



UNIVERSITY SYSTEM *of* MARYLAND

TESTIMONY TO THE BUDGET COMMITTEES OF THE GENERAL ASSEMBLY *Regarding* THE USM FY2019 CAPITAL BUDGET REQUEST

Including Response to Analysis concerning

ITEM RB36 **FACILITIES RENEWAL (STATEWIDE), THE UNIVERSITIES AT SHADY GROVE and the SOUTHERN MARYLAND HIGHER EDUCATION CENTER**

By Robert L. Caret, Chancellor

Thank you for the opportunity to testify on the Governor's FY 2019 capital budget recommendations for the University System of Maryland (USM). I intend to keep my testimony very brief and speak to the issues raised by the legislative analysts. Before I do so, however, I would like to express my sincere thanks, on behalf of the entire System, to Governor Hogan for his support of our capital request; and I wish to thank each of you, and all the members of this Committee and the General Assembly for the support you have provided the University System of Maryland over the years. As demand for jobs by companies in the STEM and healthcare industries continues to grow, so does our need to modernize and expand our facilities to support key academic programs and research. As I said during our operating budget hearings last month, your support of our priorities demonstrates—once again—Maryland's commitment to higher education. It is this commitment that sets us apart from—and above—our competitors in the knowledge economy. This commitment to the USM is matched by the USM's commitment to Maryland.

THE USM CAPITAL BUDGET

As a System, we urge full funding of the Governor's FY2019 budget recommendations for our institutions. We rely heavily on our campus infrastructure to deliver quality academic programs and house critical research. During these hearings, each president is responding on behalf of their own institution; and I would like to add my own voice in support of their needs. We understand your desire to balance the needs of higher education against a variety of other needs in an environment of constrained resources and we appreciate your consideration on behalf of our institutions. We know you're making difficult choices to accommodate these needs and we urge your continued support.

SYSTEM-WIDE FACILITIES RENEWAL (STATEWIDE)

Our Strategic Plan states that we will be good stewards of our facilities. Reducing our backlog of deferred maintenance is a high priority for me and for our Board, and we concur with the analyst's recommendation that the System-wide Facilities Renewal (FR) budget be funded in full. These funds are a critical piece of an overall approach the Regents are taking to address the problem of deferred maintenance. The Board's program encourages increases in operating expenditure for facilities renewal toward an annual spending target of 2% of the replacement value of campus facilities, as well as a high proportion of renovation and replacement projects in the capital improvement program.

Despite the budgetary challenges, we've seen a new level of commitment among our institutions to address the critical needs of aging buildings. We are also taking innovative steps to bring more resources to bear in this important effort. For instance, during last year's session, you authorized our Board of Regents to establish a quasi-endowment fund to provide annual funding for renewal and replacement spending to maintain. Together with the operating and capital renewal funding, we consider it an investment in excellence.

BIOMEDICAL SCIENCES & ENGINEERING EDUCATION FACILITY (SHADY GROVE)

The University System of Maryland and the Universities at Shady Grove (USG) greatly appreciate your support of the Biomedical Sciences and Engineering Education Facility (BSE). We concur with the analyst's recommendation that the project be funded in full. This instructional facility, located in Montgomery County along the I-270 corridor, is programmed to support the needs of the region's projected workforce, especially in science, technology, engineering, mathematics and medical sciences (STEMM).

With the addition of the BSE, USG will be able to provide state-of-the-art laboratories, active learning classrooms, clinical training facilities, academic offices, and an expanded level of student services necessary for program and enrollment growth in these fields. And as Amazon continues to review Montgomery County as a potential site for their proposed HQ2, the State's continued investment in a growing higher education center at Shady Grove will demonstrate Maryland's continued commitment to fostering talent in the region.

The analyst asked:

"USM is developing and negotiating an MOU between the Universities at Shady Grove and institutions that will offer programs at the center. The Chancellor should comment on MOUs that have been signed and what programs are slated to be offered when the facility opens in 2019." (Page 38)

USM Response:

MOU's signed and funding allocated from USG to institutions (from Chancellor's enhancement funds)

- UMCP - BS, Information Science (Fall 2018)
- UMBC, BS, Translational Life Sciences Technologies (Fall 2018)

MOU's under development for BSE programs to start Fall 2019

- UMBC, BS, Computer Sciences with a concentration in Cybersecurity
- UMBC, BS, Computer Science with a concentration in Data Science
- UMBC, BS, Translational Life Sciences Technologies, concentration in Bio-informatics
- UMBC, BS, Mechanical Engineering

Additional programs scheduled to start Fall 2019

- SU, MS, Applied Health Physiology

We are also engaged in a number of conversations involving programs that might be offered in future years.

SOUTHERN MARYLAND HIGHER EDUCATION CENTER (ST. MARY'S COUNTY)

The University System of Maryland (USM) is excited by the potential the proposed merger with the Southern Maryland Higher Education Center (SMHEC) creates. In combination with the new academic instruction, engineering & research building the USM is about to construct on the SMHEC campus, the merger will create an unprecedented opportunity to support new educational opportunities for students and the workforce throughout Southern Maryland, further drive STEM-related research and development, particularly in the growing field of

unmanned and autonomous systems, and promote greater economic innovation and diversification across the region.

The analyst has suggested eliminating funding for this project, delaying construction by at least a year and perhaps reducing the size of the building. I cannot overemphasize the negative impact of such a decision on what has the potential to be a major—even a once-in-a-generation—economic opportunity for our State. In our written testimony (below) we’ve outlined the reasons for what is seen as an enrollment decline in engineering and we’ve outlined ways we expect to build enrollment in a number of programs, including engineering, at the Center. The System and our partners at the Center, including non-USM institutions, are confident the new facility will serve to attract and retain students. But the impact of this project goes well beyond enrollment figures.

The already highly successful University of Maryland unmanned aircraft systems test site, the Naval Air Warfare Center Aircraft Division (NAWCAD), the US Navy Naval Air Systems Command (NAVAIR), local government, and commercial companies are coming together to help build an unprecedented innovation ecosystem in Southern Maryland in the rapidly developing field of unmanned and autonomous systems. Not only is the proposed new building at the Southern Maryland Higher Education Center seen as a catalyst for this economic cooperation, but the new building is expected to become the hub of the research and development that will continue to drive this growth forward.

This new facility is key to maintaining our competitive edge in the quickly moving, highly unique industry that is potentially quite profitable for the State. Given the growth of this technology, even a year’s delay could set us back to the point that other states will pass right by us in terms of cornering the grants and contracts that should have come to Maryland, not to mention the lost jobs in growing industries tied to the commercialization of this technology. We urge you to reject the analyst’s recommendation and support the Governor’s budget for this new facility.

Current Status

The project is in design. The construction documents are nearing completion and the project is slated for construction to start this summer. The University System of Maryland is requesting \$29,365,000 in GO Bonds in FY 2019 to construct and equip the Southern Maryland Higher Education Center. A second appropriation of \$46,257,000 to complete the project is requested in FY2020.

The analyst asked:

“Once the new facility is completed, UMCP plans to expand enrollment in the electrical engineering program to 20 students. However, the recent downward trend in enrollment, particularly in engineering programs, raises concerns about the program mix and if SMHEC is offering programs that meet the demands of the workforce. The Chancellor should comment on factors contributing to the decline in enrollment, particularly in the engineering programs and if the program mix at the center is being reevaluated to ensure programs are being offered that meet the region’s workforce demand.” (Page 41)

USM Response:

The enrollment decline is short-term

The field of engineering is experiencing one of the greatest periods of growth since its founding in the 1800s. Figure 1 (below) displays the steady growth in engineering freshmen applications and first year enrollment numbers. Thus, recent fluctuations in enrollment data is a result of a number of factors that should improve dramatically once a dedicated facility is available for engineering education and research.

Federal sequestration and furloughs of staff, a significant source of the Center’s students, have had a significant impact in recent years on SMHEC engineering enrollments. The loss of pay, combined with the cancellation of

Tuition Reimbursement Assistance for all federal employees was directly responsible for the loss of class enrollments at SMHEC, particularly in engineering programs offered by non-USM entities.

From the USM’s perspective, as we look at our (USM) engineering enrollments at Southern Maryland, while we don’t see a dramatic enrollment swing in our core engineering programs at SMEHC – particularly the undergraduate engineering programs offered by UMCP, which are holding steady – we do feel that the new building will serve to attract more students and that we will be able to expand the sizes of the cohorts in the BS engineering programs.

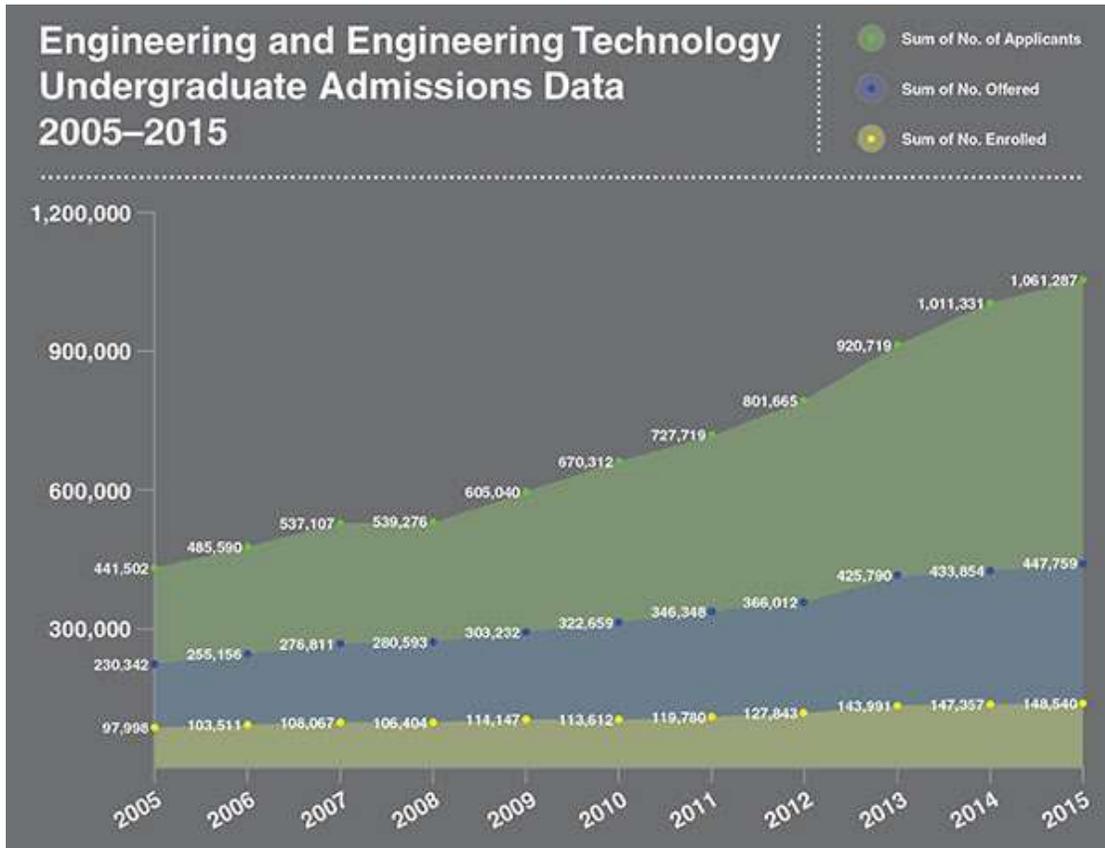


Figure 1

It’s also important to remember that the Center is focused on addressing the broader workforce preparation and training needs in the Southern Maryland Region. Engineering programs are only one element of those needs. The USM also offers teacher preparation, graduate level nursing, criminal justice, business management, social work, and other programs at SMHEC, and plans to expand the presence of such programs going forward. When we look at enrollments across all USM programs offered at SMHEC we see strong growth in those programs--a 29% increase over 4 just years.

Finally, there are multiple components to the new building – general classrooms that will serve different types of programs, engineering teaching labs sufficiently sized to allow expanded cohorts to take core courses, and of course, the critical research lab space. Focusing on short term enrollment changes in just one of those areas misses seeing the potential academic impact of the project as a whole.

Steps being taken to increase enrollment

As we noted in the USM overview testimony on the FY 19 budget, the System is committed to working with the leadership at SMEHC to stabilize and begin expanding enrollment at the Center. The decision by both the Governing Board of the Southern Maryland Center and the Board of Regents to merge the Southern Maryland Center into the USM—officially settling the question of how the Center will operate in the future and the role of

current institutions, including non-USM institutions, in those operations—will have a positive and stabilizing impact, alleviating the uncertainty that has surrounded the Center and its operations for the last three years, reassuring current institutional partners.

As testament to this, MICUA, the group representing all Maryland private institutions currently operating programs at Southern Maryland and the provost at Notre Dame of Maryland University, testified this past week in support of Senate Bill 903/House Bill 1143, which advances the merger between SMHEC and USM. In its testimony, MICUA restated its commitment to the Center, and emphasized the positive impact it sees the new building, in combination with the USM merger, having on the educational and economic development of the Southern Maryland region.

As the Center is merged into the System, the USM will focus on bringing more programs and expanding enrollment at the Center using the experience gained from building successful programs at our regional centers at Shady Grove and Hagerstown. This includes seeking to expand the mix of programs offered at the Southern Maryland Center to include more undergraduate as well as graduate programs, as well as building a stronger relationship with the College of Southern Maryland. Such efforts will be responsive to the greater education and training needs of the Region and are likely to include additional programs in K-12 education, information technology and computer science, health care, and business, as well as engineering and other fields.

The SMHEC Board of Governor's chairman has assured that the staff will continue up through the merger their efforts to recruit new programs that will help the Center increase program offerings and concomitant enrollments in technology and engineering fields through non-USM institutions. New technology graduate degree programs in Electrical Engineering, Mechanical Engineering, Aerospace Engineering, Computer Information Systems, and Computer Science have been recruited from the Florida Institute of Technology for onsite delivery at SMHEC. These programs were approved by the SMHEC Board of Governors in November 2017 and are currently under review at MHEC.

Furthermore, the SMHEC Board chairman and the chair of the SMHEC curriculum committee have initiated meetings between local education leaders in St. Mary's County that include the president of the College of Southern Maryland, the president and provost of St. Mary's College of Maryland, and the superintendent of St. Mary's County public schools to strategically plan how they can leverage each other's strengths to provide the best possible educational, certification, and training opportunities to the community, and that the USM Vice Chancellor for Academic & Student Affairs, and the Associate Vice Chancellor for Accountability and Planning will participate in this strategic planning.

Finally, the Naval Air Warfare Center Aircraft Division (NAWCAD) and the US Navy Naval Air Systems Command (NAVAIR), working with UMD, are designing additional educational programs to move into the enlarged SMHEC, including a recently started Masters in autonomous technologies, and other new advanced courses in unmanned and autonomous systems, and now Artificial Intelligence (AI). AI is the driver for breakthrough developments in unmanned systems. These courses will support both Navy and civil/commercial workforce needs.

The analyst asked:

“Due to concerns that the justification for the project does not support the scope of the project, the Department of Legislative Services recommends deleting the appropriation for the project. In addition, USMO should submit a report reevaluating the project and include an assessment of the current and planned program offerings and how programs will meet the workforce demands of the region.” (Page 42)

USM Response:

We are confident that the established scope of the project, as approved by the Department of Budget & Management in the Part I and Part II program, is appropriate and justified. The goals for the project are not only educational, but also economic; and the project has the potential to be transformative for the Southern Maryland region and for the State as a whole.

The vision for the facility is to create a project that helps to meet a broad range of educational, research, and technology testing and commercialization needs and opportunities that currently exist, or are projected to soon develop, in the Southern Maryland region. These needs range from additional K-12 teacher preparation to health care training, to advanced research and engineering opportunities in unmanned and autonomous systems.

To refocus the scope of the project based on a decline in enrollment in just one component—and primarily in only one segment (the non USM institutions) of that component— at this stage of the planning process could be counterproductive to the success of the project overall.

With that said, the USM is constantly assessing the cost effectiveness of our projects and looking for ways to find enhanced efficiency while maximizing impact. We will continue to do that as the new facility prepares to break ground this summer.

Potential economic impact of the proposed facility

Economic and Workforce Development in Southern Maryland are the primary drivers for the development of this new facility; and the long-term benefits of the research and educational programs planned for the Center will benefit the entire State.

The Association of Unmanned Vehicle Systems International (AUVSI) has projected that the unmanned and autonomous systems industry will create more than 70,000 jobs nationally by 2020, with an economic impact of \$13.6 billion. By 2025, they estimate that more than 100,000 jobs will be created with an economic impact of \$82 billion. Within Maryland, AUVSI has projected that integration of these technologies could have an economic impact of \$2 billion and create 2,500 jobs. Southern Maryland is likely to benefit from the projected growth in unmanned and autonomous systems because of the federal and state institutions located in the region.

The federal Naval Air Systems Command and the Naval Air Warfare Center Aircraft Division are expected to generate significant Unmanned Aircraft Systems (UAS) activity in the tri-county region of Southern Maryland (Calvert, Charles and St. Mary's Counties). In addition, the University System of Maryland has established a UAS test site at the St. Mary's County Regional Airport as part of the Mid-Atlantic Aviation Partnership with Virginia and New Jersey.

The Southern Maryland Higher Education Center provides extensive training programs for both the Navy and local businesses. The new building will assist in the training of the workforce needed to sustain the unmanned autonomous system industry in Southern Maryland.

Key achievements to-date

The new facility is critical to maintaining and growing the already successful unmanned aircraft systems operations in the region. Since the state provided a \$500K grant in 2012 for competing for an FAA UAS Test Site award, the location at the St. Mary's County Regional Airport, adjacent to the proposed new building, has become one of the busiest UAS flight test sites in the nation, and the one with the widest customer set of any test site. In addition:

- The University of Maryland, College Park has taken on the management of a brand-new technology incubator, TechPort at the airport, focused on advanced technology including unmanned and autonomous systems.
- Another building was erected to house the expansion of an existing prototype, integration and light manufacturing aerospace company (Pax Aero)

- Four other buildings began ground clearing this week, one of which will be an expansion of the UMD UAS Test Site facilities in partnership with the Navy and industry customers. The other three buildings at the site are already committed to industry partners.
- St. Mary's County has moved forward on the FAA-approved expansion of the runway and operating environment of its airport. Increasing its length from 4,300' to 5,400' allows a larger class of aircraft to use the facility and enables more aerospace work, aircraft maintenance and rework, and light manufacturing.
- A large international aircraft leasing corporation has bought a local aerospace company, AirTech, in support of moving more aircraft operations to the St. Mary's Airport. A new hangar was erected to house this operation, including three newly refitted polar research DC-3 aircraft, the most advanced in the world at this time. Up to 17 more aircraft are envisioned moving to the airport.
- In 2015 the FAA awarded the UAS Center of Excellence (COE) to a Mississippi State-led team made up of twenty-two of the world's leading research institutions and more than a hundred leading industry/government partners, named the ASSURE team (Alliance for System Safety of UAS through Research Excellence). The Center of Excellence will be the conduit through which the majority of FAA-funded and guided research will be awarded. The Southern MD UAS Test Site was selected as one of the test site partners for the UAS Center of Excellence

Unmanned and autonomous systems figure prominently as the top priority for diversified economic development in the latest St. Mary's County economic development strategy (CEDS) and is mentioned throughout the CEDS document. The academic and research activities in the proposed new building are crucial to this opportunity. The document states:

Unmanned and autonomous systems are emerging industries nationally with tremendous growth potential... According to author Randy Rhodes... "This current stage of (unmanned autonomous vehicles) UAV evolution might be compared with the earliest emergence of mobile phones.... UAVs are essentially aerial robots that will become increasingly autonomous and collaborative...."

St. Mary's County is one of the few locations in the nation that can support testing of unmanned and autonomous vehicles in both restricted and unrestricted air space, on the ground and underwater in the deepest depths of the Chesapeake Bay and in the turbid conditions of the Potomac and Patuxent Rivers. In 2015, the Maryland Department of Commerce published a report... that states that the "market size projections for small UAS which would include consumer and commercial applications [will be approximately] \$80B by 2025..." This same report contained the names of 10 companies leading Maryland's UAS industry. Four of those companies have a presence in St. Mary's County and each is locally owned.

Researchers from Towson University's Regional Economic Studies Institute (RESI) looked at the UAS industry in SMC in an attempt to determine the growth and economic impact of this industry. NAICS codes (North American Industry Classification System), a classification system used to classify business establishments according to type of economic activity, typically used for such research, do not break out the UAS industry separately, however. Therefore, researchers looked at industries that include UAS work... According to RESI's research, these industries have grown dramatically in SMC in the past decade:

- *Since 2005, St. Mary's County has seen a 40 percent increase in these industries that include UAS work, a 27 percent increase in the number of employees, and a 38 percent increase in average weekly wages.*
- *In 2015, industries that include UAS work in St. Mary's County generated an estimated \$2.4 billion in output, and nearly \$1.0 billion in wages.*
- *The total fiscal impact associated with industries that include UAS work in St. Mary's County amounted to \$45.9 million in state and local tax revenues annually.*

Critical facilities provided in the current program

None of the two existing buildings at the Southern Maryland Higher Education Center has research space or space specifically designed for an electrical engineering program. Specialized research space is needed to conduct flight testing of unmanned aircraft systems and for other research activities. For example, high bay space with 20 foot ceilings is needed to test unmanned aircraft. The research that will be conducted in the third academic building will support the University System of Maryland's UAS test site and the Navy. SMHEC estimates that, within eight to ten years, research revenues could range from \$3 to \$5 million per year.

Instructional lab space is also needed to support the new electrical engineering program. Students in the electrical engineering program will be required to have at least two credits of Advanced Technical Laboratory as well as two credits of a junior level microelectronics course. Lab based courses are important because they enable students to better understand engineering principles and to acquire technical skills.

Only three of the 31 classrooms in the two existing academic buildings at the Southern Maryland Higher Education Center are large enough to hold 32 students. Institutions that offer courses at the Southern Maryland Higher Education Center are now requiring larger classrooms that can accommodate up to 36 students. The new building will include five of these larger classrooms. The additional academic space in the new building will enable the Southern Maryland Higher Education Center to expand other academic programs.

CONCLUSION

In conclusion, let me once again thank you for your attention to our needs. We would be happy to answer any questions you might have.

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Rev 3/11/18*