



UNIVERSITY SYSTEM *of* MARYLAND



University System of Maryland Economic Development and Technology Commercialization

March 2016

Economic Development and Technology Commercialization

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I. Some Notable Highlights

70% increase in new patents filed (210 in FY 2015) compared to FY 2011.

330 disclosures in FY 2015 compared with 224 in FY 2011.

\$1.28 billion in extramural funding.

USM is ranked **11th** in the US in total sponsored research funding.

298 joint MPower research proposals since FY 2012. Over 80 joint awards. The anticipated dollar value of the awards exceeds **\$70 million**.

451 new companies facilitated since 2011 against the 2020 strategic plan goal of 325.



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II. Context

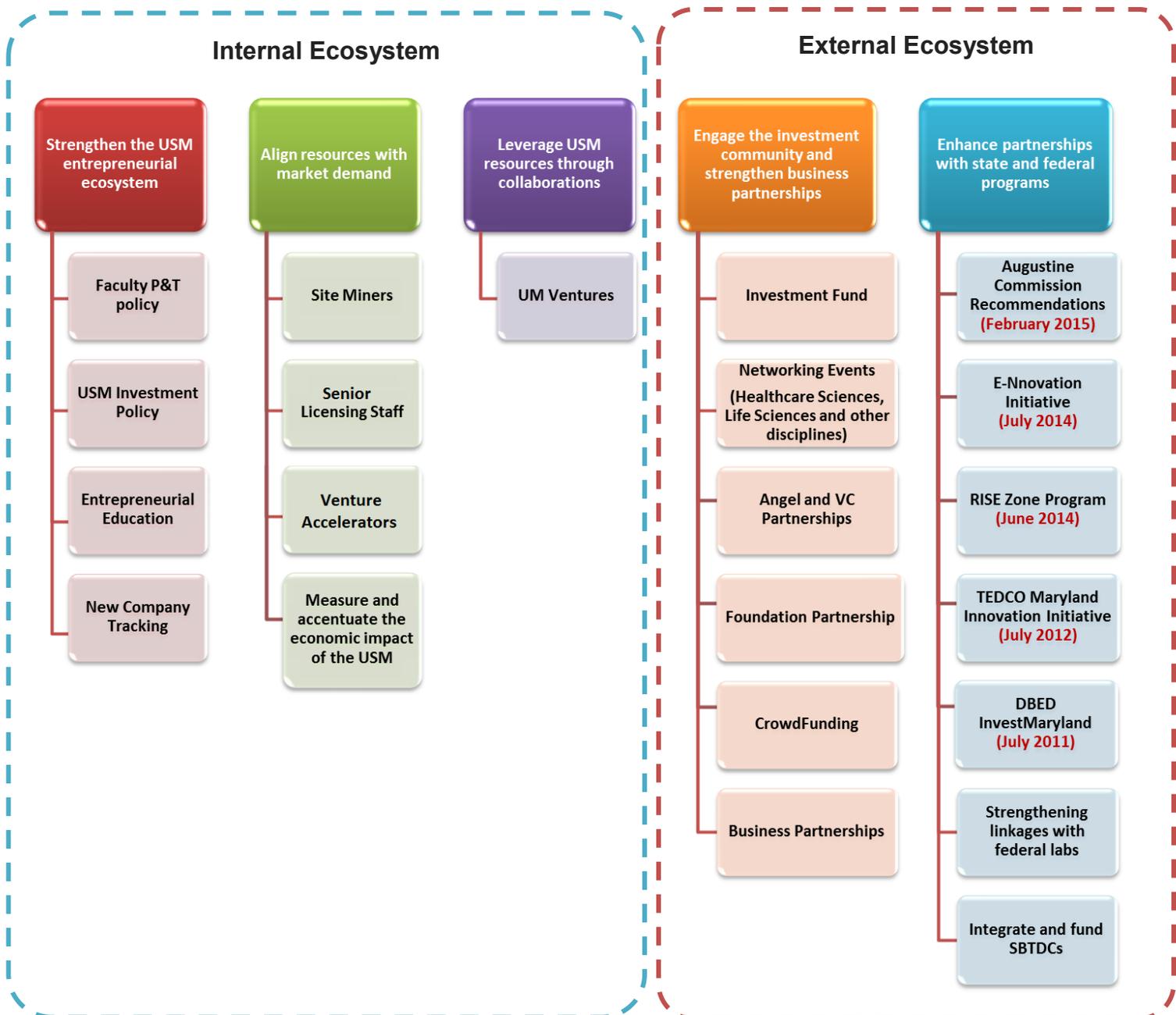
In recognition of the increasing importance of translational research, entrepreneurship and innovation, and the supply of skilled workers in STEM fields for the State of Maryland, the University System of Maryland (USM) charged two distinct presidential task forces with recommending strategies for furthering the USM's contributions and impact to the State in these areas. The USM Presidential Task Force on STEM Workforce focused on strategies for fostering STEM growth in the State, while the Presidential Task Force on Research and Economic Competitiveness recommended initiatives for enhancing the USM's contributions to translational research and innovation in a knowledge-based economy. A strategic outcome of these activities, at the Board level, was the formation of a Workgroup, which then led to the creation of the Committee on Economic Development and Technology Commercialization in July 2011.

USM institutions have facilitated the creation of 451 companies since July 2011, exceeding the 2020 Strategic Plan goal

The Committee, working with the Chancellor's Office and the COO/VCAF's Office, provides strategic leadership for the USM's economic development and technology commercialization initiatives, as well as other entrepreneurial programs. In addition, several state and federal programs (including the Maryland Innovation Initiative, Invest Maryland, I-corps and other programs) have been launched in recent years, fostering entrepreneurship in Maryland and assisting researchers with commercializing their intellectual property. Efforts by the USM have been focused on strengthening the entrepreneurial ecosystem, leveraging USM resources through collaborations, boosting site miner and licensing staff resources, enhancing partnerships with state and federal programs, and improving access to capital for entrepreneurs and researchers. UM Ventures was launched as a joint initiative of the MPowering the State Program in 2012, bringing together the resources of the University of Maryland, Baltimore and University of Maryland, College Park to commercialize discoveries, and create economic impact by engaging partners in industry.

III. Strategic Focus Areas and Growth

The USM attracts close to \$1.28 billion in extramural funding annually. In terms of sponsored research funding, 66% of funding comes from federal sources and approximately 10% from industrial sponsors. Collectively, the USM is ranked 11th in total sponsored research funding in the country and is ranked 9th in funding from industrial sources. IP-based start-ups grew significantly from 6 start-ups in FY 2011 to 12 start-ups in FY 2015. Additionally, the number of USM invention disclosures, which is a leading indicator in the commercialization process, increased by 47% to 330 invention disclosures in FY 2015, compared to 224 in FY 2011. To transform and accelerate technology commercialization and entrepreneurship throughout the USM, the BOR Committee has focused on five strategic areas, as depicted in the following chart:



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USM activities initially focused on the internal entrepreneurial ecosystem, represented by strategic focus areas 1, 2, and 3, and is now shifting attention to the external ecosystem, represented by 4 and 5. Highlights of initiatives related to these strategic focus areas include:

1. Strengthen the USM entrepreneurial ecosystem

- a. The USM has put in place Faculty P&T and Sabbatical Leave policies that reward research with potential for commercial development.
- b. The USM has established processes for tracking new companies facilitated by all USM institutions and the SBDC centers.



2. Aligning resources with market demand

- a. The USM has boosted site miners, entrepreneurs in residence, and licensing staff resources.

3. Leverage USM resources through collaborations

- a. UM Ventures, through collaborative leadership between the University of Maryland, Baltimore and College Park, is bringing innovative products to market, expanding collaborations with industry, and creating new jobs in Maryland by integrating the commercialization and entrepreneurial programs of the two powerhouse universities.
- b. Due to new investments in staffing and program funding as well as the coordination of the entrepreneurial offices at UMB and UMCP, UM Ventures has achieved significant growth in invention disclosures, licenses executed, and startup companies in the last two years.

4. Engage the investment community and enhance access to capital for USM-affiliated startups

- a. The Board also recently approved a USM Investments Policy that enables USM institutions to invest in start-ups that license USM intellectual property.
- b. The USM is also promoting networking events in the biomedical sciences and other disciplines,

where faculty members and recent start-ups give presentations on their technologies to an audience of venture capitalists, angel investors and serial entrepreneurs.

5. Enhance partnerships with state and federal programs

- a. Augustine Commission Recommendations (February 2015) -- The Senate President and House Speaker convened the Maryland Business Climate Commission in March 2014 to examine the State's current economic development structure and incentive programs and make recommendations to enable Maryland to be competitive in economic and private sector growth and prosperity. The Commission submitted its first phase recommendations in February 2015 and a second phase report addressing tax issues was released in January 2016. As a result of the recommendations, HB 941,



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which creates a task force to study exemptions from higher education ethics requirements (e.g., conflicts of interest) and procurement rules to facilitate technology transfer, was passed during the 2015 legislative session.

- b. HB 442 -- Maryland Innovation Initiative (MII) (July 2012) -- MII was created as a partnership between the State of Maryland and five Maryland academic research institutions (Johns Hopkins University, Morgan State University, University of Maryland, College Park, University of Maryland, Baltimore and University of Maryland Baltimore County) and is designed to promote commercialization of research conducted in the partnership universities.
- c. SB 180 and HB 173 -- InvestMaryland (July 2011) -- Through a premium insurance tax credit auction sale, the State of Maryland raised \$84 million to invest in early stage technologies in the areas of software, communications, cyber security, and the life sciences.
- d. Maryland Cyber Security Investment Incentive Tax Credit -- Effective January 2014, the purpose of this new program is to incentivize and attract cyber security companies to start-up in or move to Maryland and provides refundable tax credits for investments from an in-state or out-of-state investor.
- e. The USM is working with NIST and other federal agencies to evaluate and develop strategies for accelerating the technology commercialization process.

UM Ventures, in addition to its efforts on expanding collaborations among USM research institutions, has created an Investment Fund to provide early stage capital

In terms of the external ecosystem:

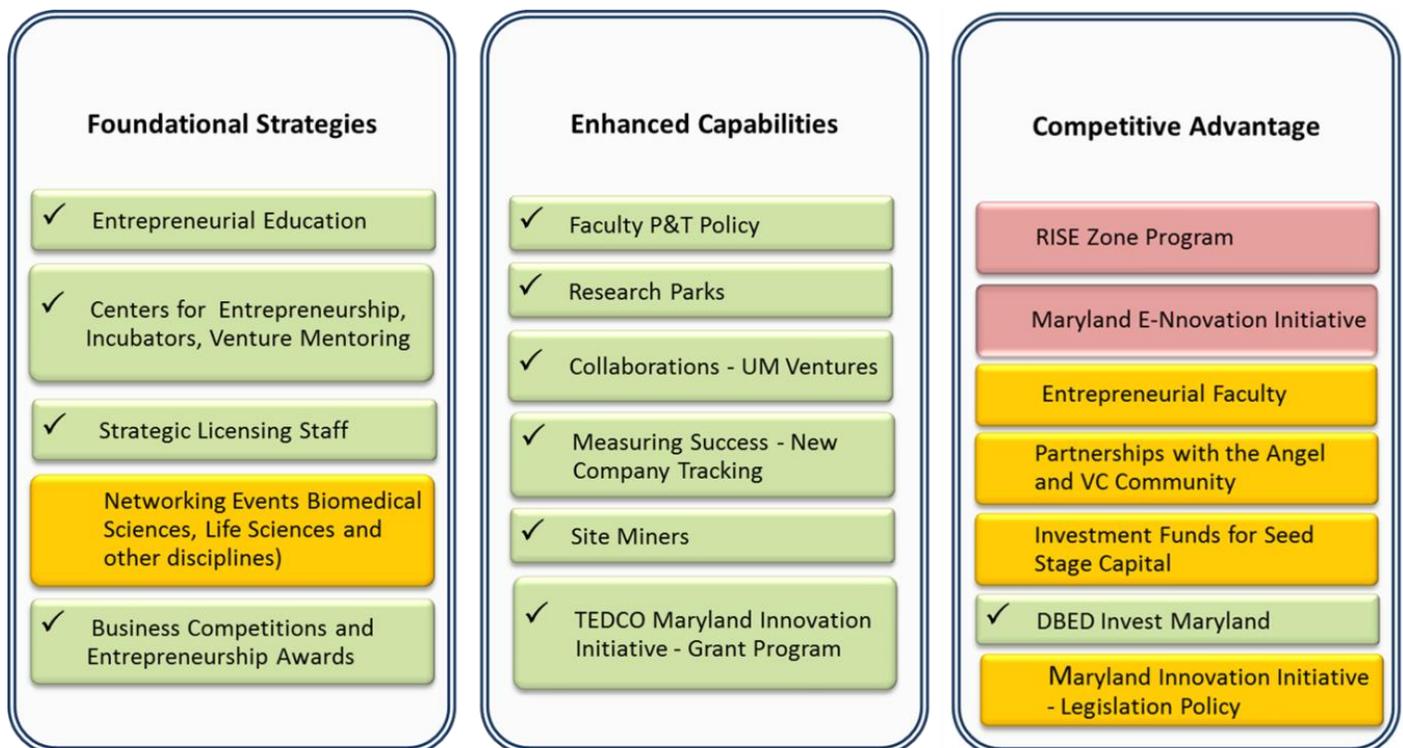
- UM Ventures has created an Investment Fund to provide early stage capital and is working on a partnership with the USM Foundation as well as developing strategies to enhance engagement with the investment community.
- The USM is also working on strengthening partnerships with various state and federal programs.
 - Legislative initiatives for economic development in 2014 included the Maryland E-Innovation Initiative, RISE Zone Program, and Cyber Seed Investment Fund
 - HB 741 -- Maryland "E-Innovation" Initiative (July 2014) -- The E-Innovation Initiative offers a state match to private funds, aiming to create a \$100 million matching fund for recruiting the world's best scholars to Maryland in areas as diverse as cyber security, biotechnology, STEM education, autonomous systems, language

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science and food safety. These scholars will be encouraged to work with other Maryland universities, federal labs or with innovative start-up companies, enhancing the integration of research into economic development. In FY 2016, UMCP and UMB were awarded a total of about \$4.2 million.

- **HB 742 -- RISE Zone Program** (June 2014) -- The Regional Institution Strategic Enterprise (RISE) Zone Program is intended to spur significant financial investments in designated "RISE Zones" through enhanced property and income tax credits and accelerated depreciation schedules. The anticipated impact is stronger ties between key state, federal, and higher education institutions and increased economic development and neighborhood revitalization. A significant part of Maryland's economy, nearly 6%, is based on the research and development sector, suggesting that the opportunities for commercial development around universities and federal labs are strong.
- **HB 740 -- Cyber Seed Investment Fund** (February 2014) -- The cyber fund would make investments of up to \$100,000 in seed/early stage cyber security companies that develop products for both government and commercial markets.

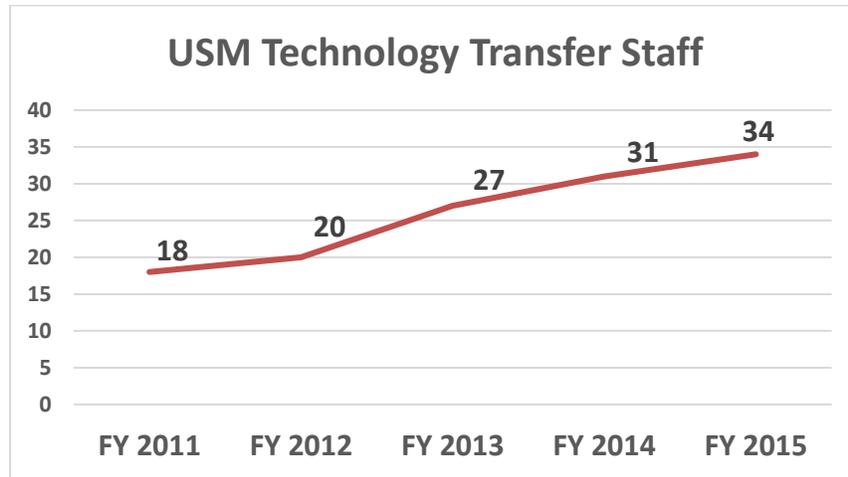
These initiatives have strengthened the USM's overall entrepreneurial capacity, as summarized in the chart below:



▪ Green boxes: programs successfully implemented ▪ Yellow boxes: programs in progress ▪ Red boxes: recently passed legislation

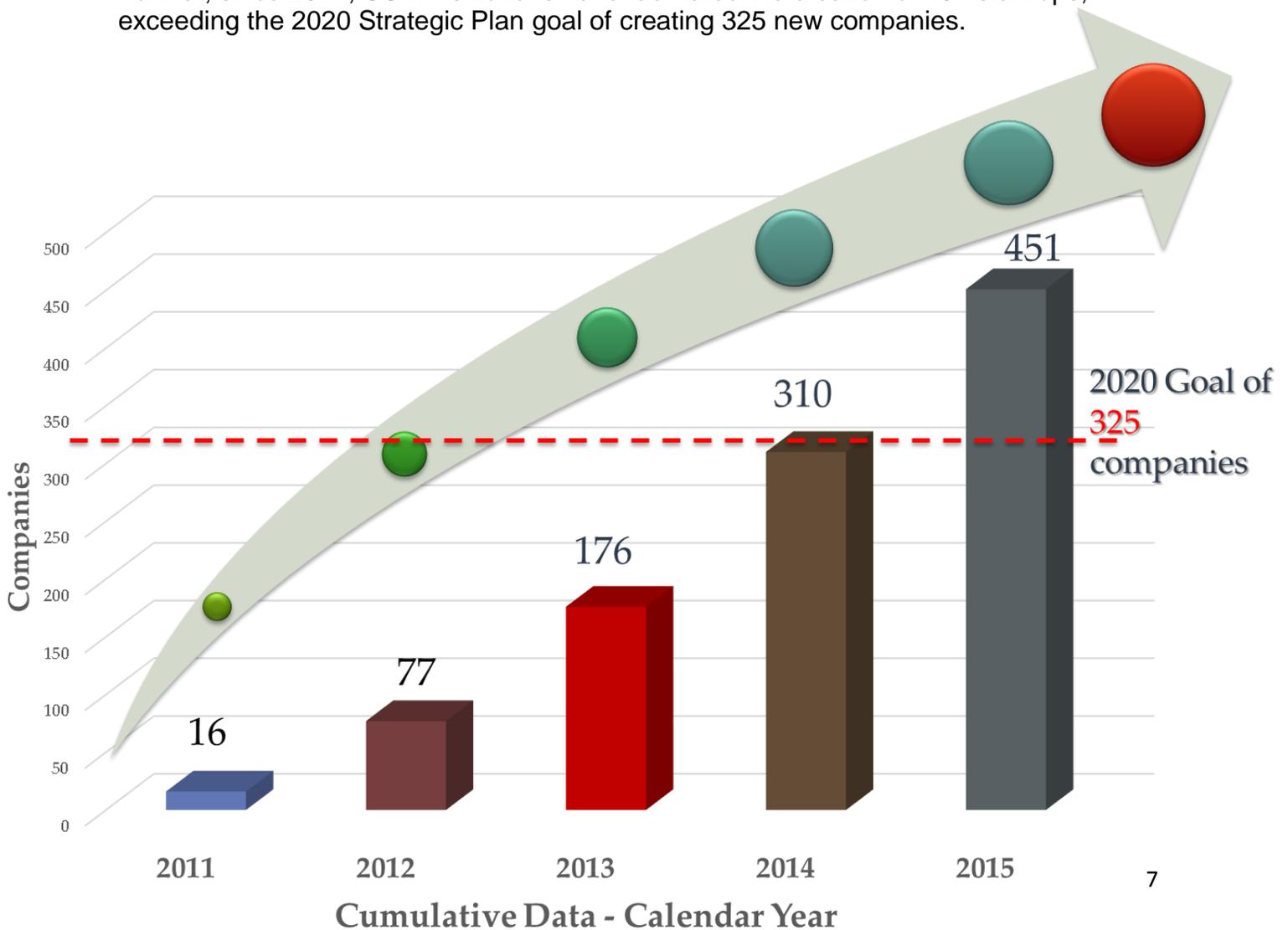
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Notably, the boost in technology transfer staff resources has resulted in significant growth in new patents filed and start-ups created based on the licensing of USM intellectual property.



Source: AUTM data

Further, since 2011, USM institutions have facilitated the creation of 451 start-ups, exceeding the 2020 Strategic Plan goal of creating 325 new companies.



IV. Economic Impact of the USM

A recent study on the economic impact of the USM, conducted by the Jacobs France Institute, provided ample evidence of the system's significant contribution to the health of the state's economy. For example:

- Economic activity generated by the lifetime incremental earnings of 1996 graduates support jobs earning \$5.9 billion in salaries and wages, resulting in a total of \$1.6 billion in additional state taxes.
- The overall increase in state income and sales taxes generated by USM graduates employed in Maryland, extrapolated from the analysis of the three graduating classes used in the study, totaled \$1.1 billion annually, an amount that exceeded the state's appropriation to the system.

USM graduates employed in Maryland increased state income and sales taxes by an estimated \$1.1 billion annually

Also, USM's FY 2014 budget included \$12 million in enhancement funding targeted to increase STEM, cybersecurity, and health-related enrollment. It is estimated that this investment would lead to an additional 1,000 students enrolled in these disciplines by FY 2017, ultimately leading to 700 additional degrees in the areas that will continue to drive the new economy. USM institutions enrolled more than 1,400 additional STEM and health care-related majors in FY 2014 alone and are adding the STEM majors needed to secure Maryland's economic future.

IV.1. Workforce Development

Ensuring that the state of Maryland has a high quality workforce and that the USM produces graduates whose degrees are closely aligned with the workforce and economic development needs of the State is one of the key goals of the USM strategic plan. The USM's success in demonstrating effectiveness under this goal, and the benefit such an alignment brings to both the State and USM graduates, has been a major factor in the System's recent success in building stronger relationships with the Governor and General Assembly.

Using the USM's workforce model to look at current state needs and how well our current level of degree



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production meets those needs, we see the following:

- **STEM** – STEM fields are the cornerstones of Maryland’s economic performance and are areas for which low production is recognized as a national challenge.
 - Current demand – Scientists: 2,175 per year (82% of demand met), Engineers: 2785 per year (54% of demand met), IT professionals: 5,860 per year (40% of demand met).
 - USM overproduces in some areas, including Chemical engineers (168% of demand), Health and Safety Engineers (162%), Biological Scientists, all types (118%) and Mathematicians (120%), while significantly under producing in others including: Computer Hardware engineers (13%), Geoscientists (45%) and all Information Technology fields (40%).

- **Healthcare** – The national shortage of nurses and other key healthcare is a workforce challenge at both the level of creating practitioners and of creating skilled faculty to educate those practitioners.
 - Current demand/supply – Nurses: 3,450 per year (41% of demand met), other high demand healthcare (such as Allied Health): 2,480 per year (30% of demand met).

- **Teachers** – Maryland faces a need to produce highly qualified K-12 teachers in very large numbers. Meeting production demands has been challenging and production remains below desired levels.
 - Current demand – Teachers: 3,570 per year (37% of demand met), other education: 2,655 per year (24% of demand met).
 - The USM does not meet 50% of current demand in any category of K-12 teacher production.

- **Business** – Some of the highest demand fields are for those with skilled training in business and financial disciplines. These educated workers are often in great demand in high-tech and biotech industries, but are frequently overlooked in discussion of the workforce.
 - Current demand – General Operations Managers: 1,660 per year (33% of demand met), Financial Services Workers: 1,365 per year (30% of demand met), and Accountants: 1,425 (21% of demand met).
 - Total demand for Business sector positions exceeds 10,000 per year with only around 45% of the need met by USM each year.

V. USM Research Parks' Impact

UMB, UMBC, and UMCP are each developing research parks that are transforming the economies surrounding their campuses.

*With 200 tenants,
USM research
parks are home to
5,950 jobs and
\$1.125 billion in
capital investments*

The research parks are home to:

- 5,950 jobs
- 200 tenants – including start-up and mature technology companies, federal research centers, private research institutes, workforce training and executive education.
- 2.9 million square feet of privately financed research space.
- \$1.125 billion in capital investment, the vast majority of which is from the private sector.

Capitalizing on university research strengths, the research parks are creating thriving technology clusters in Maryland:

- MSquare at UMCP:
 - The largest cluster of language scientists in the world and among the largest clusters of environmental scientists and food scientists in the US.
 - One of the 200 fastest supercomputers in the world and one of the fastest computer networks in the US.
 - Since 2003, new construction at MSquare has accounted for 26% of all new construction in Prince George's County.
 - UMCP is also home to the Technology Advancement Program (TAP) incubator for start-up companies and the Maryland International Incubator for US branches of international companies.
- bwtech@UMBC:
 - Home to the largest concentration of start-up companies (60) in Maryland.
 - With 50 cybersecurity companies, bwtech has the largest cybersecurity cluster in any university-affiliated research park in the US.
 - In the first six months of calendar year 2014, bwtech companies hired 105 UMBC students, employed 90 UMBC alums, and contributed \$4 million in taxes to the Baltimore County region annually.
- UM BioPark:
 - UMB has the largest concentration of biotech companies in Baltimore City.



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- UMB start-up companies located in the BioPark have attracted over \$100 million in funding from venture capital firms and pharmaceutical companies.
- UMB faculty and BioPark companies have collaborated to win over \$60 million in federal research funding.
- In 2015, UMB physicians will begin treating cancer patients at the Maryland Proton Treatment Center, a \$250 million privately financed facility that will be the twelfth in the US and first in the region.

With assistance from the State, these three university research parks have the capacity to add at least another 3.6 million square feet and 7,500 high quality jobs.

VI. Ongoing Research Infrastructure Projects

- At Bowie State University (BSU), almost \$40 million to construct a new Natural Sciences Center.
- At the University of Maryland Eastern Shore (UMES), \$6.5 million to construct and equip the Engineering and Aviation Science Building.
- At Salisbury University (SU), more than \$53 million to construct a new academic commons, including a new library along with classroom, research, and study space.
- At the University of Maryland, Baltimore (UMB), more than \$81 million to construct a new Health Sciences Research Facility.
- At the University of Maryland, Baltimore County (UMBC), \$6 million to construct an interdisciplinary and life sciences research building.
- At the University of Maryland Center for Environmental Science (UMCES), \$4.5 million to equip the recently constructed Environmental Sustainability Research Laboratory.
- Through the USM office, \$4.7 million to construct a Biomedical Sciences and Engineering Education Facility at the Universities at Shady Grove (USG) and \$450,000 for the planning and design of the Southern Maryland Regional Higher Education Center New Phase III Facility.

VII. Some Recent Successes

- USM site miners and entrepreneurs in residence have been instrumental in assisting UMB, UMBC, and UMCP faculty and start-ups to win 74 Maryland Innovation Initiative awards, totaling more than \$7 million. In FY14, USM institutions received 34 MII awards, totaling over \$4 million. Five projects involved collaborations between faculty members at multiple institutions.



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- Since FY 2012, MPower (UMCP-UMB) has submitted 298 joint research proposals and received over 80 joint awards. The anticipated dollar value of the awards exceeds \$70 million. Proposal submission increased 65% from FY13 to FY15. The following are some examples of specific awards:
 - UMCP PI Dr. Pamela Clark (SPH) was awarded a \$19 million grant over five years for the Tobacco Center of Regulatory Science from NIH. Dr. Mongodin in the Institute for Genome Sciences (UMB) is a member of the team.
 - UMB Dr. Clare Fraser at the Institute for Genome Sciences was awarded a \$15.2 million grant over five years from NIH. Dr. Hector Corrada Bravo (UMCP; UMIACS) is a member of the team.
 - UMCP Drs. Payne and Bentley (ENG) were awarded a \$1 million NSF grant over four years for Thin Film Biofabrication for Integrated Bio-electronics. Dr. Jana Shen, School of Pharmacy, is a member of the team.
- The Maryland E-Innovation Initiative has awarded \$2.1 million each to UMB and UMCP in the first round.
- Late last year, MedImmune, the global biologics research and development arm of AstraZeneca, announced a 5-year \$6+ million strategic collaboration that includes UMB, UMCP, and UMBC.
 - MedImmune has announced that they have identified the first five Joint bioscience-related research projects.
- Gliknik, a startup co-founded by a UMB faculty member raised over \$50 million, including an upfront licensing fee of \$25 million from Pfizer.
- bwtech@UMBC Cyber Incubator was a finalist for the International Incubator of the Year (National Business Incubator Association).
- Four bwtech companies are finalists for ICOY (Maryland Incubator Company of the Year) awards.
- Three startup companies leveraging technologies and know-how created at the University of Maryland, Baltimore have recently entered the commercial phase of business.
 - Advance Management Services was founded in January 2013 and achieved its first commercial sale during the second quarter of 2013. The company licensed software-based clinical outcomes management system for the healthcare industry from the University of Maryland, Baltimore.
 - Analytical Informatics (AI), founded in August 2011, offers a suite of quality improvement tools created by leading universities and innovative startup companies. These innovative tools have been proven to provide health care organizations with improved quality, efficiency and better workflows. In the last quarter, AI has added three new customers.
 - SilcsBio, LLC, founded in April of 2012 and located within the University of Maryland BioPark, provides software and services for drug discovery.

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SilcsBio has recently achieved initial revenue from drug discovery services from a company in Pennsylvania.

- Advanced Metrics, a UMB Health IT startup, moved quickly into commercialization since establishment only a year ago and moved from offices on the university's campus to the BioPark.
 - OmniSpeech, a UMCP startup that develops solutions to separate the speech signal from background noise for telecommunications applications, received \$2.8 million of funding.
 - Potomac Photonics, a digital manufacturing company specializing in micro technology for the biotech and medical device industries, has leased 8,000 SF of labs and offices at bwtech South. The CEO is a UMBC graduate; the company already is collaborating with UMBC and held a summit on 3D printing in May 2014.
- UMBC's business incubator, bwtech@UMBC, and Northrop Grumman recently announced KoolSpan as its latest graduating cyber start-up from the Cync Program. Cync is a unique global partnership between Northrop Grumman and the Cyber Incubator at bwtech@UMBC that nurtures cyber start-ups to commercialize next-generation technologies. Since being accepted into Cync, KoolSpan, a developer of a suite of patented, hardware-based mobile security encryption solutions, has grown from 8 to 40 employees, bolstered its intellectual property portfolio to more than 20 patents, and expanded into more than 55 countries.
- The Ratcliffe Foundation has awarded the Institute of Marine and Environmental Technology (IMET) —a joint research facility involving UMCP, UMBC, and UMB's School of Medicine —a three-year, \$600,000 grant to help young scientists cultivate the leadership and business skills necessary to bring their research into commercial markets.
- The co-founder of Oculus, Brendan Iribe (and other Oculus founders who are UMCP alumni), provided UMCP with \$31 million to help support a \$120 million new center called "The Brendan Iribe Center for Computer Science and Innovation" at UMCP. Oculus will help develop more UMCP partnerships with Facebook and other companies from Silicon Valley.
- The Institute of Marine and Environmental Technology has opened a 4,300-square-foot incubator in Baltimore's Inner Harbor. This effort is helping to advance research, commercialize technology, and promote economic development focused on the environment and health care.
- The UMB-UMBC Research and Innovation Partnership program focused on cutting-edge science and health celebrated its second round of seed grant recipients and held its inaugural Partnership Symposium this year to actively support meaningful and sustainable research partnerships between the two institutions.



VIII. Highlights of Grant Awards

- UMCP's Earth System Science Interdisciplinary Center was awarded \$36 million by NASA for collaboration with the National Weather and Climate Prediction Center.
- UMB received a \$4.9 million grant from NIH for artificial lung research.
- With \$3.75 million in funding from the National Science Foundation, UMCP is teaming up with George Washington University and Virginia Tech to launch a regional Innovation Corps (I-Corps) node with one sweeping goal: find the best entrepreneurial student and faculty researchers and help them bring their discoveries to market.
- The BioMaryland Center, awarded \$1.5 million to eight companies, including Harpoon Medical Inc. and Otomagnetics, startups from UMB and UMCP.
- At UMB, the Schools of Dentistry and Medicine received a five-year \$10.7 million grant award from NIH to study the causes, prevention, and treatment of sexually-transmitted diseases.
- Also at UMB, the Institute for Genome Sciences at the School of Medicine has received a grant award of \$15.2 million over five years from NIH to create a research center to apply genomic techniques to the study of pathogens and their hosts.
- UMB's Institute of Human Virology (IHV) at the School of Medicine received a \$50 million five-year grant to stop the transmission of HIV from mother to child in Zambia as part of the President's Emergency Plan for AIDS Relief.
- Researches from UMCP's College of Agriculture and Natural Resources received a \$1.6 million grant from the U.S. Department of Agriculture to test a cutting-edge approach for eradicating influenza.

UMB received a \$4.9 million grant from NIH for artificial lung research

VIII.1. Cybersecurity Grant Awards

- MITRE and the USM, with UMBC and UMCP as the lead institutions, won the bid to operate the nation's first Cyber Security Federally Funded Research and Development Center (FFRDC). The FFRDC contract has a ceiling limit of \$5 billion over 25 years.
- Bowie is one of 13 historically black colleges and universities awarded funding through a five-year, \$25 million grant as part of a consortium established by the U.S. Department of Energy. BSU will receive \$1.2 million to develop a pipeline for more minorities to enter the cybersecurity field.
- Frostburg's \$71 million Center for Communications and Information Technology, which opened in fall 2014, is the first new academic building at FSU in 11 years. It provides state-of-the-art technology and academic support for computer

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science and information technologies, mathematics, and other in-demand, high-tech disciplines.

- At UMCP, the Advanced Cybersecurity Education Scholars, or ACES, is the nation's first-ever cybersecurity honors program and has established a new ACES Northrop Grumman Cybersecurity Laboratory. The ACES program, an ongoing partnership with Northrop Grumman, is educating the next generation of cyber professionals, and strengthening our state's and nation's economic future.

IX. Major Business Partnerships

- The **Gates Foundation** has awarded UMB over \$50 million in funding in the last five years. Projects focus on HIV, Malaria, and Shigella. In addition, the Gates Foundation has made substantial investments in two companies which have licensed UMB vaccine technologies: PaxVax, which is conducting Phase III clinical trials for a UMB Cholera vaccine; and PATH, which is conducting Phase II clinical trials for a UMB Shigella vaccine.



BILL & MELINDA
GATES foundation

- **Tokai Pharmaceuticals** (an early stage biotech company based in Cambridge, Massachusetts) has licensed from UMB a promising drug candidate to treat prostate cancer. Based on the success of Phase II clinical trials, Tokai had its IPO in October 2014. Its market capitalization is approximately \$350 million.



tōkai pharmaceuticals

- **Profectus** (a Maryland-based University start-up company) has raised over \$120 million in grant funding and equity investments to develop vaccines for HIV/AIDS and Ebola. Profectus was awarded \$50 million in multi-year federal funding in 2014.



PROFECTUS
BIOSCIENCES

- As mentioned above, **MITRE** and the USM won the bid to operate the nation's first Cyber Security Federally Funded Research and Development Center (FFRDC).



MITRE

- Started by UMCP graduate Kevin Plank, **Under Armour** (UA) announced recently \$3 billion in annual sales. Kevin Plank has contributed \$25 million towards the renovation of Cole into a \$155 million Center for Sports Medicine, Health and Human Performance in partnership with UMB. UMCP is working with UA on wearable technologies, sensors and entrepreneurship through Cupid's Cup, one of the country's best known student business competitions.



UNDER ARMOUR

- UMCP has received its largest in-kind software grant from **Siemens USA**, headquartered in Washington DC, with a commercial value of more than \$750 million. Siemens' product lifecycle management (PLM) software provides UMCP



SIEMENS

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students and researchers with a sophisticated design and simulation tool for course work, research, academic projects, and team-based competitions. The Siemens CEO is a member of UMCP's Energy Research Advisory Board.

X. Other Developments

- While the University of Maryland's *MPowering the State*, the structured collaboration between UMCP and UMB, is still in its early stages, it has already had a profound impact on technology transfer and commercialization efforts at the two institutions.
- Towson is expanding its entrepreneurial efforts as well, selecting Frank Bonsal III as TU's first director of entrepreneurship, marking the advent of a larger and more integrated approach to entrepreneurship at the university.
- At Salisbury, the Baltimore-based Ratcliffe Foundation has committed to as much as \$1 million to the Franklin P. Perdue School of Business over the next five years to support student entrepreneurs who are looking to create startups.
- UMB's Office of Technology Transfer announced the addition of an Entrepreneur-in-Residence (EIR), a pathologist/immunologist with experience in biosimilars, biomarkers, manufacturing, repurposed compounds, and start-up formation.
- Bowie's College of Business is launching a new Student Business Incubator to encourage entrepreneurship and nurture student startup ventures.
- UMCP is now integrating the Lean LaunchPad into standard innovation and entrepreneurship courses across all 12 colleges within the University.
- Annually, the University of Maryland, Baltimore and The Johns Hopkins Alliance for Science and Technology Development meets for a full day, bringing together faculty members and investors to foster important biotechnical and pharmaceutical developments. The Alliance meeting includes presentations by faculty members, researchers, and start-ups to venture capitalists, entrepreneurs, and chief executive officers of biotechnology and pharmaceutical companies who are positioned to help presenters commercialize their technologies. In 2015, faculty researchers and entrepreneurs were awarded \$200,000 in prizes.



*Bowie's College
of Business is
launching a new
Student Business
Incubator*