

2020 Annual Report on Requirements of the University of Maryland Strategic Partnership Act

6/30/21

Implementation of the Strategic Partnership Act of 2016

The University of Maryland Strategic Partnership Act of 2016 outlines a series of charges to the universities, and reporting to the Chancellor, Board of Regents and/or the Maryland General Assembly. This document provides a summary of those duties, and progress toward implementation.

About the University of Maryland Strategic Partnership: MPowering the State

Overview: The University of Maryland Strategic Partnership is a formal collaboration between the University of Maryland, Baltimore (UMB) and the University of Maryland, College Park (UMCP). The framework for the Strategic Partnership began in 2012 when the University System of Maryland's (USM) Board of Regents created an alliance between UMB and UMCP called MPowering the State. The alliance was formalized and strengthened by the University of Maryland Strategic Partnership Act, enacted on October 1, 2016.

Leadership: The University of Maryland Strategic Partnership is jointly managed by the President of UMB and the President of UMCP. Each President is responsible for administration and leadership of his campus, and together responsible for accomplishing the initiatives and programs of the Strategic Partnership.

A Joint Steering Council consisting of leaders from UMB and UMCP was appointed by the Presidents and charged with achieving the goals of the Strategic Partnership Act. The Joint Steering Council oversees MPower operations and programs including funding allocations and development of partnership opportunities.

Programs: The University of Maryland Strategic Partnership: MPowering the State leverages the complementary strengths of UMB and UMCP to boost research, attract research dollars to the state, improve technology transfer, address workforce needs, create new educational opportunities, attract exceptional students, faculty and researchers, and solve important problems relevant to the people of Maryland and the nation. The Strategic Partnership Initiative enables programs that would not be achieved by UMB or UMCP alone.

The Presidents jointly shall develop and implement a plan that encourages and promotes alignment, cooperation, and collaboration between the College Park campus and the Baltimore campus. The plan shall: Identify all undergraduate and graduate academic and research programs that may benefit from alignment and collaboration between the campuses.

A working group is charged with seeking new opportunities for collaboration and alignment of undergraduate and graduate academic and research programs across the two campuses. In addition to looking at areas where collaboration may be expanded, it also identifies obstacles or infrastructure barriers that make it difficult for students to engage at the opposite university.

Because UMB and UMCP's programs are almost completely non-overlapping, the best opportunities for academic program collaborations seem to be in creating seamless articulation of UMCP undergraduate programs with UMB professional schools; examining enrollment marketing opportunities and recruitment materials; identifying financial aid opportunities; streamlining the admission process for international students seeking dual degrees; and identifying opportunities for joint hires for faculty.

UMB and UMCP have numerous collaborative academic and research programs in place, as well as 11 dual degree offerings; 3+3 programs that allow students to attend UMCP for three years and then matriculate to spend three years at UMB's schools of dentistry, law or pharmacy; guaranteed admission pathways for UMCP students to the UMB School of Nursing; and a bachelor of science pathway to a PharmD at the UMB School of Pharmacy, designed to increase the number of pharmacists in the state.

Recent efforts support the development and launch of new certificate and degree programs for UMB and UMCP students, including:

- An innovative joint UMB/UMCP master's degree and stackable certificates in policing and public safety administration. The program was approved by the Chancellor of the University System of Maryland, and launched in Fall 2020.
- A new Joint PhD Program in Bioengineering. The degree spans both institutions and offers students an opportunity to create and deliver engineering solutions to challenging clinical problems related to medicine, pharmacy, or dentistry. It launched in Fall 2019.
- An MOU was developed between the UMB School of Nursing and the UMCP Information School (iSchool) related to developing a health informatics and data science specialization within the Bachelor of Science degree in Information Science. The MOU allows a limited number of reserved spots for UMCP students in the UMB Certified Nursing Leader program.

- Collaboration regarding technology-mediated English language learning through Global
 Health. UMB and UMCP discussions focus on the development of a program to support the
 professional development of post-doctoral fellows in the area of global health. The program
 would consist of support for continued English language learning for post-doctoral fellows as
 well as support in effective science communication, both for academic and non-academic
 audiences.
- This same group is investigating the development of a collaborative graduate-level
 certificate program around multilingual language learning and communication, in which a
 technology-mediated English language instruction platform would provide personalized
 instruction to English language learners to allow it to be tailored to an individual's English
 proficiency, academic needs, and professional interests.
- An interdisciplinary PhD in health professional education between the UMB Graduate School and the UMCP College of Education is in development, and a joint degree between the UMB School of Social Work and the UMCP School of Public Policy has launched, following the development of a MOU in August 2018.

The Presidents jointly shall develop and implement a plan that encourages and promotes alignment, cooperation, and collaboration between the College Park campus and the Baltimore campus. The plan shall: Identify competitor state peers for the University of Maryland to be used in funding guidelines.

Programs offered by UMB and UMCP are almost completely complementary, and make a unique and powerful combination. This means UMB and UMCP have very few real peers in competitor states, and finding a slate of true competitor state peers proved difficult. A committee of UMB and UMCP experts named by the Joint Steering Council, studied at length the peer lists for UMB and UMCP as identified by the Maryland Higher Education Commission. After reviewing the peer lists and carefully exploring options such as combining competitor peers, the committee recommended leaving the peer comparison for the individual campuses in place as it is today. Thus, *UMB and UMCP will continue to have separate competitor state peers* because any other option puts one or both campuses at a disadvantage in funding comparisons.

The Presidents jointly shall develop and implement a plan that encourages and promotes alignment, cooperation, and collaboration between the College Park campus and the Baltimore campus. The plan shall: Promote effectiveness and efficiencies between the campuses, including potential savings in human resources, procurement, and information technology.

An active committee of senior leaders from UMB and UMCP meets regularly to assess opportunities for alignment, cooperation and collaboration between the universities in four focus areas: procurement, finance, information technology (IT) and human resources (HR). The committee is actively examining existing systems and processes, as well as operations and contracts at UMB and UMCP, and throughout the University System. Proposed actions have completion dates ranging from one to 10 years. Accomplishments in 2020 are summarized below and on the following pages:

Procurement Initiatives

Goal: Increase savings targeted at a minimum of 5% or \$17.5M, on approximately \$350M in non-construction related spending, by leveraging the buying power of the two campuses while making the procurement process more efficient.

Title/Status	Description	Update on Activities
Vendor contracts In progress	Coalesce separate contracts held with the same vendor. Wherever it is feasible, UMB and UMCP will hold one contract with any given merchant. The current focus is on developing a joint contract for photocopiers. Both campuses have many contracts for copiers that are anticipated to be consolidated into a single contract.	UMB and UMCP continue to analyze data and complete project planning for this initiative. A detailed plan was developed for a consolidated contract for photocopiers. The request for proposal is in final review and with an anticipated issue date of November 19, 2020. Award of the consolidated photocopier contract is projected for the spring of 2021.
Master contracts In progress	Develop programs to stimulate higher use of master contracts. Whether shared or not, master contract usage on both campuses must increase if other contract savings initiatives are to succeed. Education, training, process efficiency and ease of use will be evaluated as mechanisms to increase usage.	UMB and UMCP's procurement teams are preparing a plan for development of consolidated master contracts. Both campuses continue to find synergy with the use of contracts for common goods and services.
Joint Purchasing of COVID-19 Personal Protective Equipment Closed	UMB and UMCP could potentially coordinate PPE purchases to obtain better pricing and availability and to avoid competing with each other in the marketplace.	It was determined that combined purchasing across campuses is not practical due to the varied needs of each campus. UMB and UMCP have been sharing information on market conditions and sources for difficult to obtain supplies.

Title/Status	Description	Update on Activities
Procurement related	Assist with other procurement related	Each procurement department is actively
initiatives in other focus	initiatives under SB1052 as needed.	engaged in several initiatives including
areas		human resource tool consolidation.
In progress		

Finance Initiatives

Goal: Identify and implement feasible alignment between the two campuses' financial operations, including but not limited to, financial systems, chart of account, policies, etc.

Title/Status	Description	Update on Activities
Travel merchant contracts In progress	Evaluate opportunities to renegotiate contracts with common travel merchants (air, rail, lodging, vehicle rental). Analyze steps to be taken to merge buying power between the two will be done. Execute on identified steps.	UMCP is piloting the use of Concur travel and expense software as an initial step toward full implementation. Improved analysis of spending and contract utilization is expected be an outcome, enabling higher negotiated savings on existing contracts. UMB is staying abreast of this initiative and will be working on identifying requirements for a travel and expense system as well as an alternative for processing purchasing card transactions and reconciliation.

Human Resources Initiatives

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Goal: Identify and implement feasible alignment between the two campuses' Human Resource operations, including but not limited to, HR systems, job classifications, policies, etc.

Title/Status	Description	Update on Activities
HR technology applications In progress	Review HR technology potential for each campus to migrate to one or the other's current HR sub applications. There are a number of key human resources systems that we have determined both campuses could share. The goal would be to have personnel data maintained in one database, where some standardization of processes could be established through system workflows and enhancements.	I-9 Tracker: UMB is reviewing UMCP's system. HireRight Background Checks: UMCP has adopted the Big Ten contract for conducting background checks with HireRight. UMB is listed as an affiliate on UMCP's contract. UMB is currently using HireRight while evaluating use of the UMCP contract. Both campuses plan to use standard background check content for like employee classifications. This initiative continues to be on hold pending a planned update to the UMCP policy on background checks which has been delayed due to the pandemic.
Joint purchase of HR ERP system Closed	Purchase a web-based cloud hosted HR system that would include functionality to help both campuses manage the employee full life cycle (hire to retire). The solution would be to have one comprehensive HR system that includes all the HR key components in the same system, including: applicant tracking, onboarding, position management, HR employee appointment, time and attendance, total compensation, talent management, performance management, succession planning, and off-boarding.	UMB selected Oracle Cloud ERP for Financials and plans to implement Oracle for human capital management (HCM). After lengthy evaluation, UMCP selected Workday for finance, HCM, and students. Due to the very different needs of each campus, it was not practical to use the same system for both campuses.
Joint Learning and Talent Development Training In progress	Collaborate on learning and talent development training including holding joint training sessions for employees of both campuses.	 UMB and UMCP have collaborated on the following activities: Sharing trainers for cross-campus leadership skills classes planned for fall/winter. Daily development emails and mini training modules for all USM employees who are now on LinkedIn Learning Platform. Planning a daylong personal development conference for employees of both campuses. The event will also be open to other USM schools.
Staff Sharing In progress	UMB and UMCP's HR offices are preparing a memorandum of understanding to facilitate sharing benefits staff members. Staff members from both campus would be trained so that they can serve employees from both campuses. This arrangement would be helpful when one campus is short staffed.	The MOU is scheduled to be completed by the end of December 2020.

Information Technology Initiatives

Goal: Identify and implement feasible technology unification between the two campuses.

Title/Status	Description	Undate on Activities
Kuali Research Pre- Award System data reporting In progress	UMB and UMCP will develop combined research productivity reports to show research productivity as one institution.	Approval was granted by the MPower Steering Committee to hire a data architect to help develop a common research administration reporting system. The position was filled and the individual started work on August 17, 2020. The data architect is working with both campuses to develop a system capable of generating consolidated research administration reports that will facilitate joint UMB and UMCP reporting to the National Science Foundation's Higher Education Research and Development Survey.
Availability of a unified identity and access management infrastructure In progress	Build a unified identity and access management infrastructure that would allow individuals at UMCP and UMB to use their ID and password to access systems at the other campus. UMB and UMCP should jointly move toward implementing the Internet2 TIER (Trust and Identity in Education and Research). This infrastructure framework has been developed which allows individuals at UMCP and UMB to use their respective university's ID and password to access systems at the other campus. The UMB/UMCP Seed Grant Program was the first application to be added to this technology unification framework and more systems will be added as the identity management project continues and evolves.	No new activity during current reporting period.
Cyber security In progress	Explore opportunities for strengthening the cyber security program at both campuses. Both campuses have IT security experts who work on securing and protecting university systems and data assets. Collaborating on information security services would reduce costs based on collective buying power and strengthen these two areas of information security at both campuses.	Both campuses are exploring opportunities for strengthening each campus' cyber security program.

Title/Status	Description	Update on Activities
Computing software In progress	UMCP and UMB will look for opportunities to share licenses and contracts for computing software to reduce costs and administrative effort.	UMCP explored adding UMB to its MatLab contract. MatLab is used for computational mathematics and specialized programming to analyze data, develop algorithms, create models and applications. The MatLab software sharing effort was not successful. MathWorks, the company that owns the MatLab software, did not allow the UMB/UMCP software sharing agreement.
Internet1 and the Maryland Research and Education Network (MDREN) In progress	This network provides the primary connection to Internet1 (the commercial Internet). The network capacity and services provided by MDREN are offered at affordable prices.	UMB participates with UMCP and with the other USM institutions in MDREN. MDREN has leveraged the collective partnerships of USM institutions to provide network bandwidth and network redundancy at significantly discounted rates.
Internet 2 and the Mid-Atlantic Crossroads (MAX) In progress	Internet2 is the high-speed research network that is limited to Internet2 members and affiliates.	UMB connects to the Internet2 network backbone via the Mid-Atlantic Crossroads (MAX) which is operated by UMCP. This high-speed Internet2 network is used extensively by UMB and UMCP students, faculty and staff every day. UMB and UMCP have developed a cooperative arrangement with the MAX, where UMB is provided access to this network and in exchange for this access, UMCP is permitted to keep MAX network equipment in the 300 West Lexington Street computing facility at UMB. This cooperative arrangement has greatly benefited both campuses.
Maryland Education Enterprise Consortium (MEEC) In progress	UMB and UMCP are collaborating extensively with other USM institutions, other higher education institutions, K-12 schools and leveraged the buying power of the Maryland Education Enterprise Consortium (MEEC).	 Examples where IT savings have been realized for both campuses include: USM-wide Cisco contract for network hardware maintenance New USM-wide Palo Alto contract for network security equipment Internet2 for waived egress fees for Microsoft Azure, Oracle Cloud, Amazon Web Services, and for Duo multi-factor authentication, and other Internet 2 services MEEC to achieve significant volume discounts for Microsoft licenses, Apple hardware, Dell computers and servers, and other software including: Symantec, Adobe, InCommon, Terminal4, Carbon Black, and MicroFocus; and for consulting services via the use of MEEC resellers that deploy and support enterprise applications (e.g., instructional technology systems, IT security-related systems)

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Title/Status	Description	Update on Activities
USM Information Security Council In progress	UMB and UMCP participate with all other USM institutions on the USM Information Security Council. The Security Council shares information regarding security practices, procedures and policies and works collaboratively on USM security standards which are checked for compliance by USM, State, and third-party auditors.	The Council is working on a new set of standards that has a strong focus on federal security guidelines. The Council receives and discusses information security updates and notices from many sources including the REN-ISAC (Research and Education Network – Information Sharing and Analysis Center) based at Indiana University.
Technology related initiatives in other focus areas In progress	Assist with other technology related initiatives in other focus areas (e.g. HR system, financial system, etc.). Consultant and institutional resources will assess and map current processes, business practices, and administrative functions at both campuses.	As appropriate to the other conversations, IT resources are included in the discussions.

The Presidents shall actively seek collaboration with other institutions and entities, particularly in the Baltimore metropolitan region, as appropriate, to benefit the state. The Presidents shall report annually to the University System of Maryland Board of Regents and the USM Chancellor regarding collaboration with the City of Baltimore, Prince George's County, and the City of College Park, in the area of community development.

UMB and UMCP have long histories of community engagement and collaboration with other institutions and entities in the Baltimore metropolitan area including the University of Maryland Medical System. In addition, UMCP manages the state extension service and the state experiment stations for the benefit of the people of the entire State of Maryland. The Presidents are committed to harnessing the power of the University of Maryland Strategic Partnership to expand collaborations in Baltimore, as well as in UMCP's home community of College Park and Prince George's County.

Both UMB and UMCP directly impact the lives of students and faculty, and provide economic impact to the communities where they reside. Both universities are engaged in on-going, major development that includes investments in new projects on and off campus in College Park and Baltimore. New buildings, designed to enhance teaching, research, and community interaction, will further attract students, faculty, and related businesses and in turn will generate activity and sales to support the local economy. For example, in early 2021, UMCP announced a new \$300 million development at the campus' entrance. It is the latest component in an ongoing revitalization of greater College Park. The plan includes new apartments for 800 students, and 21,000 square feet of retail at Knox Road and Sterling Place.

Other recent examples of community impact and collaboration include the following:

- The Center for Maryland Advanced Ventures (CMAV), created by the University of Maryland Strategic Partnership Act of 2016, has implemented a series of initiatives that encourage university-created or sponsored technology companies to locate and expand in Baltimore City. Since its inception in 2017, 18 companies have received support through conditional grants, creating or retaining over 400 jobs in Baltimore City. Of these grants, 12 emerging companies received lease subsidies to establish operations in Baltimore City, and six grants supported the direct expansion of existing companies.
- The University of Maryland S.A.F.E. (Support, Advocacy, Freedom and Empowerment) Center for Human Trafficking Survivors is a Strategic Partnership initiative providing comprehensive direct services, research, and advocacy to victims of sex and labor trafficking. The Center is located in College Park. Since launching in mid-2016, the Center has developed a state-wide reputation for excellence and timely intervention, and is supporting Maryland in its coordinated state, local and federal effort against human trafficking. In addition to MPower, the Center is supported by grants from Prince George's County, the Governor's Office of Crime Control and Prevention, and together with Prince George's County, by a grant from the U.S. Department of Justice.

- The Steering Council for the Strategic Partnership continues to explore ways to engage with the University of Maryland Capital Region Health/Prince George's Hospital Center. The acquisition of the hospital by University of Maryland Medical System and the opening of the new hospital in Largo, provide opportunities for new research, outreach and student training. Together UMB and UMCP have deep experience with community health and health disparities, primary care delivery networks, ambulatory care, and clinical research. New programs may expand student training, attract and retain health and social service professionals to Prince George's County, and improve health care provided to under-served populations in Maryland.
- Throughout 2020, the Strategic Partnership dedicated funding to cross-university academic programs and research collaborations designed to serve citizens in UMB and UMCP's home communities and across the state. A collaboration with the State of Maryland Department of Health (MDH) allows students from across UMB and UMCP schools to work with MDH, and MDH to connect to the state's resources at the universities. The program was expanded for summer 2021 to allow students from UMCP and UMB to learn and to support MDH on research on the impact of community health worker in rural areas, and a second study regarding incentivizing provider service in Maryland's underserved areas.

The University of Maryland Joint Steering Council consists of members appointed by the President of the College Park campus and the President of the Baltimore campus. The Council shall: Develop guidelines for faculty appointments that are joint between UMB and UMCP; make recommendations to the Presidents on joint faculty appointments.

The new collaborations in research and education between UMB and UMCP have fueled a desire to jointly hire new faculty and to create cross-campus appointments for existing faculty at both institutions. University appointments may take the form of affiliate, secondary, adjunct, visiting or joint appointments, and require different levels of detail to implement. Guidelines will ensure that each appointment is managed consistently, respecting the credential review that usually has already been done on the home campus.

The guidelines will state that all faculty appointments will be facilitated by the offices of the provost at each institution. Faculty appointment letters will include a faculty member's professorial rank and tenure status, the date on which the appointment is effective, the assigned Department, Center or Institute, and the primary institution in which the appointment will reside. The primary institution's responsibilities will include administering compensation, benefits and administrative support; setting the criteria for evaluation and conducting promotion, tenure and post-tenure reviews; and managing conflicts of interest. The professional conduct policies of each university will be followed while a faculty member is on the other institution's campus.

Discussions will continue regarding policies of promotion and tenure on each campus that will hopefully facilitate joint appointments at all levels. In addition, discussions will continue to develop principles that will outline the structure for detailing these appointments to include workload expectations, resources, professional conduct, etc.

Establish the Center for Maryland Advanced Ventures (CMAV) on the UMB Campus in Baltimore City; Presidents jointly appoint Executive Director.

The 11-page FY 2020 report from the Center for Maryland Advanced Ventures is included as an Appendix at the end of this document.

*** Please proceed to the Appendix on page 22 to read the formal, submitted report.***

Establish the University of Maryland Center for Economic and Entrepreneurship (UMCEED) on the UMCP campus; Presidents jointly appoint Executive Director.

The University of Maryland Center for Economic and Entrepreneurship Development (UMCEED), based at College Park, is focused on expanding academic and research programs that support economic development in the State of Maryland. UMCEED funds have been committed to a select and highly impactful group of programs.

To date, UMCEED funding has capitalized on Maryland's outstanding research and teaching programs in neuroscience through the formal establishment of the Brain and Behavior Initiative, which is solidifying connections across UMCP and between programs in College Park and Baltimore. UMCEED funds also have been used to strengthen and stabilize the internationally ranked (8th in the United States) program in Computer Science. Over \$2 million in UMCEED funds have been invested in recruiting and retaining extraordinary tenure track faculty and academic support staff to instruct over 3,700 undergraduate majors and 450 graduate students, allowing those students to graduate on time and meet the evergrowing workforce demands.

A summary of UMCEED investments follows:

Immersive Media Design Major

After several years of planning and collaboration, the UMCP Colleges of Arts and Humanities (ARHU) and Computer Mathematical and Natural Sciences (CMNS) jointly proposed to offer Bachelor of Science and Bachelor of Arts degrees in Immersive Media Design. The field of Immersive Media Design encompasses a broad spectrum of practices drawing from both the creative arts and computing sciences. It addresses emerging developments across both disciplines and utilizes practices in augmented and virtual reality, computer graphics and game programming, digital fabrication, software art, tangible computing and computer sensing, thus allowing for the creation of multisensorial content which actively engages with its participants through deep interactivity in both virtual and dimensional settings.

This major represents a substantive and unprecedented collaboration between STEM fields and the Arts and Humanities, and will prepare students to be leaders in the production of Augmented Reality, Virtual Reality, and the aforementioned related Immersive Media Design disciplines. Students from computer science and the arts will collaborate over the course of several semesters to jointly study and address some of today's most pressing questions about the role of technology as a creative medium. The development of this program will place UMCP at the forefront of an emerging field of study, and will attract talented students who we expect will remain within the State of Maryland, creating businesses, attracting technology companies, and contributing to economic growth.

Strong progress continues with respect to this innovative, interdisciplinary major. The Immersive Media Design program is on track to start in Fall 2021 (FY 2022). The program proposal was approved by the

Maryland Higher Education Commission and the University System of Maryland's Board of Regents. Now that the Immersive Media Design Major has been officially established, more work continues on curriculum development and the hiring of faculty, academic advisors, and staff. Labs and space are also being outfitted. We expect to see the first degrees awarded in FY 2024, assuming some students are able to transfer into the major in FY 2022. We anticipate that it will produce 60-100 annual undergraduate degrees starting in May 2024.

Brain and Behavior/Neuroscience Initiative

Maryland has outstanding research and teaching programs in neuroscience and wishes to build upon its existing strength by recruiting new leadership in this field and creating closer connections across the College Park campus and between programs at UMCP and UMB. For the last five years, UMCP has invested in the Brain and Behavior Initiative, successfully winning substantial research funding and procuring state of the art equipment to furnish the laboratories.

A Founding Director of the Brain and Behavior Institute is charged with establishing interdisciplinary research at UMCP and with UMB. The director will be charged with the recruitment of a cohort of world class scientists and the establishment of an array of laboratories and research facilities which will establish the University of Maryland and the State of Maryland as a nexus for research and education in the field of neuroscience. Resources to support this initiative will be drawn from UMCEED, The Clark Family Foundation gift, E-Novate funds and contributions from the Provost, Vice President for Research, and the Deans of participating colleges. Core facilities and labs for BBI will be housed initially in the College of Computer, Mathematical, and Natural Sciences as plans to complete renovations to the Cole Research Building move forward.

<u>Visiting Fellows in Neuroscience Initiative</u>

The long-standing and highly regarded graduate program in neuroscience (NACS) at UMCP will be an integral part of this new Institute, providing training for graduate students from around the world, and facilitating lab rotations and research opportunities for students at UMB as well as at UMCP. The first call for UMCEED-funded Visiting Graduate Fellows in Neuroscience Program went out in Fall 2020. The program will enable cross-campus training by neuroscience graduate students to promote enhanced collaboration between research groups in Baltimore and College Park. The program will provide funding for research rotations of UMB's Program in Neuroscience (PIN) students at College Park and UMCP's Program in Neuroscience and Cognitive Science (NACS) students at Baltimore.

Neuroscience Undergraduate Major

Our newly established undergraduate major in Neuroscience will also be integrated into the Brain and Behavior Institute. This new major will help address a critical need to recruit and train talented students at UMCP who are interested in health care, allied health careers, biomedical industries, and clinical psychology; but it will also provide a very strong foundational major for students interested in computational data science, artificial intelligence, and virtual and augmented reality. The Neuroscience major successfully launched in Fall 2020, despite the emergency conditions of the pandemic. There are 62 majors as of Fall 2020, of which 47 are new freshmen. We continue to expect strong interest from our students, although students will not graduate before Spring 2023, assuming some are able to transfer into the major. The additional \$500,000 allocated in FY 2021 will allow us to hire additional faculty, and we expect that this will expand the number of degrees by approximately 200 over the original estimate of 100 (300 in total). This is the first intra-college major on the UMCP campus. The major is now projected to grow over a three-year period to a steady state of at least 600 students within two years of launching. The new neuroscience major will encourage more academically talented Maryland residents to stay in-state for undergraduate training, thereby increasing the probability that they will contribute to the local medical and allied health professions workforce later, rather than going out-of-state for college and graduate training.

The establishment of a strong and cohesive brain and behavior community will increase UMCP and UMB's appeal to talented faculty performing cutting edge, multidisciplinary research. Synergy with the emerging MPower initiatives and related entities such as the Center for Brain Health, and Human Performance will afford medical support and collaboration opportunities for existing and new faculty in brain research, amplifying clinical trial capabilities at UMCP while elevating and extending our competitiveness to acquire external funding from leading federal agencies.

College of Information Studies (iSchool): Continued support of the Information Science undergraduate major and specializations in cybersecurity, digital curation, and information management There has been an extraordinary amount of growth in the iSchool over the past few years, spurred by the tremendous success of new undergraduate majors and specializations.

In Fall 2016, the College of Information Studies (iSchool) launched the Information Science undergraduate major at UMCP. This major combines information technology skills, data analytics, design thinking, and domain knowledge to prepare students for careers in information management, systems development, and information security. The Information Science program has been extremely popular and successful and has enrolled more than 1,100 students, 250 of whom have graduated and entered the workforce in information technology, security, and system management. More than 90% of Information Science students had jobs immediately following graduation. Demand remains high, with approximately 900 students currently enrolled and 350 students entering the program each year.

For Fall 2019, a specialization in cybersecurity was launched at College Park by leveraging Workforce Development funds received for FY 2020. This specialization will increase the number of Information Science students who are prepared for careers in information security. The cybersecurity courses we were able to offer at College Park in Fall 2019 with current faculty were fully enrolled. In FY 2019, 213 students were awarded bachelor's degrees, and in FY 2020 there were 333 graduates. In Fall 2020, there are 1216 majors. We expect to see an increase in the number of graduates, and when fully implemented we estimate an additional 150 degrees will be produced. The Shady Grove program currently has grown from 22 majors in its first year of delivery (Fall 2018) to 86 majors in Fall 2020, with 19 students in its first graduating class in Spring 2020. We look forward to expanding the instructional resources at Shady Grove and continue to believe we will eventually be able to produce 100 new graduates, although we anticipate it will continue to take time to ramp up the student enrollment.

In Fall 2019, the iSchool also launched a specialization in digital curation and management which builds on Information Science fundamentals to prepare students for careers in information and systems management. This specialization builds on the iSchool's history of preparing students at the Masters level for information management jobs, as well as developing substantial strengths in document and data management, as reflected in the Digital Curation Innovation Center (http://dcic.UMCP.edu/), an internationally recognized resource for education and thought-leadership in this area. The digital curation and information management courses offered in Fall 2019 with current faculty, were fully enrolled.

Computer and Data Science

UMCP received FY 2021 Workforce Development Initiative (WDI) funds to launch a new Academy of Computer and Data Science Education. The proposal was developed in response to the recommendations of a task force convened by the Provost in Fall 2017 to provide recommendations on enhancing the effectiveness and connectivity of UMCP's programs in Computer Science (CS), Data Analytics, and related disciplines. A faculty task force completed its work and produced a plan to establish this academy which will provide critical instruction in computing for students across the campus, regardless of major. In addition, two new majors are under development, one addressing the technical/hard science aspects of Data Science, the other addressing the social and behavioral science aspects. When the funding is leveraged in FY 2021 (\$1,250,000), we expect to begin in FY 2022 and to begin to produce certificates in FY 2023. It is difficult to predict the ultimate number of credentials, but we continue to believe that 500 is feasible.

The investment of \$1.56 million in workforce development initiative funding to support undergraduate instruction in computer science has been effective. In 2017, there were 2,758 CS majors, and that year 378 bachelor's degrees were awarded, representing 14% of the total majors. By 2019, there were 3,404 CS majors and we awarded 656 bachelor's degrees, representing 19% of the majors. With the implementation of a limited enrollment program in computer science, the number of majors has stabilized but the number of degrees granted continues to increase, up 12% in 2020 relative to 2019.

Encouraging students across campus to take courses in computing and data sciences will produce many more graduates, beyond those in the core majors, who will have the knowledge base to contribute directly to the workforce in areas such as Machine Learning, Data Management and Analytics, Artificial Intelligence, and related fields. Students in the humanities and social sciences and other non-STEM fields need these skills today. With this initiative we intend to make such opportunities available at least at a general level to every undergraduate at UMCP and in more depth to many more than just those in the traditional STEM majors.

In addition to general knowledge there are many areas of data science and computing at large that lend themselves to interdisciplinary courses, tracks, certificates or programs. These include: Smart Cities, Computational Medicine, Machine Learning and other Artificial Intelligence techniques, Robotics, Augmented and Virtual Reality, and many others. Some areas could justify a full major or graduate program, while others may be best offered as certificates or specialized tracks.

The Academy of Data Science Education will support and coordinate various teaching initiatives across campus in Data Science, and its associated computing fields. The Academy will help bring together faculty with related teaching interests, looking for opportunities to collaboratively develop course material or programs of study. It will also facilitate development and staffing of new cross-disciplinary programs in computing and data sciences.

Once fully realized, we believe that the Academy of Computer and Data Science will ultimately impact all (approximately 30,000) undergraduates at UMCP through the provision of targeted instruction that will enhance the skills and workforce readiness of all graduates. The creation of "connector courses" will impact non-STEM majors and increase the number of certificate programs, minors and joint major programs as a result.

On or before December 1, 2016, the Presidents shall study and recommend to the Chancellor of the USM mechanisms that would permit the joint reporting for national university rankings of the campuses of the University of Maryland, including reporting under a unified federal identification number.

The UMB and UMCP Presidents studied and recommended to the chancellor on December 1, 2016, mechanisms that would permit the joint reporting for national university rankings. Since then, the Presidents with the Joint Steering Council took steps to implement those recommendations to demonstrate how the University of Maryland is functioning as one research institution.

In January 2021, The University of Maryland achieved its highest ranking ever in the National Science Foundation's (NSF) Higher Education Research and Development (HERD) survey for FY 2019, placing 14th overall nationally and 7th among all public institutions in Research & Development (R&D) spending. For the first time, UMCP and the UMB were linked together as one research enterprise in the ranking, with combined research expenditures of \$1.1 billion.

The HERD survey is the primary source of information on R&D expenditures at U.S. colleges and universities and is widely recognized as the preeminent national university ranking for higher education institutions engaged in sponsored research.

The joint reporting of Maryland's total expenditures is a direct result of Senate Bill 1052, which codified the UMB and UMCP relationship in law. UMB and UMCP first explored aligning research activities in 2012, when the MPower partnership was launched. Both UMB and UMCP conduct advanced research in a broad array of fields, and the complementary pairing of the two opened up exciting opportunities for approaching research together. When the General Assembly passed the University of Maryland Strategic Partnership Act, UMB and UMCP linked the two research offices more formally, aligning not only research projects but also infrastructure and leadership. A single leader with responsibility for research collaboration and strategic direction was appointed to enable investigators to work more easily together, thus providing the opportunity for exciting new areas of impactful research. In 2018, the UMB and UMCP Presidents appointed Laurie E. Locascio, PhD to lead the joint research enterprise as Vice President for Research, expanding a role Dr. Locascio held at UMCP since 2017. Reporting to both Presidents, she manages the combined research enterprise in Baltimore and College Park. It features a single reporting office for institutional research reporting to external agencies; a combined electronic research administration system; and a shared services approach to administration. A research office website serves as a portal to the research enterprise that comprises the University of Maryland. UMB and UMCP are identified as the University of Maryland by a single, federal identification D-U-N-S number through Dun and Bradstreet.

The Presidents of the University of Maryland campuses (UMB, UMCP) and other campuses serving the Baltimore metropolitan region shall develop a joint plan to advance employment levels in Baltimore City, including the creation of entry level employment opportunities for individuals that include a plan for on-the-job skills training that will result in a measurable employment skill, certification or license.

The Presidents of UMB and UMCP are committed to strengthening economic and community development and working with community partners and anchor institutions in Baltimore to advance employment levels.

Work continues to advance employment in Baltimore City and to build on a platform of relationships. UMB has a long history of collaboration with Baltimore City and the Mayor's Office of Employment Development; community partners like the Southwest Partnership, the Chesapeake Center for Youth Development and Bon Secours Community Works; industry partners like Humanim; other universities; and anchor institutions like the medical systems in East and West Baltimore.

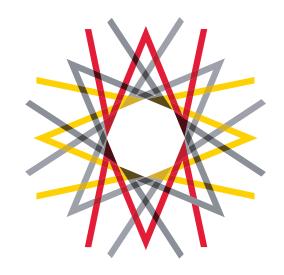
The Southwest Partnership is a coalition of seven neighborhood associations and six anchor institutions in Baltimore City near UMB's campus. Workforce development is a priority, and the partnership continues to look for support to address the unemployment needs of residents, and connect resources to residents. UMB's Office of Community Engagement and its Office of Human Resources collaborate with the partnership to reduce barriers to employment and to develop workforce opportunities. One mechanism is the creation of a referral program to connect residents on the west side of the City with jobs at UMB, as well as with the University of Maryland Medical Center, University of Maryland Midtown, and University of Maryland Faculty Physicians. As part of the initiative, applicants are guaranteed that their resume will be seen by the institution. This program collaborates with "Workforce Wednesdays", offered weekly by the UMB Community Engagement Center to provide services and resources to the community. UMB staff provide information and training in job readiness, resume writing, interview training, and other skills needed to keep job seekers on the right track.

Appendix

Center for Maryland Advanced Ventures (CMAV) FY 2020 Report

CENTER FOR MARYLAND ADVANCED VENTURES

FY 2020 REPORT



CENTER FOR MARYLAND ADVANCED VENTURES **OVERVIEW**

The University of Maryland Strategic Partnership Act of 2016 created and funded the Center for Maryland Advanced Ventures (CMAV), which launched on July 1, 2017. The legislation provides \$4 million annually to strengthen the commercialization of high-potential, university-based discoveries. Located in Baltimore City on the University of Maryland, Baltimore campus, CMAV is led by Jim Hughes, Director of CMAV and UMB's Senior Vice President and Chief Enterprise and Economic Development James L. Hughes, MBA Officer.



CMAV has implemented a series of strategic and thoughtful initiatives to fulfill its legislative mission of facilitating technology transfer, identifying research projects that can be commercialized, and developing programs to support that commercialization. The initiatives connect to and expand existing UM Ventures programming, enhancing support for the advancement of technology commercialization. Through collaboration with TEDCO and the Maryland Department of Commerce, CMAV is able to leverage existing Maryland programs, ensuring they are fully integrated with and complimentary to CMAV initiatives. CMAV works with these entities to continually augment offerings to address emerging technologies. In FY2020, additional programs were created in response to COVID-19.

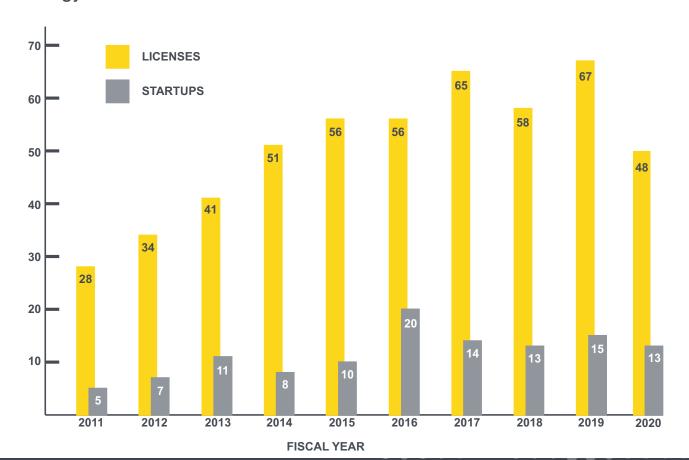
TECHNOLOGY COMMERCIALIZATION



Since UM Ventures was formed in 2012, there has been a dramatic increase in technology transfer activities at both UMB and UMCP. In FY2020, UM Ventures recorded 333 new disclosures, 48 licenses, created 13 new start-ups, and was awarded 17 Maryland Innovation Initiative (MII) grants. Licensing results in FY2020 were depressed due to economic turmoil related to the COVID-19 pandemic, however, start-up creation remained strong and included several enterprises directly related to addressing COVID-19.

Strategic industry partnerships have strengthened and the portfolio of high-profile start-ups has increased. These goals have been achieved through the concerted effort of UM Ventures staff and industry outreach.

In addition, targeted initiatives have been created to support and advance technology transfer and commercialization.



SPECIALIZED FACILITIES

Specialized facilities have been created at UMB to further foster technology commercialization.

 A 650 sq. ft. wet laboratory with molecular and cell biology capabilities and specialized equipment was opened in the UM BioPark in FY2020 and is staffed by UMB's Office of Technology Transfer (OTT).

 After significant work with leading UMB surgeons to expand the development of novel medical devices, a medical device innovation and

rapid prototyping space was created in collaboration with the University of Maryland School of Medicine (UMSOM). Located in the UMSOM and connected to the University of Maryland Medical Center, the space facilitates easy access for surgeons. OTT and the Robert E. Fischell Institute for Biomedical Devices will provide direct support, enabling CAD drawings, 3D printing, rapid



prototyping, and streamlined patent filing, all of which will support the rapid expansion of UMB's medical device portfolio. This effort is financially supported by significant philanthropic contributions to UMSOM.

LIFE SCIENCES IP FUND

21 TECHNOLOGIES

3 UMB START-UPS FORMED

The Life Sciences IP Fund provides proof-of-concept and external validation funding to accelerate commercialization of technologies at UMB. Since the program's inception in February 2018, CMAV has assisted 21 early-stage technologies, including 10 device and 11 therapeutic technologies, in moving towards commercialization. All have received project management support along with funding for technology validation and further development. Three new UMB start-ups, Isoprene Pharmaceuticals, Protaryx, and GEn1E Lifesciences, have been formed as a result of the program. Both Protaryx and GEn1E Lifesciences have successfully completed initial financing rounds, and Isoprene recently executed a sublicense agreement with Hoth Therapeutics.

INSTITUTE FOR CLINICAL & TRANSLATIONAL RESEARCH

17 PROJECTS FUNDED

COVID-19 PROJECTS

UMB's Institute for Clinical & Translational Research (ICTR) is the first Universitywide interdisciplinary hub for clinical translational research and training. CMAV funds supported this unique center which operates as part of a consortium with JHU. ICTR funded 17 general projects and 10 COVID-19-specific projects in FY2020. Of these, it is anticipated that 21 have potential technology transfer value. UMB's Office of Technology Transfer works closely with UMSOM on this initiative and aa joint program manager facilitates interaction. CMAV also supported patient-oriented research and Phase II clinical trials through ICTR.

ARTIFICIAL INTELLIGENCE & MEDICINE FOR HIGH IMPACT CHALLENGE AWARD

The Artificial Intelligence & Medicine for High Impact Challenge Award (AIM-HI) was launched by UMB and UMCP to support innovation in the fields of artificial intelligence and medicine. Four joint UMB/UMCP research teams were selected for funding.

MEDICAL DEVICE DEVELOPMENT FUND

\$200K AWARDS FUNDING COVID-19 PROJECTS

The Medical Device Development Fund launched in October 2018 with the purpose of contributing to a meaningful milestone that would advance a medical device technology towards commercialization. In FY2020, the Fund focused on proposals that would contribute to the commercialization of evidence-based medical devices related to the COVID-19 pandemic. The technologies utilize UMB and UMCP strengths in medical devices (e.g., Robert E. Fischell Institute) and related innovation (e.g., computer technology) to rapidly contribute to human health and related outcomes with respect to COVID-19 or the causal virus (SARS-CoV-2), including prevention, control, and response efforts. Awards of \$50,00 each were made to four joint UMB/UMCP projects.

ONEX

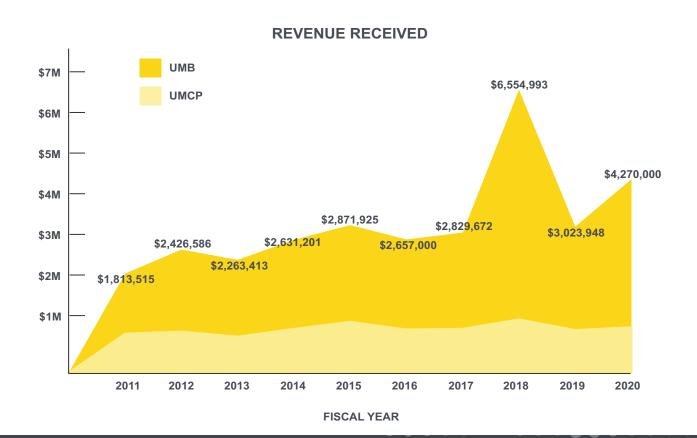
OnEx, UM Ventures' online express license store which offers a streamlined licensing experience for select software and materials, processed 39 transactions in FY2020. The store creates an additional access point for industry to peruse technologies that are routine and ready to be commercialized. Plans are underway to streamline the payment system to support an increase in the number of transactions.

VALUE OF LICENSED TECHNOLOGIES

It is difficult and highly speculative to value technologies when they are first licensed, however, the technology transfer revenues to UM Ventures increased in FY2020 to \$4.25 million. UM Ventures has also seen four acquisitions of UMB technologies in three years.

Additionally, equity raised by UM Ventures start-up companies is a good indicator of the value of the technology and the strength of the management team.

Publicly disclosed equity raised by our start-ups exceeded \$12 million in FY2020. Two UMB start-ups, SurgiGyn and Breethe, were sold in FY2020 with undisclosed terms. SurgiGyn also recently announced a Series B investment of \$7 million.



MARYLAND MOMENTUM FUND

9 INVESTMENTS

\$1.8M INVESTED

A collaboration between UM Ventures and the University System of Maryland (USM), the Maryland Momentum Fund (MMF) is a \$10 million early-stage investment fund that invests in Maryland-based, USM-affiliated start-up companies. With input from 28 review panels, the external advisory board reviewed 21 companies for investment in FY2020, approving nine. A total of \$1.8 million was invested by MMF and other USM institutions. To date, MMF has invested a total of \$4.6875 million in 16 companies (including several follow-on rounds), representing five USM campuses. MMF's investment has been matched by \$21 million from more than 20 co-investors. This 5:1 match of USM dollars far surpasses the original goal of a 2:1 match. Portfolio companies have created 66 new jobs and increased their valuation substantially.

CMAV funds a full-time Director based at UMB, partially funds additional staff based at UMCP, and covers operational expenses for the program. MMF staff work with all 12 USM institutions to solicit applications for funding and provide advice and support to entrepreneurs across USM campuses.

PRESIDENT'S ENTREPRENEURIAL FELLOWSHIP

The President's Entrepreneurial Fellowship program provides UMB and University of Maryland, College Park Robert H. Smith School of Business MBA students the opportunity to learn first-hand the unique challenges of commercializing life science technologies. Mentored by UM Ventures staff, the Fellows work on interdisciplinary teams, commercializing UMB-owned technologies. Seven students from four UMB schools were accepted into the 2019-20 cohort. The Fellows again worked with Isoprene Pharmaceutical, this year focusing on preparing for pre-clinical animal safety studies of toxicity and metabolism and an SBIR submission. Plans were created to move the President's Entrepreneurial Fellows program to an online platform for the 2020-21 cohort.

GRADUATE RESEARCH INNOVATION DISTRICT

The Graduate Research Innovation District (Grid), created in 2017, fosters student entrepreneurship through a variety of educational opportunities, entrepreneurial resources, and programming. Co-located with startups in the UM BioPark's Lion Brothers Building's innovation space, the Grid gives students a peek into the day-to-day life of an entrepreneur building their company. The Lion Brothers Building, along with CMAV, provides early-stage



companies with the space and services needed to grow their ventures.

START-UP TENANTS

UM BioPark tenants in the Lion Brothers Building include a number of startup companies, such as b.well and ARMR, the Grid, UMB Graduate School, the Small Business Development Center, and the Carey School of Law IP and Business Law Clinic.

During FY2020, two Lion Brothers start-up companies achieved significant growth. CMAV supported seven additional early-stage companies in making the Lion Brothers Building's innovation space their headquarters.

b.well

b.well, a health IT firm founded in 2015 with five employees, grew to more than 50 employees nationally and graduated from the Lion Brothers space at the end of the fiscal year.

ARMR

ARMR, a medical device company engineering a next-generation tourniquet, tripled their leasing space, expanding into a new suite of offices within the Lion Brothers Building, raised a \$750,000 seed round which included a \$350,000 joint investment from UMB and MMF, established a strategic relationship with the R Adams Cowley Shock Trauma Center, and hired additional employees.

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STUDENT PROGRAMS

The Grid's opportunities for student entrepreneurs and innovators expanded with nearly 900 participants in more than 20 programs. Additionally, eight teams participated in the Grid Pitch, an annual showcase where students pitch their innovative business ideas to a panel of experts and investors. Final presentations were held virtually due to COVID-19 restrictions.



In September 2019, the Grid became home to the UMB Graduate School's MS in Health and Social Innovation. Six students formed the inaugural cohort.

At the end of FY2020, the Grid relocated from the UM BioPark to the main UMB campus. The new location in the Health Sciences and Human Services Library (HS/HSL) provides a more central convening destination for students, faculty, staff, and the community. The innovation space in the UM BioPark's Lion Brothers Building continues to house early-stage companies.

SMALL BUSINESS DEVELOPMENT CENTER

The Small Business Development Center (SBDC), the Federal small business outreach entity, is supported by CMAV with funding and space. With two locations, one on the main UMB campus and one in the UM BioPark's Lion Brothers Building's innovation space, the SBDC is strategically positioned to provide direct assistance to local and University-affiliated entrepreneurs. **During FY2020**, they served 358 new clients in Baltimore City, resulting in the creation of 108 jobs and 21 new businesses. They also provided over \$18 million in 81 SBA loans and an additional 39 COVID-19 funding actions.

INTELLECTUAL PROPERTY LAW AND ENTREPRENEURSHIP CLINIC

The Intellectual Property Law and Entrepreneurship Clinic (IPEC), supervised by Patricia Campbell, law school professor, and two part-time clinical law instructors, engaged 24 second- and third-year law students (12 each semester). The students gained valuable work experience providing 117 clients with general counselling on basic business law, the protection of trade secrets, and preparing nondisclosure agreements. They also assisted with the formation of four new Maryland limited liability companies and worked with clients to file five copyright registrations, 50 trademark applications, and 19 patent applications. Service was suspended on March 5, 2020 due to COVID-19 restrictions, but will resume once the University returns to standard operations.

GRANT ACTIVITIES

ANCHOR VENTURES

Anchor Ventures harnesses the collective expertise and influence of local universities, key stakeholders, entrepreneurs, and investors to foster the collaboration and education of Baltimore's innovation ecosystem. Led by a cohesive team of entrepreneurial staff from UMB, Johns Hopkins University (JHU), the USM Chancellor's Office, and University of Maryland, Baltimore County (UMBC), Anchor Ventures provided six programmed events during FY2020. When COVID-19 shuttered in-person



events, the Anchor Ventures team transitioned to a virtual series, collaborating with the Chesapeake Digital Health Exchange (CDHx) to provide a four-part digital health series in May 2020. Over the course of the series, there were more than 365 live attendees and thousands of post-event views of the content. Anchor Ventures received a grant from the Maryland Department of Commerce to support programming in FY2021.

MARYLAND DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT SEED GRANT

A SEED Grant from the Maryland Department of Housing and Community Development (DHCD), is supporting UMB's development of additional entrepreneurial infrastructure in West Baltimore. The \$750,000 grant provides funding to off-set the development of District Hall, an 11,400 sq. ft. innovaton space in the 4MLK, UM BioPark's planned 330,000 sq. ft. mixed-use building. District Hall will provide places where companies of all sizes, stages, and industries can build their businesses and connect with one another as well as regional anchor institutions. Wexford Science + Technology, the developer of 4MLK, is matching the award. UMB is leveraging its innovation expertise by teaming with DHCD to help revitalize the historic Packing House in Cambridge, Maryland.

BALTIMORE FUND

18 COMPANIES

400 Jobs

The Baltimore Fund encourages University-created or -sponsored technology companies to locate and expand in Baltimore City as specified in the legislation. The program is open to all Maryland public higher education institutions and is administered by UMB. Through engagement with Maryland's entrepreneurial ecosystem and its myriad support programs and resources, including TEDCO, Baltimore Development Corporation, and the Maryland Department of Commerce, the Baltimore Fund helps facilitate the growth of companies.

- Since its inception in 2017, UMB has provided conditional grants to 18 companies. To date, these companies have created and/or retained over 400 jobs in Baltimore City.
- Of these grants, 12 emerging companies received lease subsidies to establish operations in Baltimore City, and six grants supported the direct expansion of existing companies.
- The Baltimore Fund collaborates with six Baltimore City locations and USM institutions located in Baltimore to source and house the emerging companies.
- Companies receiving Baltimore Fund conditional grants represent four USM institutions and a wide array of technologies.

FY2020 METRICS SUMMARY

- 1. Technology transfer transaction efforts at UMB and UMCP have been augmented with CMAV initiatives, resulting in 333 disclosures, 48 licenses ,and 13 new start-up companies in FY2020.
- UM Ventures staff created new programs and services to increase the pipeline of technologies that will likely convert to technology transfer opportunities in future years.
- 3. CMAV initiated extensive outreach to University entrepreneurs and industry partners, and developed multiple strategic initiatives to deliver funding, educational, and programmatic support.
- 4. UM Ventures received revenue in excess of \$4 million in FY2020 from technology transfer activities.
- 5. Publicly disclosed equity raised by UMB start-ups exceeded \$12 million in FY2020; non-disclosed equity was significantly higher.
- 6. Direct support was provided to entities affiliated with UMB, UMCP, UMBC, University of Maryland, Eastern Shore, University of Maryland Global Campus, Towson University, and University of Baltimore in FY2020.
- 7. New programs were created to encourage IP creation and development in response to the COVID-19 pandemic.

RECOMMENDATION FOR FY2021

- Support connections between tech transfer activities and research parks/ incubators.
- Strengthen connections with local angel networks and national venture capital companies.
- Ensure outreach to and inclusion of underserved populations in activities.
- Create more opportunities to educate interested USM faculty, staff, and students on technology transfer opportunities and entrepreneurial skills.