

The State should aggressively develop a brand positioning as part of the process to become a leader in the future of U.S. technology while gaining ground in the national competition for economic development.

Several regions have acquired strong reputations as leaders in the development and commercialization of advanced technologies. Over time these names – either regional titles such as the “Research Triangle” in Raleigh, Durham, and Chapel Hill, North Carolina, the “Silicon Valley” of San Francisco, the “Tech Corridor” of Boston, Massachusetts, or city names such as Seattle, Washington – have become synonymous in the national subconscious as the hot areas for new technology business. In each case, the region has become a “brand” associated with advanced technology development, with the ability to attract additional investment based upon the national perception of the region.

Despite the volume of research performed in Maryland’s federal, academic and private laboratories, our highly educated workforce, our proximity to the Federal government and countless other benefits that make Maryland an excellent candidate for new advanced technology ventures, Maryland has not achieved a high profile for these activities.

The Department of Business and Economic Development (DBED) should create a comprehensive marketing strategy focusing upon the key assets of the state, including: (1) the presence of leading academic research institutions, including Johns Hopkins University and the University System of Maryland; (2) the tremendous volume of research performed at Federal labs and agencies located in Maryland such as NIH, NIST, and NASA; (3) the proximity to the Federal government, a primary source of funding for advanced technology research and development; and (4) the attractiveness of Maryland as a site for new or relocating enterprises. The marketing strategy’s goal will be to produce a similarly strong resonance in the mind of entrepreneurs and the business world that will “brand” Maryland as a leader in advanced technology development.

Discussion

Benefits: Maryland has been transitioning to a technology-driven economy, and is now perceived by an increasing number of businesses to have a pro-business climate.^{xxiii} This increasing positive perception of Maryland’s business mindset provides the culture required for recognition of Maryland as a technology-centric hotbed. From a national standpoint, Maryland’s primary competitive edge is the fact that it encompasses very broad technology activities -- from digital to biotech to meaningful research. This provides an insurance policy to high technology businesses that Maryland can maintain that competitive edge. Nowhere else in the United States does this critical mass of key elements exist.^{xxiv}

To ensure Maryland’s high technology economic future, the State must foster growth in high technology companies, attract more high-tech businesses to Maryland and expand research and production activity of existing companies. Key to attracting business to Maryland is the “branding” of the State’s technology leadership with an emphasis on its technology market assets.

Maryland has two primary strengths that should be highlighted in meeting the branding effort: geography and economic development mindset.

Geography

Within Maryland’s boundaries is located a powerful high-tech mix that constitutes a “technology capital” on the East Coast, with national impact:

- Well-distributed high technology businesses and growing companies in Montgomery and Prince George’s Counties, the Baltimore region, and Howard and Anne Arundel Counties “bridging” these two regions of the State.
- A university consortium, led by the University of Maryland System and the Johns Hopkins University with its medical/biotech and Applied Physics Lab assets.

These research institutions operate as a generator of human capital and research talent and provide a training ground of future technology research.

- The largest concentration of Federal agencies in the United States, including the National Institutes of Health, the National Institute of Standards and Technology, the Food and Drug Administration, the National Security Agency, the Departments of the Army and Navy, the National Oceanic and Atmospheric Administration, and NASA.
- The highest state population percentage of professional and technical workforce in the nation and third highest percentage of citizens holding bachelor's degrees.
- A unique concentration of laboratories, research facilities and institutions of higher learning with the intellectual power of more than 200 major research labs.

Economic Development Mindset

Maryland has begun to focus its economic development efforts on the technology industry, and develop an economic development marketing mindset. The “Maryland is open for business” mindset presents an economic development challenge to competing jurisdictions, and is appealing to high tech companies to do business in Maryland headquarters and facilities and employ trained Maryland residents.

Implementation: To accomplish this significant branding task, Maryland must take several steps to strategically establish a branding platform:

1. Maryland must define a strong brand essence.
2. Maryland should position itself to be highly visible to each of its key target audiences.
3. Maryland must project itself as a technology brand through a powerful, integrated, and innovative communications mix. (See Appendix C).

It is clear that Maryland has the workforce, the facilities, and the funding to be a technology capital. Through these branding methods, Maryland will be able to establish itself as an innovator and leader in high technology while promoting the State as the new, ideal place to expand or locate a business.

3. Create a central database of Maryland academic and federal laboratory technology resources

Maryland's academic institutions, in conjunction with DBED, should develop a readily accessible, transparent, statewide database of key technology resources at Maryland academic and federal labs, including information on available human and technology resources, equipment and labs, legal and business support services, and funding programs, to facilitate research by private firms on opportunities for technology transfer and commercialization.

Discussion

Maryland's universities have developed sophisticated databases showcasing university-owned technology, but data on other important resources—such as faculty areas of research, consulting opportunities, specialized equipment, and other legal and business support programs are not well established, or are institution specific. Furthermore, these databases are not centrally linked nor linked to DBED'S website. This fragmentation substantially increases the opportunity costs for researchers attempting to identify potential investment opportunities.

To address this concern, the State's public academic institutions, in conjunction with DBED, should upgrade and interconnect their existing databases to contain all of the various data described above. The database should be designed for future growth and should include a wide range of information, including each participating institution's plans and programs; areas of research and interests; and technology transfer policies and processes. Eventually, it should expand to include the patents and invention disclosures of local facilities.

To ensure that the database is complete and accurate, the academic institutions should also institute policies (if not already in place) requiring all research faculty to provide and regularly update the necessary data. These policies should include firm target dates for achieving increasing levels of participation. DBED should also formulate policies that will allow private academic institutions and federal facilities to interlink and participate in the database.

Once established, this statewide database should facilitate greater technology transfers from the participating institutions and allow for increased collaboration among universities, federal labs and the private sector.

4. Pursue targeted international investment in Maryland

The State of Maryland should narrow the focus of its international marketing, and concentrate on building active partnerships with select foreign countries that offer the greatest potential partnership value for the State.

Discussion

Benefits: There are many countries willing to invest their government dollars in technology ventures and companies in the United States. A majority of U.S. high

technology companies actively seek foreign investment; however, they are not well positioned to capture foreign investment.

Historically, Maryland has sought investment from many foreign countries. Maryland must change its strategy and focus its international marketing activities to just one or two key foreign countries that will enable the State's resources to be used more effectively. In order to facilitate technology deals with other countries, Maryland must measure the value of partnering with a foreign country by:

- Their allocation of money to invest in U.S. technology companies
- Their demonstrated track record of doing so; and
- Their existing presence as an investor in the U.S.

Maryland is strong in technology creation, but weak in commercialization and funding. Partnering with foreign countries that are seeking new technologies can give Maryland based companies new sources of funding and potential access to new markets for their products.

Based upon the above criteria, Maryland should focus on countries like Singapore as a partnership candidate, and should establish a continuous communication link between both the public sectors and the private sectors, respectively, and a frequent and regularized forum for investment processes.

Singapore

Many countries – the United Kingdom's Scotland, Israel, Germany, Japan and others – have several interesting advanced technologies development projects underway. Singapore, however, is in a class by itself in terms of the sheer scale of resources it is devoting to such technologies and related investments, both at home and abroad. Singapore has a strong scientific community and an extremely well educated labor force, and is progressing rapidly in biotech and high-tech industries.^{xxv} The Singapore government plays a dominant role in business, science and academia, and has made these industries national priorities. Perhaps the most distinguishing factor about Singapore is the vast amount of resources it has available and is investing – both in Singapore and abroad -- in the development of biotech and high-tech companies and technologies. The government intends to invest more than \$4 billion during the period of 2000-2005, pursuant to "Industry 21" and Infocomm 21" national development plans. Additionally, in 2000, the Singapore government created biomedical, science and engineering research councils that manage public-sector research and development.^{xxvi} Singapore also plays matchmaker between Internet startups and venture capitalists, and is generous with seed money.^{xxvii}

Activities of Other States: To our knowledge, other states have not mounted any focused, organized pursuit of a partnership with Singapore. The investments and other activities that have arisen in California appear to have developed organically.

Costs Associated with this Recommendation: Cost to implement this recommendation should be minimal and include the following:

- Travel expenses for periodic meetings with and in the partner countries;
- Ongoing communications costs; and
- The cost of frequent investment forums or venture fairs.

Implementation: A partnership with Singapore or any other targeted country would require the State to do the following:

- The Governor, Lt. Governor or Secretary of DBED to have monthly conference calls with Government representatives and private sector representatives on both sides to identify opportunities and compare and discuss market information
- To hold an in-person conference in Singapore and one in Maryland for fundraising, partnering and deal-making initiatives.

Additional Specifics: Singapore has also shown a great interest and willingness to invest some of these resources abroad, particularly in the U.S. Singapore has a substantial presence in the U.S., with seven offices established throughout the country. Singapore has invested both in U.S. investment funds and directly in U.S. biotech and high-tech companies. To date, those investments have been heavily concentrated on the West Coast. Singapore has not yet developed any similar concentration on the East Coast thereby creating a window of opportunity for Maryland to establish itself as the primary East Coast area of focus for partnering and investment by Singapore.

5. Create an Executive Job Corps

The Department of Business and Economic Development and the Governor's Office on Service and Volunteerism should organize and maintain an Executive Job Corps to assist new technology ventures by matching entrepreneurs with experienced business professionals who can provide advice on business planning, securing capital, marketing and other aspects of business.

Discussion

The State should organize and maintain an Executive Job Corps that can match experienced business professionals with entrepreneurs in an advisory and mentoring role. This program can be administered in part through the technology database, and marketed through the Governor's Office of Service and Volunteerism (GOSV), which already coordinate similar programs.

Once such program already operating in Maryland through GOSV is the Senior Corps of Retires Executives (SCORE) Association. The Score Association is a nonprofit

association dedicated to entrepreneurial education and the formation, growth and success of small businesses nationwide, including information technology. SCORE's retired and working volunteers provide free business counseling and advice as a public service and as a resource partner with the U.S. Small Business Administration. Services include confidential face-to-face and online business counseling and low-cost workshops.

The SCORE program provides an excellent starting model for the proposed Executive Job Corps. However, special attention should be given to developing close relationships between the new Executive Job Corps and the various Centers of Entrepreneurship and Business Incubators throughout the state. Furthermore, to establish the prestige of the program and ensure that executives with recognized business expertise are engaged, the Governor should personally solicit the participation of business leaders.

6. Create a Governor's Science Advisory Board

Appoint a Governor's Science Advisory Board from the private sector and academe to keep the executive branch abreast of scientific developments relevant to Maryland.

Discussion

If Maryland is to continue as a leader in the knowledge economy, the Governor must consider emerging technology trends and opportunities as he sets budgetary and policy priorities for the state. Such consideration will require an expertise and sophisticated understanding and appreciation of a broad range of scientific and technological areas. To ensure that the Governor has access to sound and timely information on these issues, the Governor should create a Science Advisory Board. The members of Science Advisory Board would be drawn from academe, government labs and private industry. The State's Chief Technology Officer can support staffing for this Advisory Board.

APPENDIX A

Table 1 - State Pension Funds by Total Assets,
including Private Equity (PE) and Venture Capital (VC) Allocations (\$ billions)⁽¹⁾

Fund	Total Assets	Assets in PE	% of Total Assets	Assets in VC	% of Total Assets
California Public Employees	128.68	5.15	4.00%	4.98	3.87%
New York State Common	95.95	5.87	6.11%	0.57	0.60%
California State Teachers	88.13	3.70	4.19%	0.54	0.61%
Florida State Board	78.72	2.89	3.67%	NA	-
Texas Teachers	67.10	0.17	0.25%	0.23	0.35%
New York State Teachers	66.36	0.72	1.08%	0.08	0.13%
New York City Retirement	65.93	NA	-	NA	-
New Jersey	57.51	NA	-	NA	-
North Carolina	50.17	0.35	0.70%	0.16	0.32%
Wisconsin Investment Board	49.74	1.70	3.43%	NA	-
Ohio Public Employees	45.17	0.23	0.50%	0.05	0.11%
Michigan Retirement	42.38	4.84	11.42%	0.74	1.75%
Ohio State Teachers	41.65	0.57	1.37%	0.29	0.70%
Penn. School Employees	38.36	2.18	5.67%	0.22	0.58%
Washington State Board	38.03	3.94	10.35%	0.83	2.19%
Georgia Teachers	35.68	NA	-	NA	-
Minnesota State Board	35.11	1.72	4.90%	NA	-
Oregon Employees	31.70	3.33	10.49%	0.02	0.06%
Virginia Retirement	31.23	1.78	5.70%	0.42	1.34%
Massachusetts PRIM	24.80	1.11	4.48%	0.36	1.44%
Colorado Employees	23.86	2.24	9.37%	0.55	2.29%
Maryland State Retirement	23.68	0.06	0.26%	NA	-
Tennessee Consolidated	22.41	NA	-	NA	-
Pennsylvania Employees	21.37	1.41	6.59%	0.78	3.63%
South Carolina Retirement	20.95	NA	-	NA	-
Illinois Teachers	20.46	0.38	1.83%	0.18	0.87%
Alabama Retirement	20.21	NA	-	NA	-
Missouri Public Schools	17.87	NA	-	NA	-
Connecticut Retirement	17.16	2.04	11.88%	0.20	1.14%
Texas Employees	16.94	0.06	0.34%	NA	-
Arizona State Retirement	16.72	NA	-	NA	-
Utah State Retirement	16.21	NA	-	NA	-
Iowa Employees	14.86	0.68	4.58%	0.17	1.16%
Mississippi Employees	13.42	NA	-	NA	-
Georgia Employees	12.50	NA	-	NA	-
Nevada Public Employees	12.38	0.11	0.89%	0.02	0.19%
Alaska Investment Board	11.88	0.30	2.53%	NA	-
Kentucky Retirement	11.05	NA	-	0.09	0.80%
Kentucky Teachers	11.00	NA	-	NA	-
Louisiana Teachers	9.46	2.19	23.11%	0.02	0.24%
Indiana Public Employees	8.37	0.00	0.04%	NA	-
Kansas Public Employees	8.03	0.18	2.24%	0.15	1.90%
New Mexico Public Employees	7.53	NA	-	NA	-
Hawaii Employees	7.10	0.12	1.72%	0.04	0.62%
Illinois State Board	7.05	0.28	3.92%	0.11	1.58%
Maine State Retirement	6.58	NA	-	NA	-
Arkansas Teachers	6.22	0.46	7.40%	NA	-
Idaho Public Employees	5.75	0.11	1.91%	0.06	0.96%
New Mexico Educational	5.31	NA	-	NA	-
Indiana Teachers	5.26	0.04	0.76%	0.01	0.10%
Oklahoma Teachers	5.09	NA	-	NA	-
Louisiana State Employees	4.99	NA	-	0.23	4.51%
Rhode Island Employees	4.92	0.21	4.31%	0.02	0.49%
Montana Board of Investments	4.87	0.13	2.75%	0.06	1.17%
Delaware Public Employees	4.86	0.48	9.90%	NA	-
Nebraska Investment Council	4.78	NA	-	NA	-
South Dakota Retirement	4.64	0.17	3.66%	NA	-
Missouri State Employees	4.55	NA	-	NA	-
Wyoming Retirement	4.39	NA	-	NA	-
Oklahoma Public Employees	4.38	NA	-	NA	-
New Hampshire	3.91	NA	-	NA	-
West Virginia	3.80	NA	-	NA	-
Arkansas Employees	3.49	NA	-	NA	-
Vermont	2.56	NA	-	NA	-
TOTAL	1,575.15	51.86	4.69%	12.17	1.19%
TOTAL of Top 15 for Allocation to PE		44.95	8.06%		
TOTAL of Top 15 for Allocation to VC				11.11	1.72%

(1) Profiles of the Top 200 Pension Funds. The P&I 1,000. *Pensions & Investments*, Jan. 20, 2003. Data as of Sept. 30, 2002.

APPENDIX B

Table 1: The top 15 public pension funds with assets allocated to Private Equity ⁽¹⁾

Fund	Total Assets (\$ bn)	Assets in PE (\$ bn)	% of Total Assets
New York State Common	95.95	5.87	6.11%
California Public Employees	128.68	5.15	4.00%
Michigan Retirement	42.38	4.84	11.42%
Washington State Board	38.03	3.94	10.35%
California State Teachers	88.13	3.70	4.19%
Oregon Employees	31.70	3.33	10.49%
Florida State Board	78.72	2.89	3.67%
Colorado Employees	23.86	2.24	9.37%
Louisiana Teachers	9.46	2.19	23.11%
Pennsylvania School Employees	38.36	2.18	5.67%
Connecticut Retirement	17.16	2.04	11.88%
Virginia Retirement	31.23	1.78	5.70%
Minnesota State Board	35.11	1.72	4.90%
Wisconsin Investment Board	49.74	1.70	3.43%
Pennsylvania Employees	21.37	1.41	6.59%
Average			8.06%

(1) Profiles of the Top 200 Pension Funds. The P&I 1,000. *Pensions & Investments*, January 20, 2003.

(2) With the exception of Florida, Minnesota and Wisconsin, the PE totals do not include assets allocated to venture capital. Ranking based on total dollars allocated as of the end of 2002.

Table 2: The top 15 public pension funds with assets allocated to Venture Capital⁽¹⁾

Fund	Total Assets (\$ bn)	Assets in VC (\$ bn)	% of Total Assets
California Public Employees	128.68	4.98	3.87%
Washington State Board	38.03	0.83	2.19%
Pennsylvania Employees	21.37	0.78	3.63%
Michigan Retirement	42.38	0.74	1.75%
New York State Common	95.95	0.57	0.60%
Colorado Employees	23.86	0.55	2.29%
California State Teachers	88.13	0.54	0.61%
Virginia Retirement	31.23	0.42	1.34%
Massachusetts PRIM	24.80	0.36	1.44%
Ohio State Teachers	41.65	0.29	0.70%
Texas Teachers	67.10	0.23	0.35%
Louisiana State Employees	4.99	0.23	4.51%
Penn. School Employees	38.36	0.22	0.58%
Connecticut Retirement	17.16	0.20	1.14%
Illinois Teachers	20.46	0.18	0.87%
Average			1.72%

(1) Profiles of the Top 200 Pension Funds. The P&I 1,000. *Pensions & Investments*, January 20, 2003.

(2) Ranking based on total dollars allocated as of the end of 2002.

APPENDIX C

BRANDING MARYLAND TECHNOLOGY

I. Defining the Maryland Technology Brand Essence

All effective branding begins with a properly developed brand essence--the core qualities of the brand--consisting of both rational attributes and emotional values. These qualities drive constituents to choose and become loyal advocates for a brand. Defining the Maryland's technology brand will enable the State to develop many different forms of communication that deeply and effectively connect with consumer, business, and government targets.

The first step in capturing the brand essence of Maryland technology is to define the current undeveloped technology "brand" from a marketplace perspective, a competitive perspective, and an audience perspective. The creation of this complete situation analysis will clearly illustrate the environment in which Maryland must define itself and determine the variables and obstacles through which the Maryland Tech brand will have to navigate.

The next step in developing brand essence is to distill a unique profile of the Maryland Technology brand derived from those who are true champions of the Maryland technology community. The State has three main audiences to survey: 1.) all Maryland Technology constituents; 2.) those who are positive believers in the state's technology quest, and 3.) those who are true proactive champions of Maryland Technology.

Maryland's research with key target groups should include: 1) prospective employees who are considering Maryland as a workplace and 2) prospective companies who are considering Maryland as an environment in which to start or move a business.

Clearly defining Maryland Technology's brand essence will accomplish several key objectives:

1. Distinguishes Maryland Technology from competitive states.
2. Capitalizes on overall social trends and speaks directly to what key audiences are looking for today.
3. Elevates Maryland from merely another technology location to a unique destination for which businesses, employees, partners, and residents are willing to pay a premium.
4. Elevates Maryland to a status symbol, creating immediacy and demand.
5. Establishes a brand for Maryland's future.
6. Establishes a newsworthy brand for Maryland's key constituents.

II. Positioning The Maryland Technology Brand

Positioning is a unique, positive perception of Maryland as a home for technology in the minds of our best target constituents. Maryland Technology must decisively position itself in the minds of its key constituents. Positioning allows a brand to:

- Break through the clutter and become relevant, important and valuable to its target market.
- Differentiate itself from the competition – particularly important in today’s age of increasingly product parity.
- Have its product attributes perceived as benefits.
- Receive a price premium for its products.
- Deliver a better return on overall marketing investment
- Gain share and maintain it far into the future.

Maryland’s competitive position should be determined via initial research conducted as the background work leading into defining Maryland’s technology brand essence and positioning work. The relevant benefit/point of difference key to each audience should be carefully considered based on a review of the brand’s meaning from that audience’s perspective.

Positioning statement creation is an important step in the overall branding process. They force a brand to be succinct and focused, creating memorability and avoiding a laundry list of attributes. Positioning statements also ensure that everyone involved with supporting, communicating, or servicing a brand is “marching to the same drummer” in terms of format, overall direction, and core meaning. Lastly, positioning statements clearly define a brand’s strategic approach to the three key areas that must be addressed: the target, the marketplace, and the unique/relevant benefits offered.

III. Projecting the Maryland Technology Brand

The final stage in branding Maryland as a technology powerhouse involves projecting the state’s newfound tech essence and target position to the appropriate audiences. This integrated, target-based communication should encompass key public relations, advertising, direct marketing, and innovative/grass roots programs that generate the necessary awareness, drive the necessary growth, and generate the strongest possible interest in Maryland as a technology capital.

This initial announcement of the technology initiatives could serve as a proclamation of tech leadership, and use the strongest possible combination of technology communication to project the message:

- digital radio announcement
- webcast (using digital studio technology)
- webex-type phone/web simulcast
- CDR “digital cards” given to press
- Wireless messaging
- Special website with the initiative/announcement

ENDNOTES

ⁱ See Appendix B, Table 1 and Table 2

ⁱⁱ Maryland State Pension Board as of June 2003.

ⁱⁱⁱ See Appendix A. Based on average data for a subset of 64 pension funds for the 50 U.S. states. Private equity data provided for 38 funds and venture capital data for 30 funds. Source: Profiles of the Top 1000 Pension Funds. The P&I 1,000. *Pensions & Investments*, January 20, 2003. Data reflects market value as of Sept. 30, 2002.

^{iv} See generally, Comprehensive Annual Financial Report 2002; State Retirement and Pension System of Maryland.

^v Profiles of the Top 200 Pension Funds. The P&I 1000, *Pension and Investments*, January 20th 2003.

^{vi} See Appendix B, Table 1 and Table 2.

^{vii} Maryland State Pension Board as of June 2003.

^{viii} See generally, Appendix B Return Rates chart.

^{ix} *Id.*

^x North Carolina Session Law 2001-444, House Bill 327.

^{xi} Michigan Public Act 55 of 1982

^{xii} www.nasvf.org

^{xiii} National Association of Small Business Companies

^{xiv} www.sba.gov.

^{xv} www.sba.gov/INV/radione.html

^{xvi} *Id.*

^{xvii} Banks, essentially, need only select one or more SBICs and write a check.

^{xviii} <http://www.occ.treas.gov/crainfo.htm>

^{xix} Milken Institute, Sept. 2002.

^{xx} National Science Foundation, *Research and Development Spending in the States*, 2002.

^{xxii} See, *2002 Federal Property Asset Management Reform Act*, among other federal legislative efforts

^{xxiii} See *The Daily Record*, July 25, 2003 stating recent survey of the Jacob France Institute of the University of Baltimore, "Record Percentage View Maryland as Business Friendly." Of the 250 Businesses surveyed, 59% view Maryland as "Business Friendly".

^{xxiv} Maryland ranks third in the nation in the number of biotech companies, and the Washington-Baltimore metropolitan region ranks second overall in the United States in terms of IT professionals certified in cyber defense technologies. Also, Maryland ranks fourth in investments in science and technology infrastructure, as well as how those investments are leveraged for economic development purposes.

^{xxv} According to the Singapore Embassy in Washington, Singapore-U.S. bilateral relations are excellent and show great potential for an economic partnership for the following reasons:

- Bilateral US-Singapore trade exceeds US trade with all its current and potential FTA partners, outside of NAFTA. This includes Israel, Jordan, Chile, Central America, Morocco and Australia.
- Singapore is the largest export market for American electronics, machinery and equipment. The US states with key exports to Singapore include California, Texas, New York, New Jersey and Missouri.
- Singapore is the 2nd largest Asian investor in the US, after Japan. Singapore's cumulative investments in the US are more than twice those of South Korea, Hong Kong and Chinese Taipei.

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- 62% of US-Singapore trade is intra-MNC trade. Singapore plays host to 1,300 US corporations and 15,000 Americans.
 - The bilateral Trade and Investment Framework Agreement (TIFA) were signed in October 1991 to cement the economic ties between Singapore and the US.
 - Since March 2002, the US-Singapore Business Partnership Initiative has successfully matched close to 200 small and medium enterprises on both sides.
 - The US and Singapore signed a bilateral open skies agreement in 1997. Both countries are signatories of the APEC plurilateral open skies agreement, which also includes Brunei, Chile, New Zealand and Peru.
 - The Port of Singapore is a gateway into Asia for US exports. Approximately 250,000 TEUs from the US are transshipped through Singapore's terminals yearly.

^{xxvi} Amy Wu, *Asia's Next Tech Hub: Singapore*, www.wired.com, October 28, 2000

^{xxvii} *Id.*