



Office of the President

January 16, 2018

The Honorable Governor Larry Hogan
100 State Circle
Annapolis, MD 21401

The Honorable Thomas V. Mike Miller, Jr.
Senate President
State House, H-107
Annapolis, MD 21401

The Honorable Michael E. Busch
House Speaker
State House, H-101
Annapolis, MD 21401

Dear Governor Hogan, Senator Miller and Delegate Busch:

In accordance with State of Maryland Senate Bill 1158, enacted May 28, 2016, the Morgan State University (MSU) Board of Regents is providing an annual report on the MSU Office of Technology Transfer (OTT), which is an entity within the Division of Research and Economic Development (D-RED).

Enclosed, therefore, is the referenced report which covers the OTT activities for 2017. Please feel free to contact my office, if additional information is needed.

Kind regards,

David Wilson
President

Enclosure

cc: Dr. Victor McCrary
Dr. Gloria Gibson
Mr. Sidney Evans

Ms. Sarah Albert
Ms. Sara Baker
Ms. Andrea Thomson



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OFFICE OF TECHNOLOGY TRANSFER

December 2017 Progress and Status Report

In accordance with State of Maryland Senate Bill 1158, enacted May 28, 2016, the Morgan State University (MSU) Board of Regents is providing an annual report on “the implementation of the plan to enhance the Office of Technology Transfer and on the capacity of the Office to move technology into the marketplace.”

Morgan State University’s Division of Research and Economic Development (DRED), through its Office of Technology Transfer (OTT), is pleased to report significant progress in the implementation of its Technology Transfer Strategic Plan. During the first 6 months of the current 2018 fiscal year, innovations are being received at an average rate of *one new Intellectual Property Disclosure per fifteen (15) days, and U.S. patent applications are being filed at a rate of one per month.* In a comparative assessment, these innovation output performance metrics are three times the national average for US research universities, per equivalent research and development (R&D) expenditures (innovation input metric). That is, per R&D dollar invested (input) at Morgan, innovation outputs are being generated at three times the national average of research universities ¹. (N.B. Morgan State University’s 2016 R&D Expenditures were \$15.7M according to the National Science Foundation’s annual Higher Education Research and Development Survey – NSF-HERD. Morgan State University is currently classified as a ‘Doctoral Research University’ by the Carnegie Institution)

As Maryland’s Preeminent Public Urban Research University, Morgan is focusing its technology transfer efforts on the creation of new start-up businesses in Maryland - with a special emphasis on Baltimore City. Furthermore, the University believes it is not enough to facilitate new company start-ups based on university innovations. Morgan’s OTT is focusing on retention of these new companies locally, related manufacturing operations and associated jobs, through its technology transfer licensing agreements.

The progress made by Morgan in the technology transfer arena would not be possible without the support of the State of Maryland. As Morgan’s technology transfer operations mature, and the increasing number of Morgan innovations move through the tech transfer pipeline, we project a significant increase in innovation outcomes (issued patents, licenses, new business start-ups).

Enhancing the Office of Technology Transfer



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The University's technology transfer staff, with over 30 years of technology transfer leadership experience, has started to build and manage the intellectual property portfolio of the University. The OTT staff has experience in technology assessment, marketing, business development, IP protection, licensing, commercialization, new business start-ups and equity investments. The OTT offices are centrally located on the main campus with outreach engagement to the Patuxent Environmental & Aquatic Research Laboratory (PEARL) located in rural Calvert County.

Policies, Procedures and Guidelines – To foster faculty and staff entrepreneurial activity, the University is implementing a new policy and procedures for Conflict of Interest in Research and Economic Development, approved in 2017 by both the University's Board of Regents and the Maryland State Ethics Commission. A new comprehensive Intellectual Property Policy has been approved by the University Council and is in the final stages of the approval process. The OTT has developed technology transfer procedures and initiated the development of a series of technology transfer guidelines for faculty, staff, and students.

Innovation Works: *Translating Innovation into Jobs* – The OTT Innovation Works Initiative (I-Works), consists of programs for campus faculty, staff and students, as well as outreach to engage the community. The overarching goal of I-Works is translating innovation into local economic development opportunities and jobs. Early results of three I-Works programs are described below. Other Innovation Works programs are in development and will be described in future reports.

Increasing Innovation Outputs through University In-Reach Programs

Through OTT in-reach programs, the office is engaging individuals, departments and colleges/schools through informational presentations and in assisting with the development of technology transfer plans for campus units. OTT has initiated a new MSU Technology Transfer Website, to serve as a main portal for tech transfer information for faculty/staff and the external community. The framework has been developed for a new Technology Transfer newsletter - to provide the campus community and industry with a source of information on MSU innovations, activities and programs. Also, the development of an OTT program to recognize and reward innovation is near completion.

Morgan Intellectual Property Disclosures (innovation output) have increased dramatically since the passage of the Senate Bill in 2016, with twenty (20) new innovations being disclosed to the OTT. As stated earlier, on average since July 1, 2017, the office has received a new Morgan innovation every 15 days. Although most of the innovations originate from the School of



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Engineering and the School of Computer, Mathematical & Natural Sciences, there has been widespread participation across fourteen departments and eight schools/colleges. While the OTT is being recognized as main point of contact for faculty and staff innovations, it also serves to provide guidance to student innovators/entrepreneurs.

Morgan innovations encompass a wide range of technological fields, demonstrated by the following ten (10) examples: microbial production of bio-fuels; internet-of-things network security; environmentally friendly on-site system to remove poultry litter waste; a nanotechnology-based treatment of gout; oyster farming equipment; efficient combustion engines for UAVs; an early stage test for pancreatic cancer; energy efficient inventory location systems; a supply chain instructional module; and a storm water assessment system.

I-Works I-GAP program strives to enhance the commercial viability of Morgan technologies by bridging the "Gap" between laboratory inventions and the marketplace. The program is designed to increase the likelihood of transferring a Morgan invention to business and industry by enhancing existing innovations and improving the scope and value of the University's intellectual property. Seven projects are in process with an additional nine planned for implementation by the end of FY 2018.

Increasing Innovation Outcomes through Business Community Engagement

The OTT is accelerating technology transfer by actively engaging the Maryland business community and entrepreneurs in Technology Push and Market Pull projects, which focus on start-up company formations. There are currently ten (10) innovations that OTT has targeted as new business opportunities. One company, recently formed by local entrepreneurs, will establish business and manufacturing operations in Baltimore City.

I-Works ISO program reaches out to both new and seasoned entrepreneurs, and businesses in-search-of (ISO) innovations for new local technology based businesses. The program also connects and matches Morgan's students, with new and early stage MSU technology startup companies ISO employees. The OTT has initiated two technology development projects with Maryland businesses as part of both the I-Works ISO and I-Works Community programs. These projects have already generated two new joint U.S. patent applications. In addition, Morgan, and a new startup company is receiving an award under the Maryland Industrial Partnerships (MIPS) program for technology development to benefit Maryland poultry farmers, as well as the University has executed its first license agreement for its technology that will benefit this agricultural sector of Maryland's economy.



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I-Works Community program engages the Morgan Community Mile (MCM), Baltimore City and other regional and business communities to promote innovation and technology transfer. The goal is the creation of new businesses and jobs - to enhance the University's local, regional and state economic and societal impact. OTT has initiated two I-Works Community programs: I-Works Community MCM, with local focus in northeast Baltimore City; and I-Works Community Aquaculture, a Morgan PEARL aquaculture business community effort.

Working with TEDCO

In accordance with SB 1158, Morgan has actively engaged with TEDCO in a number of technology transfer initiatives. Serving as a key university resource to facilitate new business development, the TEDCO Maryland Innovation Initiative (MII) program has assisted Morgan through the award of five (5) TEDCO MII university funded projects, and a recent MII funded investment in a Morgan start-up company. In addition, four Morgan faculty/entrepreneur teams have completed the TEDCO I-CORPS training program for new business start-ups. Furthermore, TEDCO has facilitated introductions between Morgan's OTT and local entrepreneurs, looking for new start-up company opportunities. Through its programs, TEDCO continues to be the single most important State entity facilitating technology transfer successes in Maryland.

Technology Transfer Performance Metrics

In accordance with the OTT Strategic Plan, Morgan has targeted five key technology transfer innovation output and outcome performance metrics. The innovation output metrics are: Intellectual Property Disclosures (innovations) and US Patent Applications. The innovation outcome metrics are: Issued US Patents, Technology Transfer Agreements (licenses), and Start-up Companies. In establishing specific output and outcome performance metric goals Morgan evaluates its performance against other U.S. research universities with respect to the amount of research funding. The Association of Technology Transfer Managers (AUTM) has been providing technology transfer statistics for U.S. research institutions for more than 25 years, and provides statistics on university research expenditures (input) and innovation output and outcomes. Morgan's metric goals (innovation outputs and outcomes) have been established and are being measured against the national averages per equivalent amount of R&D expenditures (innovation input). The table below indicates the status of Morgan's technology transfer metrics with respect to goals.



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Office of Technology Transfer Annual Performance Metrics and Status

Technology Transfer Metric Classification ⁴	Association of University Technology Managers Data ¹		Morgan Goals Based on University R&D Expenditures ²	Morgan Projections for FY 2018 ³
	Tech Transfer Metric	U.S. Average Data ¹		
Output	Invention Disclosures	132	6	20
Output	US Patent Applications Filed	85	4	12
Outcome	Issued US Patents	36	2	1
Outcome	Licenses Executed	39	2	2
Outcome	New Start-up Companies	5	1	2
Input	Research Expenditures (\$ Millions)	343		

¹ Association of University Technology Managers (AUTM) 2016 data for 195 U.S. research institutions.

² Goals are based on achieving national averages for these Output and Outcome metrics per equivalent amount of university R&D (Input).

³ Projections are based on 6 month performance data (e.g., 11 Invention Disclosures were submitted to Morgan in first 6 months of FY 18).

⁴ Innovation Outcomes lag behind Innovation Outputs (i.e., issued patents typically lag behind patent applications by 2-3 years)

Morgan’s short term goal is to achieve technology transfer output and outcome metrics at a rate above the average of US research universities/R&D expenditures. Albeit a noteworthy short term goal, especially considering Morgan’s comparatively late entry into the tech transfer arena, Morgan’s long term technology transfer metric goal aims much higher. First, per equivalent R&D expenditures, the University seeks to achieve relative innovation output and outcome performance metrics to rank in the top 25 among US research universities. Second, the University seeks to be the national leader among its peer HBCU institutions in innovation output and outcome metrics.

With State funding beginning July 2017, the technology transfer program is in the final 6 months of the start-up phase of its Strategic Plan. During this time, the University has exceeded its performance metric expectations. For example, based on rate of invention disclosures generated/R&D expenditures at US research universities, Morgan would expect to generate six invention disclosures per year. The university has almost doubled that innovation output number (11) in only six months - and is on pace to receive twenty (20) or more invention disclosures in FY18.

The University looks forward to aggressively implementing Phase II of its Technology Transfer Strategic Plan and reporting the progress made towards full maturity of the office. Increased investment by the State of Maryland into the research enterprise at Morgan State University will





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increase innovation outcomes. Targeted investments into Morgan's niche programs in cybersecurity and oyster aquaculture will increase the University's research expenditures leading to a subsequent increase in innovation outputs, and further lend gravitas to the State of Maryland's designation to Morgan as *'Maryland's Preeminent, Public, Urban Research University'*.



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